

# Investigation of Psychometric Properties of Persian Version of Fear of COVID-19 Scale in Nurses

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## Abstract

**Background:** The COVID-19 pandemic, which has become the most challenging issue for health organizations and governments, has led to panic among healthcare workers, especially nurses. Faced with patients, insufficient access to personal protective equipment and labor shortages have made nurses afraid of COVID-19.

**Objectives:** The present study was conducted to investigate the psychometric properties of the Persian version of the Fear of COVID-19 Scale (FCV-19S) on emergency nurses.

**Methods:** This cross-sectional study was performed on 295 nurses. Face and content validity were checked qualitatively. Construct validity was checked using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The number of factors was determined based on parallel analysis and items with a factor load of 0.30 and above were retained. Cronbach's alpha and McDonald omega coefficients were used to evaluate the internal consistency.

**Results:** The mean age of nurses was  $30.37 \pm 5.46$  years (22-50 years). In exploratory factor analysis, a factor was extracted that explained 54.75% of the total variance of fear of COVID-19. In the confirmatory factor analysis, the fit indices were all appropriate: CMIN/df=1.515, GFI=0.916, AGFI=0.903, NFI=0.938, IFI=0.953, CFI=0.9, and RMSEA=0.064. Cronbach's alpha and McDonald's Omega coefficients were 0.920 and 0.787, respectively.

**Conclusion:** Fear of COVID-19 Scale has good validity and reliability in the Iranian sample of nurses and can be used in various studies.

**Keywords:** Validity, Reliability, Fear of COVID-19, Nurses.

## Introduction

Coronavirus Disease-2019 (COVID-19) is a large family of viruses that can cause respiratory infections ranging from the common cold to more severe illnesses such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).<sup>1,2</sup> COVID-19 appeared in Wuhan, China in late 2019 and spread rapidly in many countries.<sup>3</sup> COVID-19 caused the death of many people and severely affected the political, social, occupational, psychological and economic aspects of people's lives.<sup>4,5</sup> The highest rate of death and pollution in the Middle East was in Iran, which experienced several waves of disease due to international sanctions.<sup>3</sup>

The COVID-19 epidemic has put a lot of pressure on the health care system and created various challenges for the medical staff, especially nurses, which led to dysfunction and mental health problems.<sup>6,7</sup> Due to the nature of the disease, the general population and even the medical staff showed stressful reactions such as extreme fear and anxiety.<sup>8</sup> It exacerbates the fear, complications, and harms of COVID-19 and causes people with COVID-19 to be irrational in making decisions and as a result face many health problems.<sup>9,10</sup> In addition, fear of disease can prevent appropriate therapeutic intervention for patients.<sup>11</sup> Various studies have shown that nurses for various reasons such as unfamiliarity with COVID-19, lack of knowledge about this disease, fear of infecting other

family members and loss of loved ones, fear of lack of support from managers and the organization in case of infection.<sup>12-16</sup>

## Objectives

Measuring the fear of COVID-19 requires a valid and reliable instrument. FCV-19S is a standard, valid and reliable scale that has been translated in many different countries where its psychometric properties have been evaluated. Due to the persistence of COVID-19 disease in Iran, the existence of a Persian version of this scale to measure fear of COVID-19 in nurses is essential. Therefore, this study was conducted to investigate the psychometric properties of the Persian version of FCV-19S.

## Methods

### Participants and setting

This cross-sectional study was performed in April 2021 on 295 emergency nurses of selected hospitals in Kurdistan province. All data were collected by the first author of the article. The total sample was divided into two groups of 145 and 150 people. The exploratory factor analysis was performed on the first sample and the confirmatory factor analysis was performed on the second sample.

### Translation process

After obtaining permission from the scale's developer, the translation process was performed as a forward-backward. Two fluent Iranian translators translated it separately and any differences between the two translated versions were discussed and eliminated by the research team. The final Persian version was then translated into English by two other independent translators. Finally, the final English version was reviewed by an English-speaking author.

### Measurements

Demographic information form and Fear of COVID-19 Scale (FCV-19S) were used to collect data. The demographic information form included the following information: age, sex, marital status, work history, history of COVID-19, COVID-19 vaccination, and type of

employment. The FCV-19S is a single-factor instrument that measures fear of coronavirus. This tool was designed by Ahorsu et al. (2020) and tested on a sample of the general population with a mean age of  $31.25 \pm 12.68$  years. The FCV-19S instrument has 7 items that are scored on a 5-point Likert scale. The overall score is obtained by adding the scores of seven items, i.e. it varies between 7 and 35; higher scores indicate higher levels of fear.<sup>9</sup> (Supplementary Tables 1 & 2)

### Face and Content Validity

In order to assess the face validity, the Persian version of the FCV-19S was given to 5 nurses to check it in terms of writing, meaning and ambiguity. After reviewing the suggestions and making the recommended changes, the final version was given to 5 nursing experts to evaluate it in terms of content.

### Statistical Analysis

SPSS 18.0 and AMOS software were used for data analysis. Exploratory factor analysis (EFA) with maximum likelihood method was used to investigate the factor structure of FCV-19S. Although there is no general rule on sample size for exploratory factor analysis, it is recommended that the sample size should be between 150 and 300.<sup>17,18</sup> On the other hand, according to the rule of thumb, 10 participants per item of the questionnaire are considered suitable for EFA.<sup>19</sup> The data are suitable for EFA if the Kaiser-Meyer-Olkin (KMO) is above 0.6.<sup>20,21</sup> The number of factors was determined based on parallel analysis and items with a factor load of 0.30 and above were retained.

In confirmatory factor analysis (CFA), model fit was examined using fit indices, such as chi-squared test ( $\chi^2$ ), chi-square ratio to degree of freedom (CMIN/df), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), incremental fit index (IFI), confirmatory fit index (CFI) and root mean square error of approximation (RMSEA). GFI, AGFI, NFI, CFI and IFI indices should be above 0.9.<sup>22</sup> Given Cronbach's alpha constraints (affected by sample size and number of scale items),<sup>23</sup> we also calculated and reported the McDonald omega coefficient to examine internal consistency.

### Ethical Consideration

This study was approved by the Research Ethics Committee of the Kurdistan University of Medical Sciences (IR.MUK.REC.1400.174). First, the objectives of the study were explained to the nurses and after obtaining their consent, the questionnaires were distributed in person and anonymously. The participants were explained that answering the questionnaires is optional. Participants were assured that their information would remain confidential.

### Results

In this study, 300 nurses working in emergency departments in Kurdistan province were included in the study. Five incomplete questionnaires were excluded from analysis and the remaining 295 questionnaires were analyzed. The mean age of participants was  $30.37 \pm 5.46$  years and nurses were in the age range of 22 to 50 years.

Also, the average work experience of nurses was  $6.48 \pm 5.28$  years. Most female nurses (52.5%) were married (58.6%) and 89.8% of them had received COVID-19 vaccine. Also, 70.2% of these nurses had a history of COVID-19. The mean score of fear of COVID-19 was  $20 \pm 7.37$ . Further details about the demographic information of the nurses participating in the study are reported in (Table-1).

The KMO index was 0.850 and Bartlett test of sphericity was significant ( $\chi^2=401.242$ ,  $df=21$ ,  $p<0.001$ ). In the EFA, one factor was extracted that explained 54.75% of the total variance of fear of COVID-19. The factor loadings and communalities of the items are shown in (Table-2).

In the confirmatory factor analysis, the fit indices were all satisfactory: CMIN/df=1.515, GFI= 0.916, AGFI=0.903, NFI=0.938, IFI=0.953, and RMSEA=0.064. In regard to internal consistency check, Cronbach's alpha coefficient was 0.920 and McDonald's omega coefficient was 0.787 (Table-2).

**Table-1.** Demographic characteristics of nurses participating in the study

Variable		Frequency	Percentage	Mean $\pm$ SD
Gender	Male	140	47.5	19.5 $\pm$ 7.64
	Female	155	52.5	20.84 $\pm$ 7.04
Marital status	Married	173	58.6	20.83 $\pm$ 7.59
	Single	122	41.4	18.79 $\pm$ 6.92
Type of employment	Permanent	50	16.9	21.34 $\pm$ 8.08
	Conditional	79	26.8	21.32 $\pm$ 6.62
	Contract	44	14.9	20.68 $\pm$ 8.12
	Mandatory	122	41.4	18.32 $\pm$ 7.00
Vaccinated against COVID-19	Yes	265	89.8	20.14 $\pm$ 7.43
	No	30	10.2	18.66 $\pm$ 6.85
History of COVID-19	Yes	207	70.2	20.87 $\pm$ 7.44
	No	88	29.8	17.90 $\pm$ 6.82

**Table-2.** Results of exploratory factor analysis of FCV-19S in nurses

Items	Factor loading	Communality ( $h^2$ )	Internal consistency
1. I am most afraid of COVID-19.	0.775	0.601	$\alpha=0.920$ $\Omega=0.787$
3. My hands become clammy when I think about COVID-19.	0.773	0.597	
7. My heart races or palpitates when I think about getting COVID-19.	0.767	0.588	
4. I am afraid of losing my life because of COVID-19	0.750	0.563	
6. I cannot sleep because I'm worrying about getting COVID-19.	0.740	0.547	

5. When watching news and stories about COVID-19 on social media, I become nervous or anxious.	0.695	0.483
2. It makes me uncomfortable to think about COVID-19.	0.674	0.545

## Discussion

The results of this study, which aimed to investigate the psychometric properties of the Persian version of FCV-19S on nurses, showed that this instrument has a single-factor structure (i.e., it is a unidimensional scale) that is consistent with the Arabic, Bangladeshi and Turkish versions.<sup>24-26</sup> In the Japanese and Israeli versions, however, the bi-factorial structure had the best fit.<sup>27-29</sup> The reason for this finding can be attributed to the differences in the studied communities and the extent of their perception of fear of COVID-19. On the other hand, these studies were all performed on the general population, while the present study was performed exclusively on nurses. The studies that have been conducted to evaluate the psychometric properties of this scale have reported good validity and reliability. Because COVID-19 is not a specific disease and has become a pandemic, all people, regardless of age or gender, feel threatened by it.<sup>25</sup>

In the present study, the extracted factor explained more than half of the total variance of the items (manifest variables), which is consistent with the results of studies conducted in the United States and Turkey,<sup>30, 31</sup> but in the study by Martínez-Lorca et al., (2020) the Spanish version of the FCV-19S had a single-factor structure and explained less than 50% of the total variance.<sup>32</sup> The highest and lowest factor loading in this study were related to item #1 (I am most afraid of COVID-19) and #2 (It makes me uncomfortable to think about COVID-19), respectively. In the study by Luo et al., the fear score was assessed and evaluated worldwide based on translated versions of FCV-19S. Findings showed that item #1 had higher factor loading.<sup>33</sup> Also, the mean score of FCV-19S in this study was 20, which is higher than the global average (18.57).<sup>33</sup> Nurses are at greater risk due to direct exposure to infection and caring for patients with COVID-19, so they are expected to be more fearful than the general population. One of the limitations of this study was that criterion validity and congruent validity were not examined. One of the strengths of this study is the

implementation of face and content validity along with construct validity

## Conclusions

The present study showed that the Persian version of the FCV-19S in nurses has satisfactory psychometric properties and can be used to measure fear in nurses in future studies.

## Acknowledgment

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## Competing interests

The authors declare no competing interests.

## Abbreviations

Adjusted goodness of fit index: AGFI;  
Confirmatory factor analysis: CFA;  
Confirmatory fit index: CFI;  
Chi-square ratio to degree of freedom: CMIN/df;  
Exploratory factor analysis: EFA;  
Fear of COVID-19 Scale: FCV-19S;  
Goodness of fit index: FGI;  
Incremental fit index: IFI;  
Kaiser-Meyer-Olkin: KMO;  
Middle East Respiratory Syndrome: MERS;  
Normed fit index: NFI;  
Root mean square error of approximation: RMSEA;  
Chi-squared test:  $\chi^2$ ;  
Severe Acute Respiratory Syndrome: SARS.

## Authors' contributions

Design: RGG and NKK; data collection: NKK; analysis and interpretation of data: RGG and SD; Manuscript preparation: NKK, SR and FD; Manuscript revision: RGG. All the authors read and approved the final manuscript. All

authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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None.

## Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

## Ethics approval and consent to participate

All procedures performed in this study involving human participants were in accordance with the 2013 Helsinki Declaration. Informed consent was obtained from all participants.

## Consent for publication

Not applicable.

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**Supplementary Table-1.** The English version of the Fear of COVID-19 Scale (FCV-19S)

Items	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. I am most afraid of COVID-19.					
2. It makes me uncomfortable to think about COVID-19.					
3. My hands become clammy when I think about COVID-19.					
4. I am afraid of losing my life because of COVID-19					
5. When watching news and stories about COVID-19 on social media, I become nervous or anxious.					
6. I cannot sleep because I'm worrying about getting COVID-19.					
7. My heart races or palpitates when I think about getting COVID-19.					

**Supplementary Table-2.** The Persian version of the Fear of COVID-19 Scale (FCV-19S)

شماره	سؤال	کاملاً موافقم	موافقم	نه موافقم نه مخالفم	مخالفم کاملاً مخالفم
۱	من از کرونا می ترسم.				
۲	فکر کردن در مورد کرونا من را ناراحت می کند.				
۳	وقتی به کرونا فکر می کنم ، حس می کنم دستهایم سرد و مرطوب شده است.				
۴	من از اینکه جان خود را به دلیل کرونا از دست بدهم، میترسم.				
۵	من وقتی اخبار و دانستنی های راجع به کرونا را در تلویزیون یا شبکه های اجتماعی می بینم مضطرب و عصبی می شوم.				
۶	من از اینکه ممکن است کرونا بگیرم حتی نمی توانم راحت بخوابم.				
۷	من وقتی به این فکر می کنم که ممکن است کرونا بگیرم، ضربان قلبم به شدت بالا می رود.				