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Development of a Covid-19 Anxiety Scale "Investigation of Validity and Reliability"

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Muzaffer Şahin * – Didem Tetik Küçükelçi **
*Assistant Professor, CIIP, Istanbul Arel University, FEF, Istanbul/Turkey
E-Mail: muzsah@gmail.com **ORCID:** 0000-0002-2411-2803
** Assistant Professor, Istanbul Gelisim University, IISBF, Istanbul/ Turkey
E-Mail: didemcantetik@gmail.com **ORCID:** 0000-0001-8911-4554

Abstract

It was needed to develop a scale to determine the fear and anxiety developed by individuals against Covid-19 and the situations in repetitive protective behaviour. The aim of this study is to bring to the literature a scale that can measure the changes in people caused by the Covid 19 pandemic. Cronbach's Alpha coefficient was used to analyse the reliability of the data. As a result of the exploratory factor analysis, the Covid-19 Anxiety Scale was formed by 22 questions and 4 dimensions. Cronbach's Alpha coefficient was calculated for each factor and the whole scale. Accordingly, the reliability value of the twelve-question "Objective and Neurotic Anxiety" dimension (0,931) was in the "high reliable" range. The five-question "Anxiety about Contacting People" dimension (0,773); the three-question "Compulsive Behaviour" dimension (0,716) and the two-question "Sleep Hygiene" dimension (0,741) were in the "quite reliable" range. The total reliability of the Covid-19 Anxiety scale was 0,935.CR and AVE coefficients were calculated for each dimension of the scale to analyse internal consistency and reconfirm its reliability. It seems clear that the Covid-19 Anxiety Scale created as a result of these processes is a reliable tool that can be used to measure the psychological and behavioural responses of people.

Keywords: *Covid-19 Anxiety Scale, New Scale, Exploratory Factor Analysis, Anxiety, Neurotic Anxiety.*

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Covid-19 Kaygı Ölçeği Geliştirilmesi[1] "Geçerlik ve Güvenirliğinin Araştırılması"

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Öz

Bireylerin Covid-19'a karşı geliştirdikleri korku ve kaygı, tekrarlanan korunma davranışlarındaki durumları saptamak üzere bir ölçek geliştirilmesine ihtiyaç duyulmuştur. Bu çalışmanın amacı, küresel bir pandemi olan Covid-19 salgının etkisiyle kişilerde ortaya çıkan değişiklikleri ölçebilecek bir ölçeği literatüre kazandırmaktır. Ölçeğin yapı geçerliliğinin araştırılması için açımlayıcı faktör analizi ve doğrulayıcı faktör analizi uygulanmıştır. Açımlayıcı faktör analizi sonucunda Covid-19 Kaygı Ölçeği 22 soru ve 4 boyut altında toplanmıştır. Verilerin güvenilirliğinin analizi için Cronbach's Alfa katsayısı kullanılmıştır. Cronbach's Alfa katsayısı her faktör ve tüm ölçek için hesaplanmıştır. Buna göre, 12 sorudan oluşan "Nesnel ve Nörotik Kaygı" boyutunun güvenilirlik değeri (0,931) ile "yüksek güvenilir" aralığında yer almıştır. Beş sorudan oluşan "İnsanlarla Temas Kaygısı" boyutu (0,773); üç sorudan oluşan "Kompulsif Davranış" boyutu (0,716) ve 2 sorudan oluşan "Uyku Hijyeni" boyutu (0,741) değerleri ise "oldukça güvenilir" aralığında bulunmaktadırlar. Covid-19 Kaygı ölçeğinin toplam güvenilirliği (0,935) olarak gerçekleşmiştir. İç tutarlılığın analizi ve güvenilirliğinin tekrar teyit edilmesi için ölçeğin her bir boyutu için CR ve AVE katsayıları hesaplanmıştır. Bunlar sonucunda oluşturulan Covid-19 Kaygı Ölçeğinin kişilerin psikolojik ve davranışsal tepkilerinin ölçülmesi için kullanılabilecek güvenilir bir araç olduğu görülmüştür.

Anahtar Kelimeler: *Covid-19 Kaygı Ölçeği, yeni ölçek, açımlayıcı faktör analizleri, Anksiyete, Coronavirus.*

[1] *Bknz., Ölçeğin Türkçe Formu için ek-1'e*

Introduction

The earliest case of Coronavirus (COVID-19) was detected in November 2019 in Wuhan, the People's Republic of China (Toit, 2020). On 11 February 2020, World Health Organization named the coronavirus with unknown etiology and posing a threat to world health as COVID-19 (Zhao et al., 2020). At the onset of COVID-19 pandemic, a considerable part of people underestimated the danger and even some of the leaders ruling countries didn't recognize the potential danger. When COVID-19 (Coronavirus) epidemic turned into a global pandemic, people became aware of the extent and magnitude of the danger and measures started to be applied. However, it was too late.

COVID-19 was found to be highly contagious (Liu, Gayle, Wilder-Smith and Rocklov, 2020). Among the people infected with COVID-19, the time from illness onset to death is 14 days on average, but this can vary between 6 and 41 days. It appears that older people, those with chronic disease, and weak immune system are at higher risk of mortality (Wang, Tang and Wei, 2020).

The official numbers indicate that over 116 million people got infected with COVID-19 and more than 2,5 million died globally as of 7 March (https://www.who.int/publications/m/item/weekly-epidemiological-update-10-march-2021)2 As of 09:35, 20 March 2021, there has been 121.759.109 confirmed cases of COVID-19 and 2.690.731 deaths reported to World Health Organization (WHO). As of 17 March 2021, a total of 364.184.603 vaccine doses have been administered (https://covid19.who.int/). The number of infected people has increased more than 5 million in 13 days. It is believed that these figures can be far greater combined with the unrecorded cases

The official numbers show that in Turkey as of 7 March 2021, 2.780.417 people got infected with COVID-19 (coronavirus), 2.623.924 people recovered, 156.493 people were actively ill, and 29.030 people died (https://covid19.saglik.gov.tr). According to the data of the Ministry of Health (TÜİK-Turkish Statistical Institute) there has been 2.922.694 confirmed cases, 29.959 deaths, 2.807.572 recovered, 185.122 active cases in Turkey as

[2] *The table was published by WHO on 10 March.*

of 20 March 2021 (https://covid19.saglik.gov.tr). Although a considerable part of those got infected with the disease due to pandemic recovered thanks to devoted work of healthcare workers, some of them lost their lives.

Being careful with personal hygiene, using face mask, social distancing, resting adequately, getting fresh air (Gun and 2 et al., 2020), having a healthy diet and vaccine-related works are regarded as the important ones among the protective measures to avoid getting infected with the disease. After the reliability of vaccines is verified, although it is stated that it is possible to produce antibodies after 14 days from the vaccination which is administered as a course of two doses and leaving an interval of about 1 month between those, it is still unknown how long this immunity will last and whether the immunity conferred by the vaccines will be protective against mutated virus. The studies for developing a single-shot vaccine have been initiated as well.

In addition to these measures, people started to maintain their social distancing, avoid social events and apply online methods for education in order to decrease close contact during pandemic. This led to changes especially in the family structures and habits in intra-family relations as well as social relations. People started to communicate with each other without meeting in-person. Education was started to be provided online via digital platforms instead of at formal education institutions. In undeveloped countries with inadequate technological infrastructure, there has been a substantial rise in the number of children and young people who cannot receive education.

Reducing contact for protection from pandemic and suspending some lines of business and closure of some workplaces in many countries caused a rise in inflation and the number of people losing their jobs and economic problems increased. It was announced that as of February 2021, Consumer Price Index (CPI) is 15,61% annually and the unemployment rate for January 2021 is 12,2% in Turkey (https://www.tuik.gov.tr/). However, according to DISK-AR (Confederation of Progressive Trade Unions of Turkey Research Center), as of 10 March 2021 the expanded unemployment rate is 29,1% on average and 37,3% for women (http://arastirma.disk.org.tr/?p=5088).

Due to the fall in employment and rise in inflation all around the world together with the fact that unemployed people have no income, a major part of people can't even have access to staple food. As the existing malnutrition issue in the world gets worse, the immune system weakens more as well. When people having a poor immune system got infected with COVID-19, the symptoms of the disease manifested themselves even more severe. Their recovery took too long and some of them even lost their lives. Severe symptoms experienced by patients led to and leading to an increase in the fear and anxiety levels of both patients and their relatives. The uncertainities about the course of the disease, how its impact on all over the world will be taken under control caused an increase in future anxiety and despair as well as in social, economic, educational and health problems.

A significant part of the people who had to work used public transportation to go to work, had to work indoors and crowded areas at their workplaces and attend the meetings organized. The requirement to wear face mask, the carelessness of the other people for social distancing when they are being careful about it, being forced to meet their basic needs at common areas and the possibility to contact those infected with COVID-19 caused people to experience immense tension. They started to worry about whether they got infected or not when they got back home. These worries led to disorders in people's sleep hygiene.

The course of the disease took longer for some people and the disease manifests itself through symptoms such as high fever, cough, shortness of breath, headache, sore throat, runny nose, muscle and joint pain, fatigue, loss of smell and taste and diarrhea. In severe cases it was observed that patients suffered from pulmonary infection, severe acute respiratory tract infections and kidney failure (https://istanbulc.edu.tr/tr/koronavirus) and some people lost their lives. The congestion at healthcare facilities increased due to pandemic and healthcare workers had to work under heavier working conditions. Staff and equipment issues emerged in the treatment of other health problems due to the pandemic. The rise in health, economic, educational, and nutritional issues and insufficient measures against the disease caused an escalation in future anxiety and psychological problems.

According to the observations of the researchers about their own lives and the lives of others, it is concluded that the very swift transmission of Coronavirus became conducive to a decline in the people's social relations. It became harder for the people who had to stay at home during lock downs and the elders to maintain their daily lives and to meet their basic needs. As the stay-at-home and isolation time increased, the symptoms of depression started to escalate as well. People started to be afraid to go to grocery stores and shopping centres in order to meet their basic needs; and they got anxious and nervous by thinking constantly about whether they got infected or not when they got back home. They started to pay too much attention to the tiniest symptoms that they didn't care before the pandemic. As a consequence of these factors, anxiety disorders, mood disorders, illness anxiety disorders, trauma and stress disorders, repetitive behaviours for taking measures (compulsions) due to rise in obsessive thoughts became prevalent.

Kar, Arafat, Kabir, Sharma and Saxena (2020) suggested that several complex variables combined with other existing challenges in the lives of people during pandemic may make the issues even more indescribable. They also indicated that those working in the field of mental health started to study and conduct researches on the psychological problems emerged due to pandemic and the measures that can be taken.

Development of a Covid-19 Anxiety Scale

New scales have been prepared to measure how people and their feelings, behaviors, habits, psychological problems are affected by COVID-19 pandemic that has been experienced for nearly two years. In some studies carried out in Turkey, scales prepared in other countries have been adapted.

The Fear of COVID-19 Scale was developed by Ahorsu, Lin, Imani, Saffari, Griffiths, and Pakpour (2020). It is a unidimensional scale with seven items. It has a 5-point Likert-type rating system. Three different studies were conducted to adapt this scale into Turkish (Bakioğlu, Korkmaz and Ercan (2020); Haktanır, Seki and Dilmaç, (2020); Satıcı, Gocet-Tekin, Deniz, and Satıcı (2020).

The COVID-19 Related Psychological Distress Scale (CORPD) was developed by Feng et al. (2020) to measure the level of psychological distress

in uninfected people. The scale has 14 items and contains two dimensions: suspicion, and anxiety and fear. The scale has been adapted into Turkish by Ay, Oruç, and Özdoğru (2021).

"Covid-19 Hygiene Scale" consisting of 27 items and 6 sub-dimensions, was developed by Çiçek, Şahin, Erkal (2020).

It was thought that it would be useful to develop a different scale to determine the fears and anxieties and repetitive behaviours of individuals against COVID–19 in Turkey. This scale consists of twenty-two questions and four dimensions. The aim of this study was to bring to the literature a scale that could measure the changes in people caused by the COVID-19 pandemic.

Covid-19 Anxiety Scale is a different scale from the adapted scales that are mentioned above. According to observations of the researcher in sessions and social environment while preparing this scale: It has been observed that COVID-19 Coronavirus may lead to objective anxiety as it is a life-threatening and dangerous situation; to neurotic anxiety as it is not apparent very much and it is not certain when it will occur and how it will be transmitted; to contact anxiety as contact with people poses a risk for transmission; to obsession in an attempt to avoid risks due to the transmission possibility of disease to body, clothes and food; to compulsive behaviors that are repeated over and over again to be protected from the disturbing effect of obsession; to disturbances in sleep hygiene when too much attention is paid for minor symptoms due to the appearance possibility of symptoms any time. For this reason, 4 dimensions were targeted, namely Objective Anxiety and Neurotic Anxiety; Contact Anxiety; Compulsive Behavior; Sleep Hygiene, while preparing the scale questions.

Method

The correlational survey model was used in order to describe the existing state and the quantitative data from COVID-19 Anxiety Scale was evaluated by statistical techniques in order to determine the validity and reliability of the scale developed.

In the framework of the study, a questionnaire study was conducted with 375 people by online forms. 43 questionnaires were excluded from

the analysis because they had missing answers, and the studies were conducted on the data obtained from 332 questionnaires. 73,2% of the participants were university graduates, 70,4% people living alone, 50,3% female and 49,7% male. 78,6% of the participants were aged 18 to 25 and 22,4% over 26. The details are given in Table 1.

Table 1. Demographic Characteristics of the Participants

		N	**N %**
Gender	female	167	50,3%
	male	165	49,7%
Educational	primary education	9	2,7%
Status	high school	51	15,4%
	university	243	73,2%
	postgraduate	29	8,7%
Age	18 to 25	261	78,6%
	26+	71	22,4%
Marital Status	married	50	15,1%
	with a partner	48	14,5%
	single	234	70,4%

Scale Development Phases

The effects of COVID-19 on people were observed and it was aimed to create a scale which was capable of measuring the characteristics of each problem that was meant to be measured and easily understandable for readers. The questions for the scale was structured in 4 dimensions being "Objective and Neurotic Anxiety," "Anxiety about Contacting People", "Compulsive Behaviour" and "Sleep Hygiene".

Objective and Neurotic Anxiety: Objective (state) Anxiety (fear) refers to reactions of an individual in response to an external danger in his/her present life, which are proportional to the level of danger and perceived by others as normal. Neurotic Anxiety (Trait Anxiety): Reactions of an individual to a motiveless subjective situation due to his/her past experiences or a situation involving uncertainties and unknown whether it will occur or not (Öner and Le Compte, 1985; https://dictionary.apa.org/neurotic-anxiety)

Anxiety about Contacting: Avoidance of an individual from engaging in common activities with others and public areas

Compulsive Behaviour: Repetitive actions of individuals in order to avoid disturbing thoughts

Sleep Hygiene: It refers to sleeping of individuals above eighteen years of age 7 to 9 hours and the ability to sleep on without interrupted with nightmares.

The questionnaire was prepared for these four dimensions and it was carried out online. The results from the first application of the survey were examined and as Atılgan, Kan and Doğan (2011) recommended, it was analyzed in terms of criteria such as whether each question measured the intended behaviour, its language was understandable, there were any grammatical mistakes and the questions were relevant for the group to fill it and accordingly, necessary adjustments were made.

Prior to start working on large sample group, the scale, which was rearranged as a result of the analysis of construct validity, item and internal consistency, was applied to 30 people at 3 weeks intervals in order to determine reliability coefficient in terms of its stability through test-retest method. It was seen that the correlation value obtained from the first and second application was high and significant ($r=0,913$; $p<0.01$). The scale was re-adjusted as required by the responses and feedbacks given. In consequence of these studies, a scale of 25 questions in total was created by analyzing scale questions and large sampling was implemented. The statistical data was analyzed for the last time taking into consideration the responses of 332 people and COVID-19 Anxiety Scale consisting of a total 22 questions was created. The statistical studies with regard to this scale are elaborated below.

Statistical Techniques Used in Data Analysis

SPSS 22.00 package programs were used to analyse the data obtained from the questionnaires filled by the participants. Exploratory factor analysis was applied to the data to investigate the construct validity. Then, Cronbach's Alpha coefficients were calculated both for the dimensions of the scale and the scale itself as a whole in order to analyse the reliability of the scale. Composite Reliability (CR) and Average Variance Extracted (AVE) were also calculated for each dimension of the scale to analyse internal

consistency and reconfirm its reliability. Moreover, the correlation values between the dimensions were analyzed.

Exploratory Factor Analysis (EFA)

It is possible to examine the compatibility of sampling with the factor analysis by Kaiser Meyer Olkin (KMO) coefficient and Bartlett's Test of Sphericity. Some researchers state that Kaiser Meyer Olkin (KMO) coefficient value is required to be between 0,80 and 0,90 for factor analysis. And they also underline that Bartlett's Test of Sphericity is only significant when its value is less than 0.05 (Çokluk, Şekercioğlu and Büyüköztürk, 2010; Leech, Barette and Morgan, 2005). Factor analysis is a technique that is used to assess the number of independent variables contributing to interpretation of a variable associated with several variables and to identify the factor loading of these independent variables. Through these analyses it is possible to examine the correlations between all variables and the origin of these correlations, and to present data in a more meaningful way and briefly on the basis of these correlations (Turgut ve Baykul, 1992).

Findings

When taking into consideration the assessments of the preliminary tests for exploratory factor analysis of the COVID-19 Anxiety Scale, the probability value of the Bartlett's Test was calculated as ($p<0.05$) and KMO value 0,933. According to this result, the data set is fit for factor analysis at the level of "excellent".

3 out of the 25 questions included in the entire scale were excluded from the analysis due to their low factor loads. The remaining 22 items are formed by 4 dimensions. The first dimension consists of 12 questions, the second 5, the third 3 and the fourth 2. On the basis of the features of their questions, these dimensions were named respectively as "Objective and Neurotic Anxiety", "Anxiety about Contacting People", "Compulsive Behaviour" and "Sleep Hygiene".

The explanatory power of "Objective and Neurotic Anxiety" dimension of the COVID-19 Anxiety Scale was 27,458%, "Anxiety about Contacting People" 14,810%, "Compulsive Behaviour" 11,969% and "Sleep Hygiene"

8,646%. The percentage of the scale in explaining the notion was calculated as 62,883% in total. This analysis result also demonstrates that the scale has structure validity.

Table 2. Exploratory Factor Analysis for the COVID-19 Anxiety Scale

Component	Items	FL	VE (%)
Objective and Neurotic Anxiety	4- Thinking of the possibility that I can get infected with Coronavirus worries me	.833	27,458
	I am afraid of getting infected with Coronavirus	.820	
	15- I get nervous when I think I can catch Coronavirus	.770	
	11- The news on Coronavirus in the media (newspapers, tv and internet) worries me	.745	
	12- I am afraid to go to indoor spaces (shopping malls, grocery stores and etc.) because I can catch Coronavirus	.702	
	7-I'm afraid of dying of Coronavirus	.673	
	17-I'm worried that my relatives from outside can transmit Coronavirus	.632	
	10- I'm afraid to use public transport because I can catch Coronavirus	.626	
	2 - I get nervous when people approach me	.614	
	13- I am afraid that Coronavirus is transmitted by external things (food, clothing, etc.)	.562	
	2-I'm afraid of losing my relatives because of Coronavirus	.549	
	3-I am angry with people walking around without a mask	.448	
Anxiety About Contacting with People	20 - I don't have guests because I can catch Coronavirus	.746	14,810
	21-I don't participate in events because I can catch Coronavirus	.744	
	9 - I don't use public transport because I can catch Coronavirus	.739	
	8 - I pay attention to the mask and distance outside to avoid any Coronavirus transmission	.492	
	18 - I can't go out because I can catch Coronavirus	.418	
Compulsive Behaviour	23- When I come home from outside, I take off my clothes and wash them in the washing machine	.725	11,969
	24-When I come home from outside, I wash my whole body again and again but my anxiety does not go away	.676	
	14-I wash external stuff (food, clothing, etc.) over and over again to protect against Coronavirus	.674	
Sleep Hygiene	6-I have constant nightmares when I sleep because of Coronavirus	.793	8,646
	5- I can't sleep with fear of Coronavirus	.719	

COVID-19 22 questions KMO: 0,933 62,833
Bartlett's Test of Sphericity P Value: 0.00<0.05 FL: factor loading VE: Variance Explained (Extraction Method Principal Component Analysis) Rotation Method: Varimax with Kaiser Normalization.

Reliability and Internal Consistency Values of COVID-19 Anxiety Scale

It is of prime importance to evaluate the scales used in a survey and a newly-developed scale in terms of reliability and validity. Having reliability values in the recommended ranges is very important for the results of the survey. Reliability, at the same time, is an indicative of the extent to which the questions asked to the participants, with the aim of measuring a variable, have been consciously answered (Özdoğan and Tüzün, 2007). In this study, Cronbach's Alpha coefficient was used to assess the reliability analysis (Kalaycı, 2006, p.405). The classification for these values is given in Table 3.

Table 3. Cronbach's Alpha values

Cronbach's Alpha	Comment
.80-1,00	Highly Reliable
.60-.80	Quite Reliable
.40-.60	Less Reliable
.40 and less	Not Reliable

Cronbach's Alpha is a measure of consistency value on the basis of correlation between the questions and a coefficient that shows the level of reliability of the questions in total under a factor.

Table 4. Covid-19 Anxiety Scale Reliability Values

Scale	Number of Questions	Cronbach's Alpha Value
Objective and Neurotic Anxiety	12	0,931
Anxiety About Contacting with People	5	0,773
Compulsive Behaviour	3	0,716
Sleep Hygiene	2	0,741
Covid-19 Anxiety Scale	22	0,935

As shown on the Table 4, the newly-developed Covid-19 Anxiety Scale is formed by 22 questions and 4 dimensions. According to this, the reliability value for "Objective and Neurotic Anxiety" dimension is (0,931) and it is in the range of "highly reliable". The reliability value of 5-question "Anxiety about Contacting with People" dimension was (0,773), 3-ques-

tion "Compulsive Behaviour" dimension (0,716) and 2-question "Sleep Hygiene" dimension (0,741), which made them fall into the range of "quiet reliable". The total reliability of the COVID--19 Anxiety scale was (0,935).

In order to determine the reliability co-efficient in terms of temporal stability of the Scale, test-retest method at three-week intervals was applied. The applications were performed for a 30-people sampling group with three-week intervals. It was seen that the correlation value obtained from the first and second application was high and significant ($p<0.01$: $r=0,913$).

Composite Reliability (CR) and Average Variance Extracted (AVE)

It is required that the scale is reliable in that the data collected by the application of a scale give the same results for repeated measurements. The reliability is also important for the scale to be error free. In order to determine this, the concepts of Composite Reliability (CR) and Average Variance Extracted (AVE) are considered. Composite reliability is used with the aim to measure the overall reliability of the statements, the numbers of which is more than one, and that are not in a homogeneous structure, yet similar (Raykov, 1998). Therefore, CR values are measured on the basis of dimensions. Cronbach's Alpha coefficient, used in reliability analysis, can be high if the number of questions for a dimension is high. That is why CR calculation can be used as a tool for confirming the Cronbach' Alpha coefficient. It is expected that CR values is higher than (0,7). Average Variance Extracted (AVE) values, on the other hand, are calculated by the ratio of covariance values of the questions of a dimension, in other words the sum of squares of their factor loads, to the number of items. The AVE value is also calculated individually for each dimension or factor. Fornell and Larcker (1981) calculation method is applied for the calculation of Average Variance Extracted. AVE values are required to be greater than (0,5) as well. In addition, it is important for reliability results that the calculated CR values are greater than the AVE values.

In line with the above explanations, AVE and CR values, which were calculated for all dimensions of the COVID-19 Anxiety Scale, meet the required criteria and all results are given in Table 5. Moreover, the newly-developed COVID-19 Anxiety Scale satisfies the conditions on reliability and Average Variance Extracted.

Table 5. COVID-19 Anxiety Scale CR and AVE values

Component	Item	FL	AVE	CR
	Covid4	.833		
	Covid1	.820		
	Covid15	.770		
	Covid11	.745		
	Covid12	.702		
Objective and Neurotic Anxiety	Covid7	.673	0,518938	0,906559
	Covid17	.632		
	Covid10	.626		
	Covid2	.614		
	Covid13	.562		
	Covid25	.549		
	Covid3	.448		
Anxiety About Contacting with People	Covid20	.746	0,614592	0,770974
	Covid21	.744		
	Covid9	.739		
	Covid8	.492		
	Covid18	.418		
Compulsive Behaviour	Covid23	.725	0,551425	0,733653
	Covid24	.676		
	Covid14	.674		
Sleep Hygiene	Covid6	.793	0,777694	0,746465
	Covid5	.719		

Correlation Analysis

When there is a correlation between two variables, it is called simple correlation. If it is the correlation of a variable with more than one variable, it is called multiple correlations and keeping a variable independent and defining the correlations between other variables is referred to as partial correlation (Büyüköztürk, 2004, p.31). The degree of linear relationship between two variables is measured by correlation coefficient. Correlation coefficient helps to determine the relationship and its direction, however, it does not establish a cause-and-effect relationship between variables. Correlation coefficient values range between -1 and +1. If the sign is positive, this means that when one variable decreases/increases, the other variable decreases/increases as well. If the sign is negative, this means that the relation between variables is in opposite direction. If correlation coefficent (r) is zero, then it can be said that there is not a linear correlation between variables at all (Yüzer and Ağaoğlu, 2009, p.269).

Table 6. Correlation Analysis between Sub-Dimensions

		A.O	S.S	1	2	3	4
1	Objective and Neurotic Anxiety	2,2083	.99656	1			
2	Anxiety About Contacting with People	2,4620	.96068	.675**	1		
3	Compulsive Behaviour	1,7289	1,09692	.605**	.550**	1	
4	Sleep Hygiene	.2530	.59770	.398**	.361**	.422**	1

**p<0.05 **p<0.01*

The correlations between the sub-dimensions on Table 6 show that the correlations between all dimensions of COVID-19 are significant and positive. It is seen that when there is an increase in a dimension for the people, the scores of other dimensions increase as well.

The correlation between Objective and Neurotic Anxiety and Anxiety about Contacting People is significant (p<0.01) and positive (0,675). There is a significant (p<0.01) and positive (0,605) correlation between Objective and Neurotic Anxiety and Compulsive Behaviour. There is a significant (p<0.01) and positive (0,398) correlation between Objective and Neurotic Anxiety and Sleep Hygiene.A significant (p<0.01) and positive (0,550) correlation exists between Anxiety about Contacting People and Compulsive Behaviour. The correlation between Anxiety about Contacting People and Sleep Hygiene is significant (p<0.01) and positive (0,361). There is a significant (p<0.01) and positive (0,422) correlation between Compulsive Behaviour and Sleep Hygiene.

The Descriptive Statistics for the Sampling of COVID-19 Anxiety Scale

Table 7. Covid-19 Anxiety Scale

Component	Items
	1- Thinking of the possibility that I can get infected with Coronavirus worries me
	2-I am afraid of getting infected with Coronavirus
	3- I get nervous when I think I can catch Coronavirus
	4- The news on Coronavirus in the media (newspapers, tv and internet) worries me
	5- I am afraid to go to indoor spaces (shopping malls, grocery stores and etc.) because I can catch Coronavirus
	6-I'm afraid of dying of Coronavirus
	7-I'm worried that my relatives from outside can transmit Coronavirus
	8-I'm afraid to take public transport because I can catch Coronavirus

Objective and Neurotic Anxiety	9-I get nervous when people approach me 10- I am afraid that Coronavirus is transmitted by external things (food, clothing, etc.) 11-I'm afraid of losing my relatives because of Coronavirus 12-I am angry with people walking around without a mask
Anxiety About Contacting with People	13-I don't have guests because I can catch Coronavirus 14-I don't participate in events because I can catch Coronavirus 15-I don't use public transport because I can catch Coronavirus 16-I pay attention to the mask and distance outside to avoid any Coronavirus transmission 17- I don't go out because I can catch Coronavirus
Compulsive Behaviour	18-When I come home from outside, I take off my clothes and wash them in the washing machine 19-When I come home from outside, I wash my whole body again and again but my anxiety does not go away 20-I wash external stuff (food, clothing, etc.) over and over again to protect against Coronavirus
Sleep Hygiene	21-I have constant nightmares when I sleep because of Coronavirus 22- I can't sleep with fear of Coronavirus

Covid-19 Anxiety Scale Statistics and Scoring

For the sampling group composed by 332 people, the mean for the COVID-19 score was calculated as 44,503, median (44,5) and standard deviation (18,403) and range 86. The ranges for COVID-19 Anxiety were formed on the basis of these values.

Table 8. Distribution of Covid-19 Anxiety Ranges

Covid Anxiety		N	%	Valid %	Cumulative %
No Anxiety	If score ≤17	30	9,0	10,1	10,1
Less Anxiety	Score 18-35	76	22,9	25,5	35,6
Normal anxiety	Score 36-53	112	33,7	37,6	73,2
High anxiety	Score 54-71	59	17,8	19,8	93,0
Very high anxiety	Score≥72	21	6,3	7,0	100,0

The scoring ranges for the COVID-19 Anxiety Scale are shown in Table 8.

Scoring:

The participants indicate their level of agreement with the statements using a five-item Likert-type scale. The rating scores of the Likert scale,

which are (4) Always, (3) Often, (2) Sometimes, (1) Rarely, (0) Never, were used as the basis for scoring. According to this, the highest score that can be got on the scale is 88, and the lowest is 0,

When examining the ranges on the basis of anxiety levels, it is seen that: If the score of COVID-19 Anxiety Scale is equal to or less than 17, it means that there are 30 people (9%) without COVID-19 anxiety. If it is between 18-35, there are 76 people with low level of COVID-19 anxiety. If it is between 36-53, there are 112 people with normal level of COVID-19 anxiety. If it is between 54-71, there are 59 people with high level of COVID-19 anxiety and if it is equal to or higher than 72, there are 21 people with very high level of COVID-19 anxiety. As the score, obtained as a result of the scale assessment, gets higher, the anxiety developed against COVID-19 increases as well.

Table 9. Distribution of Covid-19 Anxiety Ranges by Gender

	Distribution of Covid-19 Anxiety Ranges									
Gender	No anxiety		Low anxiety		Normal anxiety		High anxiety		Very high anxiety	
	N	%	N	%	N	%	N	%	N	%
female	6	30,0	38	42,7	49	44,5	59	67,0	15	60,0
male	14	70,0	51	57,3	61	55,5	29	33,0	10	40,0

The distribution of COVID-19 Anxiety levels on gender in the sample group is given in Table 9. From the analysis of the big picture, it can be seen that when the level of COVID-19 anxiety reaches above normal, the number of female increases and when COVID-19 anxiety level is normal, low or there is no anxiety, the number of males escalates. According to this, 70% of those without any anxiety against COVID-19 is male and 30% is female. 67% of those with high level of anxiety is female and 33% is male. 60% of those with very high level of anxiety is female and 40% is male.

The total number of female participants is 167. Their mean scores are 48,39, median 51, standard deviation 17,80.

The total number of male participants is 165. Their mean scores are 40,57, median 39, standard deviation 18,2.

The COVID-19 anxiety scores of females are higher than males by approximately 8 points.

Evaluation and Results

When taking into consideration the assessments of the preliminary tests for exploratory factor analysis of the COVID-19 Anxiety Scale, the probability value of the Bartlett's Test was calculated as ($p<0.05$) and KMO value 0,933. According to this result, the data set is fit for factor analysis at the level of "excellent".

The scale was formed by 22 questions and 4 dimensions. The first dimension is "Objective and Neurotic Anxiety", the second dimension "Anxiety about Contacting People", the third dimension "Compulsive Behaviour" and the fourth dimension is "Sleep Hygiene". The explanatory power of "Objective and Neurotic Anxiety" dimension of the COVID-19 Anxiety Scale was 27,458%, "Anxiety about Contacting People" 14,810%, "Compulsive Behaviour" 11,969% and "Sleep Hygiene" 8,646%. The percentage of the scale in explaining the notion was calculated as 62,883% in total. This analysis result also demonstrates that the scale has structure validity.

When looking at COVID-19 Anxiety Scale Reliability values, the overall reliability of COVID-19 Anxiety Scale was (0,935) and 12-question "Objective and Neurotic Anxiety" dimension had a reliability value of (0,931), which made them fall into the range of "highly reliable". The reliability value of 5-question "Anxiety about Contacting with People" dimension was (0,773), 3-question "Compulsive Behaviour" dimension (0,716) and 2-question "Sleep Hygiene" dimension (0,741), which made them fall into the range of "quiet reliable".

In order to determine the reliability co-efficient in terms of temporal stability of the Scale, test-retest method at three-week intervals was applied. The applications were performed for a 30-people sampling group with three-week intervals. It was seen that the correlation value obtained from the first and second application was high in positive direction ($r=0,913$; $p<0.01$) and significant.

AVE value of Objective and Neurotic Anxiety was 0,518938 and CR value 0,906559.

AVE value of Anxiety about Contacting People was 0,614592 and CR value 0,770974.

AVE value of Compulsive Behaviour was 0,551425 and CR value 0,733653.

AVE value of Sleep hygiene was 0,777694 and CR value 0,746465.

As per above values, AVE and CR values calculated for all dimensions of COVID-19 Anxiety Scale meet the required criteria as well as requirements on reliability and Average Variance Extracted.

According to the analysis of the correlations between the sub-dimensions, the correlations between all dimensions of COVID-19 are significant and positive. It is observed that if there is an increase in the scores of a subgroup, the scores of the other dimensions rise as well.

In the analysis of the scores of COVID-19 anxiety by gender, it is seen that the average score of the COVID-19 anxiety scores for females is 48,39 while it is 40,57 for males, meaning COVID-19 anxiety scores of the females is greater than male's.

A meta-analysis was conducted by Salari et al (2020) by scanning articles on COVID-19 up to May 2020. According to the results obtained from this meta-analysis, the prevalence of stress in 5 studies with a total sample size of 9074 is obtained as 29.6% (95% confidence limit: 24.3–35.4); the prevalence of anxiety in 17 studies with a sample size of 63,439 as 31.9% (95% confidence interval: 27.5–36.7), and the prevalence of depression in 14 studies with a sample size of 44,531 people as 33.7% (95% confidence interval: 27.5–40.6)

The Fear of COVID-19 Scale developed by Ahorsu et al. (2020) was used in the two studies mentioned below. It is seen that the average fear scores are 19,06 in women and 16,99 in men. It is seen that the findings are consistent with the findings of this study.

In the findings of the study conducted by Bakioğlu, Korkmaz, and Ercan (2020), the relationship between descriptive variables and fear of COVID-19 was examined first. According to the findings, fear of COVID-19 was significantly higher in women than in men, and those with chronic diseases were significantly higher than those without any chronic diseases.

According to Ay, Oruç, and Özdogru (2021) study, females reported higher CORPD scores than men in Turkey. Similarly, females had higher CORPD scores than males in the original research of the scale (Feng et al., 2020).

It is seen that the findings obtained from all three studies mentioned above are consistent with the findings of this study.

Considering the results obtained from studies on anxiety and depression, it is seen that the rates of anxiety and depression are higher in women than in men: On the Website (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3135672/) one of the most widely documented findings in researches demonstrating anxiety levels by gender is that women are significantly more likely than men to develop an anxiety disorder throughout the lifespan. While the lifetime rates of anxiety disorders for women is 33,3%, it is 22,0% for men (McLean, C. P., Asnaani, A., Brett T. b, Hofmann, S. G., 2011). National Comorbidity Survey (NCS, fielded between 1990 and 1992) found that the lifetime prevalence of any anxiety disorder is 30,5% for females and %19,2 for males. Another study suggests that women have two to three times higher lifetime risk for generalized anxiety disorder than men (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4765378/#R20).

In a survey conducted by Tunay and Soygüt (2009) on university students, the average score of 659 female university students on Beck Anxiety Scale was 17,13 and it was 13,76 for male students. Another study conducted by Deveci, Çalmaz, Açık (2012) on university students demonstrated that 289 female students had an average score of 46,94 on the Continuous Anxiety Scale and it was 43,54 for male students.

All studies on anxiety demonstrate that the prevalence rate of anxiety disorders for women is higher than men and the prevalence rate of depressive disorders for women is also greater in comparison to men. These findings seem to be similar to those obtained from the Covid-19 Anxiety Scale.

CR and AVE coefficients and correlation coefficient between subgroups were calculated for each dimension of the COVID-19 Anxiety Scale to analyse internal consistency and reconfirm its reliability. It is also consistent with the results of other studies conducted on anxiety. In light of all these findings, the COVID-19 Anxiety Scale appears to be a reliable tool that can be used to measure COVID-19 Anxiety.

KORONAVİRÜS (COVID-19) KAYGI ÖLÇEĞİ[1] Değerli Katılımcı, aşağıda sorular KORANAVİRÜSÜN insanların duygu, düşünce ve davranışları ve genel alışkanlıkları üzerindeki etkisini ölçmek için hazırlanmıştır. Lütfen her bir maddeyi okuyunuz ve sizin için en doğru olan seçeneği işaretleyiniz (X).					
1: Her zaman, 2: Sıklıkla, 3: Zaman zaman, 4: Ara sıra 5: Hiçbir zaman					
1.Koronavirüse yakalanabileceğimi düşünmek beni endişelendiriyor	1	2	3	4	5
2.Koronavirüse yakalanmaktan korkuyorum	1	2	3	4	5
3.Koronavirüs bulaşabileceğini düşününce gerginlik yaşıyorum	1	2	3	4	5
4.Medyada (gazete, tv ve internet) koronavirüs haberleri beni endişelendiriyor	1	2	3	4	5
5. Koronavirüs bulaşır diye kapalı yerlere (AVM, market vb) girmekten korkuyorum .	1	2	3	4	5
6.Koronavirüse yakalanarak ölmekten korkuyorum	1	2	3	4	5
7.Dışardan gelen yakınlarımın koronavirüs bulaştırmalarından endişeleniyorum	1	2	3	4	5
8.Koronavirüs bulaşır diye toplu taşım araçlarına binmekten korkuyorum	1	2	3	4	5
9.İnsanlar bana yaklaşınca tedirgin oluyorum	1	2	3	4	5
10.Dışardan gelen şeylerle (yiyecek, giyecek vb) koronavirüs bulaşır diye korkuyorum	1	2	3	4	5
11.Koronavirüs yüzünden yakınlarımı kaybetmekten korkuyorum	1	2	3	4	5
12.Maskesiz dolaşan insanlara kızıyorum	1	2	3	4	5
13.Koronavirüs bulaşır diye misafir kabul etmiyorum	1	2	3	4	5
14.Koronavirüsü bulaşır diye etkinliklere katılmıyorum	1	2	3	4	5
15.Koronavirüs bulaşır diye toplu taşım araçlarına binmiyorum	1	2	3	4	5
16.Koronavirüs bulaşır diye dışarda maske ve mesafeye dikkat ediyorum	1	2	3	4	5
17. Koronavirüsü bulaşır diye dışarı çıkamıyorum	1	2	3	4	5
18. Dışardan gelince giysilerimi çıkarıp çamaşır makinasına atıyorum	1	2	3	4	5
19.Dışardan gelince bütün bedenimi tekrar tekrar yıkıyorum, kaygım yine de azalmıyor	1	2	3	4	5
20. Koronavirüsten korunmak için dışardan gelen şeyleri (yiyecek, giyecek vb) tekrar tekrar yıkıyorum	1	2	3	4	5
21.Koronavirüs yüzünden uyuduğumda sürekli kabuslar görüyorum	1	2	3	4	5
22- Koronavirüs korkusu ile uyuyamıyorum	1	2	3	4	5

[1] Ölçeği geliştirenler: Assist. Prof. Dr, CIIP Muzaffer Şahin ve Assist. Prof. Dr. Didem Tetik Küçükelçi Ölçek soruları bilimsel çalışmalarda referans gösterilerek kullanılabilir.

Scoring:

The rating scores of the Likert scale, which are (4) Always, (3) Often, (2) Sometimes, (1) Rarely, (0) Never, were used as the basis for scoring. According to this, the highest score that can be got on the scale is 88, and the lowest is 0,

Covid Anxiety	**Score**
No Anxiety	If score ≤17
Less Anxiety	Score 18-35
Normal anxiety	Score 36-53
High anxiety	Score 54-71
Very high anxiety	Score≥72

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