

Validity and Reliability of the Turkish Version of the COVID Stress Scale

Demirgöz Bal, Meltem¹ · Dişsiz, Melike² · Bayri Bingöl, Fadime¹

¹Midwifery Department, Marmara University, Health Sciences Faculty, Istanbul

²Department of Obstetrics and Gynecology Nursing, Health Sciences University, Hamidiye Faculty of Nursing, Istanbul, Turkey

Purpose: The aim of this study was to assess the Turkish adaptation of the COVID Stress Scale (CSS) on the basis of determining the stress caused by the coronavirus disease (COVID-19) pandemic, and to test its validity and reliability. **Methods:** The English CSS was translated into Turkish using forward and backward translation. Data were collected online from 360 participants. Construct validity was evaluated using confirmatory factor analysis, exploratory factor analysis, and content validity. Pearson product-moment correlation, Cronbach's alpha reliability coefficient, and test-retest methods were used to evaluate reliability. **Results:** The Turkish version of the CSS has 36 items consistent with the original scale and has five factors: COVID danger and contamination, socioeconomic consequences of COVID, COVID xenophobia, traumatic stress due to COVID, and compulsive checking for COVID. The construct validity of the Turkish version of the CSS was verified by the adjusted goodness of fit index $> .85$, and comparative fit index $> .95$. The content validity index of each item was 91%. The corrected item-total correlations of the scale ranged from .51 to .89. Internal consistency was reliable, with a Cronbach's α of .93. **Conclusion:** The Turkish version of the CSS is valid and reliable. It can be used as a measurement tool for the assessment of COVID-related stress.

Key words: Reliability and Validity; Factor Analysis; COVID-19; COVID-19 Stress Syndrome

INTRODUCTION

Pandemics that caused great and miscellaneous damage to the whole world have been encountered throughout history [1]. The last pandemic that humanity has faced is the coronavirus disease (COVID-19) pandemic. This virus, which first appeared in China (Wuhan region), spread rapidly worldwide. The situation was declared a pandemic by the World Health Organization (WHO) on March 11, 2020. Our country, Turkey, was ranked sixth in the world among countries with the most confirmed cases. There have been 6 million confirmed cases of COVID-19 with 60 thousand deaths, reported to WHO according to current data in Turkey. The number of people who have received two doses of

vaccine in Turkey is only around 20 million (25% of the total population) [2].

COVID-19 is a disease with high morbidity and mortality rates [3-5]. At the same time, during the pandemic, people can experience many negative emotions, such as the risk of infection, getting sick, fear of death, feeling of helplessness, and stigma. On the other hand, lockdowns on social life, such as the closure of schools and the restrictions on transportation, have caused constant and high levels of stress [4-6].

In our country, there were many factors affecting stress levels in this situation. Inconsistent quarantine rules applied during the COVID-19 pandemic period, such as no restrictions during weekdays, lockdown during weekends, restrictions on older persons, and no restrictions on middle-aged

Address reprint requests to : Dişsiz, Melike

Department of Obstetrics and Gynecology Nursing, Health Sciences University, Hamidiye Faculty of Nursing, Selimiye Mah., Tıbbiye Cad. No:38, Istanbul 34668, Turkey

Tel: +90-216-346-36-36 Fax: +90-216-418-96-20 E-mail: melekd78@gmail.com

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persons. Most of these inconsistencies were due to social and economic problems. The public did not have sufficient financial resources during this quarantine period. Therefore, there were hundreds of suicides [7]. Inconsistent statements were made by politicians about the use of masks, the ways of reducing the spread of the virus, and the application of the vaccine. Due to the speculations in social media, extreme anxiety prevailed among the public. People began to experience communication problems, increased anger, irritability, depression, and anxiety. The lack of opportunities to engage in social activities outside the home, families were forced to spend more time indoors at home, which led to more tension and irritability. For all these reasons, stress and anxiety have increased in our population [7,8].

It is known that stress and anxiety play an important role in shaping the behavioral responses of people [9]. People with too little anxiety about a viral outbreak are less likely to be hygienic, less likely to adhere to physical distance, and are less likely to get themselves vaccinated. On the other hand, people with excessive stress and anxiety can interpret mild infections as serious infections, and they may go to hospitals and clinics unnecessarily and also exhibit socially destructive behaviors [10]. Given the role of anxiety and stress in shaping our behavior, it is critical for healthcare professionals to comprehend this situation. However, it has been reported worldwide that COVID-19 anxiety and stress assessment scales are mostly one-dimensional and have limited psychometric properties [11-13]. In our country, only a short form of the Coronavirus Anxiety Scale Turkish version is available to evaluate this anxiety level. The scale is quite short, consisting of only five items [14]. A more detailed tool is needed to measure the COVID-related stress. It is predicted that this need can be met by the scale developed by Taylor et al. [11]. In this context, the aim of this study is to adapt the COVID Stress Scale (CSS), which is a comprehensive and multidimensional measurement tool, for Turkish society.

METHODS

1. Study design

This is a methodological study.

2. Setting and samples

The study population comprised students from a state university and their families. Improbable random sampling method was used to select the sample for the study. The sample consisted of 360 participants who were aged between 18 and 55 years, were able to understand and communicate in Turkish, had access to the online data form, had no physical disability for participating in the study, and agreed to participate. Since it is recommended to determine the sample size to include 5-10 people for each scale item in scale studies, the number of participants selected was 360, which was 10 times the number of scale items (36 items) [15,16]. The study group was formed for re-testing ($n = 24$) and those participating in the pilot study ($n = 20$) were not included in this number.

3. Measurements/instruments

The data were collected online through the CSS developed by Taylor et al. [11] and adapted for Turkish language, as well as through the descriptive information form. In the Turkish version of the validity and reliability study of the CSS, the guidelines accepted as the standard in our country for validity and reliability studies in the field of nursing were used [15,16].

1) Descriptive information form

This form, covering individual characteristics of the participants (age, education status, income level, chronic illness, etc.) are composed of a total of 13 questions.

2) COVID Stress Scale

This is a self-report scale with 36 items developed by Taylor et al. [11] to evaluate the stress experienced during the COVID-19 period. Before taking up the Turkish adaptation of the scale, permission was obtained from Taylor et al. [11], who developed the scale. The scale was prepared as a

five-point Likert scale to determine the severity of symptoms. The scale is composed of five subscales as in the original form: COVID danger and contamination (1, 2, 3, 4, 5, 6, 19, 20, 21, 22, 23, and 24), socioeconomic consequences of COVID (7, 8, 9, 10, 11, and 12), COVID xenophobia (13, 14, 15, 16, 17, and 18), traumatic stress due to COVID (25, 26, 27, 28, 29, and 30), and compulsive checking for COVID (31, 32, 33, 34, 35, and 36). Although there are no reverse-coded items in the scale, each item is answered by considering how the individual defines the item according to his/her experience during the COVID-19 pandemic. Participants determined how they felt and how often they experienced the feelings during the last seven days, and gave 0 points if the answer was Never, 1 point if it was Very rarely, 2 points if it was Sometimes, 3 points if it was Most of the time, and 4 points if the answer was Always. Higher mean scores indicated an increased stress level associated with the COVID-19 pandemic [11].

4. Data collection/procedure

The study was conducted from December 2020 to January 2021, on participants meeting the study criteria, using an online data collection method. The form, which took an average of 10~15 minutes to answer, was sent to the participants online (google doc. forms). All participants (n = 360) completed the form in full. The data were collected online through via google doc.

Application for permission to conduct the research was made to the Ministry of Health and permission was obtained (2020-11-12T13_31_40). Permission was also obtained from the Ethics Committee of the Faculty of Health Sciences at Marmara University (26.11.2020/69). In addition, online consent of the participants meeting the inclusion criteria was obtained by informing them about the purpose and method of the study, and it was stated that they could withdraw from the study at any time.

1) Providing language equivalence

To evaluate the content validity of the scale, the original English version of the CSS was translated into Turkish by a psychiatric nursing lecturer, a gynecological nursing lecturer,

and an English lecturer [11]. The researchers reviewed the translated scale and prepared a joint Turkish text. The suitability and comprehensibility of the prepared text were evaluated by a Turkish teacher. In the next stage, the scale was translated back into English by two faculty members whose mother tongue is Turkish, who have been living in the USA for 10 years, and hold a PhD. Both faculty members did not see the original version of the scale before the translation. The scale, which was translated back into English, was translated back into Turkish by a faculty member (lecturer in psychiatric nursing and gynecological nursing). The semantic change of the original scale was evaluated, and the scale was put into the final form.

2) Content validity analysis

After completing the language validity of the scale, the Turkish version of the scale was sent to 13 experts to determine the content validity, and their opinions were obtained. To evaluate the degree of measurement of each item, they were asked to score the items between 1 and 5 (1 = totally inappropriate, 2 = inappropriate, 3 = appropriate, 4 = quite appropriate, 5 = totally appropriate). Opinion differences among experts were analyzed using Lawshe's technique, and the data obtained from the experts were evaluated using the Content validity index (CVI). The CVI of the items was determined to be 91%. As a result of the evaluations made by the experts, the scale was evaluated by applying a pilot study to 20 people who were not included in the main study, and the necessary corrections were made.

5. Data analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21.0 and SPSS Analysis of Moment Structures (AMOS) 26.0 program (IBM Corp., Armonk, NY, USA). In the reliability analysis of the scale, Pearson's correlation coefficient was calculated using the test-retest method in the evaluation of time invariance. The Pearson product-moment correlation coefficient for the item-total correlation coefficient and Cronbach's alpha reliability coefficient for the internal consistency coefficient were calculated for the internal consistency evaluation. Lawshe's

technique was used in the evaluation of expert opinions for the content validity of the scale, and exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to evaluate construct validity.

6. Ethical consideration

Application for permission to conduct the research was made to the Ministry of Health and permission was obtained (2020-11-12T13_31_40). Permission was also obtained from the Ethics Committee of the Faculty of Health Sciences at Marmara University (26.11.2020/69). In addition, online consent of the participants meeting the inclusion criteria was obtained by informing them about the purpose and method of the study, and it was stated that they could withdraw from the study at any time.

RESULTS

It was determined that the mean age of the participants was 28.4 ± 6.93 (min: 18, max: 55) and their duration of education was 15.4 ± 2.33 (5-22) years. Moreover, a great majority of the participants (86.4%) were single and unemployed (75.8%), and more than half of them (62.5%) had an income equal to their expenses. More than half of the participants (67.4%) were living in a city center, 10.6% had at least one child, 16.9% were smokers, 8.5% had chronic diseases such as asthma, hypertension, and heart disease, and 7.2% received support from a psychologist or psychiatrist during the COVID-19 pandemic.

1. Reliability analysis

1) Item analysis

The item-total score correlations of the Turkish version of the CSS are given in Table 1. When the item-total score correlations of 36 items were examined for the reliability study of the Turkish version of the CSS, it was determined that the reliability coefficient varied between .51 and .89 and the correlation between item scores and total scale scores was positive and statistically significant ($p < .001$) (Table 1).

When the item-subscale total score correlations of each subscale of the Turkish version of the CSS were examined,

Table 1. COVID Stress Scale Subscales Item-Subscale Total Score Correlations ($N = 360$)

Scale subscales and items	Item-subscale total score correlation coefficients		Item-total score correlation coefficients		Cronbach's α
	r	p	r	p	
COVID danger and contamination					.91
Item 1	.72	< .001	.66	< .001	
Item 2	.62	< .001	.55	< .001	
Item 3	.63	< .001	.56	< .001	
Item 4	.66	< .001	.58	< .001	
Item 5	.67	< .001	.59	< .001	
Item 6	.65	< .001	.57	< .001	
Item 19	.73	< .001	.67	< .001	
Item 20	.75	< .001	.70	< .001	
Item 21	.80	< .001	.76	< .001	
Item 22	.79	< .001	.74	< .001	
Item 23	.78	< .001	.73	< .001	
Item 24	.76	< .001	.70	< .001	
Socioeconomic consequences of COVID					.93
Item 7	.81	< .001	.73	< .001	
Item 8	.87	< .001	.81	< .001	
Item 9	.90	< .001	.86	< .001	
Item 10	.90	< .001	.86	< .001	
Item 11	.82	< .001	.74	< .001	
Item 12	.83	< .001	.75	< .001	
COVID xenophobia					.92
Item 13	.73	< .001	.62	< .001	
Item 14	.82	< .001	.74	< .001	
Item 15	.93	< .001	.89	< .001	
Item 16	.93	< .001	.89	< .001	
Item 17	.88	< .001	.83	< .001	
Item 18	.81	< .001	.73	< .001	
Traumatic stress due to COVID					.90
Item 25	.67	< .001	.51	< .001	
Item 26	.86	< .001	.78	< .001	
Item 27	.86	< .001	.81	< .001	
Item 28	.87	< .001	.80	< .001	
Item 29	.82	< .001	.73	< .001	
Item 30	.80	< .001	.71	< .001	
Compulsive checking for COVID					.86
Item 31	.77	< .001	.67	< .001	
Item 32	.79	< .001	.69	< .001	
Item 33	.76	< .001	.65	< .001	
Item 34	.75	< .001	.63	< .001	
Item 35	.80	< .001	.70	< .001	
Item 36	.76	< .001	.64	< .001	

r = Pearson correlation test.

it was determined that the reliability coefficient of the 12 items in the COVID danger and contamination subscale ranged between $r = .62$ and $.80$, the reliability coefficient of six items in the socioeconomic consequences of COVID subscale ranged between $r = .81$ and $.90$, the reliability coefficient of six items in the COVID xenophobia subscale ranged between $r = .73$ and $.93$; the reliability coefficient of six items in the traumatic stress due to COVID subscale ranged between $r = .67$ and $.87$, and the reliability coefficient of six items in the compulsive checking for COVID subscale ranged between $r = .76$ and $.80$, and the correlation coefficients of all items were positive and statistically significant ($p < .001$) (Table 1).

2) Reliability coefficient of internal consistency

In the analysis made for internal consistency in the reliability study of the Turkish version of the CSS, the Cronbach's alpha reliability coefficients were determined as $\alpha = .91$ for the COVID danger and contamination subscale, $\alpha = .93$ for the socioeconomic consequences of COVID subscale, $\alpha = .92$ for the COVID xenophobia subscale; $\alpha = .90$ for the traumatic stress due to COVID subscale, $\alpha = .86$ for the compulsive checking for COVID subscale (Table 1), and $\alpha = .93$ for the whole scale.

3) Test and retest

In testing the time-invariance of the Turkish version of the CSS, which was adapted to Turkish, test-retest measurements conducted with 24 participants with a two-week interval were evaluated with Pearson product-moment correlation and t-test. When the correlation between the scores

obtained from the first and second applications of the Turkish version of the CSS and its subscales was examined with Pearson correlation analysis, the reliability coefficient between the scores of two measurements made for the scale and five subscales varied between $.04$ and $.97$, and no correlation was found between the subscales except for the total scores of the scale (Table 2). When the test-retest mean scores of the participants were compared with the independent groups t-test, no statistically significant difference was found between the mean scores ($p > .05$) (Table 2).

2. Validity analysis

The language validity and content validity of the scale were determined and are stated in the data collection and procedure section.

1) Exploratory factor analysis

First, an EFA was performed to determine the construct validity of the Turkish version of the CSS. In this study, the factor analysis was performed by obtaining data as 10 times the number of items ($n = 360$) for the construct validity of the Turkish version of the CSS with 36 items. In addition, the Kaiser-Meyer-Olkin (KMO) test was conducted to determine the suitability of the data for factor analysis, and Bartlett's test was applied to determine the significance and zero difference between the variables to be analyzed. The KMO coefficient was found to be $.83$, the chi-square value for Bartlett's test ($\chi^2 = 2749.62$; $df = 66$; $p < .001$) was highly significant ($p < .001$), and the data were suitable and sufficient for the factor analysis. The maximum likelihood method and oblique (oblimin) rotation method were used in the factor

Table 2. Comparison of Test and Re-Test Mean Scores of COVID Stress Scale and Sub-Dimensions, and Correlations (N = 30)

Scale subscales	First evaluation M ± SD	Second evaluation M ± SD	t	p	r	p
COVID stress scale (total)	72.79 ± 29.88	71.08 ± 34.22	.90	> .376*	.97	< .001
1. COVID danger and contamination	35.45 ± 9.13	31.79 ± 10.62	1.45	> .161*	.22	> .300*
2. Socioeconomic consequences of COVID	7.95 ± 7.50	6.62 ± 7.67	.63	> .530*	.04	> .685*
3. COVID xenophobia	13.37 ± 6.47	11.75 ± 8.57	.84	> .406*	.24	> .252*
4. Traumatic stress due to COVID	11.04 ± 8.07	8.62 ± 7.69	1.13	> .268*	.12	> .553*
5. Compulsive checking for COVID	14.45 ± 5.45	12.29 ± 6.89	1.46	> .156*	.33	> .115*

M = Mean; r = Pearson correlation test; SD = standard deviation; t = Paired samples t-test.
* $p > .05$.

Table 3. Exploratory Factor Analysis: Factor Loadings

(N = 360)

Item	D + C	SE	X	TS	CH
1. I am worried about catching the virus	.69				
2. I am worried that I can't keep my family safe from the virus	.65				
3. I am worried that our healthcare system won't be able to protect my loved ones	.58				
4. I am worried that our healthcare system is unable to keep me safe from the virus	.60				
5. I am worried that basic hygiene (e.g., handwashing) is not enough to keep me safe from the virus	.46				
6. I am worried that social distancing is not enough to keep me safe from the virus	.41				
19. I am worried that if I touched something in a public space (e.g., handrail, door handle), I would catch the virus	.72				
20. I am worried that if someone coughed or sneezed near me, I would catch the virus	.73				
21. I am worried that people around me will infect me with the virus	.77				
22. I am worried about taking change in cash transactions	.81				
23. I am worried that I might catch the virus from handling money or using a debit machine	.81				
24. I am worried that my mail has been contaminated by mail handlers	.74				
7. I am worried about grocery stores running out of food		.80			
8. I am worried that grocery stores will close down		.88			
9. I am worried about grocery stores running out of cleaning or disinfectant supplies		.94			
10. I am worried about grocery stores running out of cold or flu remedies		.93			
11. I am worried about grocery stores running out of water		.79			
12. I am worried about pharmacies running out of prescription medicines		.74			
13. I am worried that foreigners are spreading the virus in my country			.62		
14. If I went to a restaurant that specialized in foreign foods, I'd be worried about catching the virus			.75		
15. I am worried about coming into contact with foreigners because they might have the virus			.88		
16. If I met a person from a foreign country, I'd be worried that they might have the virus			.87		
17. If I was in an elevator with a group of foreigners, I'd be worried that they're infected with the virus			.79		
18. I am worried that foreigners are spreading the virus because they're not as clean as we are			.75		
25. I had trouble concentrating because I kept thinking about the virus				-.81	
26. Disturbing mental images about the virus popped into my mind against my will				-.79	
27. I had trouble sleeping because I worried about the virus				-.84	
28. I thought about the virus when I didn't mean to				-.78	
29. Reminders of the virus caused me to have physical reactions, such as sweating or a pounding heart				-.82	
30. I had bad dreams about the virus				-.88	
31. Searched the Internet for treatments for COVID-19					.68
32. Asking health professionals (e.g., doctors or pharmacists) for advice about COVID-19					.80
33. YouTube videos about COVID-19					.78
34. Checking your own body for signs of infection (e.g., taking your temperature)					.77
35. Seeking reassurance from friends or family about COVID-19					.76
36. Social media posts concerning COVID-19					.77
Variance explained by the factors (%)	Eigenvalue				
1. COVID danger and contamination (31.72)	11.41				
2. Socioeconomic consequences of COVID (11.95)	4.30				
3. COVID xenophobia (8.26)	2.97				
4. Traumatic stress due to COVID (7.66)	2.76				
5. Compulsive checking for COVID (6.21)	2.23				
Total variance explained (65.82)					

Bold characters = Salient (> .30) loading; CH = Compulsive checking; D + C = Danger and contamination, SE = Socioeconomic consequences; TS= Traumatic stress; X = Xenophobia.

analysis. It was found that the eigenvalue of the scale with a total of 36 items in the Turkish version of CSS and its sub-scales was above 1.00, with five factors accounting for 65% of the total variance (Table 3).

The items remained in the original and recommended form of the scale, and the factors were named as follows.

(1) COVID danger and contamination

This factor group consists of 12 items, including items 1, 2, 3, 4, 5, 6 (danger) and 19, 20, 21, 22, 23, and 24 (contamination).

(2) Socioeconomic consequences of COVID

This factor group consists of a total of six items including items 7, 8,9,10,11, and 12.

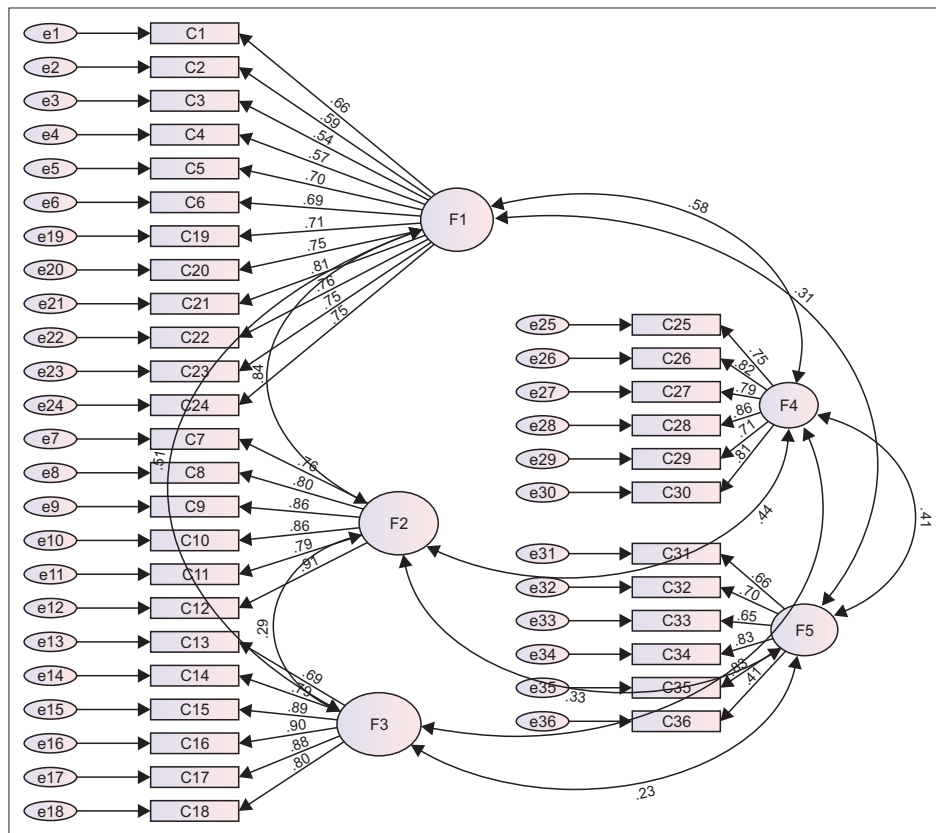
(3) COVID xenophobia

This factor group consists of six items, including items 13, 14, 15, 16, 17, and 18.

Table 4. Recommended Standard Goodness of Fit Criteria

Fit measure	Good fit	Acceptable fit
χ^2/df	$0 \leq \chi^2 \leq 2df$	$2df < \chi^2 \leq 5df$ ($n > 250$)
RMSEA	$0 \leq RMSEA \leq .05$	$.05 < RMSEA \leq .08$
p -value for test of close fit (RMSEA < .05)	$.10 < p \leq 1.00$	$.05 \leq p \leq .10$
SRMR	$0 \leq SRMR \leq .05$	$.05 < SRMR \leq .10$
CFI	$.97 \leq CFI \leq .99$	$.95 \leq CFI < .97$
NNFI	$.97 \leq NNFI \leq .99$	$.95 \leq NNFI < .97$
GFI	$.95 \leq GFI \leq .99$	$.90 \leq GFI < .95$
AGFI	$.90 \leq AGFI \leq .99$	$.85 \leq AGFI < .90$

χ^2 = Chi Square; AGFI = Adjusted goodness-of-fit-index; CFI = Comparative fit index; df = Degree of freedom; GFI = Goodness-of-fit index; NNFI = Nonnormed fit index; RMSEA = Root mean square error of approximation; SRMR = Standardized root mean square residual.



C = Item no; e = Residual covariance matrix; F1 = COVID Danger and contamination; F2 = Socioeconomic consequences of COVID; F3 = COVID xenophobia; F4 = Traumatic stress due to COVID; F5 = Compulsive checking for COVID.

Figure 1. COVID stress scale five-factor confirmatory factor analysis diagram.

(4) Traumatic stress due to COVID

This factor group consists of six items, including items 25, 26, 27, 28, 29, and 30.

(5) Compulsive checking for COVID

This factor group consists of six items, including items 31, 32, 33, 34, and 36 (Table 3).

2) Confirmatory factor analysis

The recommended CFA standard goodness of fit index measures [17] are shown in Table 4. As a result of the five-factor CFA, the fit indices were found to be Chi-square = 546.29 ($p < .001$), degree of freedom = 156 ($\chi^2 = 546.29$; $df = 156$, $\chi^2/df = 3.50$), root mean square error of approximation (RMSEA) = .08 ($p < .05$) standardized root-mean-square residual (SRMR) = .04, comparative fit index (CFI) = .92, non-normed fit index (NNFI) = .95, goodness of fit index (GFI) = .95, and adjusted goodness of fit index (AGFI) = .94. The factor loads obtained as a result of the CFA of all items were determined to be between .50 and .91. Figure 1 shows a CFA diagram.

DISCUSSION

In this study, a validity and reliability study of the CSS was conducted, and the Turkish version of the CSS was found to have good psychometric properties. There are a limited number of studies on the stress caused by COVID-19 in Turkey.

In the reliability analysis of the Turkish version of the CSS, test-retest, internal consistency, and item analysis were performed. Test-retest reliability is the power of a measurement tool to provide consistent results from application to application and to show time invariance. The test-retest correlation analysis results of the Turkish version of the CSS showed that there was no statistically significant correlation between the subscales, but there was a strong correlation for the overall scale [15,16]. Retest reliability is recommended if the measured property has a structure that shows continuity [18]. The fact that there was no statistically significant difference between the subscales in this study showed that it

was not affected by time. Another supporting result for the reliability of the scale was that the internal consistency coefficient was statistically significant. To evaluate the internal consistency of the scale, Cronbach's alpha technique, which is suitable for Likert-type scales, was used. It is assumed that the higher the alpha coefficient of the scale, the more consistent the items in the scale, and it is composed of items predicting the components of the same property. The alpha coefficient, which lies between 0 and 1 with the average of the total variances of the items with the overall variance, determines whether the questions in the scale form a whole to explain a homogeneous structure [17,19]. In the analysis of internal consistency in the reliability study of the Turkish version of the CSS, the Cronbach's alpha reliability coefficient was determined to be at the desired level in five subscales and was highly similar to the internal consistency coefficients of the original scale [11]. The internal consistency coefficients of the subscales of the original scale, which were found to be highly reliable, were found to be between .86-.93 in this study. In addition, they were between .85 and .94, and .86 and .95 in the Canadian and the United States of America samples, respectively [11].

If the items in a scale have equal weights and are in the form of independent units, the correlation coefficient between each item and the total values is expected to be high. The higher the correlation coefficient, the higher the correlation of that item with the property to be measured [17,19]. Although there is no specific standard regarding when the reliability will be deemed insufficient for the criterion below which the item total score correlation coefficient falls, the correlations are recommended not to be negative and to be above .25 and .30 [20]. It should be noted that the higher the correlation coefficient, the better the reliability of the items [17,19]. It was observed in the item analysis performed for the item reliability of the Turkish version of CSS that the correlation of the subscale score of all items in the scale with the scale total score was above the value of .30, as stated in the literature. This result means that all items measured the same attitude [20].

However, a high level of agreement among experts is an important result of the content validity of the scale [21]. In

conclusion, it can be asserted that the scale has an understandable language structure and content.

As a result of the EFA conducted to determine the construct validity of the Turkish adaptation of the scale, the items having factor loads of $< .40$, and the items that were involved in more than one factor simultaneously and had the difference between loads in two factors below 0.20 , were eliminated and a scale consisting of 36 items as in the original scale was obtained. As a result of the analysis performed in accordance with the literature, a structure with an eigenvalue greater than 1 and a total variance of over 50% was obtained [22,23]. In EFA, the adequacy of the sample is determined based on the KMO value [20]. KMO value between $.90$ and $.99$ is considered as perfect, between $.80$ and $.89$ as very good, between $.70$ and $.79$ as good, between $.60$ and $.69$ as moderate, between $.50$ and $.59$ as weak, and below $.50$ as unacceptable [17]. In this study, the KMO and Bartlett test results are consistent with the EFA results reported in the literature.

In the literature, the use of EFA and CFA analyses in the same sample remains controversial. It is suggested that if the sample size is adequate (> 300), both EFA and CFA analyses can be performed on the same population [24]. Consistent with the literature [14,25], analyses were performed on the same sample used in this study. Using CFA, the representation level of the items in the determined subscale and their adequacy in explaining the structure were tested [15,16]. For this purpose, the commonly used goodness of fit tests, chi-square fit statistics, RMSEA, SRMR, CFI, NNFI, GFI, and AGFI were used [15,16]. The goodness of fit statistics should be at the desired level in the CFA [15,16]. On the other hand, the fit indices of the 5-item short form of the Coronavirus Anxiety Scale, which was studied in Turkey, are RMSEA = $.09$, GFI = $.98$, AGFI = $.94$, CFI = $.98$, and NNFI = $.97$, which were determined to be within acceptable values. This was in agreement with the results of a previous study [14]. The results of the study indicated that all goodness of fit values of the scale adapted χ^2/df , SRMR, RMSEA, GFI, AGFI, NNFI, and CFI were above the acceptable limit values. From a holistic framework, the results obtained showed that the adapted model is acceptable.

It is very important to detect symptoms and intervene early before any psychopathology develops in individuals. The Turkish version of the CSS is a valid and reliable measurement tool for assessing the COVID-19 stress scale. It can be a valuable tool for assessing the stress caused by the pandemic (Appendix 1).

However, the Turkish version of the CSS is not aimed at establishing a diagnosis of stress disorder. It should not be ignored that the scale has the function of referring to psychotherapist/psychiatrist experts only in accordance with the obtained scores. Since all data collected for the stress levels caused by COVID-19 are based on personal statements, the error margin should be taken into account. In addition, the data were not collected face-to-face. Individuals with psychopathologies were not identified. There could be a possibility of bias in the answers, and of reliability problems. Furthermore, older individuals with lower socioeconomic levels could not be reached during the online data collection process.

CONCLUSION

The results of the study showed that the Turkish version of the CSS had sufficient validity and reliability. The internal consistency and validity values were compatible with the values obtained in the original study. Therefore, it can be asserted that the scale has sufficient psychometric properties to evaluate the stress associated with the COVID-19 pandemic. In line with these results, the use of the Turkish version of CSS in determining the stress level for the COVID-19 pandemic can be recommended by considering that it is easy, understandable, and can be filled quickly.

Researchers should focus on the effect of COVID-19 on the vulnerable population living in rural areas and on the lower socioeconomic strata, who face barriers in accessing health care. There is a need to develop mental health interventions that health professionals can use effectively.

CONFLICTS OF INTEREST

The authors declared no conflict of interest.

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DATA SHARING STATEMENT

Please contact the corresponding author for data availability.

AUTHOR CONTRIBUTIONS

Conceptualization or/and Methodology: Demirgöz Bal M & Dişsiz M & Bayri Bingöl F.

Data curation or/and Analysis: Dişsiz M.

Funding acquisition: None.

Investigation: Demirgöz Bal M & Dişsiz M.

Project administration or/and Supervision: Demirgöz Bal M & Dişsiz M.

Resources or/and Software: Dişsiz M.

Validation: Demirgöz Bal M & Dişsiz M.

Visualization: Demirgöz Bal M & Dişsiz M & Bayri Bingöl F.

Writing original draft or/and Review & Editing: Demirgöz Bal M & Dişsiz M.

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Appendix 1. COVID Stress Scale

	Hiçbir Zaman	Çok Nadir	Bazen	Çoğu Zaman	Her Zaman
1. Virüsün bulaşmasından endişelenirim.	0	1	2	3	4
2. Ailemi virüsten koruyamayacağımdan endişe duyarım.	0	1	2	3	4
3. Sağlık sistemimiz sevdiğimizi koruyamayacak diye endişelenirim.	0	1	2	3	4
4. Sağlık sistemimizin beni virüsten koruyamayacak diye endişelenirim.	0	1	2	3	4
5. Temel temizlik uygulamaları (örneğin, el yıkama) beni virüsten yeterince koruyamayacak diye endişelenirim.	0	1	2	3	4
6. Sosyal mesafe beni virüsten yeterince korumaz diye endişelenirim.	0	1	2	3	4
7. Marketlerdeki yiyecekler tükenir diye endişelenirim.	0	1	2	3	4
8. Marketler kapanacak diye endişelenirim.	0	1	2	3	4
9. Marketlerde temizlik veya dezenfektan malzemelerin tükenmesinden endişelenirim.	0	1	2	3	4
10. Marketlerde/Eczanelerde soğuk algınlığı veya gribe iyi gelen bitkisel ürünler tükenir diye endişelenirim.	0	1	2	3	4
11. Marketlerde suyun tükenmesinden endişelenirim.	0	1	2	3	4
12. Eczanelerde reçete ile satılan ilaçların tükenmesinden endişelenirim.	0	1	2	3	4
13. Yabancı uyruklu bireylerin virüsü ülkemizde yaymasından endişelenirim.	0	1	2	3	4
14. Yabancı yemeklerin sunulduğu bir restorana gidersem, virüsün bulaşmasından endişelenirim.	0	1	2	3	4
15. Yabancı uyruklularla temas etmekten çekinirim çünkü virüsü taşıyabileceğinden endişelenirim.	0	1	2	3	4
16. Eğer yabancı uyruklu biriyle tanışsam, virüsü taşıyabileceğinden endişelenirim.	0	1	2	3	4
17. Eğer bir grup yabancı uyrukluyla asansörde bulunursam, virüsün bulaşabileceğinden endişelenirim.	0	1	2	3	4
18. Yabancı uyruklu bireyler temiz olmadıklarından, virüsü yaymalarından endişelenirim.	0	1	2	3	4
19. Ortak alanlarda bir şeye dokunduğumda (örneğin; kapı kolu) virüs bulaşır diye endişelenirim.	0	1	2	3	4
20. Yakınımda biri öksürüp- hapşırdığında, virüs bulaştırır diye endişelenirim.	0	1	2	3	4
21. Etrafımda bulunan insanlar bana virüsü bulaştırır diye endişelenirim.	0	1	2	3	4
22. Nakit para işlemlerinden virüs bulaşır diye endişelenirim.	0	1	2	3	4
23. Paraya dokunduğumda ya da bankamatik kullandığımda virüsü bulaşır diye endişelenirim.	0	1	2	3	4
24. Kargoma/Postama, kuryeler/postacı tarafından virüs bulaştırılmasından endişelenirim.	0	1	2	3	4
25. Virüsün bulaştığını düşündüğümde, işime odaklanmakta zorlanırım.	0	1	2	3	4
26. Virüsle ilgili rahatsız edici görüntüler, iradem dışında aklıma gelir.	0	1	2	3	4
27. Virüs hakkında endişelendiğimde uyumakta zorlanırım.	0	1	2	3	4
28. İstemediğim halde virüs hakkında düşünürüm.	0	1	2	3	4
29. Virüsü hatırlatan şeyler terleme veya kalp çarpıntısı gibi fiziksel tepkiler yaşamama neden olur.	0	1	2	3	4
30. Virus ile ilgili kabuslar görürüm.	0	1	2	3	4
Aşağıdaki maddeler davranış kontrolü hakkında sorular sormaktadır. Son yedi gün içinde, COVID-19 ile ilgili kaygılarınız nedeniyle aşağıdakileri ne kadar yaptınız?					
31. İnternette COVID-19 tedavileri hakkında arama yapmak.	0	1	2	3	4
32. Sağlık profesyonellerine (örneğin, doktorlar veya eczacılar) COVID-19 hakkındaki tavsiyelerini sormak.	0	1	2	3	4
33. COVID-19 ile ilgili videoları (YouTube vb.) videolarını izlemek.	0	1	2	3	4
34. Vücudu enfeksiyon belirtileri açısından kontrol etmek (örneğin; ateş ölçmek).	0	1	2	3	4
35. COVID-19 konusunda arkadaşlardan veya aileden görüş almak.	0	1	2	3	4
36. COVID-19 ile ilgili sosyal medya paylaşımlarını kontrol etmek.	0	1	2	3	4

Listed above are various concerns you may have experienced in the past seven days.

In the phrases above, we refer to COVID-19 as the "virus".