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# Assessing the anxiety level of Iranian general population during COVID-19 outbreak



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## ABSTRACT

This study is aimed to assess the anxiety level of Iranian general population during COVID-19 outbreak. The online questionnaire surveyed 10,754 individuals from the general population of 31 provinces of Iran who completed the questionnaire on social networks from March 1 to March 9, 2020. The inferential statistics suggests that the level of anxiety was higher among women (95 % CI [0.1, 81.36],  $p < 0.001$ ), people who more followed corona-related news ( $p < 0.001$ ) and the age group of 21–40 years ( $p < 0.001$ ). Ultimately, the level of anxiety was significantly higher among people who had at least one family member, relative, or friend who contracted COVID-19 disease (95 % CI [1.2, 35.03],  $p < 0.001$ ). The health care system should adopt a package of psychosocial interventions to reduce the anxiety of high risk groups.

## 1. Introduction

Infectious disease disasters, including epidemics, pandemics and outbreaks, may cause high morbidity and mortality and may account for a quarter to a third of global death rate (Verikios et al., 2016).

The World Health Organization has announced COVID-19 as the sixth public health emergency of international concern. The virus was first detected in December 2019 in Wuhan, China, and its main symptoms include fever, dry cough and shortness of breath (Guan et al., 2020; Holshue et al., 2020).

It is spread by human-to-human transmission via droplets or direct contact, and infection has been predicted to have mean incubation period of 6.4 days and a basic reproduction number of 2.24–3.58 (Lai et al., 2020).

More than 203 countries, areas or territories have been affected by the virus so far, with about 630,000 infected and nearly 30,000 deaths reported by March 29. Iran, after Italy, Spain and China, has had the highest number of deaths in the world (World Health Organization (WHO, 2020a).

### 1.1. COVID-19 outbreak in Iran

Iran's Ministry of Health officially declared two people contracted COVID-19 on February 19, 2020 in Qom. Gilan, Markazi, and Tehran were the other provinces where the virus dramatically spread. To

control the infection, the National Corona Committee was set up and a parallel committee in each province as well. So far, about 35,000 people have been diagnosed to contract COVID-19 (World Health Organization (WHO, 2020a).

Evidence also suggests that individuals may experience symptoms of psychosis, anxiety, trauma, suicidal ideation, and panic during outbreaks of communicable diseases (World Health Organization (WHO, 2020b; Taylor et al., 2008; Tucci et al., 2017).

Anxiety is a feeling of tension, worriedness and physical changes such as increased blood pressure, sweating, trembling, dizziness or a rapid heartbeat (Major et al., 2000).

The unknown and newness of COVID-19, the instantaneous transmission of its mortality statistics and, overestimation by the infected, concerns about the future (Banerjee, 2020), the severe economic sanctions imposed on the country, the doubts about the adequacy of measures and the provision of health and medical needs to control the disease can all be the reasons which may cause anxiety.

Anxiety, when above its normal level, weakens the immune system and as a result the risk of the virus infection increases (World Health Organization (WHO, 2020b). In addition, people's anxious reactions trigger public disruptive behaviors as people rush to stores, health centers, and pharmacies and health supply become scarce and the country health care service provision is affected.

In Iran's history, there have been outbreaks of contagious diseases such as cholera, plague, tuberculosis, typhus, and leprosy, which have

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unfortunately cost many lives and financial losses to the country (Mirsalehian and Dalvand, 2018) and the mentality of contagious diseases among Iranian people seems to have a doubling of concern.

Eid-e Nowrooz is culturally and traditionally one of the most important national celebrations where families gather together, visit, travel and have fun, and the simultaneous prevalence of the disease with the national event has made the conditions more difficult.

The focus of the media and the health system in general is on the ramification of epidemics, and mental health problems that co-occur with diseases are largely ignored (Tucci et al., 2017). Although Iran has not yet reached the stable stage of the outbreak and perhaps the first action that seems to be key is the urgent control of the outbreak, mental health should not be neglected as the prevalence of mental disorders, especially anxiety, reduces individuals resiliency against the virus infection and may also cause irreparable economic, social, cultural and psychological problems to people in the future. More importantly, now it is unclear when COVID-19 will disappear! So far, no research has been published on the mental health status of the general population in Iran and the purpose of this study is to assess the general population anxiety level during COVID-19 spread.

## 2. Material and method

### 2.1. Design and sampling

The study is an online survey conducted in 31 provinces of Iran. Social networks such as Telegram and Instagram have been the main platforms for distribution of the questionnaire. Sampling was readily available, and news, entertainment, and scientific groups and channels of Telegram at provincial level were the most important means in which the questionnaires were shared. Over the recent decade, Internet penetration in Iran has been on a steep upward slope and according to the international reports more than 49 million Iranian users used the Internet in 2017, and it has increased in recent years (World Bank, 2019). The criteria for categorizing the provinces into three levels of high, medium and low prevalence were the prevalence of COVID-19 according to the official report of the Iranian Ministry of Health on March 10th.

### 2.2. Data collection tools

An anonymous online 15-question questionnaire was applied to collect the data, including three general sections on the demographic characteristics of the respondents (age, province, gender, marital status and education), corona-related questions (news follow-up level, coronavirus infection of the individual's family, relatives, and friends, and awareness degree of the main symptoms of coronavirus disease) together with the 7 anxiety subscale questions of the anxiety of the dass21 questionnaire which assessed autonomic arousal, skeletal muscle effects, situational anxiety and subjective experience of anxious impact (Lovibond and Lovibond, 1995).

The validity and reliability of the dass21 questionnaire have been confirmed by national and international studies and Cronbach's alpha was calculated 0.84 for its anxiety subscale. The data collection process took 9 days (1 March to 9 March). At the beginning of the questionnaire, a full explanation of the purpose of the study was stated and the participants' right to choose and their informed consent to participate in the study were obtained.

### 2.3. Data analysis method

After the data were collected and inserted in SPSS software, version 16, they were analyzed by descriptive statistics (frequency distribution, mean and standard deviation) and inferential statistics (chi-squared tests, independent *t*-test and analysis of variance).

**Table 1**

Frequency distribution of people according to demographic variables.

Variable	Item	Frequency (percentage)
Residence of place (based on COVID-19 prevalence)	High prevalence (over 500 people)	7173 (66.7)
	Average prevalence (100–500 people)	2528 (23.5)
	Low prevalence (less than 100 people)	1053 (9.8)
Gender	Female	7073 (65.8)
	Male	3681 (34.2)
Age	20 and under	1858 (17.2)
	21–30	3400 (31.6)
	31–40	3590 (33.4)
	41–50	1426 (13.3)
	Over 50	480 (4.5)
Marital status	Single	4097 (38.1)
	Married	6657 (61.9)
Education level	Under diploma	1540 (14.3)
	Diploma	3663 (34.1)
	High diploma	1047 (9.7)
	Bachelor	3203 (29.8)
	Master and higher	1301 (12.1)

## 3. Results

More than 12,000 people visited the questionnaire and about 90 % of them completed the questionnaire. The average response time was 127 s, and mobile (97 %), tablet (2%), and computer (1%) were the devices by which users completed the questionnaire. Finally, 10754 people from all provinces of Iran participated in this research.

Most of the participants (66.7 %) lived in high prevalence provinces (Tehran, Qom, Isfahan, and Mazandaran) and 23.5 % lived in average prevalence provinces. Women participated in the study about twice more than men. 65 % of people were between the ages of 21 and 40 and 4.5 % of the participants were over 50 years. Nearly 62 % was married and the rest were single. In terms of educational level, diploma and bachelor degrees were the most frequent with 34.1 % and 29.8 %, respectively (Table 1).

The findings show that more than 94 % of people always/sometimes follow COVID-19 news and about 0.6 % do not follow the news at all. Concerning the most important symptoms of coronavirus, more than 95 % of the participants mentioned that the most important symptoms include fever, dry cough and shortness of breath. In addition, nearly 19 % reported having at least one family member, relative or friend who contracted coronavirus (Table 2). The results of Table 3 show that the total anxiety level was  $8.61 \pm 6.95$  and the severity of anxiety symptoms in 49.1 % of cases was normal, in 9.3 % was severe and in 9.8 % was very severe.

The level and severity of anxiety symptoms of those resided in high prevalence of COVID-19 was significantly higher ( $p < 0.001$ ). The level of anxiety among women was significantly higher than men (95 % CI [0.1, 81.36],  $p < 0.001$ ). The level of anxiety in the age group of 21–40 years was significantly higher than the other age groups ( $p < 0.001$ ). As the level of education increased, their anxiety levels increased significantly too ( $p < 0.01$ ). The more people followed coronavirus news, the more the level and severity of their anxiety symptoms increased ( $p < 0.001$ ). Finally, the level of anxiety was significantly higher among people who had at least one family member, relative, or friend with COVID-19 disease (95 % CI [1.2, 35.03],  $p < 0.001$ ) (Table 4).

## 4. Discussion

The purpose of the present study was to evaluate the level of anxiety among the general population during the outbreak of coronavirus. The

**Table 2**  
Distribution of individual responses to coronavirus-related variables.

Variable	Item	Frequency (percentage)
Following up corona-related news	Never	64 (0.6)
	Seldom	543 (5.0)
	Sometimes	4233 (39.4)
	Always	5914 (55.0)
Most important symptoms	Fever, dry cough, shortness of breath	10253 (95.3)
	Diarrhea, fever, headache	122 (1.1)
	Running nose, sore throat, bruise	158 (1.5)
	Fever and trembling, sneezing, runny nose	221 (2.1)
Any family member, relative or friend contracted COVID-19	Yes	2005 (18.6)
	No	8749 (81.4)

**Table 3**  
Level and severity of participants' anxiety symptoms.

Variable	Rate	Frequency (percentage)	Standard deviation ± mean
Anxiety Severity	Normal	5282(49.1)	8.61 ± 6.95
	Mild	1128(10.5)	
	Average	2291(21.3)	
	Severe	999(9.3)	
	Very severe	1054(9.8)	

findings of the present study indicate that approximately one fifth of people have experienced severe/very severe anxiety and that women feel more anxiety than men. In addition, the level of anxiety among residents of provinces with a high prevalence of coronavirus infection has been reported higher. The more people follow COVID-19 news, the more anxious they are, and the anxiety level among people with someone infected by COVID-19 is higher.

Recently, Iranian researchers have emphasized on paying special attention to providing psychosocial care during COVID-19 prevalence (Zandifar and Badrfam, 2020; Javadi et al., 2020) and the findings of the present study addressed the necessity of the provision of such services.

A study in China showed that more than a quarter of participants

**Table 4**  
Relationship between the severity and rate of anxiety symptoms with demographic and COVID-19 variables.

Variable	Rate	Anxiety				
		Severity Frequency (percentage)				
		Normal	Mild	Medium	Severe/Very severe	
Living place	High prevalence	8.83 ± 7.01	3417 (47.6)	1569 (21.9)	1569 (21.9)	1428 (19.9)
	Medium prevalence	8.23 ± 6.81	1305 (51.6)	519 (20.5)	519 (20.5)	438 (17.3)
	Low prevalence	8.08 ± 6.81	560 (53.2)	203 (19.3)	203 (19.3)	187 (17.8)
	P	0.000*	0.000**			
Gender	Female	8.99 ± 6.98	3296 (46.6)	1544 (21.8)	1544 (21.8)	1458 (20.6)
	Male	7.90 ± 6.83	1986 (54.0)	747 (20.3)	747 (20.3)	595 (16.1)
	P	0.000***	0.000**			
	CI (95 %)	0.1,81.36				
Age	20 and under	7.88 ± 6.63	991 (53.3)	388 (20.9)	388 (20.9)	289 (15.6)
	21 – 30	9.13 ± 7.04	1575 (46.3)	740 (21.8)	740 (21.8)	732 (21.5)
	31 – 40	8.98 ± 7.04	1679 (46.8)	790 (22.0)	790 (22.0)	735 (20.4)
	Over 40	7.72 ± 6.74	1037 (54.4)	373 (19.6)	373 (19.6)	297 (15.6)
	P	0.000*	0.000**			
Marital status	Single	8.64 ± 7.00	3253 (48.9)	1410 (21.2)	1410 (21.2)	1269 (19.0)
	Married	8.60 ± 6.92	2029 (49.5)	881 (21.5)	881 (21.5)	784 (19.2)
	P	0.799***	0.358**			
	CI (95 %)	-0.0,23.30				
Education degree	Under diploma	8.19 ± 6.94	806 (52.4)	290 (18.8)	290 (18.8)	284 (18.4)
	Diploma	8.34 ± 6.07	1837 (50.2)	791 (21.6)	791 (21.6)	643 (17.5)
	High diploma	8.63 ± 6.87	511 (48.8)	239 (22.8)	239 (22.8)	189 (18.1)
	Bachelor	8.94 ± 7.02	1512 (47.2)	710 (22.2)	710 (22.2)	649 (20.2)
	Master and higher	9.07 ± 7.45	616 (47.3)	261 (20.1)	261 (20.1)	288 (22.1)
	P	0.000*	0.003**			
Following up corona-related news	Never or seldom	4.88 ± 5.63	462 (76.1)	65 (10.7)	65 (10.7)	41 (6.8)
	Sometimes	7.06 ± 6.20	2483 (58.7)	771 (18.2)	771 (18.2)	524 (12.4)
	Always	10.11 ± 7.19	2337 (39.5)	1455 (24.6)	1455 (24.6)	1488 (25.2)
	P	0.000*	0.000**			
	CI (95 %)	1.2,35.03				
Any family member, relative or friend contracted COVID-19	Yes	9.99 ± 7.08	812 (40.5)	485 (24.2)	485 (24.2)	497 (24.8)
	No	8.30 ± 6.88	4470 (51.1)	1806 (20.6)	1806 (20.6)	1556 (17.8)
	P	0.000***	0.000**			
	CI (95 %)	1.2,35.03				

\* ANOVA.

\*\* Chi-squared test.

\*\*\* Independent t-test.

experienced moderate to severe anxiety symptoms, and women suffered from psychological distress and stress, anxiety, and depression (Wang et al., 2020) and it complies with the findings of the present study. In this research, with the increase in education, the level of anxiety became higher due to the majority of female participants. A study conducted in Australia on the rate of psychological distress of the flu epidemic found that residents in areas with a higher prevalence of the illness were more likely to experience mental distress and younger and less educated groups were at greater risk of mental distress (Taylor et al., 2008). In our study, the anxiety rate was also directly associated with a high prevalence of coronavirus infection. Although it seems that old age increases the risk of COVID-19-related infection and mortality, our findings show that anxiety level is significantly higher in 21–40 age group, which seems the main cause to be concerned is about future and economic consequences because this group is an active force in the society and they are mostly affected by unemployment, inflation, and business closures.

Unfortunately, most of the news broadcast on COVID-19 is mostly disappointing and frustrating and sometimes such statistics come with some rumors, that is why when one is constantly exposed to COVID-19 news, the level of anxiety goes higher.

People who reported having a person with coronavirus disease experience higher level of anxiety, and this can be due to a variety of reasons, first of which can be the increased risk of contracting the disease because they may have been in contact with the infected person; secondly, he/she is worried about the health condition of his/her family, friends or colleagues.

In Iran, several hotlines have been set up to respond to people's questions on COVID-19. The hotline 1480 is intended to offer psychological and counseling services. Although a small number of governmental and most non-governmental organizations working in the field of counseling, psychology and social work started to independently offer psychosocial services to their target groups, they are generally not very effective for some reasons. First, the view of national decision makers are mainly concentrated on reducing the physical and psychological consequences of the disease; second, there is no sufficient workforce of psychosocial professionals who has already been trained for critical situations; third, there is a lack of coordination and cooperation among psychosocial service providers, and also the operation process is now being carried out that individuals requiring counseling services call the hotlines, while especially for those with a COVID-19 infected person, experts should reach out the target groups and provide health care interventions.

In addition, low and middle income countries face challenges in providing online mental health services such as lack of access to disadvantaged classes and ambiguity in the usefulness of online interventions due to the lack of research conducted to confirm these services (Yao et al., 2020).

Coronavirus infection does not differentiate between geography, ethnicity, religion and politics, therefore it is considered as a global issue and pandemic. If there is insufficient access to health care facilities, people will be victimized, so governments' international policies should not prevent aiding people. At present, Iran is subject to the most severe sanctions under the US "maximum pressure", which has affected the capability of the government to provide healthcare services. As a result, it seems that the sanctions have not only disrupted international aid but also have created more anxiety among the general population.

The research findings show that people who most follow COVID-19 news experience more anxiety and as WHO (World Health Organization (WHO), 2020b) emphasized the media and the press should not only focus on the negative aspects of producing and publishing news.

In this regard, mental health professionals are advised to educate the public about common adverse psychological consequences, promote healthy behaviors, advise people to lower their exposure to negative news, and to prevent social isolation, use alternative ways of communication such as virtual networks (Banerjee, 2020)

The responsible organizations especially National COVID-19 Committee, should design and implement a gender-sensitive psychosocial protocol to reduce anxiety. NGOs are more efficient and effective in the service provision process because of their closer relationship with the people and less bureaucratic operations, therefore their capacity should highly be used in this area. Patients and their families, personnel and healthcare professionals are also seriously exposed to mental health issues and problems, so it is recommended that this study be conducted among them.

The study was conducted under the circumstances that COVID-19 was spread throughout almost all provinces, so self-isolation care was recommended as the safest way, and conducting online research was completely safe. In addition, an acceptable sample size participated in the study, so our findings are highly validated. The low number of questions in the questionnaire made the respondents more willing to answer the questions. In the meantime, every Internet IP could once participate in the research. The answers given were self-reported, so this is considered as a limitation of the study while the study method is a survey and was conducted without a control group.

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#### Declaration of Competing Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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