



# Evaluating COVID-19 Related Health Anxiety Among Individuals Referring to Urban Health Centers in Arak, Iran: A Cross-sectional Study

Pegah Mohaghegh<sup>1\*</sup>, Ehsan Abedi<sup>2</sup>, Masomeh Sofian<sup>3</sup>, Fatemeh Rafiei<sup>4</sup>

<sup>1</sup>Assistant Professor of Community and Preventive Medicine, Department of Community Medicine, School of Medicine, Arak University of Medical Sciences, Arak, Iran

<sup>2</sup>Student of General Medicine, Students Research Committee, Arak University of Medical Sciences, Arak, Iran

<sup>3</sup>Professor of Infectious Diseases, Department of Infectious Diseases, Infectious Diseases Research Center, School of Medicine, Arak University of Medical Sciences, Arak, Iran

<sup>4</sup>PhD Student of Biostatistics, Department of Biostatistics and Epidemiology, School of Health, Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran

## Abstract

**Background and aims:** The prevalence of coronavirus disease 2019 (COVID-19) resulted in health anxiety among general population and unreasonable referring to health centers. This study aimed to assess health anxiety related to COVID-19 in individuals referring to healthcare centers of Arak, Iran in 2020.

**Methods:** Using convenient sampling method, the participants of this cross-sectional study were selected from 16 urban health centers of Arak. Salkovskis 18-item Health Anxiety Inventory (HAI-18) was completed by 392 participants. The collected data entered in SPSS software version 24 and was analyzed by Mann-Whitney U and Kruskal-Wallis tests.

**Results:** Mean  $\pm$  SD of total score of health anxiety was  $28.96 \pm 7.62$ . Most participants (74.7%) had medium anxiety and 19.1% had high anxiety. The mean of total score of health anxiety was higher in the 30-59 age range, higher education, single people and students. Participants with chronic diseases and symptoms of cold and people who referred to health centers due to COVID-19 screening had a higher anxiety level.

**Conclusion:** Most people referring to health centers of arak had moderate anxiety. COVID-19-related health anxiety was higher in middle age range, higher education, students, people with chronic diseases, and people with symptoms of common cold.

**Keywords:** COVID-19, Health anxiety, SHAI, Short health anxiety inventory, Health centers

## \*Corresponding Author:

Pegah Mohaghegh,  
Tel: +989120253653;  
Email: pmohaghegh@arakmu.ac.ir

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## Introduction

Health anxiety is characterized by continuous and severe concerns for health and people who become disabled by health anxiety are diagnosed as hypochondriasis.<sup>1,2</sup> Health anxiety is a new diagnosis in the latest classification of the American Psychological Association (APA), which has been replaced to some extent by hypochondriasis.<sup>3,4</sup> Chronic anxiety is accompanied by suppression of natural killer response and antigen-specific immunity responses. It is expected that disorders resulted from stress in the immunity system expose people to a decreased immune response caused by viral infections. It has been proved that the amount of infection to rhinovirus has been increased in people under higher stress after laboratory infections. Recently, upper respiratory infection is being reported more in people with a low number of natural killer cells due to high stress compared to low-stress periods.<sup>5</sup>

Health anxiety results in unnecessary use of healthcare services and medical consultations.<sup>6,7</sup> In health anxiety, the anxiety and mental business of the person is high and inappropriate. These people examine themselves many times (like examining their throat before the mirror), continue research on the disease (for example, on the internet), and try to become sure of their family, friends, and physicians. In some cases, anxiety results in incompatible avoidance of some conditions (like avoiding seeing the family) and/or activities (like exercise). Concerns about the disease have a prominent position in the life of people, affect daily activities, and cause problems in life.<sup>7</sup> The outbreak of health anxiety is high among people during COVID-19 pandemic.<sup>1,8,9</sup> In a study about Health anxiety levels in chronic pain was estimate at least 51% of chronic pain patients had disabling health anxiety.<sup>1</sup>

The number of new emerging viral diseases, such as

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severe acute respiratory syndrome (SARS) in 2002, swine flu pandemic (H1N1) in 2009, Middle-East respiratory syndrome (MERS) in 2012, Ebola in 2014, and Zika in 2016 has increased during the last 15 years. These new emerging viral diseases, in addition to making serious concerns in general health, resulted in the death, fear, and anxiety among people.<sup>10-12</sup>

In 2014, the Middle-East coronavirus (MERS-CoV) outbreak was accompanied by general anxiety in affected countries.<sup>8</sup> On December 31, 2019, a cluster of new cases of severe respiratory infections with nCoV-2019 was reported in Wuhan, Hubei, China. This virus is a pneumonic etiologic agent of a novel beta-coronavirus from the same family with SARS-CoV and MERS-CoV, though it is different from them. The virus was spread among human populations and caused the pandemic. The result of this pandemic was full beds in hospitals, severe exhaustion of medical teams, serious deficiency of personal protection equipment, and fear of the disease in different cities and countries of the world.<sup>11,13</sup>

Lack of early diagnosis and treatment of health anxiety can affect physicians' performance, cause bias in the diagnosis and treatment, higher demands for preclinical actions or prescription of various medications, and impose high costs on patients and society.

Field reports show that anxiety, concern, and confusion are the main feelings observed among Iranian people from the beginning of the COVID-19 pandemic.<sup>14</sup> Most of these feelings are due to the lack of knowledge about the behavior of this virus, standard protection methods, and stress in case of the lack of protection equipment. In such conditions, people may experience some kind of psychological problems like anxiety, worry, fear of death, anger, and post-trauma stress disorder.<sup>15</sup> During the current crisis, diagnosing people prone to psychological disorders from different demographic groups is vital to use psychological techniques and interventions appropriate for each demographic group.

Regarding the outbreak of COVID-19 pandemic and anxiety among people, which caused unreasonable referrals to healthcare centers and imposed high costs and stress on medical personnel, the current study aimed to assess COVID-19 health anxiety in individuals referring to healthcare centers of Arak, Iran in 2020.

**Methods**

In this cross-sectional study, 400 people were selected by convenient sampling method from 16 urban health centers of Arak city (25 people from each urban health center). After taking written consent, Salkovskis 18-item Health Anxiety Inventory (HAI-18) was completed by participants. This inventory has two parts; the first part collects demographic information, like age, gender, occupation, education, having special groups in family, having underlying diseases, and having symptoms of cold.

The second part includes 18 questions for measuring health anxiety. To have maximum participation in completing the questionnaire, researchers described the study purpose and how to complete the inventory. Moreover, the importance of giving correct responses was mentioned and confidentiality of information was confirmed. Exclusion criteria were lack of consent and incomplete inventory. The sample size was estimated 400 by considering 50% anxiety prevalence and 0.95 confidence level.

**Health Anxiety Inventory**

A long version of this inventory was first designed by Salkovskis and Warwick in 1989 based on the health anxiety cognitive model and hypochondriasis. The short version of this inventory was designed by these people in 2002, which includes 18 items.<sup>16</sup> This 18-item inventory has three subscales, including 'concern about health', 'fear of having disease', and 'negative consequences'. Each question has four choices and each choice includes a description of health and disease components in the form of a declarative sentence, and the responder should select the sentence which describes him/her better. The scoring for each question is 0 to 3. The total score for each person ranges from 0 to 54, and a higher score shows higher anxiety. A score of 0-18 shows a low anxiety, 18-36 medium anxiety, and a score higher than 36 shows high anxiety.

The test-retest reliability of this inventory was obtained 0.90 by Salkovskis and Warwick,<sup>16</sup> Cronbach's alpha was 0.70-0.82, and Abramowitz et al determined its validity as 0.94.<sup>2</sup> Persian version of this inventory was validated by Nargesi et al.<sup>1</sup> In their study, Cronbach's alpha for the whole inventory was 0.75. Moreover, Cronbach's alpha for general health concern factors, outcomes, and having disease was 0.59, 0.70, and 0.60, respectively.<sup>1</sup> Results revealed an acceptable reliability for this inventory. Moreover, confirmatory factor analysis was used for examining the validity of this inventory, the results of which showed that health anxiety is a three-dimensional structure, and all the three subscales were confirmed.<sup>1</sup> In examining sub-scales of health anxiety, the score range was 0-21 for 'concern about health', 0-18 for 'fear of having disease', and 0-15 for 'negative consequences'. Health anxiety in the current study was a score that respondents assigned to 18 items in the HAI.

After completing the inventory, the collected information entered into SPSS software version 24 and was analyzed by independent *t* test, Mann-Whitney U test, one-way ANOVA, and Kruskal-Wallis test.

**Results**

Out of 400 distributed questionnaires, eight inventories were excluded due to being incomplete, and finally 392 questionnaires were examined. Among participants, 283 (72.2%) were female and 109 (27.08%) were male. The

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mean age of participants was  $35.24 \pm 10.59$  years. The lowest age was 13 and the highest age was 75. The mean number of children was  $1.46 \pm 1.21$ . Of total participants, 194 (49.5%) had an academic education, 184 (46.9%) were housewives, and 348 (88.8%) were married.

Mean and SD for a total score of health anxiety was  $28.96 \pm 7.62$  (range: 5-48). Of 392 participants, 24 (6.1%) had low anxiety, 293 (74.7%) had medium anxiety, and 75 (19.1%) had high anxiety.

In examining the subscales of health anxiety, the mean score for 'concern about health' was 13.06 (from 21 scores) with SD of 3.86; the mean score for 'fear of having disease' was 9.01 (from 18 scores) with SD of 3.17; and the mean score for 'negative consequences' was 6.88 (from 15 scores) with SD of 2.37.

Age range classification in the current study was based on target groups receiving services in healthcare centers (<30 as young, 30-59 as middle-aged, and  $\geq 60$  as elderly). As can be seen in Table 1, the total score of health anxiety was significantly different among different age groups, so that it was lower in  $\geq 60$  group ( $P < 0.014$ ).

The mean total health anxiety score was higher in male and single people (Table 1). The mean of total health anxiety score and its different dimensions was the lowest in people with preliminary education level. In examining health anxiety in different occupations, the health anxiety score was the highest in students, and it was higher in employed people and housewives than unemployed and retired individuals (Table 1). However, the differences between the groups were not statistically significant ( $P \geq 0.05$ ).

The mean of total health anxiety score was higher in people with chronic disease, individuals having symptoms of cold, people who had children in their family, and those referring to the healthcare centers for COVID-19 screening (Table 2). Despite the fact that this difference was clinically significant, the observed differences between the groups were not statistically significant ( $P \geq 0.05$ ).

As can be seen in Table 3, most of the participants with any age, gender, education level, or occupation had medium anxiety.

As can be seen in Table 4, most of the participants had a medium anxiety when examining based on the underlying disease, symptoms of having a cold, reason for referring to the healthcare center, and having vulnerable groups in the family. The difference between the groups was not statistically significant ( $P = 0.05$ ).

### Discussion

The current study examined COVID-19-related health anxiety in people referring to health centers of Arak in 2020. The mean  $\pm$  SD of total score of health anxiety was  $28.96 \pm 7.62$ .

In our study, the health anxiety score was higher in the 30-59 age range. According to the studies by Moghanibashi-Mansourieh<sup>17</sup> and Jungmann and Witthöft,<sup>18</sup> middle-aged people reported a stronger anxiety associated with the current COVID-19 pandemic, possibly because this age group is responsible for the family, occupation, and income.

In the current study, people with preliminary education had lower anxiety scores. The results of studies by

**Table 1.** Mean and SD for Health Anxiety Score Based on Demographic Variables of Individuals Referring to Urban Health Centers of Arak

		No. (%)	Mean $\pm$ SD of Total Score of Health Anxiety	Mean $\pm$ SD of 'Concern About Health'	Mean $\pm$ SD of 'Fear of Having Disease'	Mean $\pm$ SD of 'Negative Consequences'	P Value (Total Score of Health Anxiety)
Age	<30	111 (28.3)	27.86 $\pm$ 7.30	12.64 $\pm$ 3.62	8.57 $\pm$ 3.06	6.63 $\pm$ 2.39	0.014
	30-59	258 (65.8)	29.62 $\pm$ 7.75	13.32 $\pm$ 3.95	9.25 $\pm$ 3.25	7.03 $\pm$ 2.36	
	$\geq 60$	23 (5.9)	26.91 $\pm$ 6.92	12.17 $\pm$ 3.71	8.47 $\pm$ 2.62	6.26 $\pm$ 2.22	
Gender	Female	283 (72.2)	28.91 $\pm$ 7.20	13.15 $\pm$ 3.74	8.99 $\pm$ 2.96	6.76 $\pm$ 2.3	0.857
	male	109 (27.8)	29.08 $\pm$ 8.64	12.84 $\pm$ 4.16	9.06 $\pm$ 3.68	7.17 $\pm$ 2.53	
Marriage	Single	33 (8.4)	29.63 $\pm$ 8.13	12.66 $\pm$ 3.11	9.09 $\pm$ 3.90	7.87 $\pm$ 2.66	0.982
	Married	348 (88.8)	28.89 $\pm$ 7.58	13.11 $\pm$ 3.92	9.00 $\pm$ 3.13	6.77 $\pm$ 2.31	
	Widow/divorced	11 (2.8)	29.18 $\pm$ 7.99	12.90 $\pm$ 4.08	9.18 $\pm$ 2.18	7.09 $\pm$ 2.80	
Education level	Preliminary	34 (8.7)	27.58 $\pm$ 6.23	12.26 $\pm$ 3.56	8.64 $\pm$ 2.38	6.67 $\pm$ 2.09	0.601
	Junior high-school	53 (13.5)	29.49 $\pm$ 8.6	13.18 $\pm$ 4.22	9.13 $\pm$ 3.62	7.16 $\pm$ 2.62	
	Senior high-school	111 (28.3)	29.06 $\pm$ 8.18	13.31 $\pm$ 3.96	9.13 $\pm$ 3.48	6.61 $\pm$ 2.32	
Occupation	Academic	194 (49.5)	29.00 $\pm$ 7.24	13.03 $\pm$ 3.75	8.97 $\pm$ 2.99	6.98 $\pm$ 2.36	0.120
	Unemployed	15 (3.8)	25.4 $\pm$ 6.6	11.13 $\pm$ 3.41	7.4 $\pm$ 2.99	6.86 $\pm$ 2.69	
	Employed	169 (43.1)	29.10 $\pm$ 7.67	12.91 $\pm$ 3.88	9.26 $\pm$ 3.24	6.92 $\pm$ 2.35	
	Housewife	184 (46.9)	29.04 $\pm$ 7.3	13.41 $\pm$ 3.78	8.87 $\pm$ 3.03	6.76 $\pm$ 2.22	
	Retired	14 (3.6)	26.7 $\pm$ 9.17	11.8 $\pm$ 4.31	9 $\pm$ 3.26	5.9 $\pm$ 2.72	
	Student	10 (2.6)	31.64 $\pm$ 10.16	13.42 $\pm$ 4.3	9.64 $\pm$ 3.99	8.57 $\pm$ 3.29	

**Table 2.** Mean and SD of Health Anxiety Score Based on Family and Health Information of Individuals Referring to Urban Health Centers of Arak

		No. (%)	Mean ± SD of Total Score of Health Anxiety	Mean ± SD of 'Concern About Health'	Mean ± SD of 'Fear of Having Disease'	Mean ± SD of 'Negative Consequences'	P Value (Total Score of Health Anxiety)
Chronic disease	No	326 (83.2)	28.86 ± 7.86	13.02 ± 3.97	9.00 ± 3.21	6.83 ± 2.40	0.883
	Yes	66 (16.8)	29.45 ± 6.31	13.28 ± 3.28	9.07 ± 2.99	7.09 ± 2.19	
Symptoms of common cold	No	359 (91.6)	28.79 ± 7.67	13 ± 3.90	8.94 ± 3.18	6.84 ± 2.38	0.112
	Yes	33 (8.4)	30.84 ± 6.87	13.81 ± 3.33	9.81 ± 3.04	7.21 ± 2.17	
Reason for referring to healthcare centers	Vaccination	135 (34.4)	29.48 ± 7.92	13.21 ± 4.07	9.40 ± 3.20	6.86 ± 2.38	0.462
	Diabetes and HTN care	39 (9.9)	28.12 ± 6.32	12.28 ± 3.4	8.74 ± 2.39	7.10 ± 2.43	
	COVID-19 screening	60 (15.3)	29.51 ± 8.69	13.13 ± 3.92	9.1 ± 4	7.28 ± 2.27	
	Pregnancy care	38 (9.7)	28.39 ± 6.94	13.65 ± 3.82	8.63 ± 2.83	6.10 ± 2.36	
	Child care and other care	120 (30.6)	28.55 ± 7.34	12.94 ± 3.74	8.74 ± 2.99	6.86 ± 2.36	
Having vulnerable groups in the family	Children	230 (58.7)	29.07 ± 7.99	13.11 ± 4.08	9.14 ± 3.22	6.81 ± 2.33	0.380
	Elderly	32 (8.2)	28.46 ± 7.13	12.53 ± 3.57	8.90 ± 3.15	7.03 ± 2.23	
	Patients	130 (33.2)	28.88 ± 7.10	13.12 ± 3.52	8.8 ± 3.11	6.95 ± 2.48	

**Table 3.** Level of Health Anxiety Based on Demographic Variables of Individuals Referring to Urban Health Centers of Arak

		Low Anxiety No. (%)	Medium Anxiety No. (%)	High Anxiety No. (%)	P Value
Age	<30	6 (5.4)	88 (79.3)	17 (15.3)	0.710
	30-59	17 (6.6)	187 (72.5)	54 (20.9)	
	≥60	1 (4.3)	18 (78.3)	4 (17.4)	
Gender	Female	15 (5.3)	218 (77)	50 (17.7)	0.226
	Male	9 (8.3)	75 (68.8)	25 (22.9)	
Married	Single	1 (3)	23 (69.7)	9 (27.3)	0.722
	Married	22 (6.3)	262 (75.3)	64 (18.4)	
	Widow/divorced	1 (9.1)	8 (72.7)	2 (18.2)	
Education level	Preliminary	2 (5.9)	29 (85.3)	3 (8.8)	0.389
	Junior high-school	4 (7.5)	34 (64.2)	15 (28.3)	
	Senior high-school	8 (7.2)	82 (73.9)	21 (18.9)	
	Academic	10 (5.2)	148 (76.3)	36 (18.6)	
Occupation	Employed	2 (13.3)	12 (80)	1 (6.7)	0.159
	Unemployed	9 (5.3)	127 (75.1)	33 (19.5)	
	Housewife	10 (5.4)	141 (76.6)	33 (17.9)	
	Retired	2 (20)	6 (60)	2 (20)	
	Student	1 (7.1)	7 (50)	6 (42.9)	

Maarefvand et al<sup>19</sup> and Moghanibashi-Mansourieh<sup>17</sup> in Iran on anxiety in general Iranian population showed that health anxiety was higher in people with higher education levels.<sup>17,19</sup> This might be attributed to the fact that people with lower education levels read health-related texts less than others and they have less activity in social media; thus, they experience lower anxiety. In addition, since people with higher education spend more time on reading health-related information in the social media, they experience higher anxiety.<sup>20</sup>

In this study, the total score of health anxiety was higher in men, possibly because this group has greater family and job concerns (e.g., financial worries), which is different from the results of some previous studies.<sup>17, 19</sup>

In our study, single people and students had a higher health anxiety, which is similar to the results of study by Moghanibashi-Mansourieh.<sup>17</sup>

Furthermore, in current study, the total score of health anxiety was higher in people with chronic disease and those with cold symptoms. Moreover, people referring to the healthcare centers for COVID-19 screening reported higher anxiety. Based on the study by Maarefvand et al, the anxiety level was higher in people with chronic disease.<sup>19</sup> This might be attributed to the fact that people with chronic diseases are afraid of the disease and its outcomes. Lack of vaccine and drug for preventing and treating COVID-19, in this case, causes higher anxiety among these people.

Table 4. Level of Health Anxiety Based on Family and Health Information of Individuals Referring to Urban Health Centers of Arak

		Low Anxiety No. (%)	Medium Anxiety No. (%)	High Anxiety No. (%)	P Value
Chronic disease	No	23 (7.1)	239 (73.3)	64 (19.6)	0.171
	Yes	1 (1.5)	54 (81.8)	11 (16.7)	
Symptoms of common cold	No	23 (6.4)	270 (75.2)	66 (18.4)	0.380
	Yes	1 (3)	23 (69.7)	9 (27.3)	
Reason for referring to healthcare centers	Vaccination	11 (8.1)	94 (69.6)	30 (22.2)	0.852
	Controlling Diabetes and blood pressure	2 (5.1)	31 (79.5)	6 (15.4)	
	COVID-19 screening	3 (5)	44 (73.3)	13 (21.7)	
	Pregnancy care	2 (5.3)	30 (78.9)	6 (15.8)	
	Child care and other care	6 (5.0)	94 (78.3)	20 (16.7)	
Having vulnerable groups in the family	Children	18 (7.8)	167 (72.6)	45 (19.6)	0.548
	Elderly	1 (3.1)	25 (78.1)	6 (18.8)	
	Patients	5 (3.8)	101 (77.7)	24 (18.5)	

In this study, most participants (74.7%) had a medium anxiety and 19.1% had a high anxiety level. Based on the study by Salari et al, the prevalence of COVID-19-related anxiety and depression is 31.9% and 33.7% in general world population, respectively.<sup>21</sup> In a study conducted in Wuhan, China on the COVID-19 pandemic, the prevalence of anxiety was 22.6%, the prevalence of depression was 48.3%, and the co-occurrence of both was 19.4%.<sup>22</sup> Liu et al studied the general Chinese population and reported that the prevalence of anxiety and depression was 16.8% and 24.1%, respectively.<sup>23</sup> Moreover, people who had vulnerable groups in the family like the elderly, disabled people, and people with immunity deficiency were more exposed to psychological outcomes.<sup>23</sup>

During COVID-19 pandemic, the global society is faced with an unstable, unpredictable, and ambiguous status. Long-term and severe anxiety results in weakening of immune system and vulnerability to viral infections. Hence, keeping the mental health of people and making psychological interventions that can promote the health of vulnerable groups and general population during COVID-19 pandemic are necessary.<sup>24,25</sup> Providing supportive psychological services by experts, psychologists, and consultants can mediate available stress. In addition, familiarity with alternative programs and adaptation with a new lifestyle is important due to changes in the daily life of people during the pandemic and quarantine.

### Conclusion

According to our results, middle-aged people, those with higher education, having chronic disease, and people with symptoms of common cold had a higher COVID-19-related health anxiety. Diagnosing more vulnerable groups to health anxiety may indicate starting points for interventions during the pandemic, such as providing accurate information about the pandemic as well as the promotion of adaptive emotion regulation strategies.

### Conflict of Interest Disclosures

The authors state that there is no conflict of interests in the current study.

### Ethical Approval

The current study has been extracted from the MD thesis of Ehsan Abedi at Arak University of Medical Sciences, Iran (code IR.ARAKMU.REC.1398.331).

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