

This is a provisional PDF only. Copyedited and fully formatted version will be made available soon.



**ISSN:** 1732-9841

**e-ISSN:** 1733-4594

## **Association of fear of COVID-19 and preventive behaviors (PB) against COVID-19 in Iran**

**Authors:** Hasan Mosazadeh, Abdurrahman Charkazi, Maryam Ahmadi-Livani, Abed Nori, Arezoo Foroughi, Amangholi Rahimi, Mousa Ghelichi-Ghojogh, Ehsan Allah Kalteh, Bagher Pahlavanzadeh, Rahman Berdi Ozouni-Davaji, Abdolhalim Rajabi

**DOI:** 10.5603/PSYCH.a2021.0016

**Article type:** Research paper

**Submitted:** 2021-02-18

**Accepted:** 2021-03-25

**Published online:** 2021-03-25

This article has been peer reviewed and published immediately upon acceptance. It is an open access article, which means that it can be downloaded, printed, and distributed freely, provided the work is properly cited.

Abdurrahman Charkazi<sup>1</sup>, Maryam Ahmadi-Livani<sup>2</sup>, Abed Nori<sup>1</sup>, Arezoo Foroughi<sup>3</sup>, Hasan Mosazadeh<sup>4</sup>, Amangholi Rahimi<sup>5</sup>, Mousa Ghelichi-Ghojogh<sup>6</sup>, Ehsan Allah Kalteh<sup>7</sup>, Bagher Pahlavanzadeh<sup>8</sup>, Rahman Berdi Ozouni-Davaji<sup>1</sup>, Abdolhalim Rajabi<sup>9</sup>

<sup>1</sup>Environmental Health Research Center, Faculty of Health, Golestan University of Medical Sciences, Gorgan, Iran

<sup>2</sup>Public Health, Faculty of Health, Golestan University of Medical Sciences, Gorgan, Iran

<sup>3</sup>Public Health, Health Education of Gonbad-e-Qabous, Golestan University of Medical Sciences, Gorgan, Iran

<sup>4</sup>Department of Psychology, Kazimierz Wielki University, Bydgoszcz, Poland

<sup>5</sup>Environmental Health, Gonbad-e-Qabous Health Center, Golestan University of Medical Sciences, Gonbad-e-Qabous, Iran

<sup>6</sup>Department of Epidemiology, Faculty of Health, Shiraz University of Medical Sciences, Shiraz, Iran

<sup>7</sup>Infectious Disease Research Center, Golestan University of Medical Sciences, Gorgan, Iran

<sup>8</sup>Department of Biostatistics, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>9</sup>Faculty of Health, Health Management and Social Development Research Center, Golestan University of Medical Sciences, Gorgan, Iran

**Address for correspondence:**

Abdolhalim Rajabi

Department of Biostatistics and Epidemiology

Faculty of Health, Hirkan Blvd., Gorgan 1449614535, Iran

e-mail: rajabiepid@gmail.com

**Association of fear of COVID-19 and preventive behaviors (PB) against COVID-19 in Iran**

**Abstract**

**Introduction:** The world is currently experiencing a pandemic of COVID-19. The pandemic may affect physical and mental health. Therefore, this study aims to investigate the fear of COVID-19 and study the relationship between fear of COVID-19 and preventive behaviors against COVID-19.

**Material and methods:** We conducted a web-based cross-sectional study to evaluate the fear of COVID-19 and preventive behaviors against COVID-19 among the volunteer population in Golestan Province, Iran in May 2020

and June 2020. The online questionnaire included the Fear of COVID-19 Scale (FCV-19S) and the prevention behaviors against COVID-19, which are used to assess the fear and prevention behaviors of the population, respectively. The data were presented by mean and frequency. Multiple linear regression analysis was performed to identify factors associated with Fear of COVID-19 at a significant level of 0.05 in Stata 14.

**Results:** A total of 734 of the 900 individuals contacted completed the survey, with a participation rate of 81.5%. The mean age of the participants was  $33.97 \pm 10.68$  years and 375 (51.9%) were females. The mean Fear of COVID-19 score in the participants was  $19.69 \pm 5.96$ . There was a significant positive correlation between Fear of COVID-19 and preventive behaviors ( $r = 0.19$ ,  $p < 0.001$ ). Multiple linear regression analysis showed participants with a higher perceived threat of COVID-19, women, married participants, health workers and people with underlying diseases had higher levels of fear of COVID-19.

**Conclusions:** The fear of COVID-19 in Iranian society is high, which indicates the need to pay attention to the mental health in pandemic conditions. Appropriate intervention action can be designed and implemented according to the factors that affect fear. In addition, it should be noted that people with less fear are less likely to observe the COVID-19's preventative behaviors.

**Key words:** COVID-19, fear, health promotion, preventive

## Introduction

A new type of acute respiratory disease (pneumonia) occurred in Wuhan, China in December 2019 and has spread to all parts of the world [1, 2]. The mentioned unknown pneumonia, which affected the whole world, was named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) disease. On January 30, 2020, the Emergency Committee of the World Health Organization declared this issue a world health emergency of international concern [3]. One of the salient characteristics of SARS-CoV-2 disease is its transmissibility to other people. Recent studies have shown that the number of patients per week has doubled, and each patient can spread the infection to 2.2 other people [4]. The first report of coronavirus infection in Iran was reported in Qom city on February 20, 2020, and then quickly spread to other parts of the country. The World Health Organization reported that on September 25, 32,110,656 people worldwide were infected by the coronavirus and 980,031 patients died. In this regard, it is reported that the number of people infected with this disease in Iran is equal to 436,319, and the estimated death toll is 25,015 [5].

Now, COVID-19 has become a pandemic in a short time and resulted in increasing people's anxiety, panic, and fear due to fear or perceived fear about the threat of this virus. Pandemics are not just related to medical phenomena, but can affect individuals and communities in different ways and disrupt the people's peace of mind. Fear is one of the psychological aspects of the COVID-19 pandemic, which has been considered as an unpleasant feeling of avoiding the fear stimulus [6]. The constant news about this disease has caused everyone's anxiety and worries to increase. Social media highlighted news related to COVID-19 and introduced the disease as a unique threat, which subsequently caused anxiety, stress and hysteria among people [6]. Today, despite easy access to communication technologies and the transmission of emotions, the dissemination of imprecise and incorrect information can increase harmful social reactions, such as fear, anger, and nervousness [7, 8]. In addition, the perceived threat can lead to cognitive (risk perception) and emotional (fear and anxiety) reactions [9].

When fear becomes a long-term phenomenon, it can cause damage and various mental illnesses [10, 11]. During a pandemic, fear increases anxiety and stress in healthy people, which exacerbates the signs and symptoms of mental disorders [12]. In general, the number of people whose mental health is affected by epidemics is higher than the total number of people influenced by infections [13]. Previous experience has shown that compared with pandemics, the psychological impact of pandemics can be longer, more devastating, and more widespread. Therefore, these effects will bring obvious psychological and economic obstacles to different people [6, 12, 13]. Even among patients with cold symptoms, the stress and fear of its similarity to COVID-19 cause psychological distress and worsen psychological symptoms [14, 15]. Despite the lower percentage of confirmed patients (definitive diagnosis) than suspected cases of COVID-19, most of which are mild or asymptomatic, its psychological impacts have led to overcrowding in emergency units and health systems [6]. Based on the above, it seems necessary to check the state of fear of COVID-19 disease. Therefore, this study aims to investigate the nature of fear of COVID-19 and determine the associated factors with fear of COVID-19. In this study, we have also tried to find answers about the association between fear of COVID-19 and perceived threat and effects of perceived threat on COVID-19-related preventive behaviors so that these results can be used to prevent current and future psychological consequences.

## **Material and methods**

### ***Study design and participants***

To prevent the spread of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) through droplets or contact, we used a web-based cross-sectional survey based on the Internet Survey on Fear of COVID-19 and Preventive Health Behaviors from COVID-19 to collect data. This web-based survey was sent on the Internet through the Instagram and Telegram in public groups and channels for any county of Golestan province. According to report of “Digital 2018” [16], Instagram and Telegram is the most popular social media in Iran. This web-based questionnaire was completely voluntary and non-commercial.

### ***Data collection***

Participants answered the questionnaires secretly on the Internet from May 11, 2020 to June 9, 2020. All subjects reported their demographic data, COVID-19 related information, and completed two standardized questionnaires which assessed their Fear of COVID-19 Scale (FCV-19S) and preventive behaviors (PB) against COVID-19 [17, 18]. In order to ensure the quality of survey, we set the response range of some items (e.g., the age range was limited to 15–60 years old) and encouraged participants to answer carefully through questionnaire explanations. Finally, a total of 734 participants who completed the questionnaires (response rate of 82%) were included in the analysis.

### ***Ethical statement***

This study was conducted in accordance with the Declaration of Helsinki, and was approved by the Research Council of Golestan University of Medical Sciences and the National Ethics Committee in Biomedical Research with a code of IR.GOUMS.REC.1399.013.

### ***Demographic information***

Demographic variables included gender (male or female), age, education, marital status, residence, occupation and underlying disease.

### ***COVID-19 related information***

This section was evaluated in the following items: 1. During the past two months, how much did you consider yourself to be at risk of coronavirus? 2. If you have this disease, how do you assess

the severity of its symptoms? These items measure the “Perceived threat of Corona”. History of COVID-19 morbidity is based on self-reporting. Observance of health standards and social distancing with these two questions were examined: 1. During the last two months, did people in your area comply with health standards such as using masks, washing their hands, etc. to prevent COVID-19 disease? 2. During the last two months, have people in your area complied home quarantine (stay at home) and social distancing?

### ***Fear of COVID-19 Scale (FCV-19S)***

We used Iranian version of FCV-19S (Fear of COVID-19 Scale) to assess subject’s fear of COVID-19. The FCV-19S has been previously used in Iranian populations and found to have good reliability (Cronbach’s alpha = 0.82) [17]. Seven items assessed the agreement with the statements using a five-item Likert type scale over the past two months ranging from 1 (strongly disagree) to 5 (strongly agree). A total score is calculated by adding up each item score (ranging from 7 to 35). The higher the score, the greater the fear of COVID-19.

### ***Preventive behaviors (PB) against COVID-19***

This questionnaire was designed to study preventive behaviors against COVID-19. This questionnaire already has been used in the study of Shahnazi et al. and its validity and reliability have been reported (Cronbach’s alpha = 0.89) [18]. There were 8 questions about the preventive behaviors against COVID-19. Answering the questions was on a 5-point Likert scale from Always to Never; and scoring was from 1 to 5. The score range of the preventive behaviors against COVID-19 was 8–40 points, and higher scores indicated more comply of preventive behaviors.

### ***Statistical analysis***

Data were given as means  $\pm$  SD for continuous variables or percentages (%) for categorical variables. The distribution of continuous variables was checked by a normality test.

Confirmatory factor analysis (CFA) was utilized in order to validate the factor structure of the Fear of COVID-19 Scale (FCV-19S) and Preventive behaviors (PB). As has been previously reported in the literature (e.g., Hu and Bentler 1999 [19]; Kline 2015 [20] ), CFI  $\geq$  0.90 and

SRMR  $\leq$  0.08 were considered an indication of acceptable fit. Univariate linear regression analysis was used to determine the regression coefficient ( $\beta$ ) with the 95% confidence interval for FCV-19S. Correlation coefficients between the FCV-19S and Preventive behaviors (PB) were calculated by Pearson correlation analysis. Multiple stepwise linear regression analysis was used to identify the factors associated with FCV-19S and the coefficient of determination ( $R^2$ ). All the statistical tests are two-sided, and a P value  $<$  0.05 was considered statistically significant. All statistical analyses were conducted using the Stata software program, version 14 (Stata Corp, College Station, TX, USA).

## Results

A total of 734 participants (aged  $33.97 \pm 10.68$  years) took part in the study, of which 375 (51.09%) were males and 359 (48.91%) were females. The mean value of FCV-19S was  $19.69 \pm 5.96$ . Out of this sample, 574 (78.20%) of the participants were from rural areas, and 144 (19.62%) of the participants had at least one underlying disease. There were 501 (68.26%) subjects married and 189 (25.75%) subjects had high education level (Master's degree and higher). The detailed demographic characteristics are presented in Table 1.

The results show that the mean value of the perceived threat is  $6.11 \pm 1.74$ , with a full score of 10. Of the people studied, 3.27% said that they had been affected by the coronavirus. In addition, the study indicated that more than 35% and 31% of the community complied with health standards such as using face masks, washing their hands, etc. and home quarantine (stay at home) and social distancing, respectively (Table 2).

CFA analyses for Fear of COVID-19 Scale (FCV-19S) showed that fit indices were all within the acceptable limit [ $\chi^2$  (14, N = 734) = 299.025,  $p <$  0.05; SRMR = 0.054; CFI = 0.919; RMSEA = 0.14]. The factor loadings of the Fear of COVID-19 Scale were found significant, ranging from 0.65 to 0.83. The item analysis results of the Fear of COVID-19 Scale are shown in Figure 1.

CFA analyses for preventive behaviors (PB) against COVID-19 showed that fit indices were all within the acceptable limit [ $\chi^2$  (20, N = 734) = 120.907,  $p <$  0.05; SRMR = 0.043; CFI = 0.933;

RMSEA = 0.08]. The factor loadings of the Fear of COVID-19 Scale were found significant, ranging from 0.53 to 0.73. The item analysis results of the Fear of COVID-19 Scale are shown in Figure 2.

The univariate regression between the demographic characteristics and FCV-19S are shown in Table 3. The analysis results show that there is a significant correlation between age, gender, marital status, students, comorbidities, and perceived threat of Corona with FCV-19S. In addition, preventive behavior is significantly and moderately correlated to FCV-19S ( $r = 0.19$ ,  $p < 0.001$ ).

Table 4 shows the determinants of the COVID-19 Fear Scale (FCV-19S) obtained by using multiple stepwise linear regression analysis for the factors detailed in the statistical analysis section. Preventive behaviors (Coefficient  $\beta = 0.16$ ; 95% CI, 0.08 to 0.24;  $p < 0.001$ ), job (medical staff; coefficient  $\beta = -2.57$ ; 95% CI,  $-3.84$  to  $-1.29$ ;  $p < 0.001$ ), job (non-medical staff; coefficient  $\beta = -2.02$ ; 95% CI,  $-3.10$  to  $-0.95$ ;  $p < 0.001$ ), comorbidity (yes; coefficient  $\beta = 2.03$ ; 95% CI, 1.00 to 3.06;  $p < 0.001$ ) and perceived threat of Corona (coefficient  $\beta = 0.93$ ; 95% CI, 0.69 to 1.18;  $p < 0.001$ ), were significantly associated with FCV-19S.

## **Discussion**

Currently, the COVID-19 pandemic is considered to be the most challenging public health concern. One of the most important effects of this pandemic is related to the psychological impact of the COVID-19 outbreak, such as the impact of fear on the mental health of people around the world. In general, the obtained results showed that the outbreak of COVID-19 lead to increased fear among the people. The Fear of COVID19 Scale presented by Ahorsu et al. [17] was used to measure fear. In the present study, structural validity and reliability of the questionnaire were confirmed by Confirmatory Factor Analysis (CFA) so that the calculated indices for structural validity were acceptable with the desired standards and were consistent with the study of Ahorsu et al. [17]. Furthermore, in the present study, structural validity and reliability of preventive behaviors were examined using CFA, which gave acceptable results. The results of this study show that there is a positive and significant correlation between fear of COVID-19 and compliance with preventive behaviors. In other words, fear of COVID-19 has led to an increase in preventive health behaviors. The results of studies by Alyami et al. [21] and



Harper et al. [22] showed that the fear of coronavirus has increased social distancing and hand washing, which shows that people have changed their mental health and increased motivational behaviors for COVID-19. In addition, our research results indicated that the perceived threat increases the fear of COVID-19 disease. In other words, people of any age accept the threat of serious illness from COVID-19. Therefore, its dangerous consequences have been taken seriously. Given the high rate of spread, severe physical complications, significant mortality, and the lack of vaccine and definitive drug treatment for this emerging and unknown disease that has caused fear and panic in people, the previous finding is not unexpected. In addition, after confirming the results obtained in this study, other studies conducted in other parts of the world also explained that women have higher levels of fear than men [15, 21, 23–25].

Overall, the results of several published studies show that women are significantly more fearful of COVID-19 than men. It seems that women are more susceptible to diseases than men and think that they are more susceptible to COVID-19. In this regard, some studies have shown that women are more prone to anxiety, stress and depression [26, 27]. In addition, our research results showed that the level of fear of the disease among married people is significantly higher than that of single people. This finding is consistent with the findings of Fitzpatrick et al. [23] and Doshi et al. [24]. The main reason for this difference may be that married people have a higher sense of responsibility. Therefore, due to the possibility of infecting family members, their fear and psychological conflicts about the disease have increased. Even so, our findings showed that fear of coronavirus in students was significantly lower than in other jobs. This result may be due to the fact that the students are young and single. On the other hand, the elimination of risk factors for student gatherings through the implementation of government policies, such as observing social distancing strategy against coronavirus disease in the Iranian population and the closure of universities, colleges, and dormitories, reduced the fear of infection with coronavirus among students.

In addition to the above, due to the direct contact with patients with COVID-19, observing daily reports, and high risks of the disease, such as mortality and critical mental and physical complications, health care personnel had the most perceived threat and fear of COVID-19 among the people. In support of this conclusion, the findings presented by Doshi et al. [24] also pointed out that health workers are more fearful of COVID-19 than others. In addition, another result of this study is that people with underlying diseases have an increasing fear of COVID-19. This

issue was an expectable and predictable finding because the death rate and complications of the disease are much higher in people with underlying problems such as diabetes, high blood pressure, respiratory, and kidney disorders compared to people without such diseases. Besides, the media and scientists' insistence on taking extra care of these people can increase the fear of coronavirus among them.

### **Limitations**

This study had limitations, so it is difficult to generalize the results to the general population. Since many people in the community for various causes did not have access to smartphones or social networks used in this study, conducting the study in cyberspace was considered as the first limitation. The self-reporting nature of the tool used and the unique inherent limitations of the present study, such as the cross-sectional nature of the study, were identified as other limitations.

### **Conclusions**

The results of the present study confirmed that the CFS-19 tool and the questionnaire related to preventative behaviors of COVID-19 have good validity and reliability in the Iranian population. The fear of coronavirus was also directly related to the increasing observance of preventative behaviors and high perceived threats. In addition, among women, married people, health workers and patients with underlying diseases, the fear of COVID-19 is significantly higher.

### **References:**

1. Wang C, Horby P, Hayden F, et al. A novel coronavirus outbreak of global health concern. *The Lancet*. 2020; 395(10223): 470–473, doi: [10.1016/s0140-6736\(20\)30185-9](https://doi.org/10.1016/s0140-6736(20)30185-9).
2. Li Q, Guan X, Wu P, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia. *NEJM*. 2020; 382(13): 1199–1207, doi: [10.1056/nejmoa2001316](https://doi.org/10.1056/nejmoa2001316).
3. Velavan TP, Meyer CG. The COVID-19 epidemic. *Trop Med Int Health*. 2020; 25(3): 278–280, doi: [10.1111/tmi.13383](https://doi.org/10.1111/tmi.13383), indexed in Pubmed: [32052514](https://pubmed.ncbi.nlm.nih.gov/32052514/).
4. Zhao S, Lin Q, Ran J, et al. Preliminary estimation of the basic reproduction number of novel coronavirus (2019-nCoV) in China, from 2019 to 2020: A data-driven analysis in the early phase of the outbreak. *Int J Infect Dis*. 2020; 92: 214–217, doi: [10.1016/j.ijid.2020.01.050](https://doi.org/10.1016/j.ijid.2020.01.050), indexed in Pubmed: [32007643](https://pubmed.ncbi.nlm.nih.gov/32007643/).

5. Organization. WH. Coronavirus disease (COVID-2019) situation reports. 2020 2020.  
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>.
6. Rajkumar RP. COVID-19 and mental health: A review of the existing literature. *Asian J Psychiatr*. 2020; 52: 102066, doi: [10.1016/j.ajp.2020.102066](https://doi.org/10.1016/j.ajp.2020.102066), indexed in Pubmed: [32302935](https://pubmed.ncbi.nlm.nih.gov/32302935/).
7. Ornell F, Schuch JB, Sordi AO, et al. "Pandemic fear" and COVID-19: mental health burden and strategies. *Braz J Psychiatry*. 2020; 42(3): 232–235, doi: [10.1590/1516-4446-2020-0008](https://doi.org/10.1590/1516-4446-2020-0008), indexed in Pubmed: [32267343](https://pubmed.ncbi.nlm.nih.gov/32267343/).
8. Wang Y, McKee M, Torbica A, et al. Systematic Literature Review on the Spread of Health-related Misinformation on Social Media. *Soc Sci Med*. 2019; 240: 112552, doi: [10.1016/j.socscimed.2019.112552](https://doi.org/10.1016/j.socscimed.2019.112552), indexed in Pubmed: [31561111](https://pubmed.ncbi.nlm.nih.gov/31561111/).
9. Moser RP, McCaul K, Peters E, et al. Associations of perceived risk and worry with cancer health-protective actions: data from the Health Information National Trends Survey (HINTS). *J Health Psychol*. 2007; 12(1): 53–65, doi: [10.1177/1359105307071735](https://doi.org/10.1177/1359105307071735), indexed in Pubmed: [17158840](https://pubmed.ncbi.nlm.nih.gov/17158840/).
10. Garcia R. Neurobiology of fear and specific phobias. *Learn Mem*. 2017; 24(9): 462–471, doi: [10.1101/lm.044115.116](https://doi.org/10.1101/lm.044115.116), indexed in Pubmed: [28814472](https://pubmed.ncbi.nlm.nih.gov/28814472/).
11. Shin LM, Liberzon I. The neurocircuitry of fear, stress, and anxiety disorders. *Neuropsychopharmacology*. 2010; 35(1): 169–191, doi: [10.1038/npp.2009.83](https://doi.org/10.1038/npp.2009.83), indexed in Pubmed: [19625997](https://pubmed.ncbi.nlm.nih.gov/19625997/).
12. Shigemura J, Ursano RJ, Morganstein JC, et al. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin Neurosci*. 2020; 74(4): 281–282, doi: [10.1111/pcn.12988](https://doi.org/10.1111/pcn.12988), indexed in Pubmed: [32034840](https://pubmed.ncbi.nlm.nih.gov/32034840/).
13. Reardon S. Ebola's mental-health wounds linger in Africa. *Nature*. 2015; 519(7541): 13–14, doi: [10.1038/519013a](https://doi.org/10.1038/519013a), indexed in Pubmed: [25739606](https://pubmed.ncbi.nlm.nih.gov/25739606/).
14. Wang C, Pan R, Wan X, 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), doi: [10.3390/ijerph17051729](https://doi.org/10.3390/ijerph17051729), indexed in Pubmed: [32155789](https://pubmed.ncbi.nlm.nih.gov/32155789/).
15. Park SC, Park YC. Mental Health Care Measures in Response to the 2019 Novel Coronavirus Outbreak in Korea. *Psychiatry Investig*. 2020; 17(2): 85–86, doi: [10.30773/pi.2020.0058](https://doi.org/10.30773/pi.2020.0058), indexed in Pubmed: [32093458](https://pubmed.ncbi.nlm.nih.gov/32093458/).
16. Kemp S. Digital in 2018: World's internet users pass the 4 billion mark: We are social; 2018.  
<https://wearesocial.com/blog/2018/01/global-digital-report-2018>.
17. Ahorsu DK, Lin CY, Imani V, et al. The Fear of COVID-19 Scale: Development and Initial Validation. *Int J Ment Health Addict*. 2020 [Epub ahead of print]: 1–9, doi: [10.1007/s11469-020-00270-8](https://doi.org/10.1007/s11469-020-00270-8), indexed in Pubmed: [32226353](https://pubmed.ncbi.nlm.nih.gov/32226353/).
18. Shahnazi H, Ahmadi-Livani M, Pahlavanzadeh B, et al. Assessing preventive health behaviors from COVID-19: a cross sectional study with health belief model in Golestan Province, Northern of Iran. *Infect Dis Poverty*. 2020; 9(1): 157, doi: [10.1186/s40249-020-00776-2](https://doi.org/10.1186/s40249-020-00776-2), indexed in Pubmed: [33203453](https://pubmed.ncbi.nlm.nih.gov/33203453/).

19. Hu L, Bentler P. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*. 1999; 6(1): 1–55, doi: [10.1080/10705519909540118](https://doi.org/10.1080/10705519909540118).
20. Kline RB. *Principles and practice of structural equation modeling*. Fourth Edition. Guilford publications 2015.
21. Alyami M, Henning M, Krägeloh CU, et al. Psychometric Evaluation of the Arabic Version of the Fear of COVID-19 Scale. *Int J Ment Health Addict*. 2020 [Epub ahead of print]: 1–14, doi: [10.1007/s11469-020-00316-x](https://doi.org/10.1007/s11469-020-00316-x), indexed in Pubmed: [32427217](https://pubmed.ncbi.nlm.nih.gov/32427217/).
22. Harper C, Satchell L, Fido D, et al. Functional fear predicts public health compliance in the COVID-19 pandemic. *Int J Mental Health Addict*. 2020: 1–14, doi: [0.1007/s11469-020-00281-5](https://doi.org/10.1007/s11469-020-00281-5), indexed in Pubmed: [32346359](https://pubmed.ncbi.nlm.nih.gov/32346359/).
23. Fitzpatrick KM, Harris C, Drawve G. Fear of COVID-19 and the mental health consequences in America. *Psychol Trauma*. 2020; 12(S1): S17–S21, doi: [10.1037/tra0000924](https://doi.org/10.1037/tra0000924), indexed in Pubmed: [32496100](https://pubmed.ncbi.nlm.nih.gov/32496100/).
24. Doshi D, Karunakar P, Sukhabogi JR, et al. Assessing Coronavirus Fear in Indian Population Using the Fear of COVID-19 Scale. *Int J Ment Health Addict*. 2020 [Epub ahead of print]: 1–9, doi: [10.1007/s11469-020-00332-x](https://doi.org/10.1007/s11469-020-00332-x), indexed in Pubmed: [32837422](https://pubmed.ncbi.nlm.nih.gov/32837422/).
25. Reznik A, Gritsenko V, Konstantinov V, et al. COVID-19 Fear in Eastern Europe: Validation of the Fear of COVID-19 Scale. *Int J Ment Health Addict*. 2020 [Epub ahead of print]: 1–6, doi: [10.1007/s11469-020-00283-3](https://doi.org/10.1007/s11469-020-00283-3), indexed in Pubmed: [32406404](https://pubmed.ncbi.nlm.nih.gov/32406404/).
26. Lim GY, Tam WW, Lu Y, et al. Prevalence of Depression in the Community from 30 Countries between 1994 and 2014. *Sci Rep*. 2018; 8(1): 2861, doi: [10.1038/s41598-018-21243-x](https://doi.org/10.1038/s41598-018-21243-x), indexed in Pubmed: [29434331](https://pubmed.ncbi.nlm.nih.gov/29434331/).
27. Wang C, Pan R, Wan X, 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), doi: [10.3390/ijerph17051729](https://doi.org/10.3390/ijerph17051729), indexed in Pubmed: [32155789](https://pubmed.ncbi.nlm.nih.gov/32155789/).

**Table 1.** Participants characteristics (N = 734)

Variables	Mean ± SD or n (%)
<b>Age (year)</b>	33.97 ± 10.68
<b>Fear of COVID-19 Scale (FCV-19S)</b>	19.69 ± 5.96
<b>Sex</b>	
Male	375 (51.09)
Female	359 (48.91)
<b>Education status</b>	
Under diploma	52 (7.08)

Diploma	126 (17.17)
Higher diploma and bachelor's degree	367 (50.00)
Master's degree and higher	189 (25.75)
<b>Occupation</b>	
Unemployed	34 (4.65)
Self-employed	77 (10.53)
Housewife	61 (8.34)
Student	151 (20.66)
Non-medical staff	269 (36.80)
Medical staff	139 (19.02)
<b>Marital status</b>	
Non-married	233 (31.74)
Married	501 (68.26)
<b>Residence</b>	
Rural	574 (78.20)
Urban	160 (21.80)
<b>Comorbidity</b>	
Yes	144 (19.62)
No	590 (80.38)
<b>Infected by the coronavirus?</b>	
No	449 (61.17)
Yes	24 (3.27)
Unsure	261 (35.56)
<b>Infected by the Influenza in last year?</b>	
No	475 (64.71)
Yes	190 (25.89)
Unsure	69 (9.40)
<b>Perceived threat of Corona</b>	6.11 ± 1.74

**Table 2.** Frequency distribution of observing preventive behaviors (PB) against COVID-19

Variables	Never N (%)	Rarely N (%)	Partly N (%)	Often N (%)	Always N (%)
During the last two months, did people in your area comply with health standards such as using masks, washing their hands, etc. to prevent COVID-19 disease?	85 (11.58)	121 (16.49)	260 (35.42)	175 (23.84)	93 (12.67)
And During the last two months, have people in your area complied home quarantine (stay at home) and social distancing?	81 (11.04)	117 (15.94)	294 (40.05)	190 (25.89)	52 (7.08)

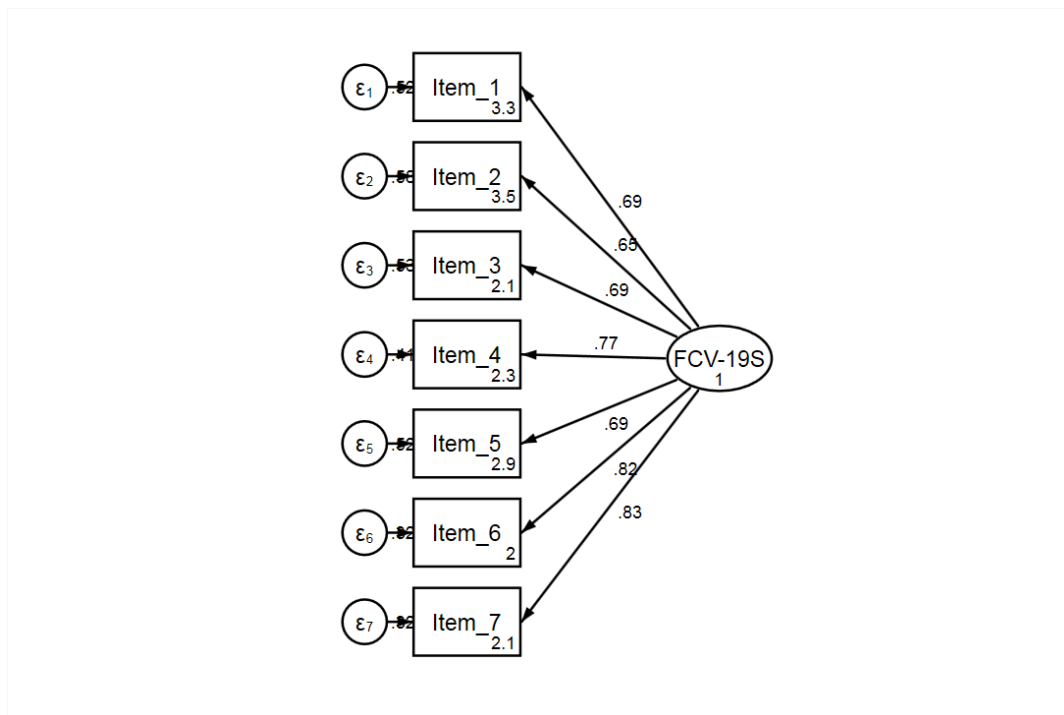
**Table 3** Univariate linear regression analysis showing variables associated with Fear of COVID-19 Scale (FCV-19S) (n = 734)

<b>Predictors</b>	<b><math>\beta</math></b>	<b>SE</b>	<b>P</b>
<b>Age</b> (year)	0.05	0.02	0.01
<b>Sex</b> (female versus male)	1.11	0.43	0.01
<b>Education</b>			
Under diploma	0		
Diploma	-0.84	0.98	0.39
Higher diploma and bachelor's degree	-0.54	0.88	0.54
Master's degree and higher	-1.12	0.93	0.22
<b>Marital status</b> (married versus single)	1.40	0.47	0.003
<b>Job</b>			
Unemployed	0		
Self-employed	-1.14	1.21	0.34
Housewife	1.23	1.26	0.33
Student	-2.26	1.12	0.04
Non-medical staff	-1.36	1.07	0.20
Medical staff	-1.24	1.13	0.27
<b>Residence</b> (urban versus rural)	0.04	0.53	0.93
<b>Comorbidity</b> (yes versus no)	2.59	0.54	< 0.001
<b>Infected by the coronavirus?</b>			
No	0		
Yes	0.35	1.25	0.77
Unsure	0.59	0.46	0.20
<b>Infected by the Influenza in last year?</b>			

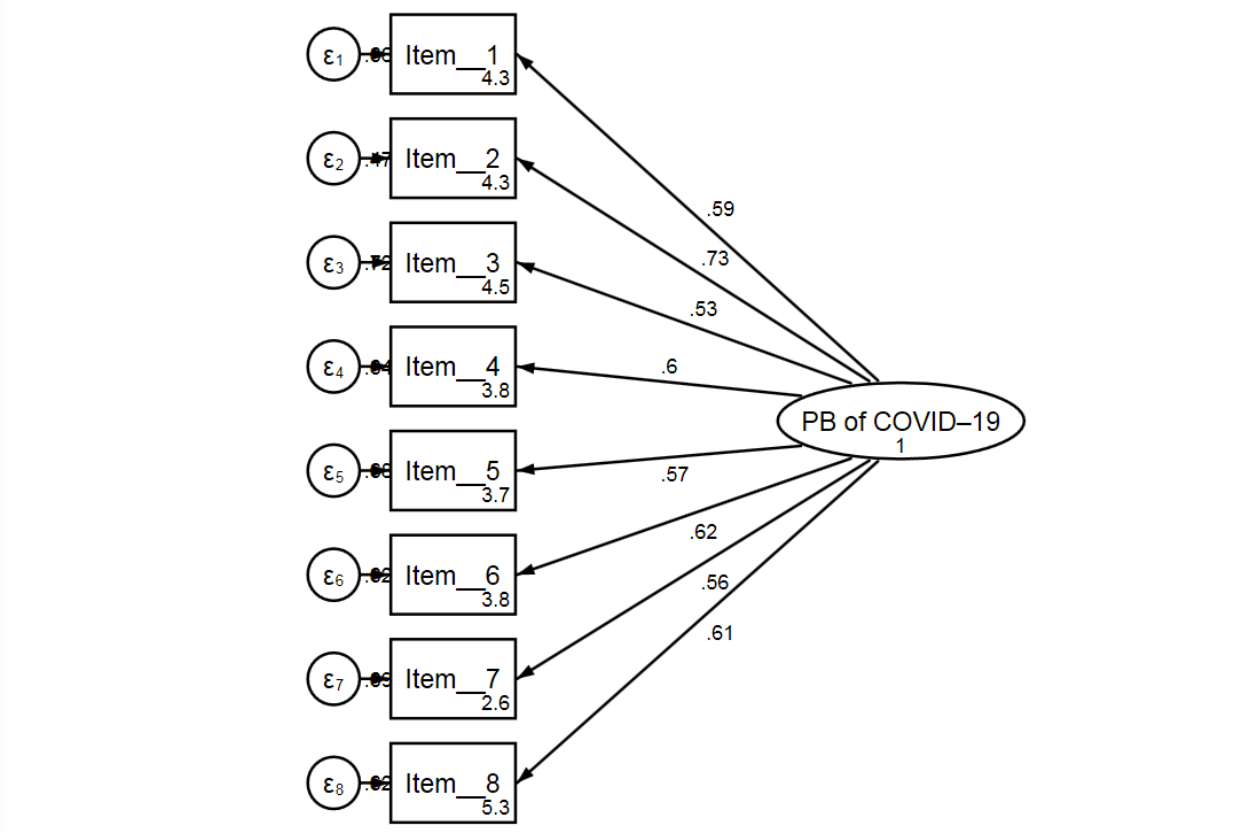
No	0		
Yes	0.74	0.51	0.14
Unsure	0.46	0.76	0.54
<b>Perceived threat of Corona</b>	0.95	0.12	< 0.001

Table 4. Multiple stepwise linear regression analysis showing variables independently associated with Fear of COVID-19 Scale (FCV-19S) (n = 734) (**Adj. R-squared = 0.14**)

Predictors	$\beta$	CI 95%	P
Sex (male)	0.74	-0.13, 1.62	0.09
Medical staff	-2.57	-3.84, -1.29	< 0.001
Non-medical staff	-2.02	-3.10, -0.95	< 0.001
Student	-1.90	-3.15, -0.65	0.003
Comorbidity	2.03	1.00, 3.06	< 0.001
Perceived threat of Corona	0.93	0.69, 1.18	< 0.001
Preventive behaviors	0.16	0.08, 0.24	< 0.001



**Figure 1.** Item characteristics for the Fear of COVID-19 Scale



**Figure 2.** Item characteristics for the preventive behaviors (PB) against COVID-19