RESEARCH & REVIEWS IN HEALTH SCIENCES - I

SEPTEMBER/2021

EDITOR
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gece kitaplığı

İmtiyaz Sahibi / Publisher • Yaşar Hız
Genel Yayın Yönetmeni / Editor in Chief • Eda Altunel
Kapak & İç T asarım / Cover & Interior Design • Gece Kitaplığı
Editör / Editor • Prof. Dr Cem Evereklioğlu
Birinci Basım / First Edition • © Eylül 2021
ISBN • 978-625-8002-42-3

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Baskı & Cilt / Printing & Volume
Sertifika / Certificate No: 47083

Research & Reviews in Health Sciences - I

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Chapter 10

"THE FEAR OF COVID-19 FAMILIAL INFECTION SCALE" TURKISH VALIDITY AND RELIABILITY STUDY

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1.INTRODUCTION

Following the World Health Organization (WHO) report of pneumonia cases with unknown cause in Wuhan, China on December 31, 2019; a novel coronavirus (COVID-19) was identified as the cause by Chinese authorities (WHO, 2020). 81% of COVID-19 cases are reported to have asymptomatic clinic, while severe disease (for exp. dyspnoea, hypoxia or more than 50% lung involvement in images within 24-48 hours) is reported in 14% and clinical disease (for exp. shock, respiratory failure or multiorgan dysfunction) is reported in %5 (Wu & McGoogan, 2020). The disease is transmitted by droplets emitted by coughing and sneezing and from the surfaces patients touch (by touching the eye, mouth and nose mucosa with hands) (Ministry of Health, 2020). It has been reported that the virus is spread with a high speed and as of October 2020, the number of infected individuals is 35.347.404 and the number of deceased individuals is 1.039.406 (WHO, 2020). While mentioning some common psychosocial effects caused by deadly epidemics, Strong stated that fear, panic, stigmatization, moral debates and call for action characterised the initial reactions. He reported that the psychology of the epidemic transformed into a new collective epidemic that showed a rapid spread from person to person. He also reported that it included at least three different kinds of psycho-social epidemic: the epidemic of fear, the epidemic of explanation and the epidemic of proposed actions. In the epidemic of fear, the basic worry of individuals includes their suspicions about themselves, their families and loved ones catching the disease (Strong, 1990).

Healthcare professionals fight on the front lines against COVID-19 infection and they are evaluated as in very high risk group in terms of the risk of COVID-19 infection (Sakaoğlu, Orbatu, Emiroğlu, & Çakır, 2020). During this pandemic period, one of the main factors affecting stress levels among healthcare professionals is being afraid of getting infected with COVID-19. It is especially the fear of transmitting the virus to family or friends (Ahorsu et al., 2020). Maunder et al. reported that healthcare professionals were worried about transmitting the infection to their children, about stigmatization by their friends and about the care of their children if they get hospitalized or quarantined (Maunder et al., 2003). When other studied conducted are examined, it can be seen that an important source of fear was not only catching the disease, but at the same time the fear of transmitting to other family members and having family members who are afraid of getting infected by them (Chan et al., 2005; Goulia, Mantas, Dimitroula, Mantis, & Hyphantis, 2010).

"The Fear of COVID-19 Familial Infection Scale" was developed by Mayer et al. in 2020. It is a highly reliable and valid scale and it includes 6 items developed to evaluate health professionals' fears of infecting the

virus to their families (spouses and children) and relatives and to evaluate whether they had families and relatives who were afraid of being infected by them during the COVID-19 epidemic (Mayer, Etgar, Shiffman, & Lurie, 2020). No scales were found which evaluated health professionals' fears of infecting the virus and having families and relatives who were afraid of being infected by them. In epidemics with a high contagiousness and life threatening risk such as COVID-19, the fear and anxiety of individuals about themselves and their relatives getting infected are transferred from the individual dimension to the social dimension (Doğan & Düzel, 2020). For this reason, it is thought that translating this scale into Turkish will enable assessing the fear levels of healthcare professionals and providing supportive programs and trainings in accordance with the needs of healthcare professionals.

2.MATERIAL and METHOD

2.1.Study Design: The study used methodological design.

2.2.Population and Sample of the Study: The study was conducted between September 10 and 30, 2020 with healthcare professionals who were married and who had children. The questionnaire form created via docs.google.com/forms was sent to healthcare professionals online (e-mail, whatsapp). It is stated in literature that adaptation studies should be tested with a sample which is at least 5-10 times the number of items (Seçer, 2015). For this reason, the study was completed with 352 healthcare professionals who volunteered to participate and who answered the questionnaires within the specified dates.

2.3.Data Collection Instruments

"Personal Information Form" and "The Fear of COVID-19 Familial Infection Scale (FCFI)" were used in the study to collect data online from the participants.

2.3.1.Personal Information Form: There are 8 questions in the form which was prepared by the researchers to find out the socio-demographic features (age, gender, level of education, profession, financial situation, number of children, state of caring for COVID-19 patients and the state of having COVID-19) of the participants.

2.3.2.The Fear of COVID-19 Familial Infection Scale (FCFI): It was developed by Mayer et al. (2020) to find out individuals' fear of familial COVID-19 infection (Mayer et al., 2020). The 6-item and 5 Likert type scale is scored as "1-strongly disagree" and "5-strongly agree". It has two sub-dimensions: The first sub-dimension "Fear of infecting others (FIO)" includes three items (1,2,3). The second sub-dimension "Perception of Others' fear of being infected by me (POF)" includes three

items (4,5,6). The lowest score one can get from each question is 1, while the highest is 5. The minimum possible total scale score is 1, while the maximum possible score is 30 and fear of familial infection increases as score increases (Mayer et al., 2020). In this study, mean values were used to measure the score of each subscale.

2.4.Data Analysis: SPSS 17.0 and LISREL 8.8 package program were used to analyze the study data. Personal Information Form was evaluated with numbers and percentages. For validity, Barlett Tests, Kaiser-Meyer-Olkin Index (KMO), Exploratory Factor Analysis, Confirmatory Factor Analysis and Principal Component Analysis were used for the determination of content and construct validity. In terms of reliability, internal consistency and homogeneity were found by Cronbach's a Coefficient, Pearson Correlation analysis and item-total score correlation.

2.5. Ethical Considerations: Before the starting the study, written permission was taken from scale developers. The study was conducted in accordance with Declaration of Helsinki. Ethics Committee approval of a foundation university (2020/08 numbered) was taken for the study.

2.6. Psychometric Assessment of the Scale

2.6.1.Validity

2.6.1.1. Language validity:

Translating a scale into another language causes an inevitable change in the essence of the scale in terms of differences in expression and conceptualization. While adapting a scale to a new culture, it is very important to examine scale items carefully, to make necessary transformations for meaning in the translated language and to standardize for individuals who use the translated language in order to minimize the differences (Çapık, Gözüm, & Aksayan, 2018). By paying attention to the aforementioned issues, the scale was translated into Turkish. First the researchers and then two faculty members translated the scale. The resulting Turkish form was edited and reviewed. Following this procedure, the process of back translation into English was done by a linguist who knew both cultures and both languages well. The original scale and Turkish translation were reviewed to evaluate any changes in meanings of the items. The translations which best expressed each item were presented to the opinions of 7 experts.

2.6.1.2.Content validity: Content Validity Index-CVI was used for testing whether the language and culture were equivalent, for proving item content validity and for evaluating expert opinions (Çapık et al., 2018). For each of the items, experts needed to choose the suitable expression among from "4=completely suitable", "3=very suitable", "2=suitable but

the items need small changes" and "1=not suitable" for scoring the items between 1 and 4. Content validity index (CVI) was found as 0.98 with Davis technique. >0.80 content validity indicates item adequacy. Thus, the scale's content validity was found as statistically significant (Çapık et al., 2018) and no items were deleted.

2.6.1.3.Construct validity

Factor analysis is the method commonly used for testing construct validity. It is a procedure performed for the assessment of whether it is possible to group scale items under different dimensions and it has two types as Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). ETA is used to identify under how many sub-dimensions the items in the measurement tool can be grouped. For the confirmation of this construct, CFA is calculated (Güngör, 2016; Seçer, 2015). As a measurement method to measure sample adequacy, KMO and Bartlett's test are conducted before construct validity analysis (Seçer, 2015). While A KMO level of <0.50 cannot be accepted, a value between .80 and .90 is good and a value of >0.90 is very good (Çokluk, Şekercioğlu, & Büyüköztürk, 2016).

Factor analysis was tested with Principal Component Analysis and Varimax rotation. The view that items should have at least 0.30 factor load and items below this value should be deleted was applied (Seçer, 2015). EFA was followed with CFA to support the findings of the scale sub-dimensions. CFA showed that $X2/sd$ ratio of ≤5, RMSEA value of ≤0.07 and GFI, CFI, IFI values >0.90 were lower limits of the model's data fit index (Çapik, 2014).

2.6.2.Reliability

It is suggested to use Cronbach's α internal consistency coefficient to analyze homogeneity and internal consistency of scale items. Higher values show that items are homogeneous and they test elements of the same characteristics (Güngör, 2016; Özdamar, 2017). ≥0.70 Cronbach's alpha reliability means that the measurement tool can be used in studies (Güngör, 2016; Özdamar, 2017).

The association between item scores and the total score is analyzed with item-total correlation coefficients. The suggestion that acceptable coefficient should be ≥0.30 was applied in item selection (Büyüköztürk, 2017).

Test-retest means reaching consistent results in repeated measurements of the test. Correlation analysis is used to evaluate the results of both tests. A correlation coefficient closer to 1 indicates that the test has better test-retest reliability (Tavşanel, 2019). 2 weeks later, the scale was given to 50 patients for test-retest reliability (Karasar, 2016; Tavşanel, 2019).

3.RESULTS

Analysis of the participants' demographic features showed that the participants had a mean age of 33.86 ±7.08, 72.7% were female, 67.9% were undergraduates, 62.8% were nurses, 50.6% had one child and 75.9% had higher income than expense. It was found that 62.2% of the nurses were not providing care to COVID-19 patients and 98.3% did not have COVID-19 (Table 1).

Table 1. Demographic Characteristics of the Participants

Mean Age (Mean ±SD)		33.86 ±7.082	
		n	%
Gender	Female	256	72.7
	Male	96	27.3
Level of Education	High School	22	6.3
	Associate degree	53	15.1
	Undergraduate	239	67.9
	Post graduate	38	10.8
Profession	Doctor	17	4.8
	Nurse	221	62.8
	Midwife	53	15.1
	Other*	61	17.4
Level of income	Income<expense	78	22.2
	Income=expense	7	2.0
	Income>expense	267	75.9
Number of children	1	178	50.6
	2	126	35.8
	3	4	12.8
	4 and more	3	0.9
The state of providing care to COVID-19 patients	Yes	133	37.8
	No	219	62.2
The state of having COVID-19	Yes	6	1.7
	No	346	98.3

*** Pharmacist, Paramedic, Emergency medical technician, Radiology technician**

3.1.Validity

Barlett's Test of Sphericity analysis showed that KMO value was 0.80 and X^2 value was 1523.46. The results were significant at p=0.000 level (Table 2). This result showed that the sufficiency and suitability of sample size for factor analysis (Capik, 2014).

Table 2. Results of the Kaiser–Meyer–Olkin measure of sampling adequacy and Bartlett's test of Sphericity

Test		Results	
Kaiser–Meyer–Olkin measure of sampling adequacy		0.80	p < 0.001
Bartlett's test	Approx. Chi-square	1523.46	
	df	15	
	Sig.	0.00	

Varimax rotation technique was employed for factor analysis. Values ranging between 0.76 and 0.90 were found for factor load values in the EFA conducted for the validity of FCFI and it was found that 83.12% of the total variance was explained (Table 3). As a result, 6-item FCFI with 2-dimension was obtained.

Table 3. Mean scores, item-total correlation coefficients, factor loads, alpha coefficients and FCFI variance explained

Item load	Factor load	Mean (SD)	Corrected Item-total Correlations	Cronbach's Alpha if Item Deleted
1	0.90	4.55 (0.91)	0.69	0.86
2	0.89	4.45 (0.95)	0.71	0.85
3	0.88	4.50 (0.88)	0.73	0.85
4	0.88	3.65 (1.18)	0.66	0.86
5	0.89	3.68 (0.21)	0.71	0.85
6	0.76	4.05 (0.96+)	0.66	0.86
% Variance Explained				Total = 83.12
Cronbach's a				Total =0.88 f1:0.92 f2:0.86

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In Table 4, confirmatory factor analysis (CFA) fit index values of FCFI were found as X^2=12.51, df= 7 ($p<0.05$), X^2/df=1.78, RMSEA=0.047, CFI= 1.00, RMR= 0.028, SRMR= 0.031,GFI= 0.99, AGFI= 0.96 and NFI= 0.99 and it was found that the model fit was acceptable (Capik, 2014). CFA Path Diagram of FCFI after DFA model can be seen in Figure 1.

EFA and CFA showed that Turkish form of FCFI with 6 items and 2 sub-dimensions was confirmed without any changes on the original scale form. All the results obtained show that the scale has a high validity in Turkish culture.

Table 4. Confirmatory Factor Analysis Results

Fit criteria	Found	Appropriate	Acceptable
x^2/df	1.78	<2	<5
RMSEA	0.047	<0.05	<0.08
CFI	1.00	>0.95	>0.90
RMR	0.028	<0.05	<0.08
SRMR	0.031	<0.05	<0.08
GFI	0.99	>0.95	>0.90
AGFI	0.96	>0.95	>0.90
NFI	0.99	>0.95	>0.90

RMSEA : Root Mean Square Error of Approximation; CFI : Comparative Fit Index; RMR :Root Mean Square Residual ; SRMR : Standardized Root Mean Square Residual; NFI: Normed Fit Index; GFI: Goodness of Fit Index; AGFI: Adjusted Goodness of Fit Index

3.2.Reliability

In the analyses conducted to test scale reliability, the data were reapplied to 50 individuals from the sample on whom EFA was conducted and the pretest-posttest correlation was found as 0.92. This value obtained indicated that the scale has a high external reliability and a stable structure (Tavşanel, 2019).

In addition, the internal reliability of the scale was found as 0.88 for the whole scale. Internal consistency coefficient was 0.92 for Fear of infecting others sub-dimension and 0.86 for Perception of Others' fear of being infected by me sub-dimension (Table 3). These values show that the 6-item scale had a high internal consistency (Çokluk et al., 2016; Özdamar, 2017). All of the item-total correlation coefficients in the scale were higher than 0.30 (0.66-0.73) (Table 3)

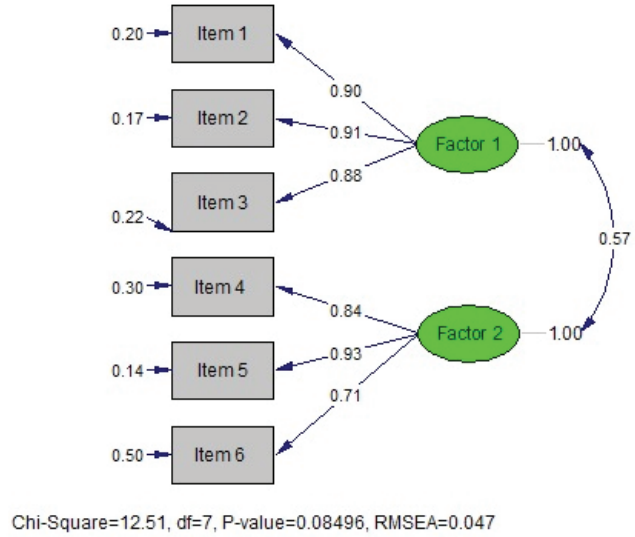

Figure 1. PATH Diagram Regarding the Factor Structure of the Scale

4. DISCUSSION

It was found that there were no specific scales were found in Turkey assessing the COVID-19 familial infection fear of healthcare professionals. Therefore, "The Fear of COVID-19 Familial Infection Scale" (Mayer et al., 2020) was adapted and its reliability and validity was tested. This section discusses the findings of FCFI consisting of 6 items and two sub-dimensions.

4.1.Validity

In the present study, construct validity of Turkish version of FCFI was tested with EFA and CFA. Before the analysis of construct validity, KMO value and Barlett Sphericity Test values were calculated to find out whether sample size was suitable. KMO value was calculated as 0.80, Barlett Sphericity Test was calculated as $x2$=1523.46, and df: 780; p=0.000. It is stated in literature that KMO value should be at least 50 and above, while Barlett Sphericity Test value should be statistically significant (Çokluk et al., 2016). Thus, the number of data was confirmed to be sufficient for factor analysis.

In Turkish adaptation of the scale, 83.1% of total variance was explained. In the original scale, the rate of total variance explained was found as 69.4% (Mayer et al., 2020). In line with these results, it was confirmed that similar to the original scale, FCFI included two sub-dimensions and the factor structure was sufficient.

In this study, item factor loads were between 0.76 and 0.90. Original scale by Mayer et al. (2020) had factor loads between 0.73 and 0.86 (Mayer et al., 2020). It is stated in literature that the acceptable value for factor loads can be as low as 30 (Büyüköztürk, 2017; Seçer, 2015). In line with these results, no items were deleted because there were no items with <0.30 factor load.

The index values calculated to examine the model fit were $X2$=12.51, df= 7 ($p<0.05$), $X2$/df=1.78, RMSEA=0.047, CFI = 1.00, RMR = 0.028, SRMR = 0.031,GFI= 0.99, AGFI= 0.96 and NFI = 0.99. These values showed the model was acceptable as it was (Çapik, 2014). CFA, which confirmed the exploratory factor analysis, confirmed the two dimensional structure of the scale as well.

4.2.Reliability

Total Cronbach's a coefficient was 0.98, while it was 0.92 for FIO and 0.82 for POF sub-dimensions. In the original scale by Mayer et al. (2020), it was found as 0.79 for FIO sub-dimension and as 0.75 for POF sub-dimension (Mayer et al., 2020). In literature, it is stated that the measurement instrument is sufficient for use in researches when Cronbach's a reliability is 0.70 and above, while it is stated to have high reliability when Cronbach's a reliability is 0.80 and above (Özdamar, 2017; Tavşanel, 2019). These results show that FCFI in healthcare professionals had high internal consistency and high reliability.

In the study, item-total correlation coefficients were between 0.66 and 0.73. In literature, the acceptable value for item selection is ≥0.30. An item is considered to be effective and sufficient to measure the targeted behaviour when it has a high correlation coefficient (Büyüköztürk, 2017; Özdamar, 2017). This result shows that the scale has high reliability.

FCFI was applied to 50 individuals with an interval of 2 weeks for retest analysis. The statistically significant correlation found was high and positive ($p<0.001$). The result shows that the scale has high consistency over time and indicates that it is possible to get reliable results for more than one application.

5. CONCLUSION

It was concluded that original scale and the present study had consistent result. The scale's two factor structure was confirmed. High cronbach's α internal consistency coefficient, item-total correlation and test-retest analysis were found. These results show FCFI is a valid and reliable instrument in measuring the fear of familial COVID-19 infection in healthcare professionals.

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