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Original Article

Factors associated with the psychological status during the Coronavirus pandemic, baseline data from an Iranian Province

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Abstract

Background: The 2019 coronavirus disease (COVID-19) is threatening public health in many ways. The psychological situation of individuals is important and limited data is available from Iran. In this study, we aimed to illustrate the psychological distress of the general population and evaluate the factors affecting it.

Methods: An online cross-sectional survey was conducted from 29th to 31st March 2020 in South Khorasan province, affected later than other parts of the country. We included sociodemographic questions, Hospital Anxiety, and Depression Scale (HADS) questionnaire, and questions addressing various symptoms and diseases. Most questions had multiple choices to select from and some were open questions. Univariate and multivariate analysis in SPSS software was used to find significant relationships.

Results: A total of 844 responses were collected, of which 788 records were included in the analysis. The mean age of responders was 36.61±10.97 (age range: 18-88) and 484 (61.4%) of them were females. The mean scores in the anxiety and depression subscale of the HADS questionnaire were 7.01±3.68 and 6.72±3.71 respectively. Experiencing cardiovascular and COVID-19 related symptoms was significantly associated with a higher number of individuals having abnormal anxiety and depression results ($p<0.001$). Widowed individuals, females, and those experiencing the above-stated symptoms showed a significant association with increased anxiety and depression in multivariate analysis.

Conclusion: Although many existing elements influence the psychological well-being of society during a pandemic, experiencing symptoms related to other diseases or having multiple chronic diseases may cause an extra burden on the psychological state of the society.

Keywords: Depression, anxiety, cardiovascular diseases, Coronavirus

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The 2019 coronavirus disease (COVID-19) pandemic which has turned out to be an emerging concern in the international community and threatening public health, is causing a challenging environment for psychological resilience (1). In a situation report published by the World Health Organization (WHO), countries standing first with regard to the number of confirmed cases in Eastern Mediterranean, Western Pacific, and European regions are Iran, China, and Italy respectively. More than 970000 people had been infected and about 50000 people died (2). Although the actual route of transmission is still debated, COVID-19 is a coronavirus and has spread to humans through an intermediate host. The transmission between human beings is caused by respiratory droplets and cases have also been detected among healthcare staff (3). Also apart from the infection itself, symptoms of the infection can cause a psychological burden in the general population and patients suffering from chronic diseases (4). Whether having cardiovascular symptoms irrespective of having the disease can affect people during this pandemic is not known.

Doctors and nurses who are working in hospitals, especially the ones who were meant to treat suspected or confirmed cases of COVID-19 may experience more stressors as they are exposed to the high-risk infection and fear that they may spread the disease to their friends and family members. There has been data suggesting the importance of developing and implementing mental health evaluation, support, and service (4). The presence of chronic diseases also affects the level of depression in individuals (5-8). Studies suggest that the prevalence of depression in patients with chronic diseases such as coronary heart disease, diabetes, and previous stroke range from 15-25% (9-11). Having a comorbid depression in chronic disease can have bad effects on mortality, treatment adherence, clinical and functional outcomes of patients (9-11). People are likely to have a fear of being infected or dying during an outbreak as well (12).

Research data can help in driving evidence-based strategies to reduce the adverse psychological impact faced by many individuals in a pandemic. This study aimed to survey the general population through an online questionnaire to find their levels of anxiety and depression and the factors affecting it during the initial stage of the COVID-19 outbreak in an eastern Iranian province called South Khorasan.

Methods

Participants: In this cross-sectional study, we used an anonymous online questionnaire addressing the general population to fill them out from 29th to 31st March 2020. It was distributed through social media specifically in an eastern Iranian province, which was affected later than other provinces. We included all individuals who filled out the form and were above 18 years old.

Procedure: As there was a global recommendation for individuals to minimize face-to-face interaction and isolate themselves at home, potential respondents were electronically invited through social media either by the existing participants or informative channels. They completed the questionnaires in the Persian Language through an online survey form. Expedited ethics approval was obtained from the Institutional Review Board of the Birjand University of Medical Sciences (IR.BUMS.REC.1399.002), which conformed to the principles embodied in the Declaration of Helsinki. All respondents had informed consent. Based on an initial pilot study of 50 individuals, although we calculated a sample size of 650 to be enough, we included more individuals in case we had missing data. Data collection took place over three days (29 March–31 March 2020). A participant could withdraw from the survey at any time without providing any justification.

Questionnaire: The online questionnaire consisted of 3 parts. The first part was focused on sociodemographic characteristics of participants including gender, age, height, weight, marital status, education level, occupation, province of their residence (if they were from another province), and whether they live in an urban or rural area, and their distance to the nearest healthcare facility. The second part contained the hospital anxiety and depression scale (HADS) questionnaire which will be discussed in detail later. Finally, the third part of the questionnaire asked the participants if they or their family members have been diagnosed with COVID-19. History of chronic diseases was also asked including diabetes mellitus, hypertension, dyslipidemia, cardiovascular diseases, cancer, renal failure, and chronic respiratory diseases. Also, they were asked to choose whether they have had experienced symptoms related to the flu and cardiovascular diseases (discussed later in statistical analysis). Information about sleeping hours and smoking habits were also asked. They could choose one of the multiple answers for most of the questions.

HADS questionnaire: HADS is a frequently used, short, and simple questionnaire that has been translated into the Persian Language and validated in Iran by Montazeri et al. in 2003 (13). Although HADS was originally designed for physical patients, other studies have reported its validity in general and healthy populations as well (14-17). In this questionnaire, anxiety and depression scores are determined based on 7 questions for each subscale. Questions 1,3,5,7,9,11 and 13 relate to the anxiety subscale, while questions 2, 4,6,8,10,12 and 14 relate to the depression subscale. Each question gets a score from 0-3 according to the answer given. Results were determined based on the score range: 0-7: normal, 8-10: borderline, and 11-21: abnormal (13).

Statistical analysis: Data were imported to an excel datasheet. It was then imported into 26 software SPSS Statistics (IBM SPSS Statistics, New York, United States) for statistical analysis. Duplicates and non-logical data and those under 18 years old were excluded. The experienced symptoms during the past week were divided into three clusters; cardiovascular, COVID-19, and other symptoms. The cardiovascular cluster included the five symptoms of dyspnea, chest pain, palpitation, leg edema, and high blood pressure.

The other cluster included myalgia, diarrhea, vertigo, sneeze, malaise, vomiting, sore throat, and rhinorrhea. Based on the WHO and Iranian ministry of health, the most frequent symptoms of COVID-19 are fever, shortness of breath and non-productive cough which people should worry about and consider that there is a possibility of Coronavirus infection. Therefore the cluster of COVID-19 only consisted of these three symptoms. Descriptive statistics were calculated for sociodemographic characteristics, physical symptoms, and other health-related variables. The scores of the HADS-A and HADS-D subscales were expressed as mean ± standard deviation and the number of people in each subgroup was also calculated. We used linear regressions to calculate the univariate associations between sociodemographic characteristics, physical symptom, knowledge and concern variables, and health-related variables, and the HADS-A and HADS-D mean subscale scores.

Chi-square test was used for the analysis of categorical variables and the Kruskal-Wallis and Mann-Whitney test were used for numerical variables as there was no normal distribution. We also performed a logistic regression model for some variables. All tests were two-tailed, with a significance level of $p<0.05$.

Results

Initially, 844 responses were recorded and after excluding 31 duplicates and 23 under 18-years-old participants, 788 records were included in the analysis. Overall 65 answers were missing or not logical and therefore, not included in the analysis. The response rate for the included records with complete answers for every question was 92.29% in this study.

Sociodemographic data of the participants: Sociodemographic variables and their number and percentage were summarized in table 1. Out of the total population, 484 (61.4%) responders were females and 304 (38.6%) were males. The mean age of responders was 36.61±10.97 (age range: 18-88) and the majority (61.9%) of them were between 30 to 49 years. The Body Mass Index (BMI) of the participants was 25.91±4.78 and the mean scores in the anxiety and depression subscale of the HADS questionnaire were 7.01±3.68 and 6.72±3.71, respectively. The number and percentages of the normal, borderline, and abnormal people with regard to their score in the anxiety and depression subscales of the HADS questionnaire were also shown in table 1. Overall, 15% of the population were healthcare workers, 94.3% lived in cities, 98.2% of individuals and their families were not affected by COVID-19 and 22% of the individuals suffered from chronic diseases. 5.5% of the participants had cardiovascular diseases and 8.1% of them were hypertensive. 81.3% of the population experienced no cardiovascular symptoms, while 5% of them had 2 or 3 cardiovascular-related symptoms. Regarding COVID-19 related symptoms defined earlier, 17.8% of the individuals experienced at least 1 symptom in the week preceding the online survey.

Anxiety, depression, and sociodemographics:

Abnormal anxiety and depression results: Abnormal and borderline anxiety results were significantly more in females in comparison to males ($p<0.001$). Respondents who were obese had more abnormal anxiety results as well ($p<0.001$). There was more number of abnormal anxiety results in participants having less than 6 hours of sleep in comparison to other groups ($p=0.032$). Those with a history of depression or smoking 1-2 packet/day also significantly had a higher number of abnormal anxiety results (table 1). Participants aged 70 and above had a higher number of abnormal depression results in comparison to other age groups ($p=o.o49$). Individuals who were widowed and those who had a history of depression had more abnormal depression results in comparison to other groups ($p<0.001$). Illiterate people experienced more abnormal depression results within the group in comparison to other educational levels ($p=0.001$). Healthcare workers showed to have less borderline depression results in comparison to other occupations in the logistic regression model with a p value of 0.044 and odds ratio (OR) 0f 0.528 and 95% confidence interval (CI) of 0.284-0.983.

Anxiety and depression score: Higher anxiety score had an association with female gender ($p<0.001$), married people ($p=0.027$), and widowed people ($p=0.022$) in univariate linear regression (table 2). This remained significant for the female gender and married people in multivariate analysis. In our logistic regression model, males had a lower anxiety score with an OR of 0.336 (95% CI: 0.225-0.499). Higher depression scores had an association with the female gender ($p=0.035$) and widowed people ($p=0.001$) in univariate linear regression (table 3). This remained significant for female gender multivariate analysis. Lower depression scores had an association with all levels of education except for under Diploma in comparison to illiterate people. It also had an association with those who had healthcare jobs and remained significant in multivariate analysis ($p=0.016$).

Table 1: Sociodemographic, symptom and disease distribution of subjects stratified by Anxiety and Depression result

Variable	Total number (percentage) or mean±SD	Anxiety result number in each group (percentage) or mean±SD			p-Value	Depression result number in each group ((percentage) or mean±SD			p-Value
		Normal	Borderline	Abnormal		Normal	Borderline	Abnormal	
Gender					<0.001*				0.223
Male	304 (38.6)	212(69.7)	63 (20.7)	29 (9.5)		187(61.5)	79 (26.0)	38 (12.5)	
Female	484 (61.4)	231(47.7)	163 (33.7)	90 (18.6)		277(57.2)	125 (25.8)	82 (16.9)	
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)	
Age					0.182				0.049*
18-29	199 (25.3)	101(50.8)	68 (34.2)	30 (15.1)		113(56.8)	50 (25.1)	36 (18.1)	
30-49	488 (61.9)	282(57.8)	128 (26.2)	78 (16.0)		294(60.2)	130 (26.6)	64 (13.1)	
50-69	90 (11.4)	54 (60.0)	28 (31.1)	8 (8.9)		51 (56.7)	24 (26.7)	15 (16.7)	
70 and above	11 (1.4)	6 (54.5)	2 (18.2)	3 (27.3)		6 (54.5)	0 (0)	5 (45.5)	
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)	
BMI					0.049*				0.467
< 18.5	42 (5.3)	16 (38.1)	18 (42.9)	8 (19.0)		24 (57.1)	11 (26.2)	7 (16.7)	
18.5-24.9	295 (37.4)	177(60.0)	84 (28.5)	34 (11.5)		182(61.7)	77 (26.1)	36 (12.2)	
25-29.9	304 (38.5)	171(56.3)	84 (27.6)	49 (16.1)		181(59.9)	77 (25.3)	46 (15.1)	
30 and above	134 (17.0	75 (56.0)	32 (23.9)	27 (20.1)		70 (52.2)	37 (27.6)	27 (20.1)	
Missing	13 (1.6)	4 (30.7)	8 (61.5)	1 (7.8)		7 (53.8)	2 (15.4)	4 (30.8)	
Total	778 (100.0)	439(56.6)	218 (28.1)	118 (15.2)		457(59.0)	202 (26.1)	116 (15.0)	
Marital Status					0.060				<0.001*
Single	102 (12.9)	69 (67.6)	25 (24.5)	8 (7.8)		66 (64.7)	20 (19.6)	16 (15.7)	
Married	656 (83.2)	363(55.3)	188 (28.7)	105 (16.0)		386(58.8)	178 (27.1)	92 (14.0)	
Dead partner	10 (1.3)	3 (30.0)	5 (50.0)	2 (20.0)		2 (20.0)	1 (10.0)	7 (70.0)	
Divorced	20 (2.5)	8 (40.0)	8 (40.0)	4 (20.0)		10 (50.0)	5 (25.0)	5 (25.0)	
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)	
Education					0.547				0.001*
Illiterate	13 (1.6)	7 (53.8)	5 (38.5)	1 (7.7)		4 (30.8)	1 (7.7)	6 (61.5)	
Under Diploma	68 (8.6)	34 (50.0)	20 (29.4)	14 (20.6)		38 (55.9)	16 (23.9)	14 (20.6)	
Diploma	215 (27.3)	115(53.5)	62 (28.8)	38 (17.7)		129(60.0)	54 (25.1)	32 (14.9)	
Bachelor	348 (44.2)	196(56.3)	102 (29.3)	50 (14.4)		201(57.8)	98 (28.2)	49 (14.1)	
Mater	95 (12.1)	58 (61.1)	24 (25.3)	13 (13.7)		57 (60.0)	27 (28.4)	11 (11.6)	
Doctorate	49 (6.2)	33 (67.3)	13 (26.5)	3 (6.1)		35 (71.4)	8 (16.3)	6 (12.2)	
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)	
Occupation					0.076				0.079
Householder, Retired, Jobless	290 (36.8)	146(50.3)	102 (35.2)	42 (14.5)		160(55.2)	84 (29.0)	46 (15.9)	
Students	36 (4.6)	20 (55.6)	10 (27.8)	6 (16.7)		22 (61.1)	6 (16.7)	8 (22.2)	
Healthcare providers	118 (15.0)	76 (64.4)	27 (22.9)	15 (12.7)		83 (70.3)	20 (16.9)	15 (12.7)	
Others	344 (43.7)	201(58.4)	87 (25.3)	56 (16.3)		199(57.8)	94 (27.3)	51 (14.8)	
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)	
Residence					0.320				0.974
Urban	743 (94.3)	413(55.6)	217 (29.2)	113 (15.2)		437(58.8)	193 (26.0)	113 (15.2)	
Rural	45 (5.7)	30 (66.7)	9 (20.0)	6 (13.3)		27 (60.0)	11 (24.4)	7 (15.6)	
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)	
Distance to Healthcare Facilities					0.694				0.988
< 1 Km	353 (44.8)	205(58.1)	99 (28.0)	49 (13.9)		211(59.8)	87 (24.6)	55 (15.6)	
1-5 Km	388 (49.2)	216(55.7)	112 (28.9)	60 (15.5)		226(58.2)	105 (27.1)	57 (14.7)	
5-20 Km	41 (5.2)	20 (48.8)	12 (29.3)	9 (22.0)		24 (58.5)	10 (24.4)	7 (17.1)	
>20 Km	6 (0.8)	2 (33.3)	3 (50.0)	1 (16.7)		3 (50.0)	2 (33.3)	1 (16.7)	
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)	

Sleep					0.032*			0.092
< 6 hours	24 (3.0)	7 (29.2)	10 (41.7)	7 (29.2)		11 (45.8)	8 (33.3)	5 (20.8)
6-8 hours	456 (57.9)	268(58.8)	118 (25.9)	70 (15.4)		285(62.5)	104 (22.8)	67 (14.7)
> 8 hours	300 (38.1)	164(54.7)	94 (31.3)	42 (14.0)		162(54.0)	91 (30.3)	47 (15.7)
Missing	8 (1.0)	4 (50.0)	4 (50.0)	0 (0)		6 (75.0)	1 (12.5)	1 (12.5)
Total	788 (100.0)	439(56.3)	222 (28.5)	119 (15.3)		458(58.7)	203 (26.0)	119 (15.3)
History of Depression					<0.001*			<0.001*
Yes	121 (15.4)	46 (38.0)	42 (34.7)	33 (27.3)		43 (35.5)	42 (34.7)	36 (29.8)
No	667 (84.6)	397(59.5)	184 (27.6)	86 (12.9)		421(63.1)	162 (24.3)	84 (12.6)
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)
Smoking					0.032*			0.064
< 1 packet/day	26 (3.3)	10 (38.5)	12 (46.2)	4 (15.4)		11 (42.3)	9 (34.6)	6 (23.1)
1-2 packet/day	44 (5.6)	19 (43.2)	13 (29.5)	12 (27.3)		21 (47.7)	11 (25.0)	12 (27.3)
> 2 packet/day	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)
No	718 (91.1)	414(57.7)	201 (28.0)	103 (14.3)		432(60.2)	184 (25.6)	102 (14.2)
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)
History of COVID-19					0.002*			0.197
Yes	14 (1,8)	3 (21.4)	10 (71.4)	1 (7.2)		5 (35.7)	6 (42.9)	3 (21.4)
No	774 (98.2)	440 (56.8)	216 (27.9)	118 (15.3)		459(59.3)	198 (25.6)	117 (15.1)
Total	788 (100.0)	443 (56.3)	226 (28.6)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)
The cluster of Cardiovascular Symptoms	0.24±0.56	0.12±0.37	0.34±0.64	0.54±0.80	<0.001*	018±0.47	0.26±0.58	0.48±0.76 <0.001*
The cluster of COVID-19 symptoms	0.21±0.47	0.13±0.39	0.31±0.58	0.28±0.48	<0.001*	0.16±0.41	0.27±0.53	0.29±0.55 <0.001*
The cluster of other symptoms					<0.001*			<0.001*
Yes	428 (54.3)	194(45.4)	144 (33.6)	90 (21.0)		221(28.0)	129 (16.4)	78 (9.9)
No	360 (45.7)	249(69.1)	82 (22.7)	29 (8.1)		243(30.8)	75 (9.5)	42 (5.3)
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)
History of Chronic Diseases					0.680			0.817
Yes								
No	173 (22.0)	101(58.4)	45 (26.0)	27 (15.6)		100(57.8)	44 (25.4)	29 (16.8)
Total	615 (78.0)	342(55.6)	181 (29.4)	92 (15.0)		364(59.2)	160 (26.0)	91 (14.8)
	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)
History of Cardiovascular Diseases					0.474			0.558
Yes	43 (5.5)	24 (55.8)	10 (23.3)	9 (20.9)		24 (55.8)	10 (23.3)	9 (20.9)
No	745 (94.5)	419(56.2)	216 (29.0)	110 (14.8)		440(59.1)	194 (26.0)	111 (14.9)
Total	788 (100.0)	443(56.2)	226 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)
History of Hypertension					0.416			0.107
Yes	64 (8.1)	32 (50.0)	19 (29.7)	13 (20.3)		37 (57.8)	12 (18.8)	15 (23.4)
No	724 (91.9)	411(56.8)	207 (28.6)	106 (14.6)		427(59.0)	192 (26.5)	105 (14.5)
Total	788 (100.0)	443(56.2)	216 (28.7)	119 (15.1)		464(58.9)	204 (25.9)	120 (15.2)
Number of Chronic Diseases	0.31±0.67	0.30±0.64	0.27±0.62	0.39±0.87	0.604	0.29±0.65	0.29±0.61	0.39±0.86 0.737

SD Standard deviation, BMI Body mass index, COVID-19 Corona Virus 2019 Disease infection,

Anxiety, depression, and symptoms:

Abnormal anxiety and depression result: People having experienced more number of cardiovascular symptoms or COVID-19 related symptoms or having experienced a symptom from the other cluster had more abnormal anxiety and depression results (p<0.001).

The logistic regression model showed an increased number of borderline anxiety results in both clusters with an OR of 2.01 (95% CI: 1.38-2.93) for cardiovascular symptoms and 1.88 (95% CI: 1.27-2.78) for COVID-19 related symptoms. Regarding abnormal anxiety results, it had an association with more number of cardiovascular symptoms with an OR of 3.58 (95% CI: 2.38-5.36). The logistic regression model also showed an OR of 1.53 (95% CI: 1.06-2.22) for increased borderline depression results with more number of COVID-19 related symptoms. It also showed an OR 1.99 (95% CI: 1.40-2.82) for increased abnormal depression results with more cardiovascular symptoms.

Anxiety and depression score: Individuals who experienced more cardiovascular or COVID-19 related symptoms had an association with increased anxiety and depression score ($p<0.001$) in univariate analysis.

This was confirmed in multivariate analysis as well but with less significance for COVID-19 ($p=0.026$) for anxiety score. Other symptoms also showed an association in univariate and multivariate analysis (table 2).

Table 2: Anxiety score linear regression

Variable	Univariate linear regression					Multivariate linear regression (R^2=0.149, AR^2=0.139)		
	R^2	AR^2	B	SE	P value	B	SE	P value
Gender	0.051	0.050						
Male			Reference	Reference	Reference	Reference	Reference	Reference
Female			1.71	0.26	<0.001*	1.69	0.25	<0.001*
Age	0.010	0.006						
18-29			Reference	Reference	Reference	Reference	Reference	Reference
30-49			-0.14	0.30	0.627	-0.17	0.30	0.58
50-69			-1.27	0.46	0.006*	-1.34	0.46	0.003*
70 and above			0.01	1.13	0.988	-1.07	1.09	0.33
Marital status	0.010	0.007						
Single			Reference	Reference	Reference	Reference	Reference	Reference
Married			0.86	0.39	0.027*	0.84	0.36	0.020*
Widowed			2.77	1.21	0.022*	1.58	1.14	0.168
Divorced			1.52	0.89	0.089	1.23	0.83	0,140
BMI	0.004	0.001						
< 18.5			Reference	Reference	Reference			
18.5-24.9			-0.98	0.60	0.106			
25-29.9			-0.83	0.60	0.168			
30 and above			-0.46	0.65	0.477			
Education Illiterate	0.007	0.000	Reference	Reference	Reference			
Under Diploma			-0.25	1.11	0.816			
Diploma			-0.26	1.03	0.731			
Bachelor			-0.43	1.04	0.678			
Mater			-1.04	1.08	0.338			
Doctorate			-1.33	1.14	0.246			
Occupation	0.003	0.000	Reference	Reference	Reference			
Householder, Retired, Jobless			-0.44	0.65	0.493			
Students			-0.57	0.40	0.154			
Healthcare providers			-0.29	0.29	0.120			
Others								
Residence	0.001	0.000	Reference	Reference	Reference			
Urban			-0.60	0.56	0.282			
Rural								
Distance to Healthcare Facilities	0.007	0.003						
< 1 Km			Reference	Reference	Reference			
1-5 Km			0.47	0.27	1.760			
5-20 Km			0.86	0.60	1.423			
>20 Km			2.11	1.51	1.394			
Smoking	0.005	0.002						
< 1 packet/day			Reference	Reference	Reference			
1-2 packet/day			-0.18	0.90	0.842			
No			-1.06	0.73	0.147			
History of COVID-19	0.006	0.004						
Yes			Reference	Reference	Reference			

No			-2.09	0.99	<0.001*			
Cluster of Cardiovascular Symptoms	0.083	0.082	1.88	0.22	<0.001*	1.66	0.23	<0.001*
Cluster of COVID-19 symptoms	0.028	0.027	1.29	0.27	<0.001*	0.63	0.28	0.026*
Cluster of Other Symptoms	0.023	0.021						
Yes			Reference	Reference	Reference	Reference	Reference	Reference
No			-0.151	0.053	<0.001*	-1.31	0.27	<0.001*
History of Cardiovascular Diseases	0.000	0.000	Reference					
0.27								
No				Reference	Reference			
Yes				0.57	0.633			
History of Hypertension	0.000	0.000						
Yes			Reference	Reference	Reference			
No			-0.32	0.48	0.505			
Number of Chronic Diseases	0.000	-0.001	-0.008	0.19	0.96			

R^2 Multiple R-squared, AR^2 Adjusted R-squared, B Beta Coefficient, SE Standard error, BMI Body mass index, COVID-19 Corona Virus 2019 Disease infection

Anxiety, depression, and chronic diseases: The presence of hypertension and the number of chronic diseases showed a significant association with increased depression scores based on univariate analysis (table 3). However, the presence of cardiovascular disease did not show any significant association with increased anxiety or depression score.

Anxiety, depression, and COVID-19: Participants who had experienced someone in the family or themselves being infected had more borderline anxiety results in comparison to individuals without the infection (Table 1). Univariate analysis (table 2 and 3) showed that those who had not experienced infection in their families or themselves had lower anxiety (p<0.001) but no difference in the depression score. However, this finding was not significant in multivariate analysis.

Correlation of different factors with anxiety and depression: Table 4 shows that the anxiety score has a significant correlation with the depression score and age. Depression score is significantly correlated with anxiety scores and the number of chronic diseases.

Table 3: Depression score linear regression

Variable	Univariate linear regression					Multivariate linear regression (R^2=0.087, AR^2=0.060)		
	R^2	AR^2	B	SE	P value	B	SE	P value
Gender	0.005	0.004						
Male			Reference	Reference	Reference	Reference	Reference	Reference
Female			0.57	0.27	0.035*	0.76	0.31	0.017*
Age	0.003	0.000						
18-29			Reference	Reference	Reference			
30-49			-0.28	0.31	0.368			
50-69			-0.01	0.47	0.970			
70 and above			0.01	1.13	0.260			
Marital status	0.015	0.011						
Single			Reference	Reference	Reference			
Married			0.44	0.39	0.259			
Widowed			3.83	1.22	0.001*			
Divorced			1.68	0.0.90	0.062			
BMI	0.009	0.005						
< 18.5			Reference	Reference	Reference			
18.5-24.9			-0.22	0.61	0.716			
25-29.9			0.01	0.61	0.980			
30 and above			0.83	0.65	0.203			

Education	0.018	0.012						
Illiterate			Reference	Reference	Reference			
Under Diploma			-1.71	1.11	0.125			
Diploma			-2.46	1.05	0.019*			
Bachelor			-2.48	1.04	0.017*			
Mater			-2.97	1.09	0.006*			
Doctorate			-3.61	1.15	0.001*			
Occupation	0.018	0.000						
Householder, Retired, Jobless			Reference	Reference	Reference	Reference	Reference	Reference
Students			-0.11	0.65	0.862	0.13	0.69	0.845
Healthcare providers			-1.62	0.40	<0.001*	-1.14	0.47	0.016*
Others			-0.50	0.29	0.084	-0.06	0.35	0.843
Residence	0.000	-0.001						
Urban			Reference	Reference	Reference			
Rural			-0.13	0.57	0.815			
Distance to Healthcare Facilities	0.007	0.003						
< 1 Km			Reference	Reference	Reference			
1-5 Km			0.46	0.21	1.755			
5-20 Km			0.85	0.60	1.430			
>20 Km			2.12	1.51	1.376			
Smoking	0.008	0.006						
< 1 packet/day			Reference	Reference	Reference			
1-2 packet/day			-0.00	0.91	0.995			
No			-1.22	0.73	0.097			
History of COVID-19	0.003	0.002						
Yes			Reference	Reference	Reference			
No			-1.58	1.00	0.113			
Cluster of Cardiovascular Symptoms	0.041	0.039	1.33	0.22	<0.001*	1.66	0.23	<0.001*
Cluster of COVID-19 symptoms	0.022	0.021	1.18	0.27	<0.001*	0.98	0.28	<0.001*
Cluster of Other Symptoms	0.062	0.061						
Yes			Reference	Reference	Reference	Reference	Reference	Reference
No			-0.249	0.051	<0.001*	-0.99	0.29	<0.001*
History of Cardiovascular Diseases	0.002	0.001						
No			Reference	Reference	Reference			
Yes			0.85	0.58	0.142			
History of HTN	0.005	0.004						
Yes			Reference	Reference	Reference			
No			-0.99	0.48	0.040*			
Number of Chronic Diseases	0.005	0.004	0.41	0.19	0.032*			

R^2 Multiple R-squared, AR^2 Adjusted R-squared, B Beta Coefficient, SE Standard error, BMI Body mass index, COVID-19 Corona Virus 2019 Disease infection,

Table 4: Correlation of different factors with anxiety and depression:

Correlations						
		Anxiety score	Depression score	BMI	Chronic number	Age
Anxiety score	Pearson Correlation	1	0.571[a]	0.018	-0.002	-0.100[a]
	Sig. (2-tailed)		<0.001	0.617	0.965	0.005
	N	788	788	786	785	788
Depression score	Pearson Correlation	0.571[a]	1	0.033	0.077[b]	0.013
	Sig. (2-tailed)	<0.001		0.357	0.032	0.706
	N	788	788	786	785	788
BMI	Pearson Correlation	0.018	0.033	1	0.024	-0.026
	Sig. (2-tailed)	0.617	0.357		0.506	0.466
	N	786	786	786	783	786
Chronic number	Pearson Correlation	-0.002	0.077[b]	0.024	1	0.432[a]
	Sig. (2-tailed)	0.965	0.032	0.506		<0.001
	N	785	785	783	785	785
Age	Pearson Correlation	-0.100[a]	0.013	-0.026	0.432[a]	1
	Sig. (2-tailed)	0.005	0.706	0.466	<0.001	
	N	788	788	786	785	788

a Correlation is significant at the 0.01 level (2-tailed),b Correlation is significant at the 0.05 level (2-tailed), BMI Body mass index, Sig. Significant, N Number

Discussion

Our findings have shown that 15.1% and 15.2% of the general population are experiencing abnormal levels of anxiety and depression respectively. While some of this can be attributed to before the COVID-19 outbreak, some associations in our study show that part of it can be because of this pandemic. Our study showed that abnormal anxiety and depression results are more in females and individuals who are widowed or married may experience them more. This may be due to the fact of having more personal life challenges faced by these individuals rather than those who are single. Our findings were similar to a study done in 2016 by Risal et al. in Nepal (18).

Anxiety levels did not show any association with the jobs of our sample population, however, healthcare workers experienced less depression. This may be attributed to the fact that they have had an active life during the outbreak while working within hospitals. We expected to see increased psychological distress in the healthcare workers as seen by Yuhong et al, in a study done in China (19), but we did not notice a significant difference.

This may be since the area evaluated in our study was in its early days of COVID-19 outbreak and the personnel had enough knowledge and personal protective equipment. In a study done by Huanga et al. in China, they found no significant difference between the healthcare population and other occupations regarding generalized anxiety disorder and depressive symptoms. However, they significantly noticed that they suffer from sleep problems higher than other groups (20). In a recent study by Nemati et al. in Iran on 85 nurses, the self-reported anxiety level was 6.02 from 10 while they have shown a good status of knowledge toward COVID-19 (21). Another study in Italy has indicated that the increased risk of infection due to the job, will result in increased levels of anxiety, and although healthcare staff in their study had more knowledge, they also had more levels of anxiety compared to the general population (22). One of the main aims of our study was to find any relationship between experiencing cardiovascular symptoms and higher anxiety or depression levels. We focused on this issue as many people either have less access to healthcare facilities at the moment or are afraid to visit clinics or hospitals. This may cause an extra burden to think about the significance of the symptoms they are experiencing. As we expected, we found that individuals reporting more number of cardiovascular symptoms have higher levels of anxiety and depression. This was true with COVID-19 related symptoms as well. Having COVID-19 related symptoms can cause much tension and make individuals experience anxiety and consequently depression. To our surprise, having cardiovascular diseases did not have any association with increased anxiety or depression. This can be because of the small number of cardiovascular patients who participated in our study. However, more chronic diseases in individuals were associated with higher depression levels. This is in line with the findings of a study done by Assari et al. in Iran years before this outbreak (23). They found that having

comorbidities in ischemic heart disease patients has a positive correlation with psychological stress based on the HADS score. As regards being infected by COVID-19, although we had only a small number of people who were affected with the virus, we found that individuals who have family members or they themselves infected, have more number of borderline anxiety levels. This may be as a result of the fact that when someone is affected in the family, the infected person may experience an extra burden of fear of acting as a vector to other family members. An early study after 36 hours following the first confirmed COVID-19 case in Hong Kong, investigated anxiety using the HADS scale and the overall result of anxiety was borderline in the general population (24). This study has provided the baseline of anxiety levels and has also shown an important increasing trend of anxiety during the study period (24). Considering the results of our study, we would like to suggest having a psychological evaluation for those at risk, especially people who are experiencing new symptoms and have limited access to healthcare facilities can help societies face the psychological consequences of this pandemic in a better way. It is important to provide the needed protective equipment for all those involved in the management of COVID-19 and provide family counseling for those infected by the virus. Doctors can help by providing online ways by which people can reach out to them and ask about their concerns and fears. This can help in reducing the psychological impact of this outbreak in society.

Our study had two limitations which we would like to address. Firstly, we did not have a baseline measure of the psychological well-being of society before the COVID-19 hit. Measuring a baseline score for anxiety and depression was not possible in our study because the pandemic had already started in Iran and although the coronavirus did not spread much in the local setting of our study, the fear of pandemic was all over the news, affecting most of the Iranian population.

Secondly, we had less presentation of some chronic diseases. This may be attributed to the fact that our survey was online and those with chronic diseases who are elderly had less chance of being able to participate in the survey. We suggest studying populations with known psychological well-being on larger sample size or doing prospective longitudinal studies and following individuals for finding different potential influencers for psychological distress to establish suitable and effective interventions.

In conclusion, Psychological well-being is affected by many factors and a long-term study during pandemics can help in identifying potential influencing factors. Irrespective of being infected with the virus, COVID-19 related symptoms can cause an extra burden on the psychological well-being of society. Experiencing cardiovascular symptoms or having many chronic diseases may have an effect in increasing the psychological distress in society.

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