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Perinatal Dönem COVID-19 Korku Ölçeğinin Türkçe Geçerlik, Güvenirlik Çalışması

The Turkish Validity and Reliability Study of the COVID-19 Fear Scale for Perinatal Period

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ABSTRACT

Objective: This study was conducted methodologically in order to test the validity and reliability of the Perinatal Period Covid-19 Fear Scale (EMC19-9) Turkish in pregnant women. Material and Method: The language validity of the scale was ensured, and the Turkish form was tested on pregnant women to determine its reliability. The content validity, construct validity and reliability of EMC19-9 were performed. Expert opinion was obtained for the content validity of the language-adapted scale. Data were collected in a city hospital and university hospital in the south of Turkey between April-May 2022. The universe of the study consisted of women who applied to hospitals for pregnancy follow-up, and the sample consisted of 100 pregnant women who were selected from the universe by convenience sampling and met the inclusion criteria. Data were collected with the personal information form, Fear of COVID-19 Scale and EMC19-9 scale. Descriptive statistics of the data, similar scale, principal component analysis, item total score analysis, explanatory, confirmatory factor analyzes, coefficient of invariance, and internal consistency analyzes were performed. Results: The content validity index of EMC19-9 was calculated as 0.997, the total variance in factor analysis was 55.069, the Cronbach's alpha coefficient was 0.896, the Spearman Brown coefficient in split-half analysis was 0.956, and the correlation value in test-retest measurement was r=0.543 ($p<0.05$). The item-total test correlation values of all items varied between 0.370 and 0.713. Conclusion: This study, it was concluded that the Turkish version of EMC19-9 is a valid and reliable scale in pregnant women.

Keywords: *Pregnancy, Validity, Reliability, Coronavirus*

ÖZ

Amaç: Bu araştırma Perinatal Dönem Covid-19 Korku ölçeğinin (EMC19-9) gebelerde Türkçe geçerlik güvenirliğini test etmek amacı ile metodolojik tipte gerçekleştirilmiştir. Gereç ve Yöntem: Ölçeğin önce dil geçerliliği sağlanmış, elde edilen Türkçe form gebelerde test edilerek güvenirliği saptanmıştır. EMC19-9 Türkçeye çevrilmiş, kapsam geçerliliği, yapı geçerliliği ve güvenirliği yapılmıştır. Dil uyarlaması yapılan ölçeğin kapsam geçerliği için uzman görüşü alınmıştır. Veriler Türkiye'nin güneyinde bir şehir hastanesi ve üniversite hastanesinde Nisan-Mayıs 2022 tarihleri arasında toplanmıştır. Araştırmanın evrenini, hastanelere gebelik izlemi için başvuran kadınlar, örneklemini ise evrenden gelişigüzel örnekleme ile seçilen, dahil edilme kriterlerine uyan 100 gebe oluşturmuştur. Veriler, kişisel bilgi formu, COVID-19 Korku Ölçeği, EMC19-9 ölçeği ile toplanmıştır. Elde edilen veriler tanımlayıcı istatistikler ile ifade edilmiştir. Ölçeğin geçerlik çalışmaları için benzer ölçek, temel bileşenler analizi, madde toplam puan analizi, açımlayıcı ve doğrulayıcı faktör analizleri, güvenirlik çalışmaları için ise değişmezlik katsayısı ve iç tutarlılık analizleri yapılmıştır. Bulgular: EMC19-9'un geçerlik güvenirlik çalışmasında; kapsam geçerlik indeksi 0,997, faktör analizinde toplam varyansı 55,069, Cronbach's alpha katsayısı 0,896, iki yarıya bölme analizinde Spearman Brown katsayısı 0,956, test tekrar test ölçümünde korelasyon değeri r=0,543 ($p<0,05$) olarak hesaplanmıştır. Tüm maddelerin madde-toplam test korelasyon değerleri 0,370–0,713 arasında değişkenlik göstermiştir. Sonuç: Bu çalışmada EMC19-9 Türkçe versiyonunun gebelerde geçerli ve güvenilir bir ölçek olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: *Gebelik, Geçerlik, Güvenirlik, Koronavirüs*

INTRODUCTION

The World Health Organization (WHO) has reported that the causative agent of Coronavirus Disease 2019 (COVID-19) is SARS-CoV-2 (1). Despite measures such as hygiene, masks, personal distance, travel restrictions, prohibition of social activities, quarantine, and vaccination to prevent the spread of COVID-19, it has become a global epidemic. The virus is released into the air during coughing and sneezing, can be transmitted by being in the same environment with patients or carriers for a long time without protection, and by touching surfaces infected with the virus. It has effects and symptoms related to other systems, especially the respiratory system. Symptoms of COVID-19 include high fever, cough, shortness of breath, sore throat, headache, muscle and joint pain, runny nose, weakness, myalgia, arthralgia, loss of smell and taste, nausea, diarrhea, and anosmia. COVID-19 laboratory findings have been reported as leukopenia, lymphopenia, thrombocytopenia, D-dimer elevation, lactate dehydrogenase elevation, C reactive protein elevation, alanine aminotransferase elevation, aspartate aminotransferase elevation, and creatine kinase elevation (2-6). Psychological effects of COVID-19 have been found, and these effects include fear, stress, anxiety, depression, panic, worry, risky attitudes, and behavioral problems. Physical and psychological effects of COVID-19 are observed in pregnant women. The effects of COVID-19 fear, depression, and anxiety levels on pregnant women due to the possibility of infection with both themselves and their babies have been determined (7,8). Pregnant women have changed their daily life activities, disrupted, postponed, or responded to pregnancy examinations and check-ups in other ways due to fear of COVID-19. Pregnant women and postpartum women have been reported to be anxious about COVID-19, and the reasons for anxiety include the family not being able to visit after birth, the baby contracting COVID-19, lack of support during birth, and changes in the birth plan (9). During the period of social isolation, a prevalence of mental disorders of 45.7% was reported among pregnant women in Brazil, and mental distress, especially anxiety, was shown to be significantly high. Therefore, in order to protect the mental health of women in the perinatal period, the effects of fear and the resulting fear on pregnant women should be examined. Support measures to protect pregnant women in the perinatal period and the development of better support and assurance tools by health professionals to cope with the impact of the pandemic were recommended (10,11). The aim of this study is to ensure the validity and reliability of the Turkish version of the COVID-19 Fear Scale for the Perinatal Period (EMC19-9), which was developed to determine the fear of COVID-19 in pregnant women.

MATERIAL and METHOD

The research is a methodological type validity and reliability study. In the language adaptation of EMC19-9, the scale was translated into the target language Turkish and back to the original language Portuguese in order to make the scale comprehensible and culturally appropriate. The Portuguese text was sent to the author of the original scale to confirm that it was appropriate. The recommended number of expert groups is generally at least 5 and at most 40 people (12). The Turkish text of the scale was submitted to expert opinion and 12 experts in the field gave their opinions. There were no changes in the scale items after expert opinions.

Ethical Principles

Approval was obtained for the study from the Scientific Research Platform of the Ministry of Health. Ethics committee approval was obtained from the Aydın Adnan Menderes University Faculty of Health Sciences Non-Interventional Clinical Research Ethics Committee (Number: E-15189967-050.04.04-97912, date: 27.10.2021). Hospital institutional permissions and permission were obtained from Monalisa Nascimento dos Barros, one of the authors who developed the scale. Verbal consent was obtained from the pregnant women for the collection of data.

Setting and Sampling

The population of the study consisted of pregnant women admitted to hospitals. In scale validity and reliability studies, the sample size is required to be 5-10 times the number of items (13). Since EMC19-9 consists of a total of 9 items, at least 90 pregnant women were planned to be sampled,

and 100 pregnant women were included in the study considering the possibility of loss. Convenience sampling method was used to determine the sample. Women who agreed to participate in the study, were 18 years of age or older, had at least primary school education, could read and write Turkish, and had a normal pregnancy were included in the study. Pregnant women who had any physical or mental disability to fill out the data collection forms and who had COVID-19 during data collection were not included in the study.

The adequacy of the sample size of the study for factor analysis was assessed using the Kaise-Meyer-Olkin (KMO) and Bartlett's sphericity test. In this study, the KMO coefficient was 0.823, which is in the range of 0.80-0.90 and indicates very good adequacy. In the Bartlett's sphericity test, p=0.00, which is less than 0.05, indicates that the data set is sufficient (12). In this study, it was determined that the adequacy of the sample size was very good and the data set was sufficient according to the calculated KMO coefficient. It was decided that the data set and sample size were suitable for factor analysis.

Data Collection Tools

The data were collected between April-May 2022. Pregnant women were invited to participate in the study, and those who agreed to participate were asked to fill out the forms by self-report method. Since the test-retest method is used to test the reliability of the scale, in this method, the scale should be reapplied to at least 50 people after two to four weeks (14). The 59 pregnant women who accepted the second interview were re-interviewed at least two weeks and at most four weeks after the first interview. The Turkish form of the scale was pre-tested with 10 pregnant women.

Fear of COVID-19 Scale (FCV-19S) was developed for the general population and the Cronbach's alpha coefficient of the scale is 0.82. The Turkish validity and reliability study of FCV-19S was conducted by the researchers. The scale consists of 7 items with a single dimension (16-21).

The EMC19-9 was developed in Brazil in Portuguese to determine the fear of COVID-19 specific to pregnant women. The first 7 items of FCV-19S and EMC19-9 are the same items. Differently, 2 items related to pregnancy and baby were added to the EMC19-9 and a total of 9 items were formed. The items of the unidimensional EMC19-9 are scored between 1 and 5, with a minimum score of 9 and a maximum score of 45. The higher the score obtained from the scale, the higher the fear of COVID-19 in pregnant women. EMC19-9 Cronbach's alpha coefficient was 0.890 and showed good internal consistency as well as construct validity (22). In this study, in which Turkish adaptation of EMC19-9 was performed, Cronbach's alpha coefficient was found to be 0.896.

Statistical Analysis

The Turkish draft form of the scale was submitted to expert opinion. Expert opinions were evaluated using the Lawshe technique for content validity rates and the Turkish version of the scale was created. FCV-19S was used for similar scale validity in the construct validity of the scale. Item-Total Score Analysis for content validity, Factor analyses for construct validity, Principal Component Analysis, Similar scale validity tests were performed. Test-retest, Cronbach's alpha analysis, two-half test/half-split, Spearman's correlation coefficient and scale response bias tests were conducted for reliability. Predictive Analytics Software-IBM SPSS Version 22.0 (PASW 22.0) and Amos 21 programmes were used for the validity and reliability of the study.

RESULTS

The mean age of the pregnant women who participated in the study was 28.03±5.01 and the mean of gestational week was 28.23±9.54. Sociodemographic and obstetric characteristics of the pregnant women are shown in table 1.

Table 1. Sociodemographic and Obstetric Characteristics of Pregnant Women

Characteristic		**Mean**	**SD**
Age (minimum 18, maximum 45)		28.03	5.01
Gestational week (minimum 5, maximum 40)		28.23	9.54
Number of pregnancies		2.06	1.09
Number of live births (n=55)		1.51	0.86
Number of living children (n=55)		1.49	0.84
Number of miscarriages (n=21)		1.14	0.36
Characteristic		**Number**	**%**
Marital status:	Married	100	100
	Single	-	-
Education level:	Primary school	1	1.00
	Secondary school	18	18.00
	High school	37	37.00
	University	39	39.00
	MA/PhD	5	5.00
Employment status:	Employed	30	30.0
	Unemployed	70	70.0
Family type:	Nuclear	91	91.0
	Extended	9	9.0
Residence:	Metropolitan	7	7.0
	Province	58	58.0
	District	24	24.0
	Town/village	11	11.0
Income status:	Low	27	27.0
	Medium	65	65.0
	High	8	8.0
Social security:	With	82	82.0
	Without	18	18.0
Husband's education level:	Literate	1	1.0
	Primary school	4	4.0
	Middle school	23	23.0
	High school	29	29.0
	University	36	36.0
	MA/PhD	7	7.0
Husband's employment status:	Employed	90	90.0
	Unemployed	10	10.0
Trimester:	First trimester	11	11.0
	Second trimester	20	20.0
	Third trimester	69	69.0
Status of wanting pregnancy:	Wanting	79	79.0
	Not wanting	21	21.0
Planning pregnancy:	Planning	66	66.0
	Not planning	34	34.0
Pre-pregnancy disease:	Yes	3	3.0
	Not having	97	97.0
Treatment for pregnancy:	Yes	4	4.0
	Not having	96	96.0
Disease during pregnancy:	Yes	11	11.0
	Not having	89	89.0
Feeling ready for pregnancy:	Yes	83	83.0
	Not having	3	3.0
	Partly having	14	14.0

%: Percentage, SD: Standard deviation

Participants characteristics related to COVID-19 are shown in table 2.

Table 2. COVID-19 Characteristics of Pregnant Women

Characteristic		Number	%
Receiving COVID-19 training:	Yes	57	57.0
	Not	43	43.0
Having COVID-19:	Yes	44	44.0
	Not	56	56.0
Pre-pregnancy vaccination:	Vaccination	80	80.0
	Non-vaccination	20	20.0
Requesting vaccination during pregnancy (n=58):	Required	10	17.2
	Non-requested	48	82.8
Death of a relative due to COVID-19:	Required	31	31.0
	Non-requested	69	69.0
Disruption during pregnancy:	Required	8	8.0
	Non-requested	92	92.0
Changing the method of birth:	Required	13	13.0
	Non-requested	87	87.0

Since the content validity rates calculated based on expert opinions do not contain negative or zero values and the calculated content validity index (CVI) is greater than the lowest content validity criterion of 0.56 for 12 experts at the significance level of $\propto$=0.05, all items of the Turkish form created were included in the scale (23). The scale consists of a total of 9 items and has no sub-dimensions. Experts were asked to respond to each item as '1: appropriate', '0: not appropriate'. According to expert opinions, only one expert gave the opinion of "not appropriate" to item 5 (I get nervous and anxious when I see news and stories about Covid-19 in the media). The consistency between expert opinions was evaluated with Kendal's goodness of fit coefficient. According to the analysis, it was determined that the expert opinions were similar (Kendall's W=0.111, chi-square=11.000, p=0.443). According to the content validity rates, since the scale is one-dimensional, the CVI was calculated as 0.997.

KMO and Bartlett's tests were applied for the conformity of EMC19-9 to the construct validity. In the study, the KMO coefficient was 0.823 and Bartlett's sphericity test found chi-square=577.327; p=0.00 (p<0.05).

Exploratory Factor Analysis (EFA) showed that the 9-item structure in the scatter plot showed an ideal distribution under one factor and was evaluated as one-dimensional in the factor analysis of the scale. In the factor analysis, the total variance of the scale was found to be 55.069 and it was determined that it measured 55.069% of the area intended to be measured. According to the Confirmatory Factor Analysis (CFA), it was determined that the structural equation model result of the scale was significant at the p=0.000 level and that it was related to the 9 items forming the scale and the single-factor scale structure. It was necessary to create covariance between the errors of the same factor in the model. Visual and unstandardized factor loadings of the model pattern are given (Figure 1). Since the fit indices were not at the expected level in the confirmatory factor analysis of the scale, modifications were made. Five modifications were made (e8-e9; e6-e7; e1-e2; e3-e4; e3-e6). As a result of the modifications, it was calculated that x^2=57.892, df=22, p=0.000 and x^2/df=2.631, IFI=0.938 showed perfect fit; GFI=0.883, CFI=0.936, TLI=0.896, NFI=0.904 and RMSEA=0.128. The factor loadings of the measurement tool regarding CFA are given unstandardized. It was observed that all factor loadings were between 0.82-1.46 (Figure 1).

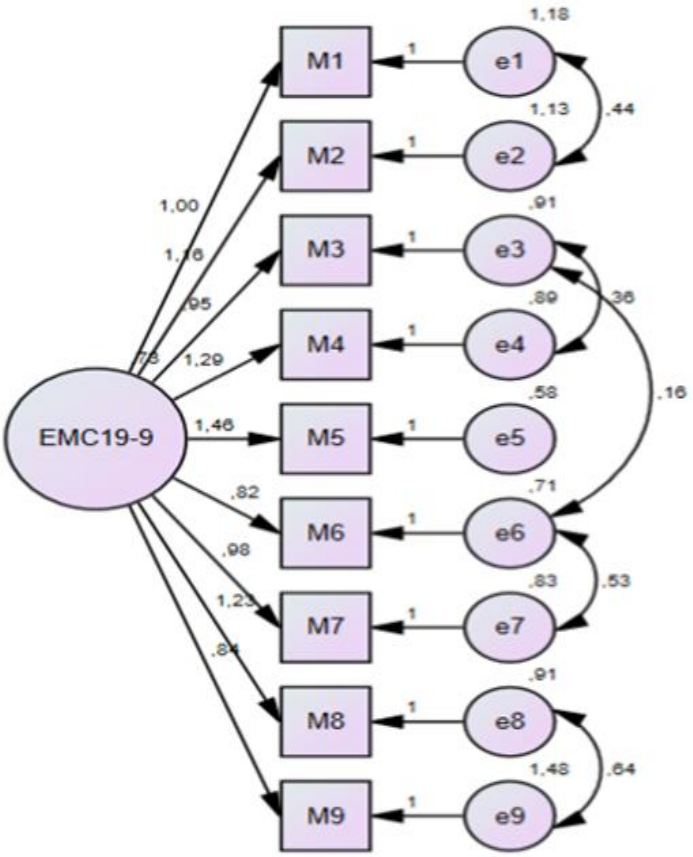

Figure 1. Confirmatory Factor Analysis

When the correlation values between the items in the measurement tool were examined, it was determined that all correlation values were statistically significant ($p<0.05$). A positive relationship was found between the items (Table 3).

Tablo 3. Relationship Between Items and Total Score in the Scale

Item		1	2	3	4	5	6	7	8	9
Item 1	r	1								
	p									
Item 2	r	0.642*	1							
	p	0.000								
Item 3	r	0.294*	0.356*	1						
	p	0.003	0.000							
Item 4	r	0.492*	0.449*	0.702*	1					
	p	0.000	0.000	0.000						
Item 5	r	0.524*	0.612*	0.529*	0.678*	1				
	p	0.000	0.000	0.000	0.000					
Item 6	r	0.319*	0.388*	0.674*	0.480*	0.478*	1			
	p	0.001	0.000	0.000	0.000	0.000				
Item 7	r	0.311*	0.485*	0.651*	0.476*	0.572*	0.850*	1		
	p	0.002	0.000	0.000	0.000	0.000	0.000			
Item 8	r	0.561*	0.534*	0.419*	0.563*	0.610*	0.482*	0.503*	1	
	p	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Item 9	r	0.394*	0.355*	0.215	0.403*	0.472*	0.209	0.237	0.696*	1
	p	0.000	0.000	0.032	0.000	0.000	0.037	0.018	0.000	
Total	r	0.693*	0.734*	0.713	0.792*	0.831*	0.710*	0.745*	0.612*	0.612*
	p	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*p<0,01

According to the data obtained from the inter-item reliability coefficients of the Turkish form of EMC19-9; it was determined that the correlation coefficient of item nine with item three was negative and its relationship with items three, six and seven was very close to zero (less than 0.20) and all other items were positive and significant with other items (Table 4).

Table 4. Inter-Item Reliability Coefficient of the Scale

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9
Item 1	1								
Item 2	0.715	1							
Item 3	0.299	0.268	1						
Item 4	0.566	0.390	0.622	1					
Item 5	0.559	0.518	0.365	0.708	1				
Item 6	0.322	0.289	0.651	0.391	0.382	1			
Item 7	0.294	0.373	0.683	0.486	0.454	0.868	1		
Item 8	0.594	0.631	0.364	0.550	0.669	0.520	0.539	1	
Item 9	0.367	0.378	-0.008	0.293	0.396	0.135	0.186	0.550	1

The item-total test correlation values of all items in the measurement tool vary between 0.370-0.713. It was determined that all items were related to each other. It was observed that there was no change in Cronbach's alpha value when an item was removed from the scale (Table 5).

Table 5. The Item Total Score Correlation

Items	Item Total Correlation	Item Deleted Cronbach's Alpha
Item 1	0.713	0.913
Item 2	0.590	0.916
Item 3	0.370	0.921
Item 4	0.612	0.916
Item 5	0.695	0.913
Item 6	0.505	0.918
Item 7	0.522	0.918
Item 8	0.635	0.915
Item 9	0.419	0.921

According to the analysis result regarding whether the difference between EMC19-9 and FCV-19S scores is statistically significant, the difference between the scores of the two measurement tools was found to be statistically significant and it was determined that FCV-19S scores were lower than EMC19-9 scores (t=24.80; p=0.00). The EMC19-9 mean score was determined as 22.53±9.09, and the FCV-19S mean score was determined as 15.69±7.24. In addition, it was determined that there was a statistically significant positive and high-level relationship between EMC19-9 and FCV-19S scores (r=0.973: p=0.00). The difference between EMC19-9 and FCV-19S scores was statistically significant and the internal consistency of EMC19-9 was evaluated using the split-half method in testing the reliability of EMC19-9. The odd-numbered and even-numbered items of the scale items were separated and divided into two halves. The mean score of the items in the first half was found to be 12.54±4.97 and the mean score of the items in the second half was found to be 9.99±4.31. In the split half test analysis as the correlation coefficient between the two halves of EMC19-9 (r=0.916), the Spearman Brown coefficient was obtained as 0.956 and the Guttman split half coefficient as 0.951 for EMC19-9 items.

The difference between the total score test and retest was found to be statistically insignificant (t=-0.078; p=0.938). In addition, a statistically significant, positive and moderate relationship was found between the total score test and retest (r=0.543; p=0.000). It is seen that the value found is below 70%, but; When the difference between the two means in the dependent groups was examined, it was found that there was no difference between the two measurements (p=0.938, p>0.05). For all items, the relationships between the first and second measurements were not found to be significant. The relationships between the first and second measurements of the third and seventh items were statistically insignificant (p>0.05). However, the relationships between the first and second measurements for the first, second, fourth, fifth, sixth, eighth and ninth items were found to be significant (p<0.05). In addition, the difference between the first and second measurements was examined with the dependent sample t-test and it was found that all scores did not show a statistically significant difference between the two measurements (p>0.05).

The ANOVA with Tukey's test for nonadditivity variance in the scale was found to be F=2.195, p=0.139, p>0.05. The additivity test results of the 9 items of the scale were not found to be significant as desired (p>0.05). The response bias of the scale was analyzed with Hotelling's T^2 analysis method. Hotelling's T^2 value was calculated in terms of response bias, and accordingly, Hotelling's T^2 value was calculated as 178.895, p=0.000 (p<0.05).

DISCUSSION

After confirming the suitability of the data for factor analysis, EFA was performed to examine the factor structure of the scale. No rotation was made in the measurement tool. Since the original Portuguese scale has one dimension, the analyses were conducted assuming that the scale was one-dimensional. It was observed that the single-factor structure in the scale was statistically and semantically sufficient. In the factor analysis scatter plot of EMC19-9, it was determined that each dimension added after a factor would be insufficient, and it was determined that the nine-item structure showed an ideal distribution under one factor. For this reason, it was decided to treat the scale as a single factor. In factor analysis, it is shown that the total variance of the scale is between 40% and 60% (12). In this study, the total variance of the Turkish form of EMC19-9 is 55.069, and it was determined that it measured 55.069% of the area to be measured and that it has a good variance.

The test of whether the theoretical structure of the scale is sufficient to explain the subject to be measured is evaluated with CFA (24). According to the CFA analysis, it was seen that the structural equation model result of the scale was related to the nine items that make up the scale and the single-factor scale structure. As a result of the modifications made, it was seen that the x^2/df value of EMC19-9 was below 3; the CFI, IFI and NFI values were above 0.90; and the GFI and TLI values were close to 0.90, and it provided acceptable limit values, and the fit indices were accepted at the expected level. It was determined that the RMSEA values were above the desired criteria in the model fit. Since the RMSEA value was greater than 0.08, a low level of fit was determined between the items (25). In the original scale, the authors of EMC19-9 stated that they obtained the values of x^2/g.l=2.480, RMSEA=0.076, CFI=0.964, TLI=0.941, GFI=0.947 by making modifications (22). It is thought that the application of the scale to pregnant women from different cultures in Brazil and Türkiye, the fact that the data collection phases of both studies coincided with different processes of the COVID-19 pandemic, and especially the fact that the pandemic bans in our country were relaxed and people believed that the pandemic was over, affected the CFA analyses.

According to the inter-item correlation results, the relationship between item nine and item three was found to be negative. However, it was found to be meaningless because the relevant relationship coefficient was very close to zero. In addition, the relationships between an item and other items are expected to be positive as well as significant. When the results were evaluated, it was determined that the relationship between item nine and items three, six and seven was very close to zero (less than 0.20). It is thought that these items are close to zero due to the fact that restrictions and prohibitions were lifted during the data collection process, people relaxed other measures, and vaccination has started and most people have been vaccinated (15).

For reliability in a scale, the Cronbach's alpha value should be above 0.70. In the reliability analysis, the Cronbach's alpha coefficient value, which varies between 0-1; is stated that the scale is not reliable if it is between 0.00-0.40; is low reliable if it is between 0.40-0.60; is quite reliable if it is between 0.60-0.80; and is highly reliable if it is between 0.80-1.00 (26). In this study, the Cronbach's alpha coefficient of 0.896 showed that the Turkish EMC19-9 showed a high level of reliability, that the items were related to the subject to be measured and that they measured the trait adequately. The Cronbach's alpha coefficient of the original scale EMC19-9 was stated as 0.890 (22). The Cronbach's alpha coefficient of both studies was found to be almost the same.

When the correlation between the items of EMC19-9 was examined, a positive, statistically significant relationship was found between all the items of the scale. As the scores obtained from each item of the scale increase, the scores obtained from other items increase. To verify both the validity and reliability of a scale, item total correlation values are examined. In the analysis, the relationship of the scale items with the scale is determined and the correlation coefficient of each item is calculated. It is reported that if the item total correlation coefficient of the scale is between 0.30-0.40, it is “good” and if it is above 0.40, it is “very good” reliable (27). It is stated that item total score correlation values should not be less than 0.30, those between 0.20-0.30 can be left in cases of necessity, and those found to be lower than 0.20 should be removed from the scale (28). In this study, when the total correlation of EMC19-9 is examined as a whole, it is seen that the total correlation is above 0.30, the item total correlation value of all items of the scale varies between 0.370-0.713 and all items are statistically significantly related to each other. The authors of EMC19-9 stated that the item total score correlation values in the original scale were greater than 0.40, and the item total correlations of all items in the scale ranged between 0.525 and 0.738. They showed that when any of the items were removed from the scale, the Cronbach's alpha coefficient of the scale decreased (22). In this study, no items were removed because the removal of the items did not cause a change in the Cronbach's alpha coefficient. Since the first seven items of EMC19-9 included COVID-19 fear scale items, the relationship between EMC19-9 and COVID-19 fear scale scores was tested with the equivalent form method. According to the test result, the difference between the mean scores of the two measurement tools was found to be statistically significant. This finding may reveal the ability of EMC19-9 to distinguish COVID-19 fear during pregnancy, unlike FCV-19S. In addition, a statistically significant, positive and high-level relationship was found between EMC19-9 and FCV-19S scores. As the fear of COVID-19 measured by FCV-19S increases, the fear of COVID-19 during pregnancy measured by EMC19-9 may increase.

In the split-half method, the reliability coefficient should be above 0.70 (12). According to the results of the split-half test analysis in this study, the correlation coefficient between the two halves of EMC19-9 was found to be 0.956, and a very strong relationship was found above 0.70. Since the items of EMC19-9 were single-numbered in the split-half test analysis, the Spearman Brown Coefficient value was found to be 0.956. The findings proved that EMC19-9 has a high level of reliability (29). Test-retest determines the invariance of the scale over time. According to the test-retest measurements of EMC19-9, it was determined that there was a statistically significant relationship between the total scores of the scale, and therefore the scale was consistent over time. A relationship was found between the first and second measurements of all items of the scale, except for the third and seventh items. However, it was observed that the scores obtained from each item of the scale were similar between the first and second measurements. In other words, similar results can be achieved when EMC19-9 is applied at different times.

In this study, ANOVA with Tukey’s test for nonadditivity variance for the evaluation of the scores obtained from EMC19-9 shows that the items have an additivity property. In other words, the lowest and highest scores can be obtained from the scale by adding the score values of the responses given to the scale. As the score obtained from the scale increases, the fear of COVID-19 in the perinatal period will increase. The response bias of the Turkish form of EMC19-9 was tested with the Hotelling T^2 analysis method. In the response bias of the scale, the homogeneity of the responses given for each item was evaluated. In other words, it determines whether the question means are equal to each other. Hotelling’s T^2 test measures whether the questions on the scale are perceived by the participants with the same approach and the difficulty level of each question (24). In this study, it was determined that individuals answered the items according to their own opinions while answering the items of the scale and that there was no response bias in the scales.

CONCLUSION

The use of the EMC19-9 Turkish form in pregnant women was found to be valid and reliable, and it is recommended to be used to determine COVID-19 fear in pregnant women. Healthcare professionals can plan their care and follow-up by determining the levels of COVID-19 fear in pregnant women and the changes in their lives, especially during periods when COVID-19 infection increases. We also recommend that studies be conducted on the usability of EMC19-9 in the postpartum period.

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Declaration of Ethical Code: Statement of Ethical Rules: We undertake that all the rules to be followed within the scope of the 'Directive on Scientific Research and Publication Ethics of Higher Education Institutions' were complied with in this study, and that none of the actions specified under the title of 'Actions Contrary to Scientific Research and Publication Ethics' were performed. Before starting the research, it was explained to all participants that the purpose of the research and the confidentiality of the data obtained will be protected and the information will be used only for scientific purposes. Verbal consent was obtained from all participants participating in the study. Approval was obtained from the ethics committee of University (Number: E-15189967-050.04.04-97912, date: 27.10.2021) and the institutions where the research will be conducted.

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