

ORIGINAL ARTICLE

## Psychological Effects of COVID-19 on Mental Health and Related Factors among Workers of a Beverage Industry in Tehran, Iran

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### ABSTRACT

The aim of this study was to evaluate the psychological effects of COVID-19 on mental health and related factors among worker in one of the drink industry. The present analytical cross-sectional study was performed in Tehran Province, Iran. All workers in the drink industry participated in this study. Three online questionnaires, namely demographic information, Impact of Event Scale-Revised (IES-R), and Stress-Anxiety-Depression questionnaire DASS-21 were distributed among the participants through social networks (WhatsApp and Telegram) to collect data. The results suggested that 79.6% of respondents rated the psychological impact of the break as moderate; 27.9% reported moderate depressive symptoms; 25.2% reported severe or extremely severe anxiety symptoms; 19.7% reported moderate stress symptoms. The majority of respondents were aware of the transmission routes (96.6%) and the dangerous and deadly virus (51.7%) that were significantly associated with lower levels of depression ( $P < 0.05$ ). The majority of the respondents (90.5%) performed protective behaviors, such as wearing masks and gloves, using disinfectants, and so on against COVID-19 on a daily basis. 63.3% of respondents were concerned about getting infected COVID-19 virus that was significantly associated with a greater psychological impact of the outbreak and higher levels of stress, anxiety, and depression. In addition, 66% of the respondents always performed protective behaviors during their work shift, and 53.7% of them were satisfied with the support receiving from their workplace. Considering the growing trend of the COVID-19 epidemic worldwide, it is suggested to improve the workforce health conditions that employers and practitioners to develop new work instructions, to design online psychological interventions, to provide personal protective equipment items, etc.

**KEYWORDS:** Anxiety, Depression, Stress, Epidemic, COVID-19, Psychological Response

### BACKGROUND

The new Coronavirus (COVID-19) entails a large family of viruses that can cause a variety of respiratory infections from colds to more serious illnesses, such as MERS and SARS. Recently, this virus has been named COVID-19 and its outbreak began in December 2019 in Wuhan, China. This

unknown and new virus could threaten the current advanced world with all superhuman technologies. The Corona Virus Disease-2019 (COVID-19) epidemic is spreading worldwide, and the majority of countries, including Iran, have been affected. The COVID-19 spread vastly in some geographical areas

of society. This local spread means that some people in an area are infected with the virus; however, it is not clear how or where they have become infected [3].

Given the prevalence of this pandemic disease, it has affected or even paralyzed almost all important economic, political, social, and even military sectors in all the countries around the world. In addition, it is highly important to consider the psychological effects of this viral disease on individuals' mental health at different levels of society [4]. Due to the pathogenicity of this virus, its rate of spread and death percentage maybe the roots of affecting the mental health of people at different levels of society from infected patients to health care workers, families, children, students, and psychologically patients; moreover, it has put different jobs at risk in different ways [5-6-7].

The results of several studies on patients with COVID-19 symptoms in China during the spread of the disease have reported the emergence of a number of psychological disorders, such as anxiety, fear, depression, emotional changes, insomnia, and post-traumatic stress along with an increasing rate of these patients [8]. In this regard, Lin et al. carried out a qualitative study and examined the sources and symptoms of the psychological stressors in which Chinese nurses were involved during Ebola treatment in Sierra Leone. They concluded that appropriate and planned actions as well as psychological and social support by the community may reduce their stress and psychological pressure [9]. In another study, Kim investigated nurses' experiences of caregiving to patients with the acute respiratory syndrome in South Korea. He argued that it was not enough to focus on nurses' healthcare to deal with patients' infectious diseases, psychological care however was needed to reduce stress and tension. Currently, due to the absence of effective treatment and vaccines, the best way to deal with the disease is to prevent the spread of the virus by means of protective measures and personal hygiene [10].

Psychological factors, such as stress, anxiety, tension, and negatively impact or weaken the immune system and make it vulnerable to diseases such as the corona. As a result, people need to learn appropriate strategies to tackle these traumatic factors [11]. Considering the rapid spread of this disease and the

paucity of research in this regard, it seems necessary to do more research to help identify the disease and its related psychological factors. In particular, the development of the best ways to deal with this virus is an essential strategy that may improve workers' quality of life and community general hygiene.

## OBJECTIVES

To date, no study has been conducted to assess the psychological effects of coronavirus on an Iranian occupational community population. So, this study was aimed to first investigate the mental health status in a sample of the worker population during the COVID-19 outbreak, in terms of the psychological impact caused by the pandemic (including the impact of the event), anxiety, depression, and stress. The second goal was to examine that to what extent the following variables were associated with psychological impact, anxiety, depression, and stress: (1) demographic variables (e.g., age, gender, and education); (2) lifestyle variables (e.g., smoking and physical activity); (3) work-related variables (e.g., work experience and job unit); (4) perceived health status (e.g., symptoms experienced in the last 14 days); (5) contact with the COVID-19 virus (e.g., knowing someone who is infected by coronavirus); (9) information-related variables (e.g., knowledge and awareness of COVID-19); and (10) protection measures (e.g., wearing masks and gloves, using disinfectants).

## METHODS

The current analytical cross-sectional study was conducted between 6th of March to 4th of April, 2020. All personnel of a drink company (147 people) in Tehran constituted the statistical population of this study. The census sampling method was used for data collection. Due to the special conditions of the society and the elimination of physical contact through paper as well as traffic and social communications restrictions, census sampling method and online implementation were applied.

The structured tools used in this study consisted of the questions covering several areas, including (1) Demographic data; (2) Physical symptoms in the last 14 days; (3) History of contact with people with the COVID-19 over the past 14 days; (4) Knowledge and concerns about the COVID-19; (5)

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Preventive actions against the COVID-19 over the past 14 days; (6) Psychological impact of the COVID-19 outbreak; and (8) Mental health status.

**1. Demographic data:** The demographic data were collected based on gender, age, education, marital status, employment status, and monthly income. All the participants were asked to answer about physical symptoms over the past 14 days including fever, chills, headache, muscle aches, cough, and shortness of breath, dizziness, sore throat, and persistent fever.

**2. Depression, Anxiety, and Stress Scale (DASS-21):** Lovibond (1995) developed this questionnaire in two forms. The main form of this questionnaire has 42 phrases that evaluate the psychological structures of depression, anxiety, and stress in 14 different phrases. The short-form consisted of 21 phrases that measure a psychological factor or structure. The subjects should mark the severity of the symptoms in each item that they have experienced over the past week. Questions were scored based on a Likert scale between 0 and 3. The validity and reliability of scales were already conducted and approved by Iranian researchers and its reliability was reported as 0.77, 0.66, and 0.77 for depression, anxiety, and stress, respectively [12].

**3. Impact of Event Scale-Revised (IES-R):** The psychological impact of COVID-19 was measured using the revised impact of event scale (IES-R) which is a self-administered questionnaire and its psychological impact has been confirmed for Iranian society ( $\alpha$  Cronbach=0.67-0.87). The 22-items questionnaire consisted of three subscales, namely avoidance, intrusion, and hyperarousal. The total IES-R score was divided into these categories, i.e. 0-23 (normal), 24-32 (mild psychological effect), 33-36 (moderate psychological effect), and 37 < (severe psychological effect) [13-14].

In the current study, a questionnaire was first designed and the related data were collected through social networks (Telegram and WhatsApp). Data were analyzed using SPSS version 24 whereas both descriptive and analytical methods of linear regression were employed.

## RESULTS

### A. Demographic variables and psychological effects:

The mean value and standard deviation of the respondents' age were  $35.13 \pm 6.26$  and the participants were aged between 22 to 57 years old. The majority of respondents were male (85%), married (72.1%), and had an operational position (57.1), also 43.5% of respondents had a bachelor degree and work experience of 1 to 5 years (25.9%), and a moderate financial status (69.4%). Demographic variables including age, gender, marital status, education, employment, and work experience had no significant association with DASS and IES-R scores. Although, operational job unit was significantly associated with the increased anxiety among workers ( $B= 2.68$ ,  $CI= 0.12-5.24$ ).

### B. Lifestyle and psychological effects:

The results showed that 40.1% of the respondents had a daily exercise or physical activity. In addition, 13.56% of the respondents had smoking experience and 11.6% of them were alcoholics. There was no significant association between their lifestyle and psychological effects relating to the COVID-19 during the epidemic.

### C. Job conditions and psychological effects:

The results of Table 1 showed that 65.3% of the respondents were satisfied with their current work shift schedule, but 56.5% were dissatisfied with long shifts at work due to their fear of developing COVID-19. Accordingly, 8.2% of them had thought about resignation because of the prevalence of COVID-19. In this regard, job shift satisfaction and long-term work shifts had no significant relationship with cognitive effects. The lack of desire to resign from work had a significant negative relationship with IES-R score ( $B=16.93$ ,  $CI=6.27-27.59$ ), DASS stress subscale ( $B= 5.16$ ,  $CI=1.37-8.96$ ), DASS anxiety subscale ( $B=4.10$ ,  $CI = 1.20 -7.0$ ), and DASS depression subscale ( $B = 5.35$ ,  $CI = 1.11-9.59$ ).

Table 1. The relationship between job condition and its psychological impact during epidemic

Variables	N (%)	IES		Stress			Anxiety			Depression			
		R-Squared (R <sup>2</sup> )	Adjusted R-Squared (AR <sup>2</sup> )	Beta (95% Confidence Interval) B (95% CI)	R <sup>2</sup>	AR <sup>2</sup>	B (95%) CI	R <sup>2</sup>	AR <sup>2</sup>	B (95%) CI	R <sup>2</sup>	AR <sup>2</sup>	B (95%) CI
<b>Performing daily protective behaviors against COVID-19</b>													
Agree	133 (90.5)			-0.61 (-13.52-12.28)			1.57 (-2.73-5.88)			0.27 (-3.07-3.62)			1.17 (-3.62-5.98)
Disagree	8 (5.4)	0.000	-0.017	0.54 (-16.16-17.24)	0.031	0.017	5.33 (-0.24-10.91)	0.015	0.002	2.45 (-1.87-6.79)	0.064	0.051	*7.70 (1.49-13.92)
Do not know	6 (4.1)			Reference			Reference			Reference			Reference
<b>Believe in the usefulness of protective behaviors</b>													
Yes	142 (96.6)			4.57 (-11.03-20.18)			1.10 (-4.15-6.36)			1.06 (-3.03-5.16)			-0.43 (-6.39-5.51)
No	1 (7.0)	0.009	-0.005	19.75 (-14.68-54.18)	0.022	0.008	10.25 (-1.35-21.85)	0.003	0.010	3 (-6.03-12.03)	0.025	0.011	11 (-2.12-24.12)
Do not know	4 (2.7)			Reference			Reference			Reference			Reference
<b>Performing protective behaviors regularly during shifts</b>													
Always	97 (66.0)			1.82 (-16.25-19.90)			2.10 (-4.04-8.26)			0.52 (-4.22-5.28)			2.74 (-4.21-9.70)
Sometimes	40 (27.2)	0.013	-0.008	-0.52 (-18.99-17.94)	0.006	-0.15	2.65 (-3.62-8.49)	0.004	-0.017	-0.01 (-4.86-4.83)	0.010	-	3.68 (-3.42-10.79)
Rarely	7 (4.8)			-5.42 (-26.72-15.85)			2.19 (-5.05-9.43)			0.76 (-4.83-6.35)			3.61 (-4.57-11.81)
Never	3 (2.0)			Reference			Reference			Reference			Reference
<b>Intention to perform protective behaviors daily until the end of the Covid-19 epidemic</b>													

<b>Agree</b>	137 (93.2)			5.29 (-5.91-16.50)			1.17 (-2.63-4.98)			0.12 (-2.80-3.05)			<b>1.45</b> <b>(-2.85-5.77)</b>
<b>Disagree</b>	2 (1.4)	0.008	-0.006	-0.37 (-24.73-23.98)	0.004	- 0.010	2.75 (-5.52-11.02)	0.013	-0.001	4.12 (-2.23- 10.48)	0.004	- 0.009	<b>3.25</b> <b>(-6.13-12.63)</b>
<b>Do not know</b>	8 (5.4)			Reference			Reference			Reference			Reference
<b>Satisfaction with the equipment and facilities for dealing with COVID-19</b>													
<b>Agree</b>	79 (53.7)			-2.55 (-9.32-4.21)			-1.37 (-3.63-0.88)			-0.23 (-1.99-1.51)			<b>-2.54</b> <b>(-5.09-0.003)</b>
<b>Disagree</b>	40 (27.2)	0.010	-0.004	0.78 (-6.79-8.37)	0.042	0.028	1.10 (-1.42-3.63)	0.027	0.013	1.30 (-0.66-3.27)	0.050	0.037	<b>0.21</b> <b>(-2.64-3.06)</b>
<b>Do not know</b>	28 (19.0)			Reference			Reference			Reference			Reference

#### D. Health status and psychological effects:

The majority of respondents had no mentioned symptoms during the past 14 days. Some respondents reported a range of physical symptoms, such as fever (3.4%), muscle pain (2.7%), shortness of breath (0.7%), cough (8.8%), dizziness (0.2%), and sore throat (9.5%). The results of linear regression showed that health status was not significantly associated with IES-R and DASS scores except for muscle pain ( $B = 5.59$ ,  $CI = 0.40-10.77$ ) and cough ( $B = 3.30$ ,  $CI = 0.31-6.29$ ). In fact, DASS depression subscale score had a significant positive relationship with muscle pain ( $B = 7.09$ ,  $CI = 1.25-12.92$ ), shortness of breath ( $B = 13.9$ ,  $CI = 1.57-24.61$ ), and cough ( $B = 3.40$ ,  $CI = 0.03-6.77$ ).

The finding also showed that 10.9% of the respondents received consultation from a doctor, 17.7% had a home quarantine, and 1.1% took a COVID-19 test. Linear regression analysis proved that the use of communication health services had no significant relationship with IES-R scale and DASS subscale score with the exception of home quarantine which was associated with an increase in DASS stress

subscale scores ( $B = 2.42$ ,  $CI = 0.14-4.69$ ) and DASS anxiety subscale scores ( $B = 1.81$ ,  $CI = 0.71-3.57$ ). Furthermore, there was no significant relationship between IES-R scale score and the DASS stress, anxiety, depression subscales, and underlying disease.

The psychological impact of COVID-19 outbreak which was measured using the IES-R scale revealed the sample mean score of 50.80 ( $SD = 15.54$ ). Among all the respondents, 14 (9.5%) reported a normal psychological impact (score 0-23), 10 (95.8%) rated a mild psychological impact (scores 24-32), and 117 (79.6%) reported a moderate psychological impact (score 33-36).

Respondents' depression, anxiety, and stress levels were measured using the DASS 21-item scale and it was revealed that the sample mean score equaled 39.94 ( $SD = 15.15$ ).

Considering the depression subscale, 50 participants (34%) had a normal depression score. Similarly, regarding the anxiety subscale, 69 (46.9%) were considered to have a normal score 91 (7.5%); moreover, for the stress subscale, 60 ones (40.8%) were considered to suffer from normal stress.

#### E. Record of psychological effects with a positive COVID-19 patient contact:

The record of psychological effects with a positive COVID-19 patient contact in the last 14 days had been presented in Table 2. In this regard, 4.8% of the respondents had a contact record with infected patients and 63.3% of them were concerned about infection by a COVID-19 virus. The record of COVID-19 patients did not show significant relationships among IES-R scale, DASS stress subscale, DASS anxiety subscale, and DASS depression subscale. Concern about COVID-19 had a significant positive relationship between IES-R scale, DASS stress, anxiety, and depression subscales.

#### F. Knowledge and awareness about COVID-19 and its psychological effects:

Based on the results of Table 6, (96.6%) of the respondents were aware about Covid-19 virus transmission methods and the dangerous and deadly nature of the virus (51.7%). Although there was no significant relationship between respondents' awareness about the case fatality of Covid-19 and their knowledge about the virus transmission methods as well as its psychological effects, there was only a significant negative relationship with DASS scale depression non-lethality and knowledge of virus transmission methods.

**G. Protection measures and psychological effects:**

The results of protection measures over the last 14 days to prevent infected by COVID-19 showed that the majority of respondents (90.5%) have had the ability to perform daily protective behaviors against COVID-19 such as wearing masks and gloves, using disinfectants, and so on. Similarly, 96.6% of the respondents believed the usefulness of protective behaviors such as wearing masks and gloves, using disinfectant solution, avoiding the common use of devices, covering the mouth when coughing sneezing or rubbing the nose, washing hands after touching objects, etc. In addition, 66% of the respondents always showed these protective behaviors regularly during shifts. It was also revealed that respondents' satisfaction with the equipment and facilities to deal with the virus in the workplace had no significant relationship with its psychological effects (see Table 4)



Table 2. The relationship between psychological effects with a positive COVID-19 patient contact during epidemic

Variables	N (%)	IES			Stress			Anxiety			Depression		
		R-Squared (R <sup>2</sup> )	Adjusted R-Squared (AR <sup>2</sup> )	Beta (95% Confidence Interval) B (95% CI)	R <sup>2</sup>	AR <sup>2</sup>	B (95%) CI	R <sup>2</sup>	AR <sup>2</sup>	B (95%) CI	R <sup>2</sup>	AR <sup>2</sup>	B (95%) CI
<b>History of contact with an individual with confirmed infection with COVID-19</b>													
<b>Yes</b>	7 (4.8)			-6.75 (-19.31-5.79)			-2.31 (-6.60-1.96)			-1.88 (-5.18-1.41)			<b>-1.26</b> <b>(-6.14-3.61)</b>
<b>No</b>	101 (68.7)	0.022	0.009	-5.08 (-10.84-0.68)	0.009	-0.005	-6.67 (-2.64-1.29)	0.013	0.000	-0.88 (-2.39-0.63)	0.002	-0.012	<b>0.03</b> <b>(-2.20-2.27)</b>
<b>Do not know</b>	39 (26.5)			Reference			Reference			Reference			<b>Reference</b>
<b>Concern about COVID-19</b>													
<b>Agree</b>	93 (63.3)			*12.25 (6.71-17.79)			*4.07 (2.17-5.98)			*2.28 (0.76-3.80)			<b>3.87*</b> <b>(1.66-6/08)</b>
<b>Disagree</b>	20 (13.6)	0.202	0.191	-5/03 (-12.82-2.75)	0.177	0.166	-1.22 (-3.90-1.46)	0.121	0.109	-1.39 (-3.53-0.74)	0.141	0/129	<b>-1.74</b> <b>(04.84-1.36)</b>
<b>Do not know</b>	34 (23.1)			Reference			Reference			Reference			<b>Reference</b>

\* P&lt; 0.05



Table 3. The relationship between knowledge about and awareness of COVID-19 and its psychological impact during epidemic

Variables	N (%)	IES		Stress			Anxiety			Depression			
		R-Squared (R <sup>2</sup> )	Adjusted R-Squared (AR <sup>2</sup> )	Beta (95% Confidence Interval) B (95% CI)	R <sup>2</sup>	AR <sup>2</sup>	B (95% CI)	R <sup>2</sup>	AR <sup>2</sup>	B (95% CI)	R <sup>2</sup>	AR <sup>2</sup>	B (95% CI)
<b>Awareness of the lethality of COVID-19</b>													
Agree	76 (51.7)			4.43 (-2.83-11.70)			2.08 (-.033-4.49)			1.39 (-0.49-3.27)			1.22 (-1.54-3.98)
Disagree	50 (34.0)	0.092	0.079	-5.92 (-5.13-1.74)	0.131	0.119	-2.10 (-4.64-0.43)	0.109	0.097	-1.55 (-3.54-0.42)	0.112	0.099	*3.15 (-6.07-0.24)
Do not know	39 (26.5)			Reference			Reference			Reference			Reference
<b>Awareness of transmission route of COVID-19</b>													
Yes	142 (96.6)	0.004	-0.003	5.38 (-8.61-19.38)	0.001	0.006	0.91 (-3.83-5.67)	0.000	0.006	0.46 (-3.20-4.13)	0.000	- 0.007	*0.05 (-5.33-5.44)
No	5 (3.4)			Reference			Reference			Reference			Reference

\* P&lt; 0.05

Table 4. The relationship between protection behaviors and its psychological impact during epidemic

Variables	IES				Stress		Anxiety			Depression			
	N (%)	R-Squared (R <sup>2</sup> )	Adjusted R-Squared (AR <sup>2</sup> )	Beta (95% Confidence Interval) B (95% CI)	R <sup>2</sup>	AR <sup>2</sup>	B (95% CI)	R <sup>2</sup>	AR <sup>2</sup>	B (95% CI)	R <sup>2</sup>	AR <sup>2</sup>	B (95% CI)
<b>Performing daily protective behaviors against COVID-19</b>													
<b>Agree</b>	133 (90.5)			-0.61 (-13.52-12.28)			1.57 (-2.73-5.88)			0.27 (-3.07-3.62)			<b>1.17 (-3.62-5.98)</b>
<b>Disagree</b>	8 (5.4)	0.000	-0.017	0.54 (-16.16-17.24)	0.031	0.017	5.33 (-0.24-10.91)	0.015	0.002	2.45 (-1.87-6.79)	0.064	0.051	<b>*7.70 (1.49-13.92)</b>
<b>Do not know</b>	6 (4.1)			Reference			Reference			Reference			<b>Reference</b>
<b>Believe in the usefulness of protective behaviors</b>													
<b>Yes</b>	142 (96.6)			4.57 (-11.03-20.18)			1.10 (-4.15-6.36)			1.06 (-3.03-5.16)			<b>-0.43 (-6.39-5.51)</b>
<b>No</b>	1 (7.0)	0.009	-0.005	19.75 (-14.68-54.18)	0.022	0.008	10.25 (-1.35-21.85)	0.003	0.010	3 (-6.03-12.03)	0.025	0.011	<b>11 (-2.12-24.12)</b>
<b>Do not know</b>	4 (2.7)			Reference			Reference			Reference			<b>Reference</b>
<b>Performing protective behaviors regularly during shifts</b>													
<b>Always</b>	97 (66.0)			1.82 (-16.25-19.90)			2.10 (-4.04-8.26)			0.52 (-4.22-5.28)			<b>2.74 (-4.21-9.70)</b>
<b>Sometimes</b>	40 (27.2)	0.013	-0.008	-0.52 (-18.99-17.94)	0.006	-0.15	2.65 (-3.62-8.49)	0.004	-0.017	-0.01 (-4.86-4.83)	0.010	-	<b>3.68 (-3.42-10.79)</b>
<b>Rarely</b>	7 (4.8)			-5.42 (-26.72-15.85)			2.19 (-5.05-9.43)			0.76 (-4.83-6.35)			<b>3.61 (-4.57-11.81)</b>
<b>Never</b>	3 (2.0)			Reference			Reference			Reference			<b>Reference</b>
<b>Intention to perform protective behaviors daily until the end of the Covid-19 epidemic</b>													

<b>Agree</b>	137 (93.2)			5.29 (-5.91-16.50)			1.17 (-2.63-4.98)			0.12 (-2.80-3.05)			<b>1.45</b> <b>(-2.85-5.77)</b>
<b>Disagree</b>	2 (1.4)	0.008	-0.006	-0.37 (-24.73-23.98)	0.004	-	2.75 (-5.52-11.02)	0.013	-0.001	4.12 (-2.23-10.48)	0.004	-	<b>3.25</b> <b>(-6.13-12.63)</b>
<b>Do not know</b>	8 (5.4)			Reference			Reference			Reference			<b>Reference</b>
<b>Satisfaction with the equipment and facilities for dealing with COVID-19</b>													
<b>Agree</b>	79 (53.7)			-2.55 (-9.32-4.21)			-1.37 (-3.63-0.88)			-0.23 (-1.99-1.51)			<b>-2.54</b> <b>(-5.09-0.003)</b>
<b>Disagree</b>	40 (27.2)	0.010	-0.004	0.78 (-6.79-8.37)	0.042	0.028	1.10 (-1.42-3.63)	0.027	0.013	1.30 (-0.66-3.27)	0.050	0.037	<b>0.21</b> <b>(-2.64-3.06)</b>
<b>Do not know</b>	28 (19.0)			Reference			Reference			Reference			<b>Reference</b>

\* P&lt; 0.05

## DISCUSSION

According to the initial psychological responses of the population in late March, about one month after the official announcement of the prevalence of COVID-19 in Iran and the first peak of the prevalence, 79.6% of the respondents reported moderate psychological impacts of the virus. In addition, 25.5% of them had symptoms of severe or excessive anxiety, 19% had severe or excessive depression, and 19.7% had moderate stress. The prevalence of moderate or severe psychological effects which was measured using IES-R was higher than the prevalence of depression, anxiety, and stress, as measured by DASS-21. The difference between IES-R and DASS-21 was so that IES-R showed the psychological impact after an event. In the present study, the respondents may have viewed COVID-19 as an event while DASS-21 may not be relevant to a particular event.

The analysis of demographic data did not show any significant effects except for the operational occupational unit which was associated with the increased anxiety levels ( $P < 0.05$ ). The psychological effects of COVID-19 as well as stress, anxiety, and depression were higher in women than those in men. No specific studies were found in the literature that has investigated the modulating effects of COVID-19 on demographic factors and mental health. However, some predictions can be made based on mental health studies. Extensive epidemiological studies have shown that women are at higher risk for depression than men [15]. A similar study carried out by Mihashi et al. demonstrated that male gender was a significant predictor of the prevalence of psychological disorders during the SARS epidemic [16]. Furthermore, Yang et al. argued that older people are more susceptible to mental illnesses due to the high mortality rate among them during the COVID-19 epidemic [17]. In addition, the level of education has positive effects because educated people enjoy better cognitive skills that may be helpful to deal with any disability [18-19]. Brooks et al. maintained that a history of mental illness is a risk factor for the development of infectious diseases [20]. Also, according to the study conducted by Wang et al. the history of underlying chronic disease is

associated with high psychological stress [21]. There was no significant relationship between lifestyle and the psychological effects of COVID-19 during the epidemic.

In terms of job conditions, the majority of respondents were satisfied with their current shift schedule (65.3%), while long shifts at work were bothersome due to the fear of developing COVID-19 (56.5%). Satisfaction with the current work shift and dissatisfaction with long work shifts were associated with reduced psychological effects, stress, anxiety and depression, although these factors were not significant. Besides, 8.2% of the respondents intended to resign due to the prevalence of COVID-19, which was associated with the increased rates of post-event stress, stress, anxiety, and depression ( $P < 0.05$ ).

Employers and health experts need to identify the psychological needs of workers at the workforce with the symptoms of the disease during the epidemic. Healthcare professionals should take advantage of this opportunity and provide the necessary psychological resources and interventions for the individuals with the above symptoms when hospitalized. The level of anxiety about COVID-19 and psychological interventions to control stress and deal with depression in co-workers should also be taken into consideration.

Health care services such as consulting a medical doctor and performing a COVID-19 test, was associated with the increased psychological effects, although the results were not significant. However, self-quarantine was significantly associated with increased stress and anxiety ( $P < 0.05$ ).

A small number of respondents (4.8%) had a direct or indirect contact record with infected or suspected to be infected by COVID-19 virus, but the majority of them (63.3%) expressed their concerns about the disease. Concerns about COVID-19 were associated with the increased post-event stress and general stress, anxiety, and depression ( $P < 0.05$ ). The organization's policies play an important role in minimizing the spread of the virus and its psychological problems. To this end, organizations are required to follow the relevant instructions issued by health officials, the government, and the World Health Organization [22].

Almost all the respondents were aware of the transmission methods (96.6%), virus risks, and fatality (51.7%). A lack of belief in fatality and knowledge of virus transmission methods was related with decreased depression ( $P < 0.05$ ). Therefore, providing up-to-date and accurate health information, especially the number of infected cases and high-risk areas, can be effective in reducing depression.

Employers should train their employees about preventive behaviors as well as the necessary facilities and equipment (such as masks, disinfectants, social distance, etc.). They should also provide prevention guidelines (such as hand washing, preventing eye, nose and mouth contact) for the safe presence of their employees at workplace [23]. According to the results of this study, the majority of respondents (90.5%) had the ability to perform daily protective behaviors against COVID-19 such as wearing masks and gloves, using disinfectants, and so on. The results of present study showed that the inability to perform daily protective behaviors like wearing masks and gloves, using disinfectants, etc. was associated with increased depression ( $P < 0.05$ ). The results of prior studies during the SARS epidemic have shown that these preventive measures have been taken by respondents with increased anxiety [24-25]. Based on the results of a study undertaken by Brooks et al. taking advantage of explicit preventive measures in the workplace creates a sense of trust and helps reduce stress [26].

## CONCLUSION

Employers have the responsibility of protecting their employees and, thereby, they should ensure that the workplace is free of hazards that may harm the personnel. In the early stages of the prevalence of COVID-19 in Iran, more than a third of respondents reported psychological impacts and about one-third reported moderate stress, anxiety, and depression. Operations staff and people with specific physical symptoms reported high levels of anxiety, stress, and depression. The findings of this study provided key guidelines for the development of psychological support strategies to fight against this disease among workforces. As the epidemic continues, the research findings could be useful for developing new work guidelines and online psychological interventions to improve occupational health during the COVID-19 epidemic.

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## CONFLICT OF INTERESTS

The authors declare no conflict of interest in this study.

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