

⇒ Research Article



The Psychological Impact of Coronavirus Disease 2019 Pandemic in the Iranian Population: A Cross-sectional Study

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Abstract

Background: Coronavirus disease 2019 (COVID-19) outbreak was first detected in China in 2019 and it has become a global threat affecting many countries. This study aimed to investigate the psychological impacts of COVID-19 pandemic, including anxiety, depression, and stress in the Iranian population.

Methods: In this cross-sectional study, an online survey was designed using the simple random sampling technique. A total of 1091 online surveys were completed during 10-18 May, 2020. The collected data included demographics, physical symptoms, history of COVID-19, information and attitudes toward COVID-19, as well as precautions and protection measures against the disease. Psychological impacts were evaluated using the Impact of Event Scale-Revised (IES-R), and mental health status by the Depression, Anxiety, and Stress Scale (DASS-21). Linear regression was used to analyze the associations.

Results: According to the results, 47.7% of the respondents demonstrated moderate to severe psychological impacts caused by the COVID-19 pandemic, of whom 28.3%, 24%, and 22.3% suffered from moderate to severe depression, anxiety, and stress symptoms, respectively. Also, female gender, decrease or cessation of income, and having chronic diseases were associated with more psychological impacts and higher scores of DASS-21 subscales.

Conclusion: Approximately, a quarter of the participants reported moderate to high levels of stress, anxiety, and depression, and half of the participants indicated moderate to severe psychological impacts. In this study, we successfully identified the vulnerable individuals to determine appropriate interventions and control the psychological consequences.

Keywords: COVID-19, Post-traumatic stress disorder, Mental health, Anxiety, Depression

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Background

The outbreak of the coronavirus disease 2019 (COVID-19) in China put the world at high risk as it spread rapidly around the world (1, 2). The World Health Organization (WHO) declared it a public health emergency of international concern on January 30, 2020 (3). COVID-19 is an enveloped, single-stranded positive-sense RNA-beta coronavirus (4) and is transmitted through direct contact via respiratory droplets. Also, human-to-human transmission of COVID-19 is potent and has a rapid pathogenesis (5)

In Iran, the first case of COVID-19 disease, which quickly spread throughout the country, was diagnosed in Qom on February 20, 2020. In a report on the same day, the WHO identified Iran as one of the countries affected by the COVID-19 (6). The sudden outbreak of the COVID-19 led to national and international preventative measures. Many everyday activities, social gatherings, high-risk, and unnecessary professions were banned

by the government, and public places such as schools, universities, and sports centers were promptly shut down.

Despite the positive contribution to disease control, the implementation of these policies inflicted negative psychological impacts upon the society. Restrictions on travel and transit, limited social interaction among colleagues, friends, and families, job-related problems, financial insecurity, and some associated consequences threatened the public's mental health (7, 8). The high incidence and mortality rate of this disease, along with the spread of the disease in the international community drastically augmented fears and worries (9). One of the most salient characteristics of any infectious disease is creating fear among masses. Furthermore, this can lead to psychological challenges such as stigmatization, discrimination, and loss (10, 11). Fear and stigma adversely influence disease control, as observed during the severe acute respiratory syndrome (SARS) and Ebola epidemics (12).

Most research has focused on the physical attributes of the COVID-19 disease, while more information is needed on the mental health problems caused by the pandemic. In a recent study carried out in India, about 80% of the subjects showed high levels of anxiety and the need for mental health care (13). In a study performed in the initial stages of the COVID-19 outbreak in China, more than half of the participants rated the psychological impact of the COVID-19 epidemic as moderate to severe (14). In another study conducted in Egypt to assess the impact of COVID-19 on mental health and social support among the youth, about 41.4% showed severe psychological shock (15). During the SARS epidemic in 2003, the non-infected community also experienced SARS-related psychiatric and post-traumatic morbidities (16). So, the COVID-19 pandemic has caused stress, anxiety, panic, and behavioral disorders among different populations.

Objectives

The COVID-19 pandemic has many social and psychological repercussions requiring immediate attention to the mental health of victims, health care professionals, people with psychiatric disorders, and the general population. This cross-sectional study aimed to examine the psychological burden of the Iranian society during the COVID-19 epidemic and the detection of factors affecting people's mental welfare.

Material and Methods

This cross-sectional study assessed the mental well-being of the Iranian people during the COVID-19 pandemic using a simple random sampling technique. According to the recommendations by the Iranian Ministry of Health and the WHO, the study was designed online. An online questionnaire was developed using Porsline, which is an online platform for surveys. More than 1500 people visited the questionnaire and about 73% of them participated in this research. Data collection took about one week (10-18 May, 2020) and 1091 people completed the questionnaire anonymously.

We also reviewed the surveys of the psychological impacts of COVID-19 in China and other countries. The questionnaire included such demographic information as age, sex, marital status, household, education, awareness, employment status, health status in the recent weeks, contact or infection with the virus, knowledge and attitudes toward COVID-19, the use of methods and precautions taken for disease prevention, psychological impact assessed by the Impact of Event Scale-Revised (IES-R), and mental health status assessed by the Depression, Anxiety, and Stress Scale (DASS-21).

In the first part of questionnaire, the participants were requested to provide information about demographic variables, such as gender, age, education, marital status, residential place, income level, employment status, parental status, and household size. Furthermore, the

individuals were asked about their current health status. Physical symptoms, including fever, chills, headache, myalgia, cough, breathing difficulty, dizziness, coryza, sore throat, and the loss of smell and taste senses were assessed. The participants were also asked about their health service utilization in the last 14 days, including consultation with a doctor in the clinic, hospitalization, and being tested for COVID-19. The contact history variables included close contact with an individual with confirmed COVID-19, indirect contact with an individual with confirmed COVID-19, and contact with an individual with suspected COVID-19. In addition, the participants were asked about COVID-19 infection in themselves, family, and colleagues. The participants rated their health status from very bad to very good (range: 1 to 5).

Knowledge and concerns about COVID-19 included the ways of disease transmission, the level of satisfaction with the available information, participant's information source, following up the news of new cases, deaths, and recoveries, changing the ratio of fear to illness compared to the previous month, and the level of satisfaction with social distancing policies. Concerns about COVID-19 included contraction with COVID-19, perceived susceptibility to infection, and the chance of survival if infected. Finally, the precautionary measures against COVID-19 included wearing mask and gloves, washing hands after coughing and sneezing, and contact with contaminated objects.

Depression, Anxiety, and Stress Scale - 21 Items (DASS-21)

The DASS-21 was developed by Lovibond in 1995. It is a combination of three self-report scales to measure depression, anxiety, and stress. This tool indicates results in five score ranges: normal, mild, moderate, severe, and extremely severe (17). The total score of depression subscale is subdivided into normal (0-9), mild (10-12), moderate (13-20), severe (21-27), and extremely severe depression (28-42) (17). The total score of anxiety subscale is subdivided into normal (0-6), mild (7-9), moderate (10-14), severe (15-19), and extremely severe anxiety (20-42) (17). The total score of stress subscale is subdivided into normal (0-10), mild (11-18), moderate (19-26), severe (27-34), and extremely severe stress (35-42) (17). In Iran, Moradipناه et al used this questionnaire in their study (18). Also, a study of 1,070 men and women in Mashhad calculated the internal consistency of DASS-21 scales using Cronbach's alpha, and the rates obtained for the depression, anxiety, and stress scales were 0.77, 0.79, and 0.78, respectively. In general, the application of this scale in Iranian society has been confirmed (19).

The Impact of Event Scale-Revised (IES-R)

The IES-R is a self-report measure that assesses current mental distress in response to traumatic events (20).

The 22-item scale is a set of three subscales designed to measure large clusters of post-traumatic stress symptoms, including infiltration, avoidance, and avoidance of hypertension (21). The total IES-R score is subdivided into 0–23 (normal), 24–32 (mild), 33–36 (moderate), and >37 (severe psychological impact). In Iran, this scale was used by Panaghi et al to study the psychological impact of Bam earthquake victims (22). The Persian version of IES-R was well-validated in the Iranian population and it had a good internal compatibility (Cronbach's alpha 0.67-0.87) and reliability.

Inclusion Criteria

The inclusion criteria were as follows: being Iranian, having access to internet, and speaking Farsi. Individuals participated through online advertisements, e-mail, blogs, and social media. There were no significant differences in the age and gender between participants and non-participants. By restricting the IP, each person could complete the questionnaire only once.

Statistical Analyses

All statistical analyses were performed using the SPSS software version 26 (IBM CORP., NY, USA). The statistical analysis was performed based on Wang's methodology (14). The questionnaire was designed in such a manner which necessitated the completion of the previous questions prior to proceeding to later sections; alternative answers such as 'None' or 'I don't know' were provided to insure minimized missed data. Descriptive analyses were performed for all variables, including demographic information, health status, knowledge and concerns about COVID-19, precautionary measures, and contact history with COVID-19. Linear regression was used to analyze the associations of variables and the sum of DASS-21 and IES-R scores. $P < 0.05$ was considered statistically significant (two-tailed tests).

Results

A total of 1091 responses were recorded from 32 provinces of Iran. The participants used mobile (93%), tablet (5%), and computer (3%) to complete the questionnaire.

The score division in DASS-21 subscales and IES-R was according to Wang's method (14). The level of psychological impact was assessed by the IES-R scale, indicating a mean score of 33.28. The number of participants with minimal, mild, and moderate to severe psychological impacts were 291 (26.7%), 280 (25.7%), and 520 (47.7%), respectively. On DASS-21, 457 (41.9%) participants were reported to have gained normal score on stress subscale (score: 0-10), 259 (23.7%) had mild stress symptoms (score: 11-18), 259 (23.7%) proved to have been suffering from moderate stress (score: 19-26), and 116 (10.6%) from severe stress (score: 27-42). Also, 591 (54.2%) respondents reported normal score on anxiety subscale (score: 0-6), 125 (11.5%) had mild anxiety

symptoms (score: 7-9), 147 (13.5%) were suffering from moderate anxiety (score: 10-14), and 228 (20.9%) from severe anxiety (score: 15-42). Furthermore, 550 (50.4%) respondents showed normal score on depression subscale (0-9), 103 (9.4%) had mild depression (10-12), 220 (20.2%) demonstrated moderate depression (13-20), and 218 (20%) were classified as severely depressed (21-42).

Sociodemographic Data

Compared to males, females showed significantly higher levels of stress ($B = 1.73$, 95% CI = 1.08, 2.38, $P < 0.001$), anxiety ($B = 0.78$, 95% CI = 0.26, 1.30 $P = 0.003$), depression ($B = 0.76$, 95% CI = 0.11, 1.41, $P = 0.02$), and more signs of COVID-19-induced psychological impact ($B = 4.73$, 95% CI = 2.29, 6.44, $P < 0.001$). Younger individuals showed fewer psychological impacts ($B = -9.84$, 95% CI = -13.83, -5.86, $P < 0.001$) and no association was found between age and DASS-21 subscales. Living in urban areas was associated with higher anxiety levels ($B = 1.02$, 95% CI = 0.06, 1.97, $P = 0.03$) compared to rural areas.

Compared to the unemployed people, increased and unchanged income status was associated with less stress levels ($B = -2.14$, 95% CI = -3.62, 0.68, $P = 0.004$), ($B = -1.15$, 95% CI = -1.88, 0.43, $P = 0.002$). Decreased income status was associated with higher anxiety levels ($B = 0.40$, 95% CI = -0.46, 1.26, $P = 0.02$) and more psychological impacts of COVID-19 ($B = 4.96$, 95% CI = 2.23, 7.73, $P < 0.001$) and those without income showed higher stress levels ($B = 0.43$, 95% CI = -0.40, 1.27, $P = 0.04$) and more psychological impacts of COVID-19 ($B = 3.96$, 95% CI = 0.06, 7.87, $P = 0.04$) compared to the unemployed people. Families with children older than 16 years of age showed less depression levels ($B = -1.66$, 95% CI = -2.96, 0.35, $P < 0.001$) than families without children. For further details, see Table 1.

Association With Health Status

Participant reported a variety of symptoms, including headaches (29.5%), myalgia (16.1%), coryza (16.2%), sore throat (15.4%), dizziness (13.6%), cough (10%), breathing difficulty (5.7%), loss of smell and taste (3.2%), chills (2.8%), and fever (2.3%).

The results showed that headache, myalgia, breathing difficulty, and sore throat were associated with higher scores of IES-R and DASS-21 subscales. While symptoms such as chills, dizziness, coryza, fever, breathing difficulty, loss of smell and taste were associated only with higher scores of DASS-21 subscales.

Individuals who had visited a doctor in the last two weeks reported higher levels of stress ($B = 1.99$, 95% CI = 0.98, 3.00, $P < 0.001$), anxiety ($B = 1.95$, 95% CI = 1.12, 2.78, $P < 0.001$), and depression ($B = 1.99$, 95% CI = 0.95, 3.03, $P < 0.001$), but lower IES-R scores ($B = -6.90$, 95% CI = -10.24, -3.56, $P < 0.001$).

Hospitalization was associated with higher anxiety ($B = 0.07$, 95% CI = -2.82, 2.98, $P < 0.001$). Medical

Table 1. Results of Statistical Analysis of the Association Between Demographic Information and Mental Health Status Measured by the DASS-21 and IES-R

Variables	Stress					Anxiety					Depression					IES-R					
	No. (%)	B (95% CI)					B (95% CI)					B (95% CI)					B (95% CI)				
Gender																					
Female	713 (65.4)	1.73*** (1.08 to 2.38)					0.78** (0.26 to 1.30)					0.76* (0.11 to 1.41)					4.37*** (2.29 to 6.44)				
Male	378 (34.6)	Reference					Reference					Reference					Reference				
Age (y)																					
12-21	341 (31.3)	0.32 (-0.91 to 1.56)					-0.02 (-1.04 to 0.98)					0.52 (-.73 to 1.79)					-9.84*** (-13.83 to -5.86)				
22-30	343 (31.4)	0.27 (-0.96 to 1.51)					0.07 (-0.93 to 1.09)					0.26 (-.99 to 1.53)					-6.26** (-10.247 to -2.27)				
31-40	219 (20.1)	-0.42 (-1.72 to 0.87)					-0.27 (-1.34 to 0.78)					-0.49 (-1.82 to 0.83)					-1.57 (-5.76 to 2.61)				
40-49	106 (9.7)	-0.78 (-2.26 to 0.68)					-0.39 (-1.60 to 0.81)					-0.46 (-1.97 to 1.04)					-4.37 (-9.12 to 0.37)				
>50	80 (7.3)	Reference					Reference					Reference					Reference				
Marital status																					
Single	678 (62.1)	-0.14 (-3.93 to 3.62)					0.58 (-2.52 to 3.69)					1.18 (-2.67 to 5.03)					-10.72 (-4.62 to 26.07)				
Married	393 (36.0)	-1.24 (-5.02 to 2.54)					0.32 (-2.79 to 3.43)					-0.09 (-3.96 to 3.77)					-5.10 (-10.28 to 20.50)				
Divorced/separated	13 (1.2)	0.42 (-4.22 to 5.08)					1.34 (-2.49 to 5.17)					1.46 (-3.29 to 6.21)					-5.85 (-12.62 to 24.34)				
Widowed	7 (0.6)	Reference					Reference					Reference					Reference				
Household size																					
Six people or more	125 (11.5)	-0.74 (-3.04 to 1.56)					0.14 (-1.74 to 2.03)					-0.68 (-3.04 to 1.67)					-3.55 (-11.13 to 4.03)				
Three to five people	834 (76.4)	-0.68 (-2.84 to 1.46)					0.20 (-1.56 to 1.96)					-0.85 (-3.05 to 1.35)					-1.21 (-8.29 to 5.87)				
Two people	110 (10.1)	0.10 (-2.22 to 2.43)					1.14 (-0.76 to 3.05)					-0.07 (-2.45 to 2.31)					1.62 (-6.03 to 9.28)				
One person	22 (2.0)	Reference					Reference					Reference					Reference				
Educational attainment																					
Primary school	7 (0.6)	-2.71 (-10.67 to 5.24)					-0.85 (-7.38 to 5.67)					-1.28 (-9.43 to 6.86)					1.71 (-24.53 to 27.96)				
Lower secondary school	18 (1.6)	-2.11 (-9.50 to 5.28)					3.00 (-3.06 to 9.06)					-0.83 (-8.41 to 6.74)					-8.27 (-32.67 to 16.12)				
Diploma	277 (25.4)	-3.89 (-10.93 to 3.14)					-0.06 (-5.84 to 5.71)					-2.15 (-9.37 to 5.06)					-10.24 (-32.67 to 16.12)				
Upper diploma	101 (9.3)	-3.83 (-10.91 to 3.25)					-0.07 (-5.89 to 5.73)					-2.10 (-9.37 to 5.15)					-7.44 (-30.82 to 15.93)				
Bachelor's degree	365 (33.5)	-3.55 (-10.59 to 3.47)					-0.04 (-5.82 to 5.72)					-1.89 (-9.10 to 5.32)					-8.32 (-31.53 to 14.88)				
Master's degree	157 (14.4)	-4.41 (-11.47 to 2.64)					-0.08 (-5.88 to 5.70)					-2.86 (-10.10 to 4.37)					-6.93 (-30.23 to 16.36)				
PhD	164 (15.0)	-4.92 (-11.98 to 2.13)					-0.45 (-6.24 to 5.34)					-3.15 (-10.39 to 4.07)					-10.07 (-33.36 to 13.21)				
None	2 (0.2)	Reference					Reference					Reference					Reference				
Residence																					
City	1012 (92.8)	0.30 (-0.86 to 1.46)					1.02* (0.06 to 1.97)					0.14 (-1.05 to 1.33)					0.32 (-3.52 to 4.16)				
Village	79 (7.2)	Reference					Reference					Reference					Reference				
Employment status																					
Retired	27 (2.5)	-0.73 (-2.98 to 1.52)					-0.40 (-2.19 to 1.38)					0.14 (-2.07 to 2.360)					4.90 (-2.13 to 11.93)				
Unemployed	153 (14.0)	0.41 (-0.95 to 1.78)					0.73 (-0.35 to 1.81)					1.52* (0.17 to 2.88)					1.36 (-2.90 to 5.64)				
Student	571 (52.3)	-0.22 (-1.39 to 0.95)					-0.22 (-1.15 to 0.70)					0.65 (-0.50 to 1.81)					-6.93** (10.59 to -3.27)				
Driver	5 (0.5)	-1.65 (-6.36 to 3.06)					-0.20 (-3.93 to 3.53)					-1.06 (-5.70 to 3.58)					-1.82 (-16.52 to 12.87)				
Self-employed	51 (4.7)	-1.07 (-2.87 to 0.73)					-0.74 (-2.17 to 0.68)					-0.39 (-2.17 to 1.37)					-3.29 (-8.92 to 2.33)				
Craftsmen	7 (0.6)	-3.10 (-7.13 to 0.91)					-2.85 (-6.04 to 0.33)					-3.54 (-7.51 to 0.42)					-14.59** (- 27.15 to -2.03)				
Medical team	55 (5.0)	-0.75 (-2.52 to 1.00)					-0.10 (-1.50 to 1.28)					-0.42 (-2.16 to 1.31)					-2.44 (-7.93 to 3.05)				
Worker	7 (0.6)	2.32 (-1.70 to 6.34)					1.42 (-1.76 to 4.62)					3.02 (-0.94 to 6.99)					-0.02 (-12.58 to 12.53)				
Day laborer	2 (0.2)	-0.75 (-8.07 to 6.570)					2.50 (-3.31 to 8.31)					0.73 (-6.48 to 7.96)					3.97 (-18.88 to 26.84)				
Employee	117 (10.7)	-1.13 (-2.57 to 0.31)					0.009 (- 1.13 to 1.15)					-0.55 (-1.97 to 0.87)					-0.20 (-4.71 to 4.31)				
Shopkeeper	3 (0.3)	0.41 (-5.60 to 6.43)					-0.66 (-5.43 to 4.10)					1.40 (-4.52 to 7.33)					6.31 (- 12.46 to 25.08)				
Farmer	2 (0.2)	1.25 (-6.07 to 8.57)					3.00 (-2.81 to 8.81)					3.73 (-3.48 to 10.96)					0.97 (-21.88 to 23.84)				
Military	3 (0.3)	-5.91 (-11.93 to 0.10)					-3.33 (-8.10 to 1.43)					-4.26 (-10.19 to 1.67)					-17.35 (-36.12 to 1.41)				
Other occupations	88 (8.1)	Reference					Reference					Reference					Reference				

Table 1. Continued

Variables					
	No. (%)	Stress B (95% CI)	Anxiety B (95% CI)	Depression B (95% CI)	IES-R B (95% CI)
Income status					
Increased	50 (4.6)	-2.14** (-3.62 to -0.68)	-0.58 (-1.80 to 0.63)	-2.19 (-3.70 to -0.68)	-4.02 (-8.82 to 0.84)
Unchanged	327 (30.0)	-1.15** (-1.88 to -0.43)	-0.16 (-0.76 to 0.43)	-1.10 (-1.85 to -0.36)	2.67* (0.28 to 5.06)
Decreased	203 (18.6)	0.43 (-0.40 to 1.27)	0.82* (0.12 to 1.51)	0.40 (-0.46 to 1.26)	4.96*** (2.23 to 7.73)
Stopped	83 (7.6)	1.24* (0.06 to 2.42)	0.55 (-0.42 to 1.53)	1.31 (0.10 to 2.52)	3.96* (0.06 to 7.87)
Non-employed					
	428 (39.2)	Reference	Reference		
Status as a parent					
Has a child over 16 and under 16	66 (6.0)	-0.47 (-1.53 to 0.57)	-0.47 (-1.53 to 0.57)	-1.66* (-2.96 to -0.35)	-2.35 (-6.53 to 1.82)
Has child 16 years or under	117 (10.7)	-0.15 (-0.97 to 0.66)	-0.15 (-0.97 to 0.66)	-0.72 (-1.73 to 0.28)	3.75 (-0.85 to 8.35)
Has a child older than 16 years	201 (18.4)	-0.52 (-1.17 to 0.13)	-0.52 (-1.17 to 0.13)	-1.44*** (-2.25 to -0.63)	2.23 (-2.76 to 7.23)
No children					
	705 (64.6)	Reference	Reference	Reference	Reference

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

insurance coverage was associated with less levels of stress ($B = -1.06$, 95% CI = -1.99, -0.3, $P = 0.02$), anxiety ($B = -1.12$, 95% CI = -1.85, -0.38, $P = 0.003$), depression ($B = -1.26$, 95% CI = -2.19, 0.34, $P = 0.007$).

A very good self-rated health status was associated with less stress ($B = -8.95$, 95% CI = -14.38, -3.53, $P = 0.001$) and depression ($B = -5.97$, 95% CI = -11.54, -0.39, $P = 0.03$), but participants who reported very poor health status showed higher IES-R scores ($B = 16.72$, 95% CI = -1.82, 35.27, $P = 0.04$).

Individuals who were unsure about getting COVID-19 showed higher levels of anxiety ($B = 0.66$, 95% CI = 0.08, 1.24, $P = 0.02$) and had higher scores in the IES-R ($B = 2.99$, 95% CI = 0.66, 3.51, $P = 0.01$).

Participants who reported that their family members had contracted COVID-19 or were not aware showed higher levels of anxiety (infected with COVID-19: $B = 1.56$, 95% CI = 0.53, 2.59, $P = 0.003$; suspected of COVID-19: $B = 0.99$, 95% CI = 0.27, 1.71, $P = 0.007$), and higher IES-R score (infected with COVID-19: $B = 4.87$, 95% CI = 0.72, 9.02, $P = 0.02$; suspected of COVID-19: $B = 3.25$, 95% CI = 0.35, 6.16, $P = 0.02$).

In Iran, during that period, no significant association was found between DASS-21 subclasses, IES-R, and contact with those suspected of having contracted or infected with COVID-19. The only exception is that individuals who contacted the infected people showed higher anxiety levels ($B = 0.81$, 95% CI = 0.00, 1.62, $P = 0.04$).

Concerns and Knowledge About COVID-19

In this study, 87% of the respondents believed that COVID-19 could be transmitted through contact with a contaminated object, 83% believed that it could be transmitted through respiratory droplets, and 50.2% thought that the disease was airborne. The following information on the recovery, infection, and mortality rates of COVID-19 was characterized by higher IES-R scores ($B = 2.61$, 95% CI = 0.17, 5.06, $P = .03$).

The sources from which the participants obtained their information included the Internet (78.2%), television (54.9%), family members (22.8%), and radio (3.6%). Using the Internet to obtain information was associated with higher levels of anxiety ($B = 0.63$, 95% CI = 0.04, 1.23, $P = 0.03$) and higher scores in the IES-R ($B = 3.24$, 95% CI = 0.83, 5.64, $P = 0.008$). Satisfaction with the information available about COVID-19 was associated with lower levels of stress ($B = -2.73$, 95% CI = -4.27, -1.19, $P = 0.001$), anxiety ($B = -1.82$, 95% CI = -3.05, -0.59, $P = .004$), and depression ($B = -3.81$, 95% CI = -5.33, -2.29, $P < .001$).

According to the results, 81.5% of the participants were confident in the skills and abilities of the doctors. Confidence in doctors was associated with lower levels of stress ($B = -3.15$, 95% CI = -4.65, -1.64, $P < 0.001$), anxiety ($B = -2.77$, 95% CI = -3.97, -1.58, $P < 0.001$), depression ($B = -4.47$, 95% CI = -5.95, -2.98, $P < 0.001$), and lower score in the IES-R ($B = -5.76$, 95% CI = -10.57, -0.95, $P = 0.01$).

Individuals who reported a high probability of COVID-19 infection showed significantly higher levels of stress ($B = 4.22$, 95% CI = 2.39, 6.04, $P < 0.001$), anxiety ($B = 3.97$, 95% CI = 2.53, 5.41, $P < 0.001$), depression ($B = 4.20$, 95% CI = 2.39, 6.01, $P < 0.001$), and higher scores in the IES-R ($B = 11.44$, 95% CI = 5.59, 17.28, $P < 0.001$).

The probability of surviving the COVID-19 infection was significantly associated with less levels of anxiety ($B = -3.61$, 95% CI = -5.74, -1.47, $P = .001$), depression ($B = -3.93$, 95% CI = -6.59, -1.27, $P = 0.004$) and lower scores in the IES-R ($B = -10.73$, 95% CI = -19.30, 2.17, $P = 0.01$).

Increased fear in the last month was significantly associated with higher levels of stress ($B = 1.72$, 95% CI = 0.81, 2.63, $P < 0.001$), anxiety ($B = 2.12$, 95% CI = 1.41, 2.84, $P < 0.001$), depression ($B = 2.00$, 95% CI = 1.10, 2.90, $P < 0.001$), and higher scores in the IES-R ($B = 9.59$, 95% CI = 6.76, 12.41, $P < 0.001$).

Precautionary Measures

Our results showed that 71.9% of the respondents always washed their hands after contact with contaminated objects, 69.2% always washed their hands with soap and water, 62.9% always covered their nose and mouth when coughing and sneezing, 53.7% always abstained from sharing utensil during meals, 39.1% always wore mask regardless of the presence or absence of symptoms, and 32.3% washed their hands after coughing, sneezing, or rubbing the nose. Covering nose and mouth while coughing or sneezing was associated with lower levels of stress ($B = -6.53$, 95% CI = -11.5, -1.56, $P = .01$), and depression ($B = -6.88$, 95% CI = -11.96, -1.81, $P = 0.008$). Sharing utensil during meals was associated with higher levels of stress ($B = 1.88$, 95% CI = 0.44, 3.32, $P = 0.01$), anxiety ($B = 1.41$, 95% CI = 0.22, 2.59, $P = 0.02$), and depression ($B = 1.83$, 95% CI = 0.35, 3.31, $P = 0.01$). Wearing mask was associated with higher scores in the IES-R ($B = 7.08$, 95% CI = 2.82, 11.35, $P = 0.001$). Participants who spent more hours at home to avoid COVID-19 reported higher levels of stress ($B = 1.15$, 95% CI = 0.35, 1.96, $P = .005$) and depression ($B = 1.15$, 95% CI = 0.33, 1.97, $P = 0.006$). People's access to protective equipment (masks, gloves, and antiseptics) was associated with lower levels of stress ($B = 0.02$, 95% CI = -5.67, 0.37, $P = 0.02$) and depression ($B = -3.82$, 95% CI = -6.53, -1.12, $P = 0.006$). Using personal protective equipment (masks and gloves) in the workplace was associated with higher IES-R scores ($B = 4.58$, 95% CI = 1.88, 7.29, $P = 0.001$). Unnecessary worry about COVID-19 was associated with higher levels of stress ($B = 4.44$, 95% CI = 3.26, 5.62, $P < 0.001$), anxiety ($B = 4.57$, 95% CI = 3.62, 5.52, $P < 0.001$), depression ($B = 3.82$, 95% CI = 2.60, 5.04, $P < 0.001$), and higher scores in the IES-R ($B = 29.51$, 95% CI = 26.05, 32.96, $P < 0.001$).

Chronic Illness

Participants reported chronic diseases such as cancer (0.2%), diabetes (2.5%), cardiovascular disease (2%), renal disease (2.4%), inflammatory bowel disease (1.7%), rheumatoid arthritis (1.9%), autoimmune disease (1.8%), hypertension (3.5%), asthma (2.4), acute respiratory disease (0.7), acute liver disease (0.5%), and obesity (3.3%). Cardiovascular diseases were associated with higher levels of stress ($B = 3.72$, 95% CI = 1.51, 5.94, $P = 0.001$), anxiety ($B = 3.69$, 95% CI = 1.94, 5.44, $P < 0.001$), depression ($B = 2.47$, 95% CI = 0.27, 4.66, $P = 0.02$), and higher score in the IES-R ($B = 10.61$, 95% CI = 3.55, 17.66, $P = 0.003$).

Discussion

The present cross-sectional study aimed to assess the psychological burdens caused during the COVID-19 pandemic in Iran. According to the results, 41.9% of the participants reported the psychological impact as moderate or severe, 34.3% showed moderate to severe

stress symptoms, 34.4% experienced moderate to severe anxiety, and 40.2% were classified as moderately to severely depressed.

Our findings are in line with a previous study conducted during the pandemic in China (14), reporting the prevalence of moderate to severe psychological burden, as measured by IES-R, to be higher than DASS-21 subscales. The difference between DASS-21 and IES-R is in that DASS-21 does not examine a specific event, while IES-R assesses the psychological impacts caused by a particular event. Similar studies conducted in China, Austria, and Saudi Arabia (14, 23, 24) on the psychological impacts of the COVID-19 showed more psychological impacts compared to those of the Iranian population. Less psychological impact on the Iranian population may be due to the lack of strict laws such as lock down, the ban on intercity travel, etc. Iran and Austria showed higher levels of stress, anxiety, and depression than China. The spread of COVID-19 was a regional problem when the survey was conducted in China (14); however, at the time the mentioned studies were done in Iran and Austria, it turned into a global pandemic. High prevalence of COVID-19 and its classification as a pandemic may be associated with higher levels of stress, anxiety, and depression (24).

In this study, female participants reported higher levels of stress, anxiety, depression, and psychological impacts, which is in agreement with studies conducted in Austria, Saudi Arabia, and Turkey (23-25). Women were recognized as the most liable to post-traumatic stress disorder symptoms after the COVID-19 pandemic (26). Younger people showed less psychological impact, which suggests that older people are at higher risk of more severe outcomes and even death.

Moreover, 18.6% of the participants reported that their income had decreased, which was associated with increased anxiety and psychological impacts, and 7.6% stated that their income had stopped, which was significantly associated with higher levels of stress and psychological impacts. The economic damage of the COVID-19 pandemic cannot be ignored, as a study conducted in Saudi Arabia found that low-income individuals reported higher psychological impacts and depressive symptoms (23). The Austrian study was also in line with our findings (24), but the government in these countries had considered measures to reduce damages and improve financial security by increasing financial aid to individuals and companies. The consequences of COVID-19 are more likely to cause psychological burden in vulnerable people. Identifying these groups and providing the needed support is critical and is a requirement of efficient social security and health care.

Satisfaction with the information available on COVID-19 was associated with less stress, anxiety, and depression. In Iran, as in China, Austria, and Saudi Arabia (14, 23, 24), the majority of people received more information and news about COVID-19 via the

Internet. Using the internet was associated with higher psychological impact as most of the information is not based on reliable facts. The massive amount of information about COVID-19 shared on social media was associated with fear and panic among users. Similar to another study in Iran that measured the level of anxiety in people during the COVID-19 pandemic, we found that most of the information available about the coronavirus was disappointing and frustrating (7). This may be explained by the fact that why anxiety levels increase when a person is constantly exposed to COVID-19 news.

Our findings showed that the incidence of symptoms like headache, chills, myalgia, breathing difficulty, dizziness, sore throat, loss of smell and taste, and coryza were associated with psychological distress, which is in line with the studies in China and Saudi Arabia (14, 23). However, some symptoms may be caused by stress, anxiety, and depression. People who consulted with a doctor showed more stress, anxiety, and depression, but less psychological damages. Although hospitalization was associated with more anxiety, 81.5% of participants who were confident in physicians' skills in diagnosis and treatment showed less stress, anxiety, depression, and psychological impacts were similar to the studies carried out in China (14) and Bangladesh (27).

In line with recent studies (14, 24), the presence of chronic illnesses was associated with higher psychological burden, but in this study chronic diseases were classified into several groups to identify individuals with higher risk factors. The results revealed that cardiovascular diseases, autoimmune disease, hypertension, respiratory disease, and obesity were associated with higher scores of IES-R and DASS-21 subscales. A study in Hong Kong found that the COVID-19 pandemic disrupted non-communicable disease patients' access to clinical services (28). In Iran, uncertain economic conditions, changes in daily activities, and lack of access to certain drugs due to sanctions can be associated with psychological harm to non-communicable disease patients. Another factor that can lead to psychological distress in these patients is that it worsens the outcomes in the COVID-19 disease.

In Iran, the use of precautionary measures such as avoiding sharing utensils and covering the nose and mouth when coughing or sneezing showed a higher DASS-21 subscale score, which is in line with a study in China conducted in the early stage of pandemic, and another study in Saudi Arabia (14, 23). Wearing masks regardless of the presence or absence of symptoms was associated with higher psychological impact, which is in contrast with Chinese and Saudi Arabian studies (14, 23). Due to the shortage of masks worldwide and the WHO declaring that the use of masks is necessary for people with symptoms and caregivers of people with COVID-19 (29), wearing masks in the initial stages of the disease may be associated with stigmatization. Wearing masks in the workplace was associated with more severe psychological

impacts, so that 19.5% of employees reported that their co-workers had COVID-19 disease, which may make them feel endangered at work.

One of the limitations of this study was the use of an online survey, because only people with access to the Internet and social media could participate. As a result, the conclusion was less generalizable to the entire population. Also, individuals were included in the study regardless of their history of mental health problems, and IES-R and DASS-21 were reported by the individuals themselves, which may have been exaggerated in the responses. Therefore, prospective studies are needed to provide more accurate results to support the need for focused public mental health. However, to ensure the confidentiality of the study and ethical considerations, the participants' contact information and personal information were not collected, so it was not possible to conduct a prospective study. Therefore, prospective studies can be considered in future research. The small sample size in the current study suggests caution in interpreting the results and the majority of the participants had academic education. Hence, the finding cannot be regarded as representative of the population in Iran. Despite all the above limitations, our study collected data on the psychological response of the Iranian community to a pandemic and identified many influential factors. Our results provide an idea of the psychological burden on society during such outbreaks and suggest ways to minimize the effects.

Conclusion

Prevalence and high mortality rate of COVID-19 and the absence of vaccines and safe treatments caused psychological burden among people who feared contracting the disease. In times of pandemic, vulnerable people should be given more attention and appropriate interventions should be devised to reduce harms. Our findings can help to design proper interventions to reduce the psychological impacts of COVID-19, stress, anxiety and depression in the Iranian population.

Authors' contribution

ND and MRGF contributed to study design, statistical analysis, and data gathering. MRGF and MM performed statistical analysis. ND and MRGF interpreted data and prepared the tables. The authors revised the manuscript and approved the final version.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of Interests

The authors declared that they have no competing interests.

Ethical Approval

The Ethics Committee of the Hormozgan University of Medical Sciences (IR.HUMS.REC.1399.069) approved the study protocol. Also, the study was performed according to the Helsinki Declaration. An informed consent was obtained, and all participants completed the questionnaire anonymously.

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