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Development and Psychometric Evaluation of COVID-19 Distress Scale

COVID-19 Psikolojik Zorlanma Ölçeği'nin Geliştirilmesi ve Psikometrik Özelliklerinin Değerlendirilmesi

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Abstract

Recent findings indicate that the COVID-19 outbreak is associated with high distress levels. The present study reports the development and psychometric evaluation of the COVID-19 Distress Scale, a fourteen-item self-report measure assessing anxiety, threat perception, and hopelessness related to COVID-19. In Study 1, 626 individuals completed the COVID-19 Distress Scale and established measures of mental health. Exploratory factor analysis suggested a three-factor structure, consisting of anxiety, threat perception, and hopelessness regarding COVID-19. The COVID-19 Distress Scale was internally consistent, had test-retest reliability, concurrent, divergent, and predictive validity. In Study 2, 548 participants completed the COVID-19 Distress Scale. Confirmatory factor analysis supported the three-factor structure of the scale. These results suggest that the COVID-19 Distress Scale is a robust and multidimensional measure for assessing COVID-19 related distress.
Keywords: Coronavirus, pandemic, anxiety, threat perception, hopelessness.

Öz

Güncel araştırmalar COVID-19 salgınının yüksek psikolojik sıkıntı düzeyi ile ilişkili olduğuna işaret etmektedir. Bu çalışmada, COVID-19'a ilişkin kaygı, tehdit algısı ve umutsuzluğu değerlendiren on dört maddelik özbildirime dayalı bir ölçüm aracı olan COVID-19 Psikolojik Zorlanma Ölçeği'nin geliştirilmesi ve psikometrik özelliklerinin değerlendirmesi amaçlanmıştır. Bu amaç doğrultusunda yürütülen birinci araştırmada, 626 katılımcıdan COVID-19 Psikolojik Zorlanma Ölçeği'ni ve diğer ruh sağlığı ölçüm araçlarını yanıtlaması istenmiştir. Açımlayıcı faktör analizi sonuçları, ölçeğin COVID-19'a ilişkin kaygı, tehdit algısı ve umutsuzluktan oluşan üç faktörlü bir yapıya sahip olduğunu ortaya koymuştur. Ölçeğin istenilen iç tutarlık, test-tekrar test güvenilirliği, bileşen, ayrışan ve yordayıcı geçerlik değerlerine sahip olduğu görülmüştür. İkinci araştırmada, 548 katılımcı COVID-19 Psikolojik Zorlanma Ölçeği'ni yanıtlamıştır. Doğrulayıcı faktör analizi sonuçları, ölçeğin üç faktörlü yapısını desteklemiştir. Bu bulgular,

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COVID-19 Psikolojik Zorlanma Ölçeği'nin COVID-19'a ilişkin psikolojik sıkıntıyı değerlendirmek için kullanabilecek çok boyutlu, geçerli ve güvenilir bir ölçüm aracı olduğuna işaret etmektedir.
Anahtar sözcükler: Koronavirüs, pandemi, kaygı, tehdit algısı, umutsuzluk.

Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes the coronavirus disease (COVID-19) was first detected in December 2019 in China. The virus spread quickly to the Middle East, Europe, and North America. The World Health Organization (WHO) announced the COVID-19 outbreak as a pandemic on March 11, 2020. In addition to its impact on physical health, the pandemic negatively affects mental health (American Psychiatric Association, 2020). Recent findings suggest that many people experience anxiety and stress in response to the pandemic (e. g. Wang et al., 2020; Rossi et al., 2020). Loneliness caused by social isolation and insecurity due to economic difficulties may lead to fear, sadness, and hopelessness. The psychological effects of the COVID-19 can be disruptive, long-lasting, and require immediate attention by mental health professionals (Brooks et al., 2020).

Taylor (2019) suggests that anxiety is a precursor of pandemic-related safety behaviors or the lack thereof. For instance, during the H1N1 outbreak in 2009, high anxiety levels were positively associated with a higher likelihood of adopting hygiene behaviors such as handwashing and disinfecting doorknobs (Rubin et al., 2009). Excessive anxiety might lead to the misinterpretation of minor complaints as an indication of severe sickness, over-use of safety behaviors, too much reassurance-seeking, and overutilization of medical resources. On the other hand, low levels of anxiety might result in the neglect of precautions. All in all, a certain amount of anxiety in response to the outbreak can be adaptive for survival, while excessive anxiety might result in functional impairment at the individual and societal levels. Furthermore, cognitive models of anxiety suggest that higher levels of threat perception might lead to higher levels of anxiety and safety behaviors, while anxiety, in turn, might increase the perception of threat (Clark & Beck, 2011). Recent studies showed that higher levels of perceived threat of coronavirus for oneself and loved ones are associated with increased fear of coronavirus and anxiety symptoms (Mertens et al., 2020; Shevlin et al., 2020). Considering the central role of threat perception in the development and maintenance of psychological disorder and cognitive-behavioral models of anxiety disorders, its relation to COVID-19 should be investigated in more detail. In addition to anxiety and high threat perception, hopelessness is one of the most prominent effects of the COVID-19 (Trnka & Lorencova, 2020). A recent study indicated that people feel five times more hopeless than before during the pandemic (Twenge & Joiner, 2020). Therefore, assessing hopelessness related to COVID-19 might contribute to a more thorough assessment of COVID-19 related distress.

Recently, a number of studies have been conducted to develop measures of COVID-19 related fear and stress (e. g., Ahorsu et al., 2020; Taylor et al., 2020). Even though the use of the aforementioned scales contributed to the clinical psychology literature on COVID-19, these measures did not address threat perception and hopelessness, which might constitute a significant deficiency in the evaluation of COVID-19 related distress. Assessing anxiety, perception of threat, and hopelessness regarding COVID-19 might facilitate the identification of high-risk groups and the provision of psychological support and treatment. Therefore, the goal of this study was to develop a short robust scale assessing anxiety, perception of threat, and hopelessness related to COVID-19. We developed the COVID-19 Distress Scale (CDS) and conducted two studies to investigate its psychometric properties.

Study 1

Method

Participants

Six hundred twenty-six individuals participated in Study 1. Participants who were diagnosed with a mental disorder and receiving psychotherapy or pharmacotherapy were excluded from the sample. The final sample consisted of 596 individuals (415 females, 69.6%) with a mean age of 34.38 years (*SD* = 14.48, range 18–73). The mean years of education were 13.36 (*SD* = 2.56). The occupational characteristics of the participants were as follows: 36.9% of participants were students (*n* = 220), 8.1% worked in healthcare (*n* = 48), 14.3% worked from their office (*n* = 85), 24.7% worked from home due to the pandemic (*n* = 147), 14.9% were unemployed or homemaker (*n* = 89), and 1.2% have lost their jobs due to the pandemic (*n* = 7). Participants who shared their household with a baby under the age of 3 or a pregnant woman consisted of 6.9% of the sample (*n* = 41), and 16.9% lived with an adult older than 65 (*n* = 101). Participants who were infected by the coronavirus formed 0.5% of the sample (*n* = 3), 1.1% had an infected family member (*n* = 8), and 23.5% had a friend or relative who got infected (*n* = 140). We used a subsample of 249 individuals (169 females, 67.9%) to assess the test-retest reliability of the CDS. The mean age of the participants in the subsample was 31.55 (*SD* = 14.37).

Procedure

We aimed to create a robust multidimensional scale assessing COVID-19-related anxiety, perception of threat, and hopelessness. To that aim, researchers with clinical experience in assessing and treating individuals with anxiety disorders, somatization, and OCD generated a pool of 19 items. The item pool was based on clinical observation and relevant literature. The term "coronavirus" was used in the scale to refer to SARS-CoV-2 and COVID-19 since the respondents are more familiar with this expression. Coronavirus anxiety subscale items were designed to capture various aspects of the phenomena, including worry, preoccupation, rumination, checking bodily signs, and checking the media (e.g., *"I am very concerned about catching the coronavirus."*). Perception of threat subscale included items assessing the perceived likelihood of contracting the virus and perceived transmissibility of the virus (e.g., *"I believe that I am very likely to become infected with the coronavirus"*). Hopelessness due to the COVID-19 subscale included items regarding the hopelessness and uncertainty about the future and thoughts about the controllability of the virus (e.g., *"I believe that my future is dark because of the coronavirus"*). The participants were asked to indicate to what extent they agreed with each statement on a 5-point Likert scale ranging from 1 ("not at all") to 5 ("completely").

The study announcement was accompanied by a link to surveymonkey.com, where voluntary participants could fill out the online self-report battery of questionnaires that includes the demographic information form, the CDS and measures of mental health and well-being. Data were collected between May 20 and May 30, 2020. All participants consented before beginning the survey. 249 participants completed the CDS once again 2 weeks later.

Materials

Obsessive-Compulsive Inventory-Revised (OCI-R; Foa et al., 2002)

The OCI-R is an 18-item, self-report measure assessing OCD symptoms. The OCI-R has six-factor dimensions, including washing, checking, ordering, obsessing, hoarding, and neutralizing. Previous studies showed that the OCI-R has good psychometric properties (Foa et al., 2002). The Turkish adaptation of the OCI-R had excellent psychometric properties (Yorulmaz et al., 2015). The Cronbach's alpha value was 0.89 in the present study.

Short Health Anxiety Inventory (SHAI; Salkovskis et al. 2002)

The SHAI is an 18-item self-report measure assessing the severity of health anxiety. The SHAI has a two-factor structure measuring anxiety about health and negative consequences of having an illness. Previous studies showed that the SHAI has good reliability and validity (Alberts et al., 2013). The Turkish adaptation of the SHAI also had good psychometric properties (Aydemir et al., 2013). The Cronbach's alpha value for the present study was 0.86.

Depression Anxiety Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995)

The DASS-21 is the short form of the 42-item DASS. It consists of three self-report scales measuring depression, anxiety, and stress. DASS-21 demonstrated good reliability and validity (Henry & Crawford, 2005). The reliability and validity of the Turkish adaptation of the scale were high (Yıldırım et al., 2019). Cronbach's alpha values for the current study were 0.89 for depression, 0.78 for anxiety, and 0.82 for stress subscales.

Obsessive-Beliefs Questionnaire-20 (OBQ-20; Obsessive Compulsive Cognitions Working Group, 2001; Moulding et al., 2011)

The OBQ-20 is the 20-item short form of the OBQ-44, a self-report inventory measuring beliefs related to OCD. The OBQ-20 has four subscales: overestimation of threat, inflated responsibility, importance, and control of thoughts, perfectionism, and intolerance of uncertainty. The OBQ-20 and its Turkish adaptation demonstrated good psychometric properties (Moulding et al., 2011; Yorulmaz et al., 2019). The Cronbach's alpha value for the present study was 0.86.

Resilience Scale for Adults (RSA; Friborg et al., 2003; Hjemdal et al., 2011)

The RSA is a 33-item self-report measure assessing the capacity to cope with stressful experiences and overcome adversity. RAS's reliability and validity have been established (Hjemdal et al., 2011). The Turkish version of the RAS has a similar factor structure and good psychometric properties (Basım & Çetin, 2011). The Cronbach's alpha value for the present study was 0.89.

Positive Negative Affect Schedule (PANAS; Watson et al., 1988)

The PANAS is a 20-item self-report scale consisting of 10-item Positive Affect and 10-item Negative Affect subscales. PANAS has good psychometric properties (Watson et al., 1988). The Turkish adaptation of the scale has comparable psychometric properties to those of the original version (Gençöz, 2000). The Positive Affect subscale used in the current study had a Cronbach's alpha coefficient of 0.90.

Statistical Analysis

Since the subscales were expected to correlate, a principal component analysis with promax rotation was conducted. Cronbach's Alpha values were calculated to assess the internal consistency, while means, standard deviations, correlation, and regression coefficients were calculated to assess the scale's concurrent and predictive validity and test-retest reliability. All statistical analyses were conducted using SPSS version 26.0.

Results

Factor Structure

We conducted a principal component analysis with promax rotation with 19 items to assess the scale's factor structure. Eigenvalues and scree plot graph suggested a three-factor solution, which explained 50.88% of the variance. Examination of the items with higher factor loadings indicated that three components represented anxiety, overestimation of threat, and hopelessness regarding COVID-19. We excluded 3 items that substantially loaded on more than one factor and 2 items with the weakest loadings to their respective components. We conducted another principal component analysis with promax rotation with the final version of the scale consisting of 14 items. Results yielded a three-factor solution accounting for 60.58% of the variance. Items of the CDS and factor loadings are presented in Table 1. Intercorrelations among the subscales were small to moderate, suggesting that three subscales tap on distinct yet related contents (see Table 2).

Table 1. Factor Loadings of the COVID-19 Distress Scale from Exploratory Factor Analysis with Promax Rotation (N = 596)

Item	Factor 1	Factor 2	Factor 3
I cannot stop following the news about the coronavirus on TV.	.96	-.29	-.25
I constantly read coronavirus-related content on the internet/social media.	.91	-.15	-.16
I am very afraid of dying because of the coronavirus.	.55	.22	.11
I am very concerned about catching the coronavirus.	.54	.22	.18
I think that any minor health issue I experience is due to the coronavirus.	.53	.09	.19
Even when there is no one coming to the house from outside, it feels like the entire house is infected.	.53	.10	.00
I cannot stop thinking, "What if the coronavirus infects my loved ones?"	.51	.17	.19
I am very afraid of losing people in my immediate circle because of the coronavirus.	.48	.24	.19
I feel that my future is uncertain because of the coronavirus.	-.09	.97	-.10
I believe that my future is dark because of the coronavirus.	-.05	.94	-.12
I am worried about my future because of the coronavirus.	.00	.86	-.04
I believe that I am very likely to become infected with the coronavirus.	-.08	-.15	.94
I believe that people in my immediate circle are very likely to become infected with the coronavirus.	-.18	.02	.82
I believe that I am more likely to catch the coronavirus than other people are.	.09	-.17	.73
Eigenvalue	5.39	1.71	1.39
Total % of variance	38.51	12.18	9.90

Table 2. Intercorrelations, Cronbach's Alpha Coefficients, Means, and Standard Deviations for COVID-19 Distress Scale Subscales

	Study 1 (N = 596)			Study 2 (N = 520)		
	CDS Anxiety	CDS Hopelessness	CDS Threat perception	CDS Anxiety	CDS Hopelessness	CDS Threat perception
CDS Anxiety	**.85**	-	-	**.85**	-	-
CDS Hopelessness	.49**	**.86**	-	.56**	**.87**	-
CDS Threat perception	.44**	.21**	**.71**	.43**	.21**	**.75**
M	2.57	2.71	2.59	2.57	2.82	2.81
SD	0.78	1.00	0.78	0.74	0.98	0.79

Note. Cronbach's alpha coefficients are bold and placed on the diagonal.
** $p > 0.01$

Internal Consistency

Reliability coefficients for the total scale and the subscales were examined. Cronbach alpha coefficients for the total scale were 0.87 in Study 1. Cronbach alpha coefficients for three subscales are presented in Table 2.

Test-retest Reliability

Test-retest reliability was .82 for the total scale, .84 for the anxiety subscale, .60 for the hopelessness subscale, and .66 for the perception of threat subscale across a 2-week period.

Concurrent and Divergent Validity

Zero-order correlations between the CDS and measures of OCD symptoms, obsessive beliefs, health anxiety, depression, anxiety, stress, positive affect, and resilience were calculated. As expected, the CDS had significant positive correlations with obsessive-compulsive symptoms, obsessive beliefs, health anxiety, depression, anxiety, and stress (Table 3). Also, the CDS had significant negative correlations with positive affect and resilience.

Table 3. Intercorrelations between CDS, OCI-R, OBQ-TRIP, SHAI, DASS-21, PANAS Positive Affect and RES Scores (N = 596)

	CDS	CDS Anxiety	CDS Hopelessness	CDS Threat perception
OCI-R	**.40****	.41**	.26**	.15**
Washing	.40**	.43**	.22**	.18**
Obsessing	.32**	.30**	.29**	.11**
Hoarding	.24**	.16**	.19**	.08
Ordering	.19**	.08	.10*	.07
Checking	.34**	.19**	.20**	.18**
Neutralizing	.25**	.19**	.21**	.03
OBQ-20	**.30****	.16**	.18**	.14**
Perfectionism	.20**	.10*	.12**	.10
Threat	.34**	.24**	.25**	.21**
Responsibility	.21**	.08	.9*	.04
Importance of thought	.21**	.10*	.12**	.09*
SHAI	**.39****	.33**	.34**	.23**
DASS Depression	**.27****	.35**	.35**	.09*
DASS Anxiety	**.39****	.31**	.32**	.24**
DASS Stress	**.38****	.37**	.38**	.19**
PANAS Positive affect	**-.10***	-.22**	-.21**	.03
RSA	**-.08***	-.21**	-.21**	-.01

Note. Correlations among total scale scores are in bold. CDS: COVID-19 Distress Scale; OCI-R: Obsessive-Compulsive Inventory-Revised; OBQ-TRIP: Obsessive Beliefs Questionnaire-TRIP; SHAI: Short Health Anxiety Inventory; DASS: Depression Anxiety Stress Scale; PANAS: Positive Negative Affect Scale; RSA: Resilience Scale for Adults

$^{*}p > 0.05$, $^{**}p > 0.01$

We conducted two hierarchical regressions to assess the predictive validity of the CDS. In the first model, the dependent variable was general anxiety. Health anxiety, obsessive-compulsive symptoms, and depression were entered in the first step, and COVID-19 related distress was entered in the second step. COVID-19 related distress significantly predicted general anxiety, when controlling for other measures of mental health (see Table 4).

Table 4. Regression Coefficients for DASS Anxiety Regressed on OCI-R, SHAI, and CDS (N = 596)

	β	***t***	***R^2***	***R^2 change***	***F***
Step 1			.41***	.41***	137.157
OCI-R	.16	4.55***			
SHAI	.20	5.87***			
DASS Depression	.47	13.67***			
Step2			.43***	.02***	111.664
CDS	.16	4.60***			

Note. OCI-R: Obsessive-Compulsive Inventory-Revised; SHAI: Short Health Anxiety Inventory; DASS: Depression Anxiety Stress Scale; CDS: COVID-19 Distress Scale.
***$p < .001$

In the second hierarchical regression analysis, the dependent variable was health anxiety. In the first step obsessive-compulsive symptom level, general anxiety and depression were added to the model, followed by COVID-19 related distress in the second step (see Table 5). The CDS was a significant predictor of health anxiety, over and above other measures of mental health.

Table 5. Regression Coefficients for SHAI Regressed on OCI-R, DASS Depression, and DASS Anxiety (N = 596)

	β	***t***	***R^2***	***R^2 change***	***F***
Step 1			.19***	.19***	46.629
OCI-R	.20	4.88***			
DASS Depression	.07	1.48			
DASS Anxiety	.28	5.87***			
Step2			.24***	.05***	46.050
CDS	.25	6.00***			

Note. SHAI: Short Health Anxiety Inventory; OCI-R: Obsessive-Compulsive Inventory-Revised; DASS: Depression Anxiety Stress Scale; CDS: COVID-19 Distress Scale; SHAI: Short Health Anxiety Inventory.
***$p < .001$

Study 2

Method

Participants

The sample of Study 2 consisted of 548 adults. Participants with a mental disorder receiving psychotherapy or pharmacotherapy were excluded from the sample. The final sample included 520 individuals (354 females, 68.1%). The mean age was 35.79 (*SD* = 14.80, age range: 18–81 years). The mean years of education was 14.46 (*SD* = 2.47). The occupational characteristics of the participants were as follows: 28.8% were students (*n* = 150), 32.5% worked from their office (*n* = 169), 17.1% worked from home due to the pandemic (*n* = 89), 10.8% were retired (*n* = 56), 10% were unemployed or homemaker (*n* = 52) and 0.8% have lost their jobs due to the pandemic (*n* = 4). A small percentage of participants (7.5%, *n* = 39) lived with a baby under the age of 3 or a pregnant woman, and 14.8% shared their household with an adult older than 65 (*n* = 77). Four participants had contracted COVID-19 (0.8%), 1.9% had a family member who had contracted COVID-19 (*n* = 10), and 29.8% had a friend or relative who got infected (*n* = 155).

Procedure

The study was announced along with a link to surveymonkey.com, where voluntary participants filled out the demographic information form and the CDS. Data were collected between June 26 and July 13, 2020. All participants consented prior to beginning the survey.

Statistical Analysis

We conducted a confirmatory factor analysis to determine the model fit using AMOS Version 23.

Results

Stability of Factor Structure

The 3-factor model, obtained through the exploratory factor analysis in Study 1, was tested through confirmatory factor analysis with the sample of Study 2. Three subscales of the CDS were represented by three latent factors and allowed to covary. The initial model did not have a good fit to the data (χ^2/df = 5.677, CFI = .90, NFI = .88, RMSEA = .095 [90% confidence interval: 0.086−0.104], SRMR = 0.067, AIC = 510,116). Modification indices suggested that adding an error covariance between items 1 and 2 could improve the model (χ^2 = 113.53, p<0.001). Examination of the contents of item 1 (*I cannot stop following the news about the coronavirus on TV*.) and item 2 (*I constantly read coronavirus-related content on the internet/social media*.) indicated that they both assessed checking the news about the coronavirus but through different mediums. Hence, their errors were allowed to covary and the model's re-specification led to a significant improvement of the model fit (χ^2/df = 4.2027 , CFI = .93, NFI = .91, RMSEA = .076 [90% confidence interval: 0.067−0.086], SRMR = 0.056, AIC = 385,965). Another modification suggested by modification indices was the addition of an error covariance (χ^2 = 30.35, p<0.001) between item 7 (*I cannot stop thinking, "What if the coronavirus infects my loved ones?"*) and item 8 (*I am very afraid of losing people in my immediate circle because of the coronavirus.*). Since the contents of items 7 and 8 were both related to fear for loved ones due to the pandemic, a correlated residual was added to the model. Final model showed a good fit to the data: χ^2/df = 3.581, CFI = .94, NFI = .92, RMSEA = .071 (90% confidence interval: 0.061−0.080), SRMR = 0.055, and AIC = 351,860.

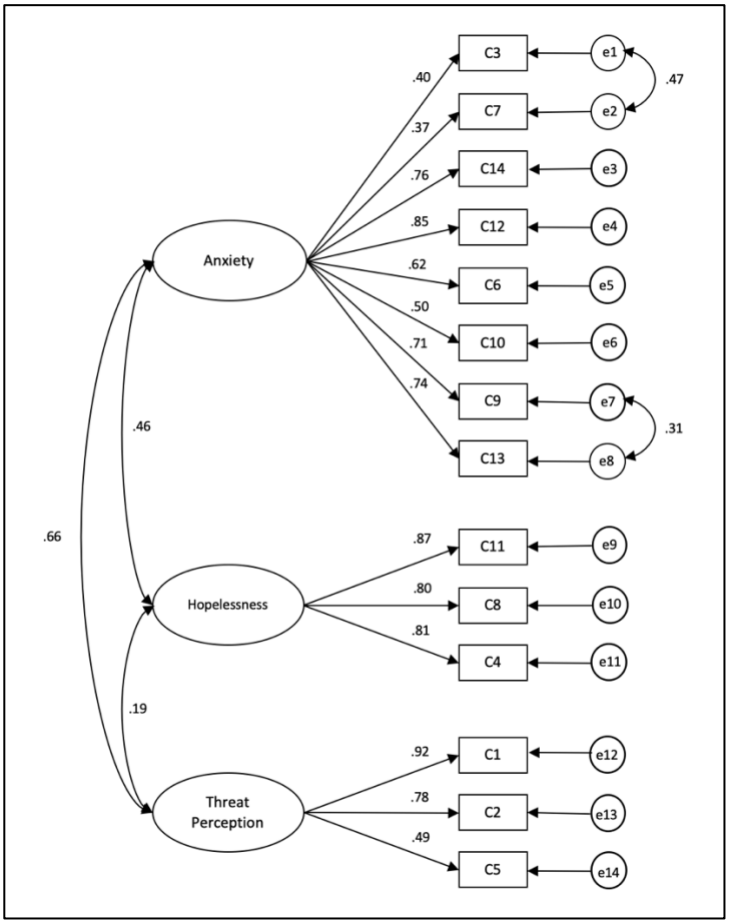

Figure 1. Confirmatory factor analysis model

Internal Consistency

Cronbach alpha coefficient for the total scale was .87 in Study 2. Cronbach alpha coefficients for the subscales are presented in Table 2.

Discussion

This study's main goal was to develop a robust scale assessing psychological distress associated with COVID-19 and evaluate its psychometric properties. Analyses revealed that the CDS consists of 14 items that tap three factors: anxiety, threat perception, and hopelessness related to COVID-19. Previous research showed that people might experience a significant amount of distress as a result of the pandemic (e.g., American Psychiatric Association, 2020). Other studies indicated that people who feel more vulnerable to becoming infected by the coronavirus are more anxious and vulnerable to psychological problems (Mertens et al., 2020; Shevlin et al., 2020). Furthermore, many people experience hopelessness and despair due to the pandemic (Twenge & Joiner, 2020). In line with these studies, our results pointed out that anxiety, threat perception, and hopelessness were unique components of COVID-19 distress.

Previous research showed that pandemics are associated with distress and activate fears of contamination and illness (Wang et al., 2020; Wheaton et al., 2012). Therefore, we examined associations between COVID-19 related distress, depression, anxiety, stress, health anxiety, OCD symptoms, obsessive beliefs, positive affect, and resilience. Results indicated that COVID-19 related distress was positively associated with depression, anxiety, stress, and OCD symptoms (e.g., washing symptoms). Increased emphasis on hygiene and frequency of cleaning might have led to the heightening of contamination-related

obsessive-compulsive tendencies. Obsessive beliefs, especially overestimation of threat, were also significantly correlated with COVID-19 related distress. Since threat perception is an important component of anxiety in general, this finding was in line with our expectations. COVID-19 distress was also associated with health anxiety, which is related to overestimating the probability and negative consequences of becoming ill (Salkovskis et al. 2002). Consistent with previous research (Wheaton et al., 2012), our results indicated that individuals with higher pandemic-related distress might experience higher levels of anxiety about becoming ill. On the other hand, COVID-19 related distress was negatively associated with positive affect and resilience. All in all, small to moderate correlations suggested that the CDS captures a construct related to but also distinct from general distress, health anxiety, and obsessive-compulsive tendencies.

The predictive validity of the CDS was investigated with two hierarchical regression analyses. The CDS was a significant predictor of general anxiety over and above other mental health measures. The CDS also significantly predicted health anxiety after controlling for the effects of other measures of mental health. However, considering the study's cross-sectional nature, individuals with health concerns might also be predisposed to worrying more about COVID-19. Even though further longitudinal studies are needed to clarify the direction of this relationship, health anxiety needs to be carefully monitored in individuals with high COVID-19 related distress.

To our knowledge, the CDS is the first scale assessing threat perception and hopelessness in the context of the COVID-19 pandemic. However, our study also had several limitations. First, the study was conducted using self-report measures. This might have led to inflation of the shared variance between variables. Second, the correlational nature of the study prevented making causal inferences about the relationships between variables. Further studies with different designs will contribute to the assessment of pandemic-related distress. Third, test-retest reliability of hopelessness and perception of threat subscales were in the moderate range (.60 and .66, respectively). Since the study was conducted in May 2020, when the pandemic was at its peak; various health-related, work-related, and economic conditions may have changed, affecting and fluctuating COVID-19 related distress level of the participants. In addition, the study was conducted with healthy adults. Future research with clinical samples, high-risk groups such as the elderly, individuals with chronic health problems, and healthcare workers is necessary to establish the generalizability of these findings. Moreover, the fact that our item pool contains only 19 items is a limitation in terms of evaluating the face validity of CDS. Finally, since the data were collected in May 2020, it is important for future studies to evaluate the psychometric properties of the CDS in the post-pandemic context.

Notwithstanding these limitations, our results have clinical implications. Individuals experiencing high COVID-19 related distress might be vulnerable to developing anxiety disorders. Assessment of anxiety, threat perception, and hopelessness related to COVID-19 might facilitate the identification of problematic mental health areas. On the other hand, individuals susceptible to disorders such as health anxiety or OCD might also be vulnerable to excessive COVID-19 related distress. The monitoring of pandemic fears and functional impairments might help clinicians take precautions or interfere with cognitive-behavioral techniques such as psychoeducation, cognitive restructuring, and exposure therapy.

Conclusion

In conclusion, the present study demonstrated that the CDS is a brief multidimensional scale assessing distress associated with COVID-19. Findings indicated that the CDS consisted of a three-factor structure: anxiety, threat perception, and hopelessness related to COVID-19. The three-factor model had sound psychometric properties. The present study provides researchers and practitioners with a robust instrument that can facilitate the identification of high-risk groups and the provision of psychological support and treatment.

Authorship Contribution:	Conceptualization: ET, Mİ; Data curation: ET; Formal analysis: ET; Investigation: ET; Methodology: ET, Mİ; Project administration: ET, Mİ; Resources: ET; Writing-original draft: ET, EÜ; Writing-review and editing: Mİ, ABH.
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References

Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The fear of COVID-19 scale: development and initial validation. *International Journal of Mental Health and Addiction*, 1-9. Advanced online publication. https://doi.org/10.1007/s11469-020-00270-8

Alberts, N. M., Hadjistavropoulos, H. D., Jones, S. L., & Sharpe, D. (2013). The Short Health Anxiety Inventory: A systematic review and meta-analysis. *Journal of Anxiety Disorders*, *27*(1), 68-78. https://doi.org/10.1016/j.janxdis.2012.10.009

American Psychiatric Association (2020) New Poll: COVID-19 Impacting Mental Well-Being. Available at https://www.psychiatry.org/newsroom/news-releases/new-poll-covid-19-impacting-mental-well-being-americans-feeling-anxious- especially-for-loved-ones-older-adults-are-less-anxious (accessed 3 August 2020).

Aydemir, O., Kirpinar, I., Tülay, S., Uykur, B., & Cengisiz, C. (2013). Reliability and validity of the Turkish version of the Health Anxiety Inventory. *Nöro Psikiyatri Arşivi*, *50*(4), 325-331. https://doi.org/10.4274/npa.y6383

Basim, H. N., & Cetin, F. (2011). The reliability and validity of the Resilience Scale for Adults-Turkish Version. *Turkish Journal of Psychiatry*, *22*(2), 104-114.

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, *395*, 912-920. https://doi.org/10.1016/S0140-6736(20)30460-8

Clark, D. A., & Beck, A. T. (2011). *Cognitive therapy of anxiety disorders: Science and practice*. Guilford Press.

Foa, E. B., Huppert, J. D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., & Salkovskis, P. M. (2002). The Obsessive-Compulsive Inventory: Development and validation of a short version. *Psychological Assessment*, *14*(4), 485-496. https://doi.org/10.1037/1040-3590.14.4.485

Friborg, O., Hjemdal, O., Rosenvinge, J. H., & Martinussen, M. (2003). A new rating scale for adult resilience: What are the central protective resources behind healthy adjustment?. *International Journal of Methods in Psychiatric Research*, *12*(2), 65-76. https://doi.org/10.1002/mpr.143

Gençöz, T. (2000). Positive and Negative Affect Schedule: A study of validity and reliability. *Türk Psikoloji Dergisi*, *15*(46), 19-28.

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, *44*(2), 227-239. https://doi.org/10.1348/014466505X29657

Hjemdal, O., Friborg, O., Braun, S., Kempenaers, C., Linkowski, P., & Fossion, P. (2011). The Resilience Scale for Adults: Construct validity and measurement in a Belgian sample. *International Journal of Testing*, *11*(1), 53-70. https://doi.org/10.1080/15305058.2010.508570

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, *33*(3), 335-343. https://doi.org/10.1016/0005-7967(94)00075-U

Mertens, G., Gerritsen, L., Duijndam, S., Salemink, E., & Engelhard, I. M. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. *Journal of Anxiety Disorders*, *74*, 102258. https://doi.org/10.1016/j.janxdis.2020.102258

Moulding, R., Anglim, J., Nedeljkovic, M., Doron, G., Kyrios, M., & Ayalon, A. (2011). The Obsessive Beliefs Questionnaire (OBQ): Examination in nonclinical samples and development of a short version. *Assessment*, *18*(3), 357-374. https://doi.org/10.1177/1073191110376490

Obsessive Compulsive Cognitions Working Group. (2001). Development and initial validation of the obsessive beliefs questionnaire and the interpretation of intrusions inventory. *Behaviour Research and Therapy*, *39*(8), 987-1006. https://doi.org/10.1016/S0005-7967(00)00085-1

Rossi, R., Socci, V., Talevi, D., Mensi, S., Niolu, C., Pacitti, F., ... & Di Lorenzo, G. (2020). COVID-19 pandemic and lockdown measures impact on mental health among the general population in Italy. An N= 18147 web-based survey. *MedRxiv*. Advance online publication. https://doi.org/10.1101/2020.04.09.20057802

Rubin, G. J., Amlôt, R., Page, L., & Wessely, S. (2009). Public perceptions, anxiety, and behaviour change in relation to the swine flu outbreak: cross sectional telephone survey. *British Medical Journal*, *339*, b2651. https://doi.org/10.1136/bmj.b2651

Salkovskis, P. M., Rimes, K. A., & Warwick, H. M. C. (2002). The Health Anxiety Inventory: development and validation of scales for the measurement of health anxiety and hypochondriasis. *Psychological Medicine*, *32*(5), 843-853. https://doi.org/10.1017/s0033291702005822

Shevlin, M., McBride, O., Murphy, J., Shevlin, M., Gibson Miller, J., Hartman, T. K., Levita, L., Mason, L., Martinez, A. P., Stocks, V. A., Bennett, K. M., Hyland, P., Karatzias, T., & Bentall, R. P. (2020). Anxiety, depression, traumatic stress, and COVID-19 related anxiety in the UK general population during the COVID-19 pandemic. *PsyArXiv Preprints.* Retrieved from https://psyarxiv.com/hb6nq

Taylor, S. (2019). *The psychology of pandemics: Preparing for the next global outbreak of infectious disease*. Cambridge Scholars Publishing.

Taylor, S., Landry, C., Paluszek, M., Fergus, T. A., McKay, D., & Asmundson, G. J. (2020). Development and initial validation of the COVID Stress Scales. *Journal of Anxiety Disorders*, 102232. https://doi.org/10.1016/j.janxdis.2020.102232

Trnka, R., & Lorencova, R. (2020). Fear, anger, and media-induced trauma during the outbreak of COVID-19 in the Czech Republic. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*(5), 546-549. https://doi.org/10.1037/tra0000675

Twenge, J., & Joiner, T. E. (2020). Mental distress among U.S. adults during the COVID-19 pandemic. *PsyArXiv Preprints.* Retrieved from https://psyarxiv.com/wc8ud

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, *17*(5), 1729. https://doi.org/10.3390/ijerph17051729

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063-1070. https://doi.org/10.1037//0022-3514.54.6.1063

Wheaton, M. G., Abramowitz, J. S., Berman, N. C., Fabricant, L. E., & Olatunji, B. O. (2012). Psychological predictors of anxiety in response to the H1N1 (swine flu) pandemic. *Cognitive Therapy and Research*, *36*(3), 210-218.

Yıldırım, A., Boysan, M., & Kefeli, M. C. (2018). Psychometric properties of the Turkish version of the Depression Anxiety Stress Scale-21 (DASS-21). *British Journal of Guidance & Counselling*, *46*(5), 582-595. https://doi.org/10.1080/03069885.2018.1442558

Yorulmaz, O., Güngör, D., & Gökdağ, C. (2019). The Obsessive Beliefs Questionnaire: Adaptation of Its Short Forms to the Turkish and Examination of Their Psychometric Properties. *Turkish Journal of Psychiatry*, *30*(3), 191-199. https://doi.org/10.5080/u23433

Yorulmaz, O., Inozu, M., Clark, D. A., & Radomsky, A. S. (2015). Psychometric Properties of the Obsessive-Compulsive Inventory-Revised in a Turkish Analogue Sample. *Psychological Reports*, *117*(3), 781-793. https://doi.org/10.2466/08.PR0.117c25z4