Iran J Psychiatry 2022; 17: 2: 230-239

Original Article

Prevalence of Anxiety and Depression in the Iranian General Population during the COVID-19 Pandemic: A Web-Based Cross-Sectional Study

Saman Maroufizadeh[1], Majid Pourshaikhian[2], Ali Pourramzani[3], Farzaneh Sheikholeslami[2], Mohammad Taghi Moghadamnia[2], Seyed Amirhossein Alavi[4*]

Abstract

Objective: This study aimed to determine prevalence of anxiety and depression and associated factors in the general population of Iran during the COVID-19 pandemic.
Method: We conducted this web-based cross-sectional study on 5328 individuals in Iran between 17th and 29th of April 2020. Data were collected using the convenience sampling method through an anonymous online questionnaire via social media like WhatsApp and Telegram. The online survey collected data on demographic variables, COVID-19-related variables, and symptoms of anxiety and depression. Anxiety and depression were assessed using the Generalized Anxiety Disorder-7 (GAD-7) and the Patient Health Questionnaire-9 (PHQ-9), respectively. Simple and multiple logistic regression analyses were performed to determine independent predictors of anxiety and depression.
Results: The mean GAD-7 and PHQ-9 total scores were 7.17 (SD = 5.42) and 7.80 (SD = 6.68), respectively. Prevalence of anxiety, depression, and comorbid anxiety-depression were 30.1%, 33.4%, and 22.1%, respectively. According to the adjusted analysis, anxiety was significantly associated with female gender, being young and middle-aged, being unemployed or a housewife, having chronic diseases, spending considerable time thinking about COVID-19, having family members, friends, and/or relatives infected with COVID-19, and death of family members, relatives or friends due to COVID-19. Same results were also found for depression. Furthermore, depression was associated with being single, being resident in urban area, and having high risk individual in family.
Conclusion: Prevalence of anxiety and depression were considerably higher in the general population of Iran during the COVID-19 pandemic. In addition, the findings suggest that more attention needs to be paid to vulnerable groups such as women, young/middle-aged adults, the unemployed, and people with chronic disease.

Key words: *Anxiety; COVID-19; Depression; Population; Iran*

1. Department of Biostatistics, School of Health, Guilan University of Medical Sciences, Rasht, Iran.
2. Department of Nursing, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.
3. Department of Psychiatry, School of Medicine, Shafa Hospital, Guilan University of Medical Sciences, Rasht, Iran.
4. Student Research Committee, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.

***Corresponding Author:**
Address: Student Research Committee, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran, Postal Code: 4146939841.
Tel: 98-902 1161314, Fax: 98-13 33550097, Email: alaviseyedamirhossein@gmail.com

Article Information:
Received Date: 2020/09/20, Revised Date: 2021/04/10, Accepted Date: 2021/07/28

The Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in Wuhan, Hubei province, China, in December 2019. On January 30, 2020, the WHO declared the outbreak a Public Health Emergency of International Concern, and on March 11, 2020, a pandemic. As of 11 July 2021, more than 188 million cases have been reported across 223 countries and territories, resulting in more than 4.06 million deaths. The first confirmed case of COVID-19 in Iran was reported on February 19, 2020. As of March 11, 2021, 3.44 million cases have been confirmed in Iran, based on the Ministry of Health and Medical Education report. There have been 86,391 deaths (1).

As the COVID-19 pandemic rapidly sweeps across the world, it is leading to mental health problems such as fear, stress, anxiety, depression, anger, and insomnia in the general population at large and particularly among special groups, such as older adults, healthcare workers, patients and people with underlying health conditions. Other factors that may increase the risk of developing these mental health problems include female sex, low socioeconomic status and frequent use of social media, low resilience and social support (2). One study of 1210 participants in China between January and February 2020 found that 53.8% of respondents rated the psychological impact of the COVID-19 pandemic as moderate or severe; 28.8% and 16.5% reported moderate to severe anxiety and depressive symptoms, respectively (2). Notwithstanding possible response bias, these are very high proportions—and it is likely that some people are at even greater risk. Beyond stresses inherent in the COVID-19 pandemic itself, related containment measures—including quarantine, social distancing, and self-isolation—can have considerable effect on mental health and well-being. In particular, increased loneliness and reduced social interactions are well-known risk factors for mental health problems such as anxiety and depressive disorders (3-5).

A growing body of evidence has also indicated that the outbreak of infectious diseases, including SARS, MERS, H1N1 and Ebola, were associated with poor mental health in the general population (6, 7), healthcare workers (8, 9), patients and their family members (10). For example, in a study conducted during the SARS outbreak, symptoms of post-traumatic stress disorder and depression were observed in 28.9% and 31.2% of respondents, respectively (11).

The psychological impact of the COVID-19 pandemic must be acknowledged alongside the physical symptoms for the general population, patients, and healthcare workers. On the other hand, early identification of persons at greater risk of psychological distress is essential for prevention and management strategies. Therefore, this study aimed to determine prevalence of anxiety, depression, and comorbid anxiety-depression in a large sample of the general population in Iran during the COVID-19 pandemic. We also examined the effect of demographic and COVID-19-related variables on these disorders.

Materials and Methods

Participants and study design

We performed this web-based cross-sectional study on 5328 individuals in Iran, between 17th and 29th of April 2020. Data were collected using the convenience sampling method through an anonymous online questionnaire via social media like WhatsApp and Telegram. The eligibility criteria for this study included (a) age over 18 years, and (b) ability to read, write, and comprehend Persian.

Ethical consideration

This study was performed with the approval of the Ethics Committee of Guilan University of Medical Sciences, Rasht, Iran (Ethical Code: R.GUMS.REC.1399.020). All individuals were fully informed about the aim of the study and the voluntary nature of their participations.

Instruments

Demographic variables

Demographic variables of participants including age, sex, marital status, parental status, place of residence, education, employment status, and ethnicity were collected.

COVID-19-related variables

The COVID-19-related variables included: (1) having chronic diseases, (2) time focused on COVID-19 during a day, (3) contact with suspected or confirmed COVID-19 cases, (4) families, relatives or friends infected with COVID-19, (5) death of families, relatives or friends due to COVID-19.

Generalized Anxiety Disorder-7 (GAD-7)

The GAD-7 is a 7-item self-report scale that measures anxiety during the last two weeks based on DSM-IV criteria (12). Each item is scored on a scale ranging from 0 to 3, where 0 represents “not at all” and 3 represents “nearly every day.” The total score ranges from 0 to 21. Higher scores indicate more anxiety symptoms. A cut-off score of ≥ 10 was used to identify individuals experiencing anxiety. This scale has been widely used in psychiatric, primary-care and general populations. The Persian version of this scale also has been reported to be a reliable and valid scale (13). In this study, the Cronbach’s alpha coefficient of GAD-7 was 0.871.

Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 is a 9-item self-report scale that measures depression during the last two weeks based on DSM-IV criteria (14). Each item is scored on a scale ranging from 0 to 3, where 0 represents “not at all” and 3 represents “nearly every day.” The total score ranges from 0 to 27. Higher scores indicate more depressive symptoms. A cut-off score of ≥ 10 was used to identify individuals experiencing depression. This scale has been widely

used in psychiatric, primary-care and general populations. The Persian version of this scale has also been reported to be a reliable and valid scale (15). In this study, the Cronbach's alpha coefficient of the PHQ-9 was 0.894.

Statistical analysis

In the present study, continuous variables were expressed as "mean (standard deviation (SD))" and categorical variables were reported as "frequency (percentage)". Simple and multiple logistic regression analyses were undertaken to examine the association of anxiety and depression with demographic and COVID-19-related variables. The crude and adjusted odds ratio (OR) and 95% confidence interval (CI) were calculated. SPSS for windows, version 16.0 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Level of significance was set at 0.05, and all statistical tests were two-sided.

Results

Participants' characteristics

The mean age of the participants was 32.95 (SD = 10.53) years (range: 18-90 years). Of the participants, 63.1% were female, 63.4% were young adults, 54.8% were married, 94.7% were resident in urban area (94.7%), 76.1% had university education, 45.5% were employed, and 9.3% had chronic diseases. Other demographic and COVID-19-related characteristics of the participants are presented in Table 1.

Distribution of GAD-7 and PHQ-9 scores

The mean GAD-7 and PHQ-9 scores for all respondents were 7.17 (SD = 5.42) and 7.80 (SD = 6.68), respectively. Table 2 also presents the distribution of scores falling within GAD-7 and PHQ-9 severity cutoffs. Distribution of scores falling within GAD-7 severity cut-offs were as follows: no anxiety, 2033 (38.2%); mild, 1690 (31.7%); moderate, 962 (18.1%); and severe, 643 (12.1%). Distribution of scores falling within PHQ-9 severity cut-offs were as follows: none-minimal, 2124 (39.9%); mild, 1425 (26.7%); moderate, 835 (15.7%); moderately severe, 563 (10.6%); and severe, 381 (7.2%). Using a cut-off value of 10 for both measures, prevalence of anxiety, depression, and comorbid anxiety-depression were 30.1% (n = 1605), 33.4% (n = 1779), and 22.1% (n = 1178), respectively. Overall, females and young adults reported anxiety and depressive symptoms more frequently than males and older adults (Table 2).

Factors associated with anxiety symptoms

Simple and multiple logistic regression analyses were undertaken to examine factors associated with anxiety symptoms among the general population (Table 3). According to adjusted analysis (i.e., multiple logistic regression analysis), females were 1.20 times more likely to have anxiety than males (OR Adj = 1.20, 95% CI: 1.03-1.40). Young adults and middle-aged adults reported higher anxiety symptoms compared with older adults (OR Adj = 1.69, 95% CI: 1.07-2.65, and OR Adj = 1.67, 95% CI: 1.07-2.60, respectively). Compared with employed participants, those who were unemployed and housewives had more anxiety symptoms (OR Adj = 1.68, 95% CI: 1.33-2.12, and OR Adj = 1.27, 95% CI: 1.03-1.55, respectively). Participants with chronic diseases were 1.68 times more likely to be anxious than other participants (OR Adj = 1.68, 95% CI: 1.35-2.08). The odds of anxiety increased with increasing time spent to focus on COVID-19 per day. Those who had family members, friends, and/or relatives infected with COVID-19 were more likely to have anxiety symptoms (OR Adj = 1.49, 95% CI: 1.21-1.82). Furthermore, those who reported death of families, relatives or friends due to COVID-19 were more likely to have anxiety symptoms (OR Adj = 1.26, 95% CI: 1.05-1.51).

Factors associated with depressive symptoms

Simple and multiple logistic regression analyses were undertaken to examine factors associated with depressive symptoms among the general population (Table 4). According to adjusted analysis, females were 1.18 times more likely to have depression than males (OR Adj = 1.18, 95% CI: 1.03-1.36). Young adults and middle-aged adults reported higher depressive symptoms compared with older adults (OR Adj = 2.03, 95% CI: 1.29-3.19, and OR Adj = 1.57, 95% CI: 1.00-2.44, respectively). Depression was less prevalent in married participants compared with those not married (OR Adj = 0.77, 95% CI: 0.66-0.91). Those who resided in urban areas reported higher depressive symptoms compared with those who resided in rural areas (OR Adj = 1.65, 95% CI: 1.23-2.20). Compared with employed participants, those who were unemployed and women who were students had more depressive symptoms (OR Adj = 2.29, 95% CI: 1.85-2.84, and OR Adj = 1.42, 95% CI: 1.18-1.71, respectively). Participants with chronic diseases were 1.81 times more likely to be depressed than other participants (OR Adj = 1.81, 95% CI: 1.47-2.23). The odds of depression increased with increasing time spent to focus on COVID-19 per day. Those who had family members, friends, and/or relatives infected with COVID-19 were more likely to have anxiety symptoms (OR Adj = 1.30, 95% CI: 1.07-1.57). The depression rate in those who reported death of families, relatives or friends due to COVID-19 was more than other participants (OR Adj = 1.17, 95% CI: 0.99-1.39), although the difference was not statistically significant (P = 0.066). Participants who had high risk individuals in their family were more likely to have depressive symptoms than other participants (OR Adj = 1.24, 95% CI: 1.09-1.41).

Table 1. Demographic and COVID-19-Related Characteristics of the Participants (n = 5328)

	n (%)
Age (years)	
Young adults (18-35)	3377 (63.4)
Middle-aged adults (36-55)	1775 (33.3)
Older adults (>56)	176 (3.3)
Sex	
Male	1966 (36.9)
Female	3362 (63.1)
Marital status	
Single	2407 (45.2)
Married	2921 (54.8)
Place of residence	
Urban	5048 (94.7)
Rural	280 (5.3)
Education	
Primary	124 (2.3)
Secondary	1151 (21.6)
University	4053 (76.1)
Occupation	
Employed	2424 (45.5)
Housewife	1040 (19.5)
Retired	180 (3.4)
Student	1161 (21.8)
Unemployed	523 (9.8)
Chronic diseases	
No	4830 (90.7)
Yes	498 (9.3)
Times focused on COVID-19 during a day	
< 0.5 h	2320 (43.5)
0.5-1 h	1087 (20.4)
1-2 h	728 (13.7)
>2 h	1193 (22.4)
Contact with suspected or confirmed COVID-19 cases	
No	3701 (69.5)
Yes	1627 (30.5)
Families, relatives or friends infected with COVID-19	
No	4575 (85.9)
Yes	753 (14.1)
Death of families, relatives or friends due to COVID-19	
No	4477 (84.0)
Yes	851 (16.0)
High risk individual in family	
No	1781 (33.4)
Yes	3547 (66.6)

COVID-19: Coronavirus Disease 2019

Table 2. Distribution of Participants across the Generalized Anxiety Disorder-7 and Patient Health Questionnaire-9 Severity Ratings (n = 5328)

	Total	Sex		Age group		
		Male	Female	Young Adults	Middle-Aged Adults	Older Adults
GAD-7 severity						
No anxiety (0-4)	2033 (38.2)	863 (43.9)	1170 (34.8)	1255 (37.2)	692 (39.0)	86 (48.9)
Mild (5-9)	1690 (31.7)	580 (29.5)	1110 (33.0)	1124 (33.3)	516 (29.1)	50 (28.4)
Moderate (10-14)	962 (18.1)	307 (15.6)	655 (19.5)	606 (17.9)	327 (18.4)	29 (16.5)
Severe (15-21)	643 (12.1)	216 (11.0)	427 (12.7)	392 (11.6)	240 (13.5)	11 (6.2)
PHQ-9						
None-minimal (0-4)	2124 (39.9)	887 (45.1)	1237 (36.8)	1232 (36.5)	787 (44.3)	105 (59.7)
Mild (5-9)	1425 (26.7)	487 (24.8)	938 (27.9)	902 (26.7)	486 (27.4)	37 (21.0)
Moderate (10-14)	835 (15.7)	285 (14.5)	550 (16.4)	570 (16.9)	249 (14.0)	16 (9.1)
Moderately severe (15-19)	563 (10.6)	163 (8.3)	400 (11.9)	400 (11.8)	153 (8.6)	10 (5.7)
Severe (20-27)	381 (7.2)	144 (7.3)	237 (7.0)	273 (8.1)	100 (5.6)	8 (4.5)

GAD-7: Generalized Anxiety Disorder-7; PHQ-9: Patient Health Questionnaire-9.
Values are presented as n (%).

Table 3. Association between Generalized Anxiety Disorder and Demographic/COVID-19-Related Variables among Participants (n = 5328)

Variables	Prevalence, n (%)	Simple Logistic Regression		Multiple Logistic Regression	
		OR_{Crude} (95% CI)	*P*	OR_{Adj} (95% CI)	*P*
Age					
Young adults	998 (29.6)	1.43 (0.99 – 2.04)	0.053	1.69 (1.07 – 2.65)	0.024
Middle-aged adults	567 (31.9)	1.60 (1.11 – 2.30)	0.012	1.67 (1.07 – 2.60)	0.024
Older adults	40 (22.7)	1		1	
Sex					
Male	523 (26.6)	1		1	
Female	1082 (32.2)	1.31 (1.16 – 1.48)	< 0.001	1.20 (1.03 – 1.40)	0.016
Marital status					
Single	685 (28.5)	1		1	
Married	920 (31.5)	1.16 (1.03 – 1.30)	0.016	0.94 (0.79 – 1.12)	0.503
Place of residence					
Urban	1540 (30.5)	1.45 (1.09 – 1.93)	0.010	1.20 (0.88 – 1.63)	0.256
Rural	65 (23.2)	1		1	
Education					
Primary	49 (39.5)	1		1	
Secondary	347 (30.1)	0.66 (0.45 – 0.97)	0.033	0.79 (0.51 – 1.21)	0.281
University	1209 (29.8)	0.65 (0.45 – 0.94)	0.021	0.73 (0.48 – 1.11)	0.140
Occupation					
Employed	701 (28.9)	1		1	
Housewife	371 (35.7)	1.36 (1.17 – 1.59)	< 0.001	1.27 (1.03 – 1.55)	0.023
Retired	40 (22.2)	0.70 (0.49 – 1.01)	0.056	0.82 (0.53 – 1.28)	0.385
Student	290 (25.0)	0.82 (0.70 – 0.96)	0.014	0.99 (0.80 – 1.21)	0.892
Unemployed	203 (38.8)	1.56 (1.28 – 1.90)	< 0.001	1.68 (1.33 – 2.12)	< 0.001
Chronic diseases					
No	1402 (29.0)	1		1	

Yes	203 (40.8)	1.68 (1.39 – 2.03)	< 0.001	1.68 (1.35 – 2.08)	< 0.001
Times focused on COVID-19 during a day					
< 0.5 h	364 (15.7)	1		1	
0.5-1 h	244 (22.4)	1.56 (1.30 – 1.86)	< 0.001	1.58 (1.31 – 1.89)	< 0.001
1-2 h	267 (36.7)	3.11 (2.58 – 3.75)	< 0.001	3.18 (2.63 – 3.85)	< 0.001
>2 h	730 (61.2)	8.47 (7.21 – 9.96)	< 0.001	8.26 (7.00 – 9.73)	< 0.001
Contact with suspected or confirmed COVID-19 cases					
No	1067 (28.8)	1		1	
Yes	538 (33.1)	1.22 (1.08 – 1.38)	0.002	0.97 (0.83 – 1.15)	0.759
Families, relatives or friends infected with COVID-19					
No	1320 (28.9)	1		1	
Yes	285 (37.8)	1.50 (1.28 – 1.78)	< 0.001	1.49 (1.21 – 1.82)	< 0.001
Death of families, relatives or friends due to COVID-19					
No	1304 (29.1)	1		1	
Yes	301 (35.4)	1.33 (1.14 – 1.55)	< 0.001	1.26 (1.05 – 1.51)	0.012
High risk individual in family					
No	491 (27.6)	1		1	
Yes	1114 (31.4)	1.20 (1.06 – 1.36)	0.004	1.10 (0.96 – 1.27)	0.177

COVID-19: Coronavirus Disease 2019; CI: Confidence Interval; OR: Odds Ratio

Table 4. Association between Depression and Demographic/COVID-19-Related Variables among Participants (n = 5328)

Variables	Prevalence, n (%)	Simple Logistic Regression		Multiple Logistic Regression	
		OR $_{Crude}$ (95% CI)	*P*	OR $_{Adj}$ (95% CI)	*P*
Age					
Young adults	1243 (36.8)	2.43 (1.66 – 3.56)	< 0.001	2.03 (1.29 – 3.19)	0.002
Middle-aged adults	502 (28.3)	1.65 (1.12 – 2.43)	0.012	1.57 (1.00 – 2.44)	0.048
Older adults	34 (19.3)	1		1	
Sex					
Male	592 (30.1)	1		1	
Female	1187 (35.3)	1.27 (1.12 – 1.43)	< 0.001	1.18 (1.03 – 1.36)	0.019
Marital status					
Single	927 (38.5)	1		1	
Married	852 (29.2)	0.66 (0.59 – 0.74)	< 0.001	0.77 (0.66 – 0.91)	0.001
Place of residence					
Urban	1711 (33.9)	1.60 (1.21 – 2.11)	< 0.001	1.65 (1.23 – 2.20)	< 0.001
Rural	68 (24.3)	1		1	
Education					
Primary	42 (33.9)	1		1	
Secondary	411 (35.7)	1.08 (0.73 – 1.60)	0.685	1.00 (0.66 – 1.52)	0.995
University	1326 (32.7)	0.95 (0.65 – 1.38)	0.787	0.83 (0.55 – 1.25)	0.373
Occupation					
Employed	702 (29.0)	1		1	
Housewife	331 (31.8)	1.15 (0.98 – 1.34)	0.091	1.10 (0.90 – 1.33)	0.359
Retired	31 (17.2)	0.51 (0.34 – 0.76)	< 0.001	0.69 (0.44 – 1.08)	0.106

Student	452 (38.9)	1.56 (1.35 – 1.81)	< 0.001	1.42 (1.18 – 1.71)	< 0.001
Unemployed	263 (50.3)	2.48 (2.05 – 3.01)	< 0.001	2.29 (1.85 – 2.84)	< 0.001
Chronic diseases					
No	1571 (32.5)	1		1	
Yes	208 (41.8)	1.49 (1.23 – 1.80)	< 0.001	1.81 (1.47 – 2.23)	< 0.001
Times focused on COVID-19 during a day					
< 0.5 h	576 (24.8)	1		1	
0.5-1 h	323 (29.7)	1.28 (1.09 – 1.50)	0.003	1.29 (1.09 – 1.52)	0.003
1-2 h	274 (37.6)	1.83 (1.53 – 2.18)	< 0.001	1.97 (1.64 – 2.37)	< 0.001
>2 h	606 (50.8)	3.13 (2.70 – 3.62)	< 0.001	3.33 (2.86 – 3.89)	< 0.001
Contact with suspected or confirmed COVID-19 cases					
No	1186 (32.0)	1		1	
Yes	593 (36.4)	1.22 (1.08 – 1.37)	0.002	1.05 (0.90 – 1.22)	0.516
Families, relatives or friends infected with COVID-19					
No	1487 (32.3)	1		1	
Yes	301 (40.0)	1.40 (1.19 – 1.63)	< 0.001	1.30 (1.07 – 1.57)	0.007
Death of families, relatives or friends due to COVID-19					
No	1464 (32.7)	1		1	
Yes	315 (37.0)	1.21 (1.04 – 1.41)	0.015	1.17 (0.99 – 1.39)	0.066
High risk individual in family					
No	531 (29.8)	1		1	
Yes	1248 (35.2)	1.28 (1.13 – 1.44)	< 0.001	1.24 (1.09 – 1.41)	0.001

COVID-19: Coronavirus Disease 2019; CI: Confidence Interval; OR: Odds Ratio

Discussion

The COVID-19 pandemic has had a profound effect on all aspects of society, including mental health and physical health. The present study is the first large-scale survey of mental health status in the general population of Iran during the COVID-19 pandemic. Similar to other web-based studies (2, 16-21), the majority of participants in this study were female (63.1%), in the 18-35 years age group (63.4%), resided in urban areas (94.7%), and had university education (76.1%). In this study, using the GAD-7 and PHQ-9 instruments, prevalence of anxiety, depression, and comorbid anxiety-depression were 30.1%, 33.4% and 22.1%, respectively. In all, our results indicated that the mental health status of people in Iran may have deteriorated compared to the pre-COVID-19 period. Other studies during the COVID-19 pandemic have also used this scale to assess mental health in the general population (16-18, 20), patients and health workers (22-24).

In a study performed in Wuhan, China during the COVID-19 pandemic, prevalence of anxiety (using GAD-7), depression (using WHO-5), and comorbid anxiety-depression were 22.6%, 48.3% and 19.4%, respectively (18). In another study conducted in Wuhan and Shanghai, prevalence of anxiety using GAD-7 was 32.7% and 20.4%, respectively. In a study by Liu *et al.* conducted from 13 to 30 February 2020 in the Chinese general population, prevalence of anxiety (using GAD-7 $\geq$ 10) and depression (using PHQ-9 $\geq$ 10) were 16.8% and 24.1%, respectively (17).

Prevalence of anxiety (using GAD-7 $\geq$ 10) in the general population of other countries were as follows: Bangladesh, 37.3% (25); Japan, 33.2% (26); Nepal 31.0% (27); Cyprus, 23.1% (28); UK, 21.6% (29); Ireland, 20.0% (30); Austria, 19.1% (31); Germany, 16.8% (32); Spain, 15.0% (33). Prevalence of depression (using PHQ-9 $\geq$ 10) in the general population of other countries were as follows: Japan, 43.1% (26); Nepal 34.0% (27); UK, 22.1% (29); and Hong Kong, 14.0%. These differences may be due to different demographic characteristics, and conduct of studies at different periods of time.

As expected, the present study shows that females were 1.20 and 1.18 times more likely to have anxiety and depression symptoms than males, respectively. This finding is in line with studies from the general population in which anxiety and depressive disorders are more prevalent in females than in males (2, 17, 21). Contrary to our expectation, we found strong evidence that the mental health of young and middle-aged adults may be significantly worse than that of older adults during the COVID-19 pandemic. Given that older adults may be at higher risk for contracting COVID-19 based

on their underlying medical conditions, state of mental health was expected to be relatively poor in this group. The unemployed working-age responders had strikingly poorer mental health (i.e., higher anxiety and depression symptoms) compared to the employed participants. These findings are consistent with studies from the general population in which anxiety and depression disorders are more common with unemployed people than in employed people (34, 35). Furthermore, compared to the employed participants, students had higher depression symptoms, and housewives had higher anxiety symptoms. This is in line with the population-based studies from China, in which depression is more prevalent in students (2, 17). Also, findings by Liu *et al.* (2020) showed that level of anxiety and depression significantly increased among college students in mainland China during the COVID-19 pandemic (36). Having chronic diseases increased the likelihood of having anxiety and depressive symptoms by 68 and 81 percent, respectively. These findings are consistent with previous studies (2, 17, 18, 21, 37) that showed some groups of people may be more vulnerable to infection because of general health or some particular illness.

In addition to the above-mentioned factors, some people, such as those who had special groups in the family (including elderly, pregnant women, breastfeeding mothers, people with compromised immune function, and patients with disability) and those who had family members, friends, and/or relatives infected with COVID-19 were at increased risk for adverse psychological outcomes.

Limitation

The present study has several strengths that should be highlighted: (a) population-based setting, (b) relatively large sample size, (c) evaluation of both anxiety and depressive symptoms. There are also a few limitations that should be noted when interpreting these findings. Major limitations of this study come from the web-based nature of the study. Similar to other web-based studies, these limitations were a low response rate, demographic biases, and variations in computer literacy and internet access. The other limitation was the cross-sectional nature of the present study, which precludes the ability to infer causality between demographic/COVID-19-related variables and anxiety and depressive symptoms. Finally, we did not have data on some potentially important factors such as economic status, family income stability during the COVID-19 pandemic, and being infected with COVID-19 at time of study.

Conclusion

Prevalence of anxiety and depression were considerably high in the Iranian general population during the COVID-19 pandemic. In addition, the findings suggest that more attention needs to be paid to vulnerable groups such as women, young/middle-aged adults, unemployed people, and people with chronic disease. It is hoped this epidemiological study will provide a comprehensive picture of psychological distress in the general population for policy markers not only in the COVID-19 pandemic but also in other infectious diseases that affect the mental health of the community. Moreover, research funders and researchers must deploy resources to understand the psychological and social, and economic effects of the COVID-19 pandemic.

Acknowledgment

We thank all the people who participated in this study, and the Guilan University of Medical Sciences, Rasht, Iran for supporting this study.

Conflict of Interest

None.

References

1. World Health Organization. Coronavirus disease (COVID-19) Weekly Epidemiological Update. 4 April 2021. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210406_weekly_epi_update_34.pdf?sfvrsn = e1ae1be7_10&download = true.
2. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. Int J Environ Res Public Health. 2020;17(5):1729.
3. Zhou X, Snoswell CL, Harding LE, Bambling M, Edirippulige S, Bai X, et al. The Role of Telehealth in Reducing the Mental Health Burden from COVID-19. Telemed J E Health. 2020;26(4):377-9.
4. Smith EM. Ethnic minorities: Life stress, social support, and mental health issues. The Counseling Psychologist. 1985;13(4):537-79.
5. Fiorillo A, Gorwood P. The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. Eur Psychiatry. 2020;63(1):e32.
6. Cowling BJ, Ng DM, Ip DK, Liao Q, Lam WW, Wu JT, et al. Community psychological and behavioral responses through the first wave of the 2009 influenza A(H1N1) pandemic in Hong Kong. J Infect Dis. 2010;202(6):867-76.
7. Ko CH, Yen CF, Yen JY, Yang MJ. Psychosocial impact among the public of the severe acute respiratory syndrome epidemic in Taiwan. Psychiatry Clin Neurosci. 2006;60(4):397-403.
8. Lu YC, Shu BC, Chang YY, Lung FW. The mental health of hospital workers dealing with severe acute respiratory syndrome. Psychother Psychosom. 2006;75(6):370-5.

9. Bai Y, Lin CC, Lin CY, Chen JY, Chue CM, Chou P. Survey of stress reactions among health care workers involved with the SARS outbreak. Psychiatr Serv. 2004;55(9):1055-7.
10. Page LA, Seetharaman S, Suhail I, Wessely S, Pereira J, Rubin GJ. Using electronic patient records to assess the impact of swine flu (influenza H1N1) on mental health patients. J Ment Health. 2011;20(1):60-9.
11. Hawryluck L, Gold WL, Robinson S, Pogorski S, Galea S, Styra R. SARS control and psychological effects of quarantine, Toronto, Canada. Emerg Infect Dis. 2004;10(7):1206-12.
12. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166(10):1092-7.
13. Omani-Samani R, Maroufizadeh S, Ghaheri A, Navid B. Generalized Anxiety Disorder-7 (GAD-7) in people with infertility: A reliability and validity study. Middle East Fertil Soc J. 2018; 23(4):446-9.
14. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606-13.
15. Maroufizadeh S, Omani-Samani R, Almasi-Hashiani A, Amini P, Sepidarkish M. The reliability and validity of the Patient Health Questionnaire-9 (PHQ-9) and PHQ-2 in patients with infertility. Reprod Health. 2019;16(1):137.
16. Qian M, Wu Q, Wu P, Hou Z, Liang Y, Cowling BJ, Yu H. Anxiety levels, precautionary behaviours and public perceptions during the early phase of the COVID-19 outbreak in China: a population-based cross-sectional survey. BMJ Open. 2020;10(10):e040910 .
17. Liu D, Ren Y, Yan F, Li Y, Xu X,Yu X, et al. Psychological Impact and Predisposing Factors of the Coronavirus Disease 2019 (COVID-19) Pandemic on General Public in China. SSRN Electron J. 2020. Available at SSRN: https://ssrn.com/abstract=3551415
18. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. PLoS One. 2020;15(4):e0231924.
19. Li J, Yang Z, Qiu H, Wang Y, Jian L, Ji J, et al. Anxiety and depression among general population in China at the peak of the COVID-19 epidemic. World Psychiatry. 2020;19(2):249-50.
20. Cao W, Fang Z, Hou G, Han M, Xu X, Dong J, et al. The psychological impact of the COVID-19 epidemic on college students in China. Psychiatry Res. 2020;287:112934.
21. Mazza C, Ricci E, Biondi S, Colasanti M, Ferracuti S, Napoli C, et al. A Nationwide Survey of Psychological Distress among Italian People during the COVID-19 Pandemic: Immediate Psychological Responses and Associated Factors. Int J Environ Res Public Health. 2020;17(9):3165.
22. Lv Y, Yao H, Xi Y, Zhang Z, Zhang Y, Chen J, et al. Social support protects Chinese medical staff from suffering psychological symptoms in COVID-19 defense. 2020.
23. Lv Y, Zhang Z, Zeng W, Li J, Wang X, Luo G. Anxiety and depression survey of Chinese medical staff before and during COVID-19 defense. Available at SSRN 3551350. 2020.
24. Ying Y, Ruan L, Kong F, Zhu B, Ji Y, Lou Z. Mental health status among family members of health care workers in Ningbo, China, during the coronavirus disease 2019 (COVID-19) outbreak: a cross-sectional study. BMC Psychiatry. 2020;20(1):379.
25. Banna MHA, Sayeed A, Kundu S, Christopher E, Hasan MT, Begum MR, et al. The impact of the COVID-19 pandemic on the mental health of the adult population in Bangladesh: a nationwide cross-sectional study. Int J Environ Health Res. 2020:1-12.
26. Ueda M, Stickley A, Sueki H, Matsubayashi T. Mental health status of the general population in Japan during the COVID-19 pandemic. Psychiatry Clin Neurosci. 2020;74(9):505-506.
27. Sigdel A, Bista A, Bhattarai N, Chandra Pun P, Giri G, Marqusee H, et al. Depression, Anxiety and Depression-anxiety comorbidity amid COVID-19 Pandemic: An online survey conducted during lockdown in Nepal. medRxiv. 2020; 20086926.
28. Solomou I, Constantinidou F. Prevalence and Predictors of Anxiety and Depression Symptoms during the COVID-19 Pandemic and Compliance with Precautionary Measures: Age and Sex Matter. Int J Environ Res Public Health. 2020;17(14):4924.
29. Shevlin M, McBride O, Murphy J, Miller JG, Hartman TK, Levita L, et al. Anxiety, depression, traumatic stress and COVID-19-related anxiety in the UK general population during the COVID-19 pandemic. BJPsych Open. 2020;6(6):e125.
30. Hyland P, Shevlin M, McBride O, Murphy J, Karatzias T, Bentall RP, et al. Anxiety and depression in the Republic of Ireland during the COVID-19 pandemic. Acta Psychiatr Scand. 2020;142(3):249-56.
31. Pieh C, Budimir S, Probst T. The effect of age, gender, income, work, and physical activity on mental health during coronavirus disease (COVID-19) lockdown in Austria. J Psychosom Res. 2020;136:110186.
32. Bäuerle A, Teufel M, Musche V, Weismüller B, Kohler H, Hetkamp M, et al. Increased generalized anxiety, depression and distress during the COVID-19 pandemic: a cross-sectional study in Germany. J Public Health (Oxf). 2020;42(4):672-8.
33. Fullana MA, Hidalgo-Mazzei D, Vieta E, Radua J. Coping behaviors associated with decreased anxiety and depressive symptoms during the COVID-19 pandemic and lockdown. J Affect Disord. 2020;275:80-1.
34. Watterson RA, Williams JV, Lavorato DH, Patten SB. Descriptive Epidemiology of Generalized Anxiety Disorder in Canada. Can J Psychiatry. 2017;62(1):24-9.

35. Kessler RC, Bromet EJ. The epidemiology of depression across cultures. Annu Rev Public Health. 2013;34:119-38.
36. Liu X, Liu J, Zhong X. Psychological State of College Students During COVID-19 Epidemic. SSRN Electron J. 2020. Available at SSRN: https://ssrn.com/abstract=3552814
37. Zhu J, Su L, Zhou Y, Qiao J, Hu W. The effect of nationwide quarantine on anxiety levels during the COVID-19 outbreak in China. Brain Behav. 2021;11(1):e01938.