

Adaptation of the Fear of 2019 Coronavirus Disease (COVID-19) Scale to Turkish Culture: A Validity and Reliability Study

Seda KAYA¹, Emre DÜNDER², Funda Pınar ÇAKIROĞLU¹, Zeynep UZDİL³

¹Ankara University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Ankara, Turkey

²Ondokuz Mayıs University, Faculty of Science, Department of Statistics, Samsun, Turkey

³Ondokuz Mayıs University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Samsun, Turkey

Abstract

COVID-19 outbreak in the world has caused wide psychological effects and related concerns. Nonetheless, only a few studies have thus far evaluated the degree of fear of COVID-19, partially due to the lack of validated measures. This study was planned and conducted to study of the “Fear of COVID-19 Scale” adapted to Turkish culture which to measure level of fear of adult individuals Coronavirus Disease and developed by Ahorsu et al. (2020). In the study, over 18 years old adults has been achieved through a online questionnaire form who living in Turkey. 839 individuals were analyzed. In the first part of the questionnaire form, demographic features were questioned, and in the second part, Fear of COVID-19 Scale was applied. The scale is five-item Likert type consisting of 7 questions. Whether there is a correlation between the items that is a prerequisite for the study factor analysis was examined by Bartlett Sphericity Test ($\chi^2 = 2770.755$, $p < 0.001$) and the adequacy of the sample size was examined by Kaiser-Meyer-Olkin (KMO = 0.926). Accordingly, the results show that the sample size is sufficient. The level of internal consistency between items of the Fear of COVID-19 Scale was analyzed with item total correlations (>0.5) and Cronbach alpha internal consistency coefficients (0.874). As a result of the analyzes, the adaptation of the Fear of COVID-19 Scale to Turkish is robust and can be used in research assessing the psychological impact of COVID-19 among a Turkish adult population.

Keywords: COVID-19, fear, confirmatory factor analysis, validity and reliability analysis

Öz

Kovid-19 Korku Ölçeğinin Türk Kültürüne Uyarlanması: Geçerlik ve Güvenirlik Çalışması

Kovid-19 salgını dünyada geniş psikolojik etkilere ve ilişkili sorunlara yol açmıştır. Bununla birlikte bugüne kadar çok az çalışma, kısmen valide edilmiş çalışmaların eksikliği nedeniyle salgının neden olduğu korkuyu değerlendirmiştir. Bu çalışmada yetişkin bireylerin Kovid-19 salgınına bağlı korku düzeyini ölçmek için Ahorsu ve ark. (2020) tarafından geliştirilen “Kovid-19 Korku Ölçeği”nin geçerlik ve güvenilirlik çalışmasının yapılması ve Türk kültürüne uyarlanması amaçlanmıştır. Türkiye’de yaşayan 18 yaş üzeri yetişkin bireylere online anket yoluyla ulaşılmıştır. Toplamda 839 bireyin verileri analiz edilmiştir. Anketin ilk bölümünde demografik özellikler sorgulanmış, ikinci bölümünde Kovid-19 Korku Ölçeği uygulanmıştır. Ölçek yedi sorudan oluşan 5’li Likert tiptedir. Çalışma faktör analizinin ön koşulu olan maddeler arası korelasyon olup olmadığı Bartlett Küresellik testi ($\chi^2=2770,755$, $p<0,001$) ile örneklem büyüklüğünün yeterliliği ise Kaiser-Meyer-Olkin (KMO=0,926) ile incelenmiştir. Buna göre sonuçlar örneklem büyüklüğünün yeterli olduğunu göstermektedir. Kovid-19 Korku Ölçeğinin maddeler arasında iç tutarlılığının ne düzeyde olduğu madde toplam korelasyonları ($>0,5$) ve Cronbach alpha iç tutarlılık katsayıları ile (0,874) incelenmiş ve ölçeğin bütünü Kovid-19 salgınına bağlı korku durumunu yansıttığı belirlenmiştir. Yapılmış analizler sonucunda yetişkin bireylerde Kovid-19 nedeniyle gelişen korku düzeyini ölçmek için uygundur ve bu ölçeğin Türkçe formunun geçerli ve güvenilir olduğu saptanmıştır.

Anahtar Kelimeler: Kovid-19, Korku, Doğrulayıcı faktör analizi, Geçerlik güvenilirlik

Correspondence / Yazışma:
Seda KAYA, Ankara University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Ankara, Turkey
Phone: +90 312 212 60 40-6579
E-mail: dyt.seda06@outlook.com

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INTRODUCTION

The 2019 coronavirus disease (COVID-19) was first reported in December 2019 as a case of pneumonia of unknown etiology to the Chinese health authorities in Wuhan, Hubei Province, China. Many of the initial pneumonia cases have been linked to the Huanan wholesale seafood market that also traded live animals (Wang, Horby, Hayden, & Gao, 2020; Zhu et al., 2020). The COVID-19 can be transferred between people via close contacts (Huang et al., 2020). In infected patients, severe and even fatal respiratory diseases (e.g., acute respiratory distress syndrome (ARDS) and acute respiratory failure) resulting in intensive care may develop (Huang et al., 2020; Wang et al., 2020). Although the COVID-19 originated in China, it has spread to many countries (Thompson, 2020; Wang, Horby, Hayden, & Gao, 2020). On the 30th January, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak as a global health emergency (WHO, 2020). As of May 11, the number of confirmed cases worldwide has now exceeded 4 million (WHO, 2020). In Turkey, on the 11th May, 2020, 139771 cases has been identified and 3841 patients died from the COVID-19 (Turkey's Health Ministry, 2020).

The COVID-19 outbreak poses serious threats to people's physical health and life. Therefore, the current treatment for the COVID-19 worldwide is mainly focused on infection control, effective vaccine treatments (Dong, Hu, & Gao, 2020; Wang et al., 2020). The psychosocial aspect is not yet fully taken into account. The COVID-19 also triggered a wide range of psychological problems, including panic attacks, sleeplessness, anxiety, fear, and depression (Li et al., 2020; Qiu et al., 2020). Previous research has had a profound and wide range of psychosocial effects on infectious outbreaks, both on the individual and on communities. In addition, people experience feelings of fear of being sick or killed, feelings of helplessness and stigmatization (Hall, Hall, & Chapman, 2008). During an influenza epidemic (influenza A H1N1v), approximately 10–30% of the population was found to be quite or very worried about the possibility of contracting the virüs (Rubin, Potts, & Michie, 2010). In the COVID-19 epidemic, the closure of schools and businesses, and the implementation of law or/and limited quarantine practices have affected individuals psychologically (Van Bortel et al., 2016; Parmet & Sinha, 2020). When evaluated from this point of view, infectious diseases cause more depression and anxiety as well as fear compared to other conditions. There is

a relationship between fear, the speed and environment of the epidemic, and morbidity and mortality (Pappas, Kiriaze, Giannakis, & Falagas, 2009). With high levels of fear, individuals may not think clearly and rationally when reacting to the COVID-19. At the same time, countries around the world should work on individual fears to achieve a holistic goal, in addition to the effective treatment options of the COVID-19. Therefore, it was aimed to adapt the Fear of COVID-19 Scale developed in this study to Turkish and to make its validity reliability.

METHOD

Participants

The sample of this study was formed by adult individuals who are literate and agree to participate in the study voluntarily via an online questionnaire during April 2020 and living in Turkey. We applied power analysis to evaluate the sample size, based on the reference study of Ahorsu et al., (2020). We conducted the research with $n=839$ samples with 100% power. The sample size was selected such as being greater than the original reference study of the Fear of COVID-19 Scale. The participants were reached online via e-mail, blogs and social media. 856 participants participated in the online survey, and 17 participants were excluded from the study because it was found to be under the age of 18 years. For this reason, the analysis of the scale; 692 (82.5%) females and 147 (17.5%) males totally 839 participants aged between 18–65 years (28.3 ± 8.56) were conducted. The education level of 88.6% of the participants is university. 34.6% of them are married.

Online questionnaires were sent to the participants, the identity information was not asked in the questionnaire, and it was declared to the participants in writing that the answers would not be used anywhere other than this study.

Ethical Approval

This study, participated on a voluntary basis, was conducted in accordance with all ethical procedures/standards and the the Declaration of Helsinki. The study was approved by the Turkey's Health Ministry (Approval number: 2020–05–08T16_44_17) and Ondokuz Mayıs University Clinical Research Ethics Committee (Approval number: B. 30.2. ODM. 0.20.08/246).

Data Collection

Questionnaire Form

A questionnaire form in online was applied to question the demographic characteristics of individuals and their responses to the Fear of COVID-19 Scale. Age, gender, marital status, education level were questioned for demographic characteristics.

The Fear of COVID-19 Scale

The “Fear of COVID-19 Scale” developed by Ahorsu et al. (2020) was developed to measure the fear level of adult individuals over the age of 18 in the Iranian society during the COVID-19 outbreak. The scale is a 5-point Likert-type and 7 questions that take the values “1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree 5=Strongly agree”. The minimum score possible for each question is 1 point, and the maximum is 5 point. A total score is calculated by adding up each item score (ranging from 7 to 35 point). The higher the score, the greater the fear of coronavirus-19 (Ahorsu et al., 2020).

Translating the Original Form of the Fear of COVID-19 Scale into Turkish-Adaptation process

Before the adaptation of the Fear of COVID-19 Scale, permission to use via e-mail was obtained from the researchers who developed the scale. Later, it was translated from English to Turkish in about a week by five academics who are proficient in English. After evaluating the consistency of five different translations, a scale was created in the appropriate Turkish language in terms of language and meaning. The form was sent to five different academics who have proficiency in English and translated from Turkish to English. The compatibility of five different translations to the original language was evaluated, and the Turkish form was arranged in line with these opinions. The organized Turkish scale was presented to the opinions of 5 different lecturers at Ankara University Faculty of Health Sciences and its final version was given. In order to evaluate the level of understanding the Turkish version of the scale in the group to be administered, it was sent online to ten adult individuals over the age of 18 and evaluated whether it was understood correctly. In this way, it was determined that the demographic feature questionnaire and the Turkish form of the Fear of COVID-19 Scale can be answered within 8–10 minutes. After this stage, the scale was finally shared with all participants via the online system.

Statistical Analysis

The evaluation of the demographic characteristics of the individuals participating in the study was made with the SPSS (Statistical Package for Social Sciences) 21.0 package program.

Explanatory Factor Analysis of the Fear of COVID-19 Scale

We implemented the exploratory factor analysis (EFA) using principal axis factoring and varimax rotation techniques for checking the sub-dimension of the Fear of COVID-19 Scale. While implementing the EFA, we preferred to use the polychoric correlation matrix since it is more suitable than the Pearson correlation's for ordinal data (Holgado et al., 2010).

Confirmatory Factor Analysis

We assessed the reliability utilizing the Cronbach Alpha and inter-reliability (ICC) coefficients. After the EFA and reliability analyses, we applied confirmatory factor analysis (CFA) for validating the obtained structure. We divided the data into two different sets with the ratios 70–30 for EFA and CFA, independently. We conducted the EFA on the first set ($n_1=588$) and then we applied CFA on the other set ($n_2=521$). We performed the applications with R Software (R Core Team, 2020). Also, we gained the psych package for the reliability and EFA part (Revelle, 2018), we used Lavaan package for the CFA part (Rosseel, 2012).

RESULTS

Table 1 shows the median, range values and Wilcoxon test results for the divided sets. The items have completely the same descriptive statistics and there is no significant difference of the medians between the item pairs ($p>0.05$). Thus, we observe the homogeneity of the sample sets.

According to the preliminary results of EFA, Bartlett's test of Sphericity is significant ($\chi^2=2770.755$, $p<0.001$) and Kaiser-Meyer-Olkin test of sampling adequacy value ($KMO=0.926>0.900$) is quite high. The number of the factor was selected with Kaiser rule based on the correlation matrix. We extracted only one factor since there is one eigenvalue which is greater than 1 and this factor explained 65.60% of the total variance. Similarly, the original scale includes one factor and this fact is verified in our results.

Table 1: Descriptive statistics of the data sets and Wilcoxon test results

Item	First set (n=588)		Second set (n=251)		W	p
	Median	Range	Median	Range		
i1	3	4	3	4	72339	0.641
i2	2	4	2	4	72723	0.723
i3	4	4	4	4	71184	0.380
i4	3	4	3	4	73832	0.991
i5	2	4	2	4	68622	0.092
i6	4	4	4	4	70851	0.325
i7	4	4	4	4	72809	0.747

Table 2 reports the EFA and internal consistency results. The communalities of the items greater than 0.30 and the loadings are greater than 0.50 for all the items. All the results of the EFA point out the suitability of the data for the obtained factor structure. We attempted to confirm the reliability of the factor structure with Cronbach's Alpha values. The Cronbach's Alpha value is $\alpha=0.874$ and there is no requirement to discard any items, since the reliability values do not increase. Also, we calculated the intra-class correlation coefficient (ICC) to assess the inter-rater reliability with $ICC=0.877$, denoting great inter-rater reliability.

Table 2: EFA and reliability results

Item	Factor-1	Communality	Alpha if item deleted	Alpha	ICC
i7	0.870	0.751	0.863	0.874	0.877
i6	0.850	0.716	0.865		
i3	0.840	0.705	0.857		
i4	0.820	0.666	0.857		
i1	0.780	0.607	0.869		
i2	0.770	0.598	0.856		
i5	0.740	0.549	0.851		

Figure 1 shows the CFA results with standardized loadings based on the obtained factor structure. The loadings of each item are statistically significant, where the loading values ranged from 0.65 to 0.77. The overall fit indices of the model are $\chi^2/df=2.519$, $CFI=0.976$, $GFI=0.982$, $AGFI=0.965$, $TLI=0.964$, $NFI=0.961$, $SRMR=0.052$ and $RMSEA=0.078$.

The χ^2/df ratio of the model is lower than 2; RMSEA and SRMR are less than 0.08, which indicate great fit results. Also, the remaining measurements CFI, GFI, AGFI, TLI

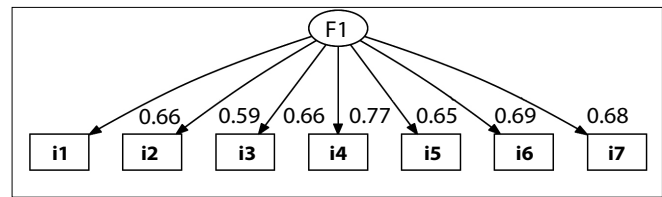


Figure 1. The CFA results of the fear of COVID-19 Scale.

and NFI are greater than 0.95. The fit indices demonstrate the validity of the factor structure, since they lie in acceptable limits (Hu and Bentler, 1999) ($\chi^2=35.262$, $df=14$, $\chi^2/df=2.519$, $CFI=0.976$, $GFI=0.982$, $AGFI=0.965$, $TLI=0.964$, $NFI=0.961$, $RMSEA=0.078$).

Both the findings of the exploratory and confirmatory factor analysis confirm the one-dimensional structure with a great internal consistency in consequence of the statistical analysis results.

DISCUSSION

In this study, it was aimed to adapt the 7-item Fear of COVID-19 Scale to Turkish. Adaptation of the scale begins with translating it from its original language into Turkish, then linguistic and narrative evaluation was completed by applying to the front group and applying the scale to the total subjects in the sample. Finally, the Turkish form of the scale was sent online to adult individuals and the data of the obtained 839 participants were analyzed.

In the study, firstly, factor and reliability analyzes of the scale were performed. Accordingly, whether there is a sufficient correlation between the items in the scale and the adequacy of the sample size were examined; it was determined that the sample size was sufficient and ($KMO=0.926>0.900$) and there was a sufficient level of relationship between items ($\chi^2=2770.755$, $p<0.001$).

The level of internal consistency among the items of the Fear of COVID-19 Scale, item total correlation numbers and Cronbach alpha internal consistency coefficients were examined and the internal consistency coefficient of the scale was found to be 0.874 accordingly. Cronbach alpha coefficient takes a value between 0–1. Approaching the value to 1 indicates that the scale is perfectly good. In addition, the correlation of all items with the total score was positive and above 0.50. This indicates that the scale can measure COVID-19 outbreak fear as a whole. As a result,

appropriate fit indices, good internal consistency and results related to structure compatibility support the quality of the scale approved in this study.

This study has several important results. The relationship between COVID-19 outbreak and fear has been shown to be an effective scale in explaining studies. Moreover, identifying the levels of this specific fear among different populations and their associations with specific demographic variables (e.g., gender, marital status, education level, etc.) could assist in locating potential risk groups. This ability might assist doctor, healthcare professionals, and clinicians to screen those who are more prone to fear during the COVID-19 outbreak and foster the development of educational interventions, while targeting the relevant groups.

Although the study has several strengths, such as the large sample size and relatively heterogenous and representative sample of the general population in Turkey, several limitations should also be noted. First, the findings of this study were based on self-report data which has the risk of source bias. Second, the data were collected using a non-clinical sample. Therefore, results may not be generalizable to a clinical sample. Third, the fact that a large percentage of the sample comprised female participants might affect the generality of our findings. Notwithstanding these limitations, the Fear of COVID-19 Scale is a valid and reliable measurement tool in the Turkish population, as well as highlight its potential in clinical and research settings.

Ethics Committee Approval: The study was approved by the Turkey's Health Ministry (number of approval: 2020-05-08T16_44_17) and Ondokuz Mayıs University Clinical Research Ethics Committee (number of approval: B.30.2. ODM. 0.20.08/246).

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors declare no conflict of interest.

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