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Investigating the psychometric properties of the Persian version of the fear of COVID-19 scale in nurses

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Abstract

Background: The COVID-19 pandemic has caused significant concerns among healthcare professionals, including nurses. The aim of this study was to investigate the psychometric properties of the Persian version of the Fear of COVID-19 Scale (FCV-19S) in an emergency nurse population. The FCV-19S is a widely used tool for measuring fear of COVID-19. However, its validation in different populations remains limited.

Objectives: To assess the construct validity and reliability of the FCV-19S in an Iranian sample of emergency nurses.

Methods: This cross-sectional study included 295 nurses working in emergency departments. The face and content validity of the FCV-19S were evaluated through qualitative feedback. Construct validity was assessed using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), and the number of factors was determined based on parallel analysis. Internal consistency was evaluated using Cronbach's α and McDonald's Ω coefficients.

Results: The mean age of participants was 30.37 ± 5.46 years (range: 22–50 years). EFA revealed a single factor that accounted for 54.75% of the total variance in fear of COVID-19. CFA showed adequate model fit indicators: 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 α and McDonald's Ω coefficients were 0.920 and 0.787, respectively.

Conclusion: Findings suggest that the FCV-19S has good validity and reliability in the Iranian emergency nurse population. It can be used in future research to assess the fear of COVID-19 in similar populations.

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).[1,2] COVID-19 emerged in Wuhan, China, towards the end of 2019 and quickly spread across numerous countries.[3] COVID-19 has caused the deaths of numerous individuals and had a profound impact on various aspects of people's lives, including their political, social, occupational, psychological, and economic wellbeing.[4,5] The country with the highest rate of mortality and air pollution in the Middle East is Iran, which has suffered through multiple waves of the virus due to international sanctions.[3]

The COVID-19 pandemic has placed significant strain on the healthcare system and posed numerous challenges for medical professionals, particularly nurses, resulting in burnout and mental health issues.[6,7] The unprecedented nature of the disease has triggered stressful responses from both the general public and medical personnel, including intense fear and anxiety.[8] It exacerbates the fear,

complications, and harm caused by COVID-19, causing individuals with COVID-19 to make irrational decisions that lead to various health problems.[9,10] Additionally, fear of disease can hinder proper therapeutic treatment for patients.[11] Various studies have shown that nurses cite various reasons for not getting vaccinated against COVID-19, including: unfamiliarity with the virus, lack of knowledge about the disease, fear of infecting other family members or loved ones, fear of a lack of support from managers and the organization in cases of infection.[12-16]

Objectives

Measuring the fear of COVID-19 requires a valid and reliable instrument. FCV-19S is a standardized, valid, and reliable scale that has been translated into many languages across various countries, where its psychometric properties have been evaluated. Given the continued presence of COVID-19 in Iran, it is crucial to develop a Persian version of this scale to assess the fear of COVID-19 among nurses. Thus, this study aimed to evaluate the psychometric properties of the Persian version of FCV-19S among emergency nurses in Kurdistan Province, Iran.

Methods

Participants and setting

This cross-sectional study was carried out in April 2021 on 295 emergency nurses working at select hospitals in Kurdistan Province. The first author of the study collected the data. The entire sample was split into two groups of 145 and 150 participants. Exploratory factor analysis was performed on the initial group, while confirmatory factor analysis was conducted on the second group.

Translation process

After obtaining permission from the scale's developer, the translation process was conducted using a forward-backward approach. The study team addressed and resolved any differences between the two translated versions, which were translated separately by two competent Iranian translators. The final Persian version was then translated into English by two additional independent translators. Finally, an English-language specialist assessed the final English version.

Measurements

The Demographic Information Form and the Fear of COVID-19 Scale (FCV-19S) were employed to gather data. The demographic information form included the following details: age, gender, marital status, work history, history of COVID-19, COVID-19 vaccination, and occupation type. The FCV-19S is a unidimensional instrument that assesses fear related to coronaviruses. Ahorsu et al. (2020) created it and validated it on a sample of the general population with a mean age of 31.25±12.68 years. The FCV-19S consists of 7 items rated on a 5-point Likert scale. The total score ranges from 7 to 35, where higher values represent greater levels of fear.[9] (See Supplementary Tables 1 and 2.).

Face and Content Validity

To assess the validity of the face, the Persian version of the FCV-19S was provided to five nurses for checking in terms of writing, meaning, and ambiguity. Based on their response, proposed adjustments were made, and the new version was subsequently reviewed for content validity by five nursing professionals.

Statistical Analysis

SPSS version 18.0 and AMOS software were used for data analysis. Exploratory factor analysis (EFA) with maximum likelihood methods was employed to investigate the factor structure of FCV-19S. There is no universally accepted rule regarding sample size for conducting EFA, but it is generally recommended that samples consist of between 150 and 300 participants. According to a commonly cited guideline, at least 10 participants are needed per item in a questionnaire for EFA to be feasible. Suitable data for EFA are characterized by a Kaiser-Meyer-Olkin (KMO) value greater than 0.6.[17-21]

The number of factors was determined based on parallel analysis, and items with a factor loading of 0.30 or higher were retained. Model fit was evaluated using fit indices such as the chi-squared test ($x2$), the chi-square ratio to degrees of freedom (CMIN/df), the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), the normed fit index (NFI), the incremental fit index (IFI), the confirmatory fit index (CFI), and the root mean square error of approximation (RMSEA). GFI, AGFI, NFI, CFI,

and IFI indices should be above 0.9. Additionally, given Cronbach's alpha constraints (affected by sample size and number of scale items), we also calculated and reported the McDonald omega coefficient to examine internal consistency.[22,23]

Ethical Consideration

This study was approved by the Research Ethics Committee of the Kurdistan University of Medical Sciences (IR.MUK.REC.1400.174). 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 informed that answering the questionnaires was 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 analysis. Five incomplete surveys were excluded, leaving 295 questionnaires that were analyzed. The mean age of

participants was 30.37±5.46 years, with participants ranging in age from 22 to 50 years old. Additionally, the average work experience of nurses was 6.48±5.28 years. A majority of female nurses (52.5%) were married (58.6%), and 89.8% of them had received the COVID-19 vaccination. Furthermore, 70.2% of these nurses had a history of COVID-19. The mean level of fear of COVID-19 was 20±7.37. More detailed information on the demographic characteristics of the participating nurses can be found in Table 1.

The KMO index was 0.850, and Bartlett's test of sphericity was significant ($\chi 2 = 401.242$, df = 21, p<0.001). In the exploratory factor analysis (EFA), one factor was extracted that explained 54.75% of the total variance in fear of COVID-19. The factor loadings and communalities of the items are presented in Table 2. In the confirmatory factor analysis (CFA), 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. Additionally, internal consistency checks revealed a Cronbach's alpha coefficient of 0.920 and McDonald's omega coefficient of 0.787 [Table 2].

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

Variable		Frequency	Percentage	Mean±SD
Gender	Male	140	47.5	19.5±7.64
	Female	155	52.5	20.84±7.04
Marital status	Married	173	58.6	20.83±7.59
	Single	122	41.4	18.79±6.92
Type of employment	Permanent	50	16.9	21.34±8.08
	Conditional	79	26.8	21.32±6.62
	Contract	44	14.9	20.68±8.12
	Mandatory	122	41.4	18.32±7.00
Vaccinated against COVID-19	Yes	265	89.8	20.14±7.43
	No	30	10.2	18.66±6.85
History of COVID-19	Yes	207	70.2	20.87±7.44
	No	88	29.8	17.90±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	
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	α=0.920
6. I cannot sleep because I'm worrying about getting COVID-19.	0.740	0.547	Ω=0.787
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

This study's findings, which attempted to explore the psychometric qualities of the Persian version of the FCV-19S among nurses, found that this instrument has a unidirectional structure (i.e., it is a single-factor scale). This finding is consistent with previous studies conducted in Arabic, Bengali, and Turkish populations.[24-26] However, in contrast, the Japanese and Israeli versions exhibited a better fit with a bifactorial structure.[27-29]

The reason for this finding can be attributed to the differences in the studied communities and the extent of their perceived fear of COVID-19. On the other hand, these studies were conducted on the general population, whereas the present study focused exclusively on nurses. The psychometric properties of this scale have been evaluated in previous studies, which reported good validity and reliability. Notably, COVID-19 is an umbrella term for a diverse range of symptoms and conditions caused by COVID-19, making it a highly threatening and unspecific disease that affects people of all ages and genders equally. Because COVID-19 is not a specific disease but rather a pandemic, all people, regardless of age or gender, feel threatened by it.[25]

In the current study, the extracted factor accounted for over half of the total variance in the manifest variables, which aligns with findings from previous research in the US and Turkey.[30,31] However, contrastingly, Martínez-Lorca et al.'s (2020) study found that the Spanish version of the FCV-19S exhibited a unifactorial structure and explained less than 50% of the total variance.[32] The highest and lowest factor loadings in this study were associated with item #1 ("I am most afraid of COVID-19") and item #2 ("It makes me uncomfortable to think about COVID-19"), respectively. According to a previous study by Luo et al., the fear scores were assessed and evaluated globally using translated versions of FCV-19S. The findings revealed that item #1 had a higher factor loading. Additionally, the mean score of FCV-19S in this study was 20, which is higher than the global average of 18.57.[33]

Nurses are at a higher risk due to direct exposure to infection and caring for patients with COVID-19; thus, they are expected to be more fearful than the general population. One limitation of this study was that criterion validity and congruent validity were not examined. However, one strength of this study is the implementation of face and content validity along with construct validity.

Conclusions

The present study demonstrated that the Persian version of the Fear of Cancer Vulnerability Scale (FCV-19S) in nurses exhibits satisfactory psychometric properties and can be employed to assess fear in nurses in future research.

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: $\chi2$; 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.

Availability of data and materials

The datasets used and/or analyzed 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 fearful due to COVID-19.					
2. It causes discomfort for me to contemplate COVID-19.					
3. My hands grow clammy whenever I ponder COVID-19.					
4. I am afraid of losing my life due to COVID-19.					
5. When watching news and stories about COVID-19 on social media, I become nervous or anxious.					
6. I can't sleep because I'm worried 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)

کاملاً مخالفم	مخالفم	نه موافقم نه مخالفم	موافقم	کاملاً موافقم	سوأل	شماره
					من از کرونا می ترسم.	۱
					فکر کردن در مورد کرونا من را ناراحت می‌کند.	۲
					وقتی به کرونا فکر می‌کنم ، حس می‌کنم دستهایم سرد و مرطوب شده است.	۳
					من از اینکه جان خود را به دلیل کرونا از دست بدهم، میترسم.	۴
					من وقتی اخبار و دانستنی‌های راجع به کرونا را در تلوزیون یا شبکه‌های اجتماعی می بینم مضطرب و عصبی می شوم.	۵
					من از اینکه ممکن است کرونا بگیرم حتی نمی‌توانم راحت بخوابم.	۶
					من وقتی به این فکر می‌کنم که ممکن است کرونا بگیرم، ضربان قلبم به شدت بالا می‌رود.	۷