

Development of the Outbreak Change Curve Scale: Validity and Reliability

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ABSTRACT

COVID-19, which affected the world, caused many people to get sick and die. The sudden emergence of the disease, the uncertainties regarding its treatment, and the high mortality rate affected individuals in a psycho-social manner. This study was conducted to develop a valid and reliable measurement tool which measures the shock, rejection, disappointment, depression, trial, decision-making, and participation levels experienced by individuals in the COVID-19 epidemic. This research is designed to be methodological. The data collection tool was distributed to individuals over digital networks using Google Forms between 04.20.2020 - 05.20.2020, and 1137 people were reached online. The data of the research was analyzed with the AMOS and SPSS programs. In order to carry out the study, the necessary permissions were obtained from the ethics committee of the relevant university and from the participants. As a result of the factor analysis performed for the validity and reliability of the scale, it was seen that the values were within the acceptable range. The Kaiser-Meyer-Olkin value, which shows the scale's suitability for factor analysis, was 0.761, and Barlett's test result was $p < 0.001$. The Outbreak Curve Scale explained 42,133% of the total variance. The CVI value indicating the content validity of the scale is 0.87, and the Cronbach's α value is 0.714. The 3-Likert type Outbreak Change Curve Scale, which consists of 26 items and 7 sub-dimensions, has robust psychometric qualities. The usage of the Outbreak Change Curve Scale is recommended in terms of measuring individuals' psychosocial responses towards the COVID-19 pandemic.

Keywords: Coronavirus, Nursing, Reliability, Validity.

Salgın Değişim Eğrisi Ölçeğinin Geliştirilmesi: Geçerlilik ve Güvenilirlik

ÖZ

Dünyayı etkisi altına alan COVID-19, birçok kişinin hastalanmasına ve ölümüne neden olmuştur. Hastalığın ani olarak ortaya çıkması, tedavisinin belirsizlikler içermesi, ölüm oranının yüksek olması bireyleri psikososyal yönden çok fazla etkilemiştir. Bu çalışma, bireylerin COVID-19 salgınında yaşadıkları şok, reddedilme, hayal kırıklığı, depresyon, deneme, karar verme ve katılım düzeylerini ölçen geçerli ve güvenilir bir ölçüm aracı geliştirmek amacıyla yapılmıştır. Bu araştırma metodolojik olarak tasarlanmıştır. Veri toplama aracı, 04.20.2020 - 05.20.2020 tarihleri arasında Google Formlar kullanılarak dijital ağlar üzerinden bireylere iletilmiş ve online olarak 1137 kişiye ulaşılmıştır. Araştırmanın verileri AMOS ve SPSS programları ile analiz edilmiştir. Çalışmanın yapılabilmesi için ilgili üniversitenin etik kurulundan ve katılımcılardan gerekli izinler alınmıştır. Ölçeğin geçerlik ve güvenilirliği için yapılan faktör analizi sonucunda değerlerin kabul edilebilir aralıkta olduğu görülmüştür. Ölçeğin faktör analizine uygunluğunu gösteren Kaiser-Meyer-Olkin değeri 0.761 ve Barlett's test sonucu $p < 0.001$ olarak bulunmuştur. Salgın Değişim Eğrisi Ölçeği toplam varyansın %42,133'ünü açıklamıştır. Ölçeğin kapsam geçerliliğini gösteren CVI değeri 0.87, Cronbach's α değeri 0.714'tür. 26 madde ve 7 alt boyuttan oluşan 3'lü Likert tipi Salgın Değişim Eğrisi Ölçeği sağlam psikometrik özelliklere sahiptir. Salgın Değişim Eğrisi Ölçeği'nin bireylerin COVID-19 pandemisine karşı psikososyal tepkilerini ölçmek için kullanılması önerilir.

Anahtar kelimeler: Geçerlilik, Güvenilirlik, Hemşirelik, Koronavirüs.

INTRODUCTION

The serious negative economic, social, and physiological effects of the COVID-19 outbreak has been seen in many countries. The COVID-19 pandemic is preventing individuals from performing their daily routines. As a result, it causes anxiety and phobic reactions (Duan and Zhu 2020; Huang et al. 2020). The associated negative effects pave the way for shock, denial of the process, and disappointment; depression has become quite common among people (Duan and Zhu 2020; Qiu and et al. 2020; Arpacı et al. 2020). In a study conducted during the first COVID-19 outbreak in China, 53.8% of the participants rated the psychological impact of the epidemic as moderate or severe, while 8.1% reported moderate to severe stress levels, 16.5% stated to experience moderate to severe symptoms of depression, and 28.8% of them reported moderate to severe symptoms of anxiety (Ho et al. 2020; López-Bueno et al. 2020; DeJong et al. 2020). Anecdotal experiences often indicate that people are afraid of being infected with COVID-19. Therefore, people are struggling with phobic responses to the COVID-19 outbreak. As the pandemic spreads rapidly, COVID-19 is expected to cause advanced psycho-pathological problems due to its easy transmission potential, lack of treatment, and to increased virus-related death rates (Duan and Zhu 2020; Arpacı et al. 2020).

The Kübler Ross Change Model Curve is a method often used to understand the stages of people's responses towards a dramatic change in their lives. The process of rejection, frustration, trial, depression, and the associated stages has been used as the Curve of Change since the 1980s. The individual can go through the stages in a random order, and each stage may take a different time, be stuck at a certain stage, not be able to continue from there, and sometimes even return to the first stage after a certain time (Uşşaklı, 2010).

The Kübler-Ross Change Curve has been translated to the COVID-19 process by Ekmekçi (2020). Ekmekçi evaluated this process in 7 stages; including shock, refusal, frustration, depression, trial, decision making and participation (Ekmekçi 2020). Ekmekçi (2020) has translated only the items of this model into Turkish.

Identifying the early signs of psychosocial pathologies is important in terms of providing timely psychological support to individuals (Duan and Zhu 2020; Qiu and et al. 2020). It is essential for people to easily determine their psychosocial status and take the necessary precautions so that they can try to start their lives again, decide on adopting new lifestyles, and be included in normal daily activities. An accurate diagnostic tool is required to prevent, intervene and eliminate these negative processes in their early periods which are experienced by individuals. With the idea that the Kübler Ross Change Model Curve is a model that can be used to evaluate the COVID-19 process, there was a need for adapting the present measurement tool in order to determine the level of reactions and processes experienced by people in the process of the outbreak. For this reason, the present study was conducted to construct a valid and reliable scale which assesses the levels of shock, refuse, frustration, depression, trial, decision making, and participation of individuals against the COVID-19 pandemic. Outbreak CCS aims to contribute to the literature by its usage in future studies on the coronavirus.

MATERIALS AND METHODS

Research Type

This study is designed as a methodological research.

The Population and Sample of The Research

In order to participate in the research, individuals from Turkey, who can accept and use digital networks as a volunteer over the age of 18 were chosen while citizens, who meet none of these criteria were excluded from the study. It was planned to include at least 10 times (32 ×10) individuals in the study in order to be in accord with the available literature (Çapık, 2014). The data collection tool was delivered to 1157 individuals who met the inclusion criteria through Google forms and digital networks between 04.2020-05.2020. 20 individuals were excluded from the study because they made flagging errors. The results of 1137 individuals were evaluated.

Inclusion criteria;

- Being a citizen of the Republic of Turkey,
- Being able to read and write in Turkish,
- Being over the age of 18,

- Having and/or using a social media account (i.e. whatsapp, Twitter, Instagram),
- Voluntarily agreeing to participate in the study.

Exclusion criteria;

- Having received a diagnosis/treatment of any mental disorder or being included in a support/therapy group,
- Having a first degree relative who performs the nursing profession,
- Performing the nursing profession,
- Failing to fill the questionnaire form in a proper manner.

Data Collection

An introductory information form, which determines the socio-demographic characteristics of individuals, and the Kübler Ross Change Model Curve which was adapted to COVID-19 by Ekmekçi (2020) were used. Ekmekçi (2020) has translated only the items of this model into the Turkish language. He did not realize the Turkish validity and reliability of the model. We have done the necessary adaptation studies in order to use this model as a measurement tool during the COVID-19 process.

Data Collection Tools

- **Introductory information form:** It is a form consisting of 9 questions that determine the socio-demographic characteristics of individuals.
- **The Outbreak Change Curve Scale (CCS):** It is a tool to determine the psychosocial reactions and processes of individuals with regards to the pandemic; which has 32 items and seven sub-dimensions.

These items and the sub-dimensions are; Shock with 4 items, Refusal with 4 items, Frustration with 5 items, depression with 5 items, Trial with 4 items, Decision Making with 5 items, and Participation with 5 items (Ekmekçi 2020).

In this study, the calculation of the items in the scale was determined as "Yes = 3", "Neutral/Uncertain = 2", "No = 1" and there is no reverse item. The increase in the scores obtained from the sub-dimensions shows the intensity of psychosocial reactions in the relevant dimension.

Evaluation of the Data

The data obtained from the research was analyzed using SPSS

26.0 and AMOS 24.0 programs. As descriptive statistics, mean \pm standard deviation (SD) and median (minimum-maximum) were calculated for quantitative variables, and the number (percent) was calculated for qualitative variables. While examining the psychometric properties of the "Outbreak CCS", confirmatory factor analysis was used in the construct validity study. In the confirmatory factor analysis based on the data obtained from the measurement tool developed in line with a previously determined theoretical structure, it is tried to test whether the aforesaid structure is confirmed. Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed to evaluate construct validity. In the explanatory factor analysis, the KMO Test and the Bartlett Sphericity Test for Sampling Sufficiency Measurement were used to determine whether the data set was suitable for factor analysis. Internal consistency coefficients and Hotelling's T2 were calculated for the reliability of the scale. Item analysis was conducted with corrected item-total score correlation. CVI (Content Validity Index) grading criterion developed by Waltz and Bausel (1981) was used in the content validity of the scale. In order to test the internal consistency of the scale, Cronbach's Alpha coefficient, item-total score correlation, eigenvalues of the factors in determining the sub-dimensions, common factor variance and variance ratios were calculated.

In order to determine the suitability of the fit of the model tested in confirmatory factor analysis, The Comparative Fit Index(CFI), The Goodness of Fit Index(GFI), Root Mean Square Errors of Approximate (RMSEA), Root Mean Square Errors (RMR), The Relative Chi-Square Index(CMIN/DF), The Adjusted Goodness of Fit Index (AGFI) was used. The p significance level was taken as less than 0.05 for the analyses.

Ethical Considerations

For the research to be applied online, necessary permissions were obtained from the Scientific Research Board (2020-05-15T23_08_34) and the University Ethics Committee (2020/141).

RESULTS

Findings Regarding the Validity and Reliability of the Outbreak CCS Scale

Validity

Content validity index (CVI): According to the evaluation made by the professionals, it was determined that the CVI values of the substances varied between 1.00-0.80, and the CVI value for all substances was found to have a high validity of 0.87 (Table 1).

Table 1. Factor values of outbreak CCS

Tests	Results	p
KMO	0.750	
Barlett's	$\chi^2:5066.657$	0.000
Hotelling's T ²	28397.180	0.000
CVI	0.87	

Construct validity: Factor analysis was carried on by two different methods.

Exploratory factor analysis: The KMO value of the 32-item draft scale was 0.750 and the Barlett test result was $\chi^2=5066,657$,

$p=0.000$, and it was determined that the data set was suitable for factor analysis (Table 1).

Leading components sought to determine the structure of the data for the presence of ten components with an eigenvalue greater than 1.0 and the ability to clarify 52,220% of the total variance.

Among these, the eigenvalues of seven factors were found to be greater than 1.153, and together they explained 42.133% of the total variance. According to the slope in the scree graph, Outbreak CCS 26 is organized by the seven components of Turkey (Figure 1).

Confirmatory factor analysis: As a result of the confirmatory factor analysis applied to the epidemic CCS, items 1, 5, 9, 10, 16, and 19, which are predictive values that give factor loads below 0.3, were removed (D'Souza et al. 2015). Confirmatory factor analysis was applied to the remaining items. As a result of the process, a scale consisting of 26 items was obtained. The item numbers, $X \pm SD$, and Prediction values of the items in the scale are shown in Table 2.

As a result of the study, CFI value is 0.90, GFI value is 0.95, RMSEA value is 0.037, SRMR value is 0.019, CMIN / DF value is 2.55, and AGFI value is 0.94, and the values are found to be in the acceptable range (Table 3).

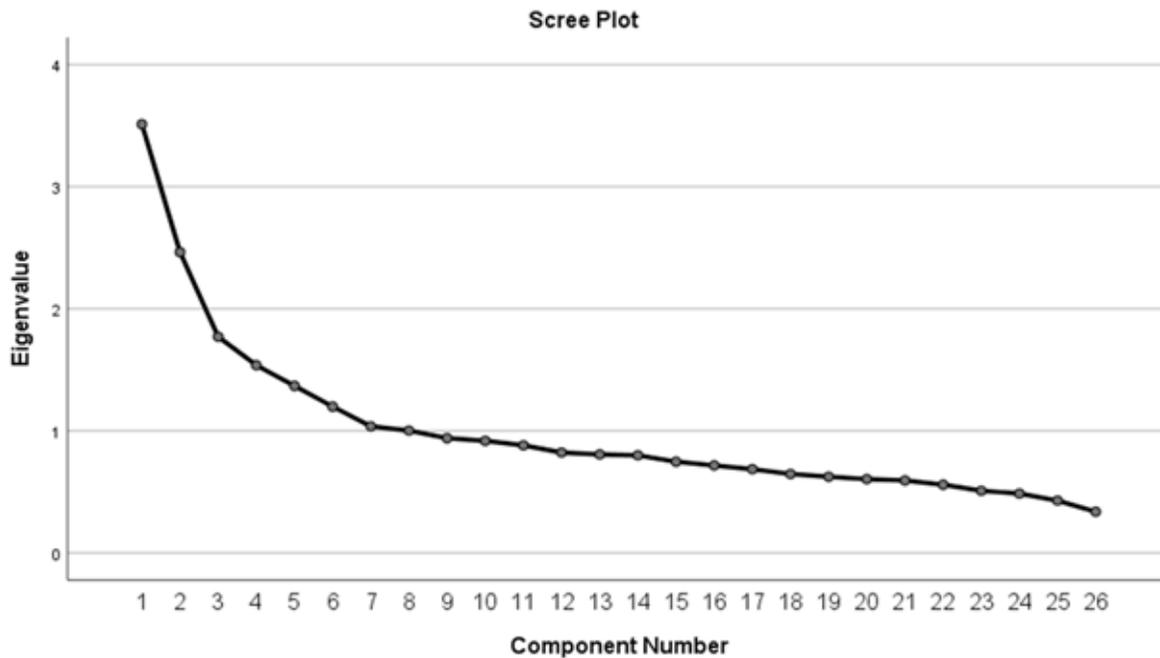


Figure 1. Scree plot graph.

The path diagram for CFA analysis is shown in Figure2.

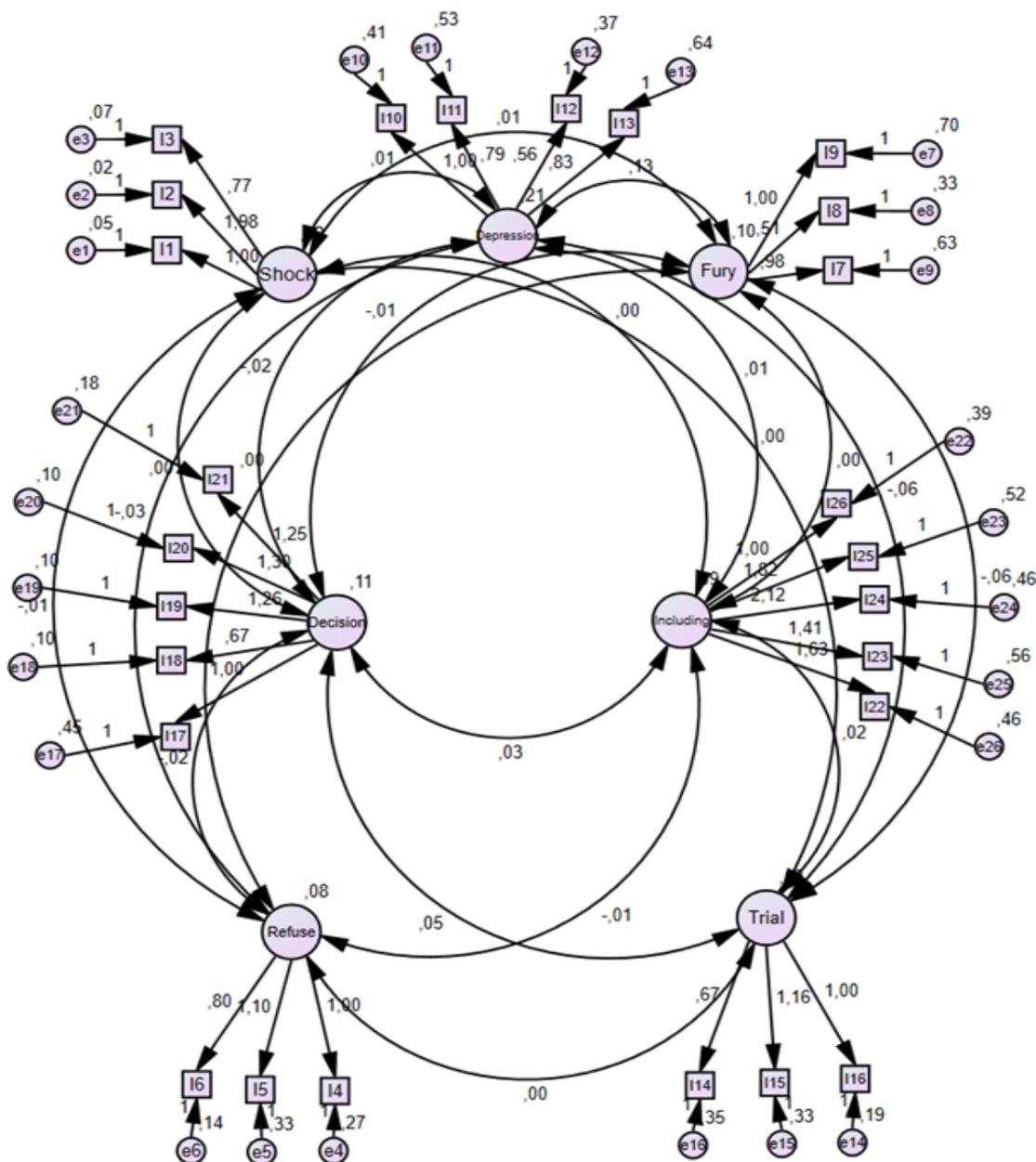


Figure 2. Path analysis of the outbreak change curve scale.

Reliability

The Cronbach's α reliability coefficient of the last 26-item model of the scale is 0.714 (Table 4). The Cronbach's Alpha, and Item-Total Item values of the items in the scale are presented in Table 2.

According to the analysis findings, it can be said that the item-total score correlation values of the scale vary between 0.352 and 0.798 and are sufficient.

Table 2 shows the predictions of the items and item-total

score correlations, Cronbach's α , and significance levels. The correlation levels of all items and factors with the item-total score is very difficult ($p = 0.0001$).

Findings of Individuals on the Outbreak CCS Scale

Considering the epidemic CCS score averages; 8.8 ± 0.6 from the shock; 3.8 ± 1.1 from the refusal; 6.3 ± 1.5 from frustration; 8.6 ± 2.0 from depression; 7.9 ± 1.2 from trial; 13.8 ± 2.0 from decision making; and 11.3 ± 2.8 points were obtained from participation (Table 4).

Table 2. The first and last item numbers and estimate values of the 26 items remaining at the change process scale after confirmatory factor analysis

First Item Number	Last Item Number	Items	Estimate	Cronbach Alpha	Inter-Item Correlation Matrix	X±SD
Shock Level (4 Items)						
I.1	Excluded	A corona outbreak that started in China and spread to the world has emerged.	0.069	0.715	0.388	2.9±0.2
I.2	I.1	The outbreak continues to spread rapidly.	0.482	0.714	0.645	2.9±0.2
I.3	I.2	It continues to affect millions of people.	0.848	0.713	0.761	2.9±0.2
I.4	I.3	It continues to kill thousands.	0.336	0.712	0.630	2.9±0.2
Refusal Level (4 Items)						
I.5	Excluded	There were similar situations before, but it did not affect my life.	0.097	0.708	0.644	2.2±0.9
I.6	I.4	It will be cured until he comes to me.	0.477	0.714	0.601	1.4±0.5
I.7	I.5	This exaggeration of the disease in the world is the game of strong structures.	0.477	0.715	0.588	1.2±0.6
I.8	I.6	I will get through this process without being affected by the disease.	0.520	0.715	0.495	1.1±0.4
Frustration Level (5 Items)						
I.9	Excluded	All this is the result of the global plans of the secret forces/foreign powers.	0.223	0.713	0.503	1.8±0.8
I.10	Excluded	Such a virus would not have spread to the world without the Chinese.	0.280	0.712	0.518	1.7±0.8
I.11	I.7	Official authorities are hiding the data and do not take adequate precautions.	0.367	0.711	0.557	1.8±0.8
I.12	I.8	Insensitive people will infect me.	0.300	0.709	0.352	2.7±0.5
I.13	I.9	Why does everything find me/lifetime.	0.356	0.706	0.622	1.7±0.8
Depression Level (5 Items)						
I.14	I.10	I'll probably be sick too.	0.585	0.711	0.636	1.9±0.7
I.15	I.11	I may lose someone from my family / close circle.	0.450	0.712	0.605	2.2±0.8
I.16	Excluded	I am about to lose or I have already lost my job/income/career because of the pandemic.	0.224	0.713	0.487	1.4±0.7
I.17	I.12	It will take a long time for the effects of the crisis to disappear.	0.389	0.708	0.516	2.6±0.6
I.18	I.13	My world / life will never be the same again.	0.429	0.705	0.636	1.8±0.8
Trial Level (4 Items)						
I.19	Excluded	Will the epidemic affect us less if adequate measures are taken in the country?	0.182	0.710	0.506	2.7±0.6
I.20	I.14	Can I protect myself and my family if I take adequate measures in my life?	0.337	0.712	0.633	2.6±0.6
I.21	I.15	If I suspect the disease, can it be diagnosed accurately/quickly?	0.537	0.713	0.641	2.5±0.6
I.22	I.16	If I get ill, can I recover and get good treatment?	0.591	0.713	0.632	2.7±0.5
Decision Level (5 Items)						
I.23	I.17	I know how to be protected from the next outbreak.	0.439	0.707	0.677	2.5±0.7
I.24	I.18	I know how to change my hygiene habits.	0.563	0.710	0.609	2.9±0.3
I.25	I.19	I know how to change my working model / habits.	0.786	0.707	0.790	2.8±0.5
I.26	I.20	I know how to change my life order.	0.797	0.707	0.798	2.8±0.5
I.27	I.21	I know what new competencies I should acquire.	0.693	0.706	0.767	2.7±0.5

Table 3. Distribution of scores from outbreak CCS sub-dimensions

Model Fit Indices	Results	Acceptable Level of Compliance	Good Level of Compliance
Comparative Fit Index (CFI)	0.90	CFI \geq 0.90*	CFI \geq 0.95**
Goodness of Fit Index (GFI)	0.95	GFI \geq 0.90*	GFI \geq 0.95*
Root Mean Square Error of Approximation (RMSEA)	0.037	RMSEA \leq 0.08*	RMSEA \leq 0.05**
Root Mean Square Residual (RMR)	0.019	RMR $<$ 0.08*	RMR $<$ 0.05*
Relative Chi Square Index (CMIN/DF)	2.55	CMIN/DF $<$ 5***	CMIN/DF \leq 2.5***
Adjusted Goodness of Fit Index (AGFI)	0.94	AGFI \geq 0.90*	AGFI \geq 0.95*

* Çapık 2014. **Ozen & Durkan 2016. ***Yaşlıoğlu 2017.

The mean age of the individuals participating in the study was 30.8 ± 10.3 , 72.5% of them were women, 54.6% were undergraduates, 50.7% were single, 56.8% had no children, 2% of them were pregnant, 29.7% were students, 53.4% were unemployed at that time and 67.6% have never smoked (Table 5).

A statistically negative relationship was found between the age of the participants and the anger sub-dimension, and a positive and weak relationship between depression (Table 5).

The level of refusal of the individuals who were unemployed; the frustration of those who were single, childless, and students; depression of self-employed individuals and workers; trial of males, college and doctoral educated and unemployed

individuals; the decision of doctoral educated, working, and academics; again, it was determined that academicians got high scores from the sub-dimensions of participation (Table 5).

Considering the relationship between the epidemic CCS sub-dimensions; refusal with shock; depression with refusal; trial with frustration; negative between depression and trial and decision making; frustration, depression, and participation with shock; depression with frustration; participation with depression, a decision making by trial, and participation; there was a statistically significant positive correlation between decision making and participation (Table 6).

Table 4. Outbreak CCS internal consistencies of the calibration sample

Scale	Min-Max	X \pm SD	Cronbach Alpha
Shock	3-9	8.8 \pm 0.6	0.784
Refusal	3-9	3.8 \pm 1.1	0.771
Frustration	3-9	6.3 \pm 1.5	0.726
Depression	4-12	8.6 \pm 2.0	0.745
Trial	3-9	7.9 \pm 1.2	0.768
Decision	5-15	13.8 \pm 2.0	0.783
Including	5-15	11.3 \pm 2.8	0.764
Total	26-78	60.8 \pm 5.2	0.714

Table 5. The relationship between descriptive characteristics of the subjects participating in the research and sub-dimensions of the outbreak CCS

Descriptive Characteristics		n(%)	Shock	Refusal	Frustration	Depression	Trial	Decision	Including
Age	30.8±0.3,	1137 (100)	*r:-.016 p:0.59	r:-.030 p:0.30	r:-.173 p:0.000	r:.094 p:0.002	r:-.058 p:0.05	r:-.029 p:0.32	r:.029 p:0.33
Gender	Female	824 (72.5)	8.8±0.5	3.7±1.1	6.3±1.5	8.6±1.9	7.9±1.3	13.8±2.0	11.3±2.7
Statistical Analysis	Male	313 (27.5)	8.8±0.7 **U:126106 p:0.20	3.9±1.2 U:122811.5 p:0.17	6.2±1.5 U:125969.5 p:0.53	8.5±2.0 U:126375 p:0.59	8.1±1.2 U:112883.5 p:0.000	13.8±2.0 U:128369.5 p:0.89	11.2±2.9 U:125536.5 p:0.48
Educational Background	The Untrained/Primary Education	108 (9.5)	8.8±0.6	3.9±1.2	6.3±1.6	8.6±2.0	7.9±1.3	13.2±2.5	11.4±3.0
	Middle School	143 (12.6)	8.8±0.6	3.8±1.1	6.1±1.5	8.5±2.1	7.9±1.3	13.6±2.1	11.2±2.8
	High School	107 (9.4)	8.7±0.8	3.6±0.9	6.4±1.4	8.7±1.9	7.6±1.4	13.3±2.4	11.2±3.1
	Bachelor's Degree	621 (54.6)	8.8±0.5	3.8±1.2	6.3±1.5	8.6±1.9	8.0±1.2	14±1.8	11.2±2.6
	Master's Degree	104 (9.1)	8.9±0.3	3.8±1.1	6.3±1.3	8.5±2.0	7.7±1.2	14.1±1.8	11.4±2.8
Statistical Analysis	Doctor's Degree	54 (4.7)	8.8±0.5 ***H: 5.894 p:0.31	3.6±1.0 H: 3.340 p:0.64	5.8±1.2 H: 0.945 p:0.96	8.8±1.9 H: 1.375 p:0.92	8.0±1.2 H: 14.822 p:0.01	14.6±0.9 H: 25.620 p:0.000	12.4±2.7 H: 2.046 p:0.84
Marital Status	Married	561 (49.3)	8.8±0.6	3.7±1.1	6.0±1.4	8.7±2.0	7.9±1.3	13.8±2.0	11.3±2.8
Statistical Analysis	Single	576 (50.7)	8.8±0.5 U:161201 p:0.88	3.8±1.1 U:154150 p:0.13	6.6±1.5 U:122778.5 p:0.000	8.5±1.9 U:154239.5 p:0.17	8.0±1.2 U:158808 p:0.58	13.8±2.0 U:156343 p:0.27	11.3±2.7 U:160635.5 p:0.86
Child Status	Yes	491 (43.2)	8.8±0.6	3.7±1.1	6.0±1.4	8.7±2.1	7.9±1.3	13.8±1.9	11.3±2.8
Statistical Analysis	No	646 (56.8)	8.8±0.6 U:156845.5 p:0.48	3.8±1.2 U:151408.5 p:0.14	6.5±1.5 U:126873.5 p:0.000	8.5±1.9 U:148913 p:0.07	8.0±1.2 U:154977 p:0.47	13.8±2.0 U:154156.5 p:0.35	11.3±2.7 U:155386.5 p:0.55
Occupation	Civil Servant	292 (25.7)	8.8±0.6	3.7±1.1	6.0±1.3	8.7±2.0	7.8±1.4	14.0±1.8	11.1±2.6
	Academician	75 (6.6)	8.8±0.4	3.6±1.0	6.1±1.3	8.8±1.9	8.0±1.1	14.2±1.9	12.3±2.7
	Tradesman	58 (5.1)	8.8±0.7	3.8±1.1	6.0±1.5	8.5±2.2	7.9±1.5	13.2±2.6	11.6±3.1
	Self-employment	37 (3.3)	9.0±0	3.8±1.1	6.5±1.6	9.5±1.6	8.2±1.2	13.7±2.3	12.4±2.9
	Housewife	129 (11.3)	8.8±0.5	3.7±1.0	6.1±1.6	8.4±2.0	7.8±1.3	13.4±2.2	11.2±2.9
	Student	338 (29.7)	8.8±0.5	3.9±1.2	6.7±1.4	8.4±1.9	8.1±1.1	13.9±1.9	11.2±2.6
Statistical Analysis	Other	208 (18.3)	8.8±0.7 H: 4.438 p:0.61	3.8±1.2 H: 3.758 p:0.70	6.2±1.5 H: 43.512 p:0.000	8.7±2.0 H: 15.182 p:0.01	7.8±1.2 H: 12.460 p:0.05	13.8±2.0 H: 17.756 p:0.007	11.2±2.7 H: 24.590 p:0.000
Working Status	Yes	530 (46.6)	8.8±0.5	3.7±1.1	6.1±1.4	8.8±2.0	7.8±1.3	13.9±1.9	11.4±2.7
Statistical Analysis	No	607 (53.4)	8.8±0.6 U:158460.5 p:0.33	3.8±1.2 U:150589 p:0.04	6.4±1.5 U:141280.5 p:0.000	8.4±1.9 U:143466 p:0.001	8.0±1.1 U:149316 p:0.02	13.7±2.0 U:151221 p:0.04	11.2±2.8 U:153856.5 p:0.19

* r: Spearman Correlation, **U: Mann Whitney U, *** H: Kruskal Wallis Test was used.

DISCUSSION

The Relationship Between the Socio-demographic Characteristics of Individuals and the Outbreak CCS Scale

The COVID-19 pandemic, which all societies have to deal with and which deeply affects people, disrupts people's normal lives, causes them to change their lifestyles, and reshape their social relationships (Vezzali et al. 2020). Since it is a situation that fluctuates in an instant manner, causes death, and its treatment which is yet to be discovered, it leaves individuals with emotions such as shock, rejection, disappointment, depression, and causes some reactions in the decisions and actions of the people about this process.

A measurement tool based on The Kübler Ross Change Model Curve was developed by the researchers to determine the reactions of individuals, to find the stages of the reactions, and to provide appropriate interventions for these stages.

The Shock stage is the first stage in which the individual learns that the disease exists and that it continues to spread rapidly. Thanks to both social media and other communication tools, people can access information about the course of the disease, the disease itself, and the consequent death toll all over the world, and they would follow the effects of the disease. However, the growing number of cases and deaths

prevents the shock level in individuals from decreasing. In this study, it was determined that all individuals had high shock levels regardless of their socio-demographic characteristics.

The refusal sub-dimension is the state of denying the seriousness of the COVID-19 disease, thinking that the pandemic is exaggerated and that the disease will not affect the individual. Although the data which was gathered during the epidemic process revealed the seriousness of the situation, some individuals still approach the graveness of this process with suspicion. In this study, the mean scores of non-working individuals were found to be higher in the rejection level. This situation is thought that it is because individuals have to work both for themselves and for the people they are obliged to care for, and therefore are trying to normalize the pandemic process.

It was determined that the Frustration levels were higher in young, single, childless, unemployed individuals and students. The physical and social quarantines applied during the pandemic lead individuals to solitude (Galea et al. 2020). This situation causes the individual to question the needs of love, being loved, and belonging. If these basic needs are not met, an increase in the anger level of the individual is expected. The existence of spouses who spend time at home, the time they

Table 6. Distribution of scores from outbreak CCS sub-dimensions

SUB-DIMENSIONS	Shock	Denial	Frustration	Depression	Experiment	Decision	Integration
Shock	-	*r: -.069 p: 0.02	r: .117 p: 0.000	r: .188 p: 0.000	r: -.004 p: 0.90	r: .036 p: 0.22	r: .076 p: 0.01
Denial		-	r: .024 p: 0.42	r: -.115 p: 0.000	r: -.006 p: 0.84	r: -.054 p: 0.07	r: -.040 p: 0.17
Frustration			-	r: .340 p: 0.000	r: -.225 p: 0.000	r: -.021 p: 0.47	r: .009 p: 0.75
Depression				-	r: -.175 p: 0.000	r: -.061 p: 0.04	r: .082 p: 0.006
Experiment					-	r: .270 p: 0.000	r: .136 p: 0.000
Decision						-	r: .237 p: 0.000
Integration							-

* r: Spearman Correlation.

spend with their children, and their efforts to hold on to life for their family may be among the reasons for low frustration levels among individuals.

The COVID-19 outbreak has caused some changes and disruptions in the field of education, as in many other fields (Kırmızıgül 2020). Social injustice and digital inequalities that emerged in the education processes during the epidemic caused a serious increase in the psychological pressure levels of individuals, especially students, and accordingly an increase in the levels of frustration (Bozkurt et al. 2020). In addition, the transition from normal education to distance education due to the pandemic has caused young people to move away from their social environment and relationships, which used to provide them both social, cognitive, and spiritual development, and it has also caused familial conflicts to emerge due to constantly staying at home (Zhou et al. 2020). It is thought that these situations may have increased the frustration levels of young people and students.

The epidemic causes an increase in psychological problems in the vast majority of people. The biggest factor in the formation of this situation is the economic conditions (Duran and Acar 2020). Those who did not have any savings or social security or were dismissed during this period were pushed into a bigger nightmare apart from the psychological problems caused by the disease. Socio-economic inequalities during the epidemic will lead to serious inequalities with regards to the probability of contacting the disease and to the access to health. It is thought that the psychological pressure created by this situation may cause an increase in the level of frustration.

It was determined that the elderly individuals got higher scores from the depression sub-dimension. Especially social isolation causes an increase in the depression levels of the elderly individuals (Armitage and Nellums 2020). Various isolation and health measures such as quarantine, curfew, and social distance are taken for the safety and protection of the elderly. But despite these measures; the severity of the COVID-19, the risk of death, the uncertainty of the process, social isolation, etc. still threatens the mental health of the elderly (Mills et al. 2020). An increase in the depression levels of the elderly individuals are observed in addition to the increased sense of physical, social, and social inadequacy. This increase may also

result from anxiety and fear due to the high risk of death (Zhou et al. 2020). In our study, although the depression levels of the elderly individuals were significantly higher, it was determined that the depression levels of all individuals were moderate. Dilmen Bayar et al. (2021) also determined that the COVID-19 process affects all individuals psychologically, and therefore depression levels are close to moderate (Dilmen Bayar et al. 2021). The rapid spread of the disease, its transmission to our closest relatives, the increase in death rates, isolation, and quarantine measures cause anger, fear, and depression in all individuals (Çubuk 2020).

The pandemic process has especially devastating outcomes when it comes to small businesses; such as economic loss, unemployment, uncertainty, and serious financial loss due to quarantine (Osakwe et al. 2021). Uncertainties in the pandemic and not knowing how to manage the process are thought to be important factors that negatively affect the mental health of employees. In this study, the fact that individuals in the self-employed group got higher scores from the Depression sub-dimension compared to other occupational groups supports this idea. Erdoğan et al. (2020) determined that the employees did not find the economic measures taken in COVID-19 sufficient and therefore their anxiety levels were high (Erdoğan et al. 2020). The reasons for depression includes the lack of a fixed income and job security, as well as the continuing needs for food, beverage, shelter, and the necessity of meeting these needs. In this context, it can be said that mental problems such as depression due to economic risks are more common in individuals working in small businesses, in the private sector, or in individuals who are working as tradesmen.

Trial level; Individuals think that if they get sick, they can be diagnosed quickly and accurately, they can receive good treatment and they can protect themselves and their families if they take adequate precautions. In this study, it was determined that men scored higher in the Trial sub-dimension. In this situation; it is thought that men have a "care-free" mindset which is the opposite of being "distressed" and "apprehensive" and accordingly, their stress levels and coping levels can be better than women, who generally tend to be more uneasy than men. In addition, non-working individuals have higher Trial sub-dimension scores. This may be related to their denial of the seriousness of the illness due to their

high level of rejection, their thinking that the pandemic is exaggerated, and that they will not be affected by the disease. In the Decision making sub-dimension, it was determined that academicians scored higher than the other occupational groups. The pandemic has negatively affected educators as well as students. In the research of Çakın and Külekçi-Akyavuz (2020), teachers; stated that in addition to the student's lack of technological equipment and low motivation, they experience difficulties in the education process due to the boredom of the families and their inability to provide academic support (Çakın and Külekçi Akyavuz 2020). 63 million teachers in the world have been adversely affected by measures and precautions such as quarantines, lockdowns, and school closures during the COVID-19 process. In most countries, digital classrooms are still not available due to the lack of computers, the internet, other online platforms, and due to the extraordinary costs of access, and data flow (Balci 2020). In this context, and regarding the high decision sub-dimension scores of educators; it can be said that their efforts to adapt to constantly changing processes and decisions, especially efforts to adapt to the changes in the education systems, may be due to their planning to be ready for what they will do when they experience such a process in the future, their desire to know alternative education forms during the crisis, and their renewal of their working models.

Level of Participation; it is the stage in which the individual accepts the current situation and begins to adapt and participate in new life conditions. If the individual's coping mechanisms are sufficient, they will no longer experience anger or depression when they reach this stage (Uşşaklı, 2010). In our study, it was determined that the self-employed individuals had higher participation sub-dimension scores. It is thought that this may be related to the fact that the basic needs of self-employed people who have to work have to be satisfied consistently and the necessity of meeting these needs require them to adapt to the current situation. The quarantine and social distance practice implemented in many sectors, especially the public sector, has kept individuals out of this process, albeit a bit. However, since self-employed individuals did not have such an opportunity, they had to continue their work. This situation may have made it necessary for them to adapt to the current conditions, and therefore, it

can be said that their level of participation is higher.

The COVID-19 pandemic has affected people in terms of a bio-psycho-social, cultural and spiritual structure in all its dimensions and forced them to adapt to this process. As a result of this study, a significant relationship was found between the depression, trial, and decision-making sub-dimensions of individuals. In a large-scale study conducted in regions where the newly emerging COVID-19 is active such as India, Brazil, California, Michigan, and New York, it was determined that the COVID-19 pandemic caused a serious burden on the mental health of individuals in the forms of lifestyle changes, emotional distress and quarantine procedures (Osakwe 2021). These results; reveal that although societies change, the process that people go through is similar.

Development of the Outbreak CCS Scale

Construct validity: Factor Analysis is the most frequently used method to evaluate whether the items in the scale will be grouped under different dimensions. The purpose of the factor analysis is to express a large number of items with fewer "factors". Factor analysis is carried out in two ways; as explanatory and confirmatory factor analysis.

Explanatory Factor Analysis is a form of examination in which the researcher tries to obtain information about the nature of the factors which the measuring tool measures, rather than testing a particular hypothesis. For this purpose, KMO and Barlett Test are applied. The KMO value which is less than 0.50 is unacceptable, whereas a value between 0.81-1.0 shows that it is perfect (Yaşlıoğlu 2017). Since this value was found to be 0.750 (intermediate level) in the study, it is the proof that these data can be clustered in the factor analysis. If the p value of the Barlett test result is ≤ 0.05 , it indicates that the data is suitable for factor analysis (Yaşlıoğlu 2017). The scale consists of 26 items; Barlett test results were calculated as χ^2 : 5066,657, p: 0.000. According to these findings, it can be said that the collected data set is good and suitable for factor analysis.

Confirmatory factor analysis (CFA) is the type of procedure that researchers use when they want to test a theory/model developed in their mind. The theory of this research is to test the usability of Ekmekçi's (2020) COVID-19 Curve of Change Scale Adaptation as a valid and reliable measurement tool

consisting of 32 items. As a result of the analyzes, six items (items 1.5,9,10,16,19) with a Predictive Value of less than 0.3 were removed and the scale was reduced to 26 items (D'Souza et al. 2015).

Confirmatory Factor Analysis Compliance Values

1. In order for the tested model to be fit, the chi-square value is evaluated by dividing by the degrees of freedom, and if this value is equal to or less than 2.5, the model is suitable, if it is 5 or below, it means that the model has an acceptable coherence/suitability (Yaşlıoğlu 2017). CMIN/DF value was 2.55; and since it is equal to 2.5, it shows that the fit of the developed model is good.

2. Root Mean Square Error of Approximation (RMSEA): If the RMSEA is less than or equal to 0.05 and the p value is less than 0.05, it indicates a good fit (Özen and Durkan 2016). Therefore a RMSEA value of 0.037 in our study indicates a good fit.

3. Root Mean Square Residual (RMR): An RMR of less than 0.08 indicates an acceptable fit and values less than 0.05 indicate good fit (Çapık, 2014). A value of 0.019 in our study indicates a good fit.

4. Comparative Fit Index (CFI): Acceptable fit if the relevant value is equal to or greater than 0.90; if it is equal to or above 0.95, it indicates good fit. In our study, the relevant value was 0.90, indicating to an acceptable fit (Özen and Durkan 2016; Çapık 2014).

5. Goodness of Fit Index (GFI): A value of 0.90 or above is acceptable fit, and a value above 0.95 is a good fit (Çapık 2014). In our study, this value shows good fit with a value of 0.95.

6. Adjusted Goodness of Fit Index (AGFI): It is an index which is used to compensate for the high sample volume deficiency of the GFI test. Its value varies between 0-1. A value of 0.90 or above is acceptable fit, and a value above 0.95 is a good fit (Çapık 2014). In our study, this value indicates good fit with 0.94.

As a result of this study, the findings provided the first evidence that the scale has reliability and validity features. However, the current article has some limitations that should be mentioned at this point. Relevant metrics should also be checked with clinically diagnosed COVID-19 cases with clinical symptoms of COVID-19.

Reliability: The criteria used for reliability in this study are Cronbach's α , Item-Total Item correlation and The Hotelling's T2.

Cronbach's Alpha Coefficient of Confidence; is generally used to determine the internal consistency of Likert-type scales. There may be a single Cronbach α value for each item or an average Cronbach α value for all items. The Cronbach α value obtained for all items indicate the overall reliability of the relevant questionnaire, and that the value is expected to be greater than or equal to 0.7. If Cronbach $\alpha > 0.8$; it indicates that the reliability of the questionnaire is high (Kiliç 2016). The Cronbach's α value of this study was found to be 0.714.

Item-Total Item Correlation; the connection of each item in the scale with the total score is investigated. The minimum value required for the item-total test correlation to be sufficient is specified as 0.30 in the relevant literature (Özyurtseven and Güngörmüş 2021). In the study, this value was between 0.352-0.798.

The Hotelling's T2 value of the draft scale was found to be 28397.180, p: 0.000. It was found that the difference between the item averages of the Hotelling's T2 test was significant (p<0.05).

CONCLUSION

The 3-point Likert-type Epidemic Change Curve Scale, consisting of 26 items and 7 factors, is accepted as a useful measurement tool. The Epidemic Change Curve Scale is a seven-item scale with robust psychometric properties which can be used to assess individuals' responses and actions concerning the COVID-19 pandemic. The Outbreak CCS is recommended to be used to measure individuals' psychosocial responses to the COVID-19 pandemic.

Future studies may be replicated in clinically defined patients as well as in populations of different cultures.

AUTHOR CONTRIBUTION

Idea/Concept: Z.G., B.Ç.; Design : Z.G., B.Ç.; Data Collection And/Or Processing: B.Ç.; Analysis and/or Interpretation: Z.G., B.Ç., S.K.; Writing The Article: Z.G., B.Ç., S.K.; Critical Review – Z.G., B.Ç., S.K.

CONFLICT OF INTEREST

No conflict of interest was declared by the authors.

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