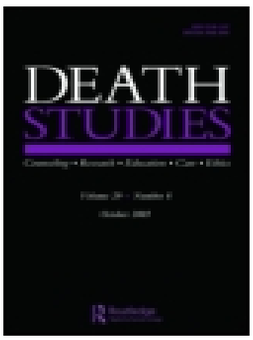

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Adaptation and evaluation of Turkish version of the fear of COVID-19 Scale

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ABSTRACT

We investigated the psychometric properties of the Fear of COVID-19 Scale in Turkish among a diverse group with a focus on the prevalence of coronavirus related fear across gender, age intervals, SES, chronic illness situation, and educational level. Based on a confirmatory factor analysis, the Fear of COVID-19 Scale had appropriate psychometric properties for utilization, including excellent goodness-of-fit indices, a Cronbach's alpha value of .86, and discriminant validity, as shown by a significant negative correlation with resilience. Furthermore, group comparison analyses revealed that women reported significantly higher fear of coronavirus. Additionally, individuals from middle SES reported significantly higher fear of coronavirus while the fear of coronavirus did not differ based on participants' educational level, socioeconomic status, and age level. Implications for mental health providers are discussed.

The novel coronavirus 2019 (COVID-19) pandemic has unfolded in an unprecedented manner. Between the first situation report (World Health Organization (WHO), 2020a) and the 91st situation report (World Health Organization (WHO), 2020b) of the World Health organization, within 90 days, the reported cases of COVID-19 drastically increased globally from 282 cases to 2,314,621 cases, representing an 820,687.59% increase. While only four countries were reported to be affected by coronavirus in the first situation report of the World Health Organization (WHO) (2020a), a total of 179 countries and 33 territories worldwide confirmed at least one case by 20 April 2020 (World Health Organization (WHO), 2020b). Additionally, the 91st report of the WHO revealed the official COVID-19 reported death toll to be 157,847 globally.

The first officially reported COVID-19 case in Turkey was on 10 March 2020. The numbers have escalated rapidly since then and have reached to 90,980 as of 20 April 2020 (Ministry of National Health, 2020), with a total of 2,140 deaths. The Turkish government urged citizens to stay at home except for necessities and ugencies, and a new lockdown was announced on 20 April urging citizens in the largest 30 provinces as well as a relatively smaller province with higher rates of coronavirus cases to stay at home between 22nd and 26 April 2020 (Ministry of the Interior, 2020). Additionally, the travel restriction in-and-out of these provinces was extended for an additional 15 days, as of April 18th. Currently, Turkey has the most confirmed COVID-19 cases outside of Europe and the U.S., leaving China and Iran behind (World Health Organization (WHO), 2020b).

To date, there is no particular estimation as to the duration of the pandemic. This uncertainty in conjunction with the highly infectious nature of the virus and misconceptions around coronavirus have disturbed millions of individuals around the world and can have a detrimental effect at individual and societal levels which may continue to be felt for years. Some of these adverse effects include depression, anxiety, traumatic stress (Zandifar & Badrfam, 2020), and fear of coronavirus (Ahorsu et al., 2020). These adverse conditions are exacerbated by the ubiquity of the COVID-19-related news in the press and social media (Arpaci et al., 2020). Additionally, researchers reported that individuals kept in quarantine experienced mental health issues, including anxiety, anger, PTSD, and confusion (Brooks et al., 2020). These adverse conditions were observed during previous pandemics, such as the SARS (Severe Acute Respiratory Syndrome) (Cheung et al., 2008). Recently, two papers reported COVID-19 related suicides, one in Bangladesh (Mamun & Griffiths, 2020) and another in India (Goyal et al., 2020). Additionally, a study examining Chinese medical staff revealed that 73.4% of the staff reported traumatic stress, half of the participants reported depression,

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and 44.7% reported generalized anxiety (Liu et al., 2020).

Attending to the psychosocial aspect of the COVID-19 is essential, as it is reasonable to assume potential psychological, social, and economic crises in the aftermath of the pandemic. To mitigate potential mental health issues, researchers (e.g. Xiang et al., 2020) recommended investigating the level of fear, worry, and helplessness associated with COVID-19. This is an important task, as high levels of fear may impede one's rational decision making in the process of reacting to coronavirus (Ahorsu et al., 2020). Mental health providers, such as counselors, psychiatrists, and psychologists, can play a pivotal role in addressing these psychological needs and helping individuals to cope with the pandemic. Nonetheless, due to the scope and ongoing impact of the COVID-19, current interventions predominantly focus on infection control, vaccine development, and controlling as well as eliminating the pandemic (Dong et al., 2020).

Though one of the reasons little attention has been given to the mental health aspect of coronavirus is its nature and ongoing impact, another potential reason appears to be the lack of psychometric measures targeting psychological disorders related to COVID-19. To bridge this gap, researchers all around the world have shown an increased interest in instrument development related to COVID-19. To date, mental health researchers have developed COVID-19-related screeners assessing fear (Ahorsu et al., 2020), anxiety (Lee, 2020), and phobia (Arpaci et al., 2020). To provide appropriate treatment for COVID-19, medical professionals use a COVID-19 test to determine whether or not one is indeed infected. When test results are positive, medical professionals then provide specific treatment. Similarly, for mental health professionals to accurately diagnose and appropriately treat psychological symptoms (e.g. fear) related to COVID-19, they need psychometrically sound instruments to determine the presence and severity of psychological symptoms related to COVID-19. Since Turkey has one of the largest COVID-19 outbreaks in the world, it is imperative to have instruments measuring psychological symptoms of coronavirus that can help professionals understand how the pandemic affects the mental health of the public.

In addition to establishing psychometrically robust instruments, understanding the differences across diverse groups can provide valuable information for mental health professionals, researchers as well as policymakers. This understanding, specifically, can guide policymakers in identifying vulnerable groups and perhaps allocate more resources or funds to alleviate the psychological impact of COVID-19, specifically as it relates to fear. Furthermore, identifying vulnerable to COVID-19 groups can motivate researchers to examine COVID-19 phenomena with these populations and perhaps gain more in-depth insight pertaining to factors protective against coronavirus-related mental health disorders. Finally, this understanding also can be useful for clinicians, as awareness of fear-based vulnerability can inform their treatment plans to reduce the severity of fear, related explicitly to COVID-19, and reduce the likelihood of a fear-related psychological crisis, such as hospitalization.

Researchers have reported that COVID-related hospitalization and mortality rates were higher for men compared with women (Richardson et al., 2020, e4). Given the higher rates of prevalence of hospitalization and mortality among men, we hypothesize the fear of COVID-19 to be higher among men than women (*Hypothesis 1*). Moreover, COVID-19-related mortality rates increase in "every 10-year age interval older than 20 years" (New York City Department of Health and Mental Hygiene, 2020; Richardson et al., 2020, p. e4). Thus, we expect the fear of COVID-10 to be higher among older individuals (*Hypothesis 2*). Additionally, COVID-19 mortality rates among people with a chronic medical condition (e.g. diabetes, lung disease, cancer, heart disease) are much higher (37:1, excluding patients whose underlying conditions are unknown) compared with individuals having no underlying conditions (New York City Department of Health and Mental Hygiene, 2020). Due to the clear evidence that hospitalization and comorbidity rates are much higher among individuals with a chronic condition, we hypothesized the fear of COVID-19 to be higher among those with a chronic condition (*Hypothesis 3*).

As discussed earlier, with global lockdown to decrease the spread out of COVID-19, many individuals, especially from low SES (e.g. cashiers, food industry workers) still have to work. Additionally, it is possible that individuals from low SES do not have enough savings to stock up the necessary food and medical supplies. Jointly, individuals from low SES might feel more vulnerable to COVID-19 and experience higher levels of COVID-19 fear. Therefore, we hypothesized the fear of COVID-19 to be higher among individuals from low SES (*Hypothesis 4*). Finally, as potentially more conscious consumers of data, reports, and news, we hypothesized that individuals with higher levels of educational attainment might experience lower coronavirus related fear than

Table 1. The fear of COVID-19 across demographic variables.

Variable	*N*	*M*	*SD*	*F*	*t*	*p*
Gender					4.49	0.00
Women	481	19.06	5.42			
Men	187	16.99	5.15			
Existence of chronic illness					0.70	0.48
Yes	91	18.85	5.88			
No	577	18.42	5.35			
Age Interval				0.38		0.82
Between 18 and 29	343	18.42	5.47			
Between 30 and 39	164	18.79	5.54			
Between 40 and 49	121	18.47	5.44			
Between 50 and 59	32	18.00	4.63			
60 years & +	8	16.87	3.90			
Educational level				2.40		.049
Primary school	18	21.00	5.06			
Middle school	25	19.20	5.94			
High school	98	19.37	5.75			
Bachelor's degree	450	18.30	5.31			
Master's degree	77	17.59	5.34			
Socio-economic level				3.83		.02
Low	48	17.77	6.42			
Middle	410	18.94	5.27			
High	210	17.75	5.40			
Total	668	18.48	5.42			

those with lower levels of educational attainment (*Hypothesis 5*).

Therefore, the purpose of the current study is two-fold: (a) to translate and validate the fear of COVID-19 Scale (FCV-19S) in a diverse Turkish sample and (b) to compare the COVID-19 fear across demographic variables (i.e. gender, educational level, age level, socioeconomic status). Accordingly, we address these purposes in two different studies.

Study 1: adaptation of the fear of COVID-19 Scale

Method

Participants

Our sample consists of people living in various provinces of Turkey. The sample is composed of 668 people, of whom 481 are women (72%), and 187 are men (28%). The overall mean age was 31.04 ($SD = 10.70$). Women's mean age ($M = 29.37$, $SD = 9.56$) was lower than that of men ($M = 35.33$, $SD = 12.21$). Ninety-one (14%) participants reported chronic disease, whereas 577 (86%) participants did not report a chronic disease. Additionally, 343 participants (51%) are within the age range of 18–29, 164 participants (25%) are within the age range of 30–39, 121 people (18%) are within the age range of 40–49, 32 people (5%) are within the age range of 50–59, and 8 people (1%) are 60 years old and above. When we examined the educational level of the sample, 43 (7%) participants reported less than a high school education, 98 (15%) were high school graduates, 450 (67%) hold bachelor's degrees, and 77 (12%) hold master's degrees. Finally, 48 (7%) identified being in a low socioeconomic level, 410 (61%) participants reported a middle socioeconomic level, and 210 (31%) participants reported a high socioeconomic level, see Table 1.

Translation of the instrument

To translate the fear of COVID-19 scale, we followed a six-step process consistent with recommendations in the literature (e.g. Eremenco et al., 2005; van Widenfelt et al., 2005). At the first stage, we conducted a thorough literature review, examining international and national databases (e.g. PsychINFO, Pub Med, ULAKBIM) to determine that a published instrument related to the fear of COVID-19 existed. In the second phase, we searched through ULAKBIM, which is a national database in Turkey, and Google Scholar using the Turkish translations of the keywords "fear of COVID-19," "COVID-19 fear," and "coronavirus fear," which yielded no studies. In the third step, the second and third coauthors, who have mastery of both Turkish and English, independently implemented the forward translation. In the fourth stage, the second and third coauthors compared forward translations and reached a consensus. In the fifth stage, the scale was back-translated to English by the first author, who obtained his master's and doctoral degrees in an English-speaking country and is bilingual in Turkish and English. In the final stage, all three researchers and an English language expert reviewed all items in Turkish and English and investigated any semantic differences.

Procedures

First, we contacted the authors of the original scale by e-mail and requested permission to translate and adapt the instrument into Turkish. The corresponding author shared the instrument and its guidelines with the principal investigator. Then, an expedited ethics committee application was submitted and approved by the authors' university. We created an online survey including information sheet, demographic questionnaire without any item jeopardizing anonymity, the Turkish version of the fear of COVID-19, and the Turkish version of the brief resilience scale. We disseminated the survey through an online data collection platform, considering that online recruitment would be best during lockdowns and social/physical distancing. We shared the study link on social media accounts, which enabled us to reach out to a diverse population. We also kindly asked potential participants to share our study link with others. The data

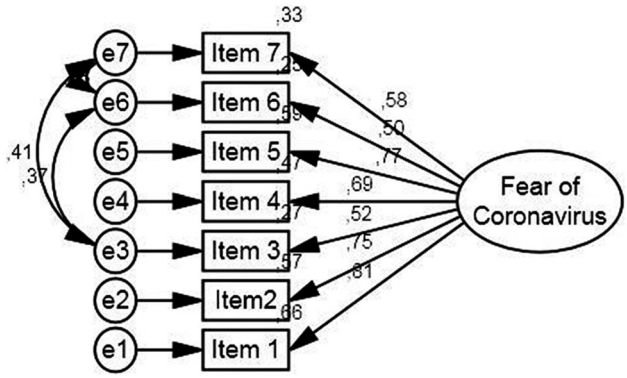

Figure 1. The results of the final CFA model of the Coronavirus Fear Scale.

were downloaded after one week of recruitment and aggregated into an SPSS (version 21) file for analyses.

Measures

Demographic questionnaire. We used a questionnaire to obtain demographic information about the participants, including age, gender, educational status, socioeconomic status, and whether or not they had a chronic illness.

The Fear of COVID-19 Scale. Covid-19 Fear Scale was developed by Ahorsu et al. (2020) and consists of 7 items comprising a single dimension. Possible scores range from 7 to 35, with higher scores indicative of greater coronavirus fear. Potential responses to each item are made on a five-point Likert-scale, ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Ahorsu et al. (2020) reported that item-total correlations ranged from 0.47 to 0.56, and factor loadings of items ranged between 0.66 and 0.74. Sample items in the instrument include "It makes me uncomfortable to think about coronavirus-19." The internal consistency of the scale was 0.82, and composite reliability was 0.88. A correlation value of 0.42 was found between COVID-19 fear and depression, and a value of 0.51 was found between COVID-19 fear and anxiety. In this study, we found a Cronbach's alpha value of 0.86.

Brief Resilience Scale. The Brief Resilience Scale (Smith et al., 2008) was developed to measure an individual's ability to overcome difficult situations. The Turkish version of the instrument (Haktanir et al., 2016) consists of 6 Likert-scale items with a single dimension, and each item includes five potential participant responses ranging from 1 (*Strongly disagree)* to 5 (*Strongly agree*). Possible scores for the BRS-T range between 6 and 30, with higher scores indicative of higher self-recovery ability. Sample questions include "It is hard for me to snap back when something bad happens". The instrument has shown acceptable to excellent reliability across studies ranging from 0.78 to 0.91 (Haktanir et al., 2018; Karaman et al., 2018; Karaman, et al., 2019; Smith et al., 2008). In this study, the Cronbach's alpha coefficient was 0.82.

Data analysis

Preliminary analysis. We inspected the data for any missing values, conducted reverse coding on the resilience scale and calculated reliability scores. We performed a confirmatory factor analysis to test whether the scale was valid in the Turkish sample. Maximum likelihood method was used in CFA. For model fit, the criteria of $\chi^2/df < 3$ RMSEA and SRMR <0.05; AGFI and GFI <0.90; NFI, IFI, GFI, CFI, and TLI <0.95 were used. For criterion validity, the correlation of the model with the Brief Resilience Scale- T was calculated. Internal consistency and split-half reliability tests were performed for the reliability analysis of the scale.

Results

We ran a first order confirmatory factor analysis (CFA) to determine whether the factor structure of the original form of the scale would be confirmed in the Turkish sample. We used a CFA to examine to what extent a predetermined or edited construct is verified with the data collected (Ayık et al., 2015). The first analysis without any modifications revealed a poor fit for the seven-item single-factor construct, $\chi^2(14)=348.05$ ($p<0.001$), $\chi^2/df = 24.86$, RMSEA = 0.18, SRMR = 0.08, AGFI = 0.69, NFI = 0.84, IFI = 0.84, GFI = 0.85, CFI = 0.84, TLI = 0.76.

The final model

Following the modification suggestions, we paired error terms between item #3 (My hands become clammy when I think about coronavirus) and #6 (I cannot sleep because I'm worrying about getting coronavirus), #3 and #7 (My heart races or palpitates when I think about getting coronavirus) and #6 and #7, which yielded an improved model. In the final model, we obtained a chi-square fit value of $\chi^2=30.45$, χ^2/df value of 2.77 for the model fit. The goodness-of-fitness values were as the following: RMSEA = 0.05, SRMR = 0.03, AGFI = 0.97, NFI = 0.98, IFI = 0.99, GFI = 0.99, CFI = 0.99, TLI = 0.98. These values suggest an excellent fit level (Byrne, 2010; Kline, 2011),

see Figure 1. All the paths shown in the model in Figure 1 were significant at the level of 0.01. Factor loadings of the items tested with CFA were found as I1 = 0.81, I2 = 0.75, I3 = 0.52, I4 = 0.69, I5 = 0.77, I6 = 0.50, I7 = 0.58. Since the factor loadings obtained are greater than 0.30, these values can be deemed adequate (Seçer, 2015).

Discriminant validity

We inspected the relationship between the FCVS-T and resilience to address the evidence of validity. A bi-variate correlational analysis revealed a correlation of −0.32 ($p < .001$). Though the negative relationship was significant, it was a moderate relationship.

Reliability

We performed internal consistency and split-half reliability analyses to determine the reliability of the coronavirus fear scale. The internal consistency of the FCVS-T was 0.86, which is slightly higher than the score obtained in the original form of the instrument, and the split-half reliability was 0.83.

Discussions

Our results demonstrated that the FCVS-T is a unidimensional scale consisting of a total of 7 items. The factor loadings of the scale items vary between 0.50 and 0.081. Our results confirmed that the Turkish version of the Fear of COVID Scale (FCVS-T) demonstrated a factor structure that was similar to the original instrument- the Fear of COVID-19 (FCV-19S; Ahorsu et al., 2020) when administered to a diverse Turkish group. Though we paired error terms, no item elimination was required to obtain data fit. The error covariate suggestions by AMOS were related to the physical symptoms of coronavirus fear. Since they targeted the same area, we applied the suggested changes.

The reliability and validity results of the current study were promising. The Cronbach's alpha coefficient for the FCVS-T was 0.86, which was slightly above the internal consistency reliability score ($a = 0.82$) obtained in the original investigation. Additionally, the discriminant validity investigation with resilience revealed a moderately significant negative correlation. This finding also supports the idea that individuals with higher levels of resilience tend to cope with stressful events more successfully than those with lower resilience (Haktanir et al., 2016; Smith et al., 2017). CFA, reliability, and validity results demonstrate that the underlying theoretical framework of the fear of COVID-19 is valid in the language of Turkish.

When we compared our instrument with other existing anxiety disorder-based COVID-19 scale, the FCVS-T is a single factor brief assessment similar to the Coronavirus Anxiety Scale (Lee, 2020). Another instrument developed by Arpaci et al. (2020) assesses individuals' coronavirus-related phobia. This instrument is composed of four sub-scales (psychological, psycho-somatic, economic, and social) and includes 20 items. Though this study was also based on fear of coronavirus, researchers implemented a unique way of handling the instrument. Though differences exist in the structure and approach, similar questions exist across all three instruments, and they demonstrate robust psychometric properties.

Study 2: investigation of Coronavirus fear scores in terms of various variables

Method

The primary purpose of the second component of the present study was to investigate coronavirus-related fear across demographic variables of the participants, details of whom are presented in the previous section. Thus, the same procedures are also applicable here.

Data analysis

Preliminary analysis. We inspected boxplots to inspect outliers. We ran the analysis with and without the outliers, and the difference was negligible due to the large sample size. Thus, we retained the outliers. We checked the univariate normality and the data were normally distributed, skewness value of 0.20 and kurtosis value of −0.18. In addition, homogeneity of variances assumption was met as evidenced by Levene's test for equality of the variances.

Primary analysis. Independent-samples *t*-test and ANOVA analyses were performed to examine the variation of the coronavirus fear scale scores based on participants' demographic characteristics. When then calculated the Cohen's *d* or *F* effect sizes, whichever was applicable.

Results

Hypothesis 1

We conducted an independent samples *t*-test to ascertain whether coronavirus fear scores differ based on participants' gender. The result of the independent *t*-test analysis showed that women reported significantly

higher fear of COVID-19, $t(666) = 4.49$, $p < .001$, Cohen's $d = 0.39$).

Hypothesis 2

We also examined coronavirus fear scores across age intervals. To achieve this, we created 10-year intervals, as reports suggested that hospitalization and mortality rates increase with 10-year age interval (e.g. New York City Department of Health and Mental Hygiene, 2020). Our results showed no significant differences among age groups, $F(4,663) = 0.38$, $p = .82$.

Hypothesis 3

Furthermore, we carried out an independent *t*-test to understand whether coronavirus fear would be any different between those with and without a chronic illness. Our results revealed no significant differences between the mean scores of people with and without chronic illness, $t(666) = 0.70$, $p = .48$, (Cohen's $d = 0.08$).

Hypothesis 4

Additionally, we conducted an ANOVA to compare coronavirus fear based on participants' socioeconomic level and obtained a significant difference. Using Scheffe *post-hoc* analysis, we found that individuals from middle SES reported significantly higher coronavirus fear than those in the high SES, $F(2,665) = 3.83$, $p = .02$, Cohen's $F = 0.22$.

Hypothesis 5

Finally, we conducted an ANOVA to compare the fear of coronavirus across participants' educational level. The mean scores for coronavirus fear increased as the level of education decreased, and the results of this test revealed a significant difference between at least two pairwise comparisons. However, when we ran a post hoc analysis, using Scheffe and Sidak tests, we detected no pairwise differences, $F(4,663) = 2.40$, $p = .049$, see Table 1 for group comparison test results.

Discussions

We investigated the fear of coronavirus among different subgroups. We conducted a number of group comparison test to determine whether significant differences existed among groups.

First, we compared the level of coronavirus fear between men and women. Our analysis revealed that women reported significantly higher levels of coronavirus related fear than men. This result contradicts our hypothesis that men would report higher COVID-19-related fear than women, as coronavirus-related hospitalization and mortality rates are higher among men. Also, this finding opposes the findings of Ahorsu et al. (2020) which reported no significant gender differences. However, it may be possible that women are more frequently affected by fear or phobia than men, at a ratio of approximately 2:1 (American Psychiatric Association, 2013). Additionally, our finding supports the finding of Dattel and Neimeyer (1990), suggesting that women from different racial backgrounds displayed significantly higher death anxiety/fear than men.

Second, the WHO reported that individuals 50 and above are at higher risk for coronavirus-related death than those in any other age groups. Specifically, coronavirus related death is more common among individuals 60 years of age and above. Therefore, we compared different age groups to ascertain whether they differed in reported levels of coronavirus fear. We detected no difference among any age group, which is in accordance with Ahorsu et al. (2020) findings. Moreover, our analysis showed that individuals 60 years or more ($M = 16.87$) reported the lowest COVID-19 fear, which was followed by individuals between the ages of 50 and 59 ($M = 18.00$), see Table 1 for detailed descriptive statistics. Though this finding did not support our initial hypothesis that individuals at or above 50 would display higher levels of fear, this result is consistent with findings of Neimeyer (1985) that older individuals were not necessarily more concerned about death. Additionally, Feifel and Branscomb's (1973) study suggested that older individuals reported lower levels of death fear than their younger peers. It is noteworthy, however, that though the fear of COVID-19 may be related to one's fear of death, it can also be related to fears related to other factors, such as fear of infecting the loved ones. Another interesting finding in the literature (Milman et al., 2020) suggested that as social isolation increased, adverse psychological symptoms related to COVID-19 decreased. Currently in Turkey, individuals above the age 64 are in a lockdown and are not permitted to go outside. Our finding that individuals who are at or above 60 years reported lower fear of coronavirus may be explained by the findings of Milman and her colleagues.

Third, we investigated the difference in coronavirus fear between individuals with and without a chronic illness. Despite our prior hypothesis that individuals with chronic illness would report higher levels of

coronavirus-related fear, we detected no significant difference between these two groups. Though individuals with a chronic illness ($n = 91$; $M = 18.85$) reported slightly higher coronavirus fear than those who reported having no chronic illness ($n = 577$; $M = 18.42$), the number of individuals with a chronic illness constituted only 13.62% of all participants, which may reduce with the accuracy of the comparison, as one group was underpowered.

Fourth, we investigated whether significant differences exist between individuals from different educational levels. Though as the educational level increased, the level of COVID-19 related fear decreased, our analysis revealed that these differences were not significant and that individuals from different educational levels reported similar levels of COVID-19 related fear. This nonsignificant difference may be due to the smaller sample size in some sub-groups.

Finally, we compared the COVID-19 fear across participants' socioeconomic level (SES). Participants in middle SES reported significantly higher fear of coronavirus than those in high SES. Though we could not find any studies to confirm or disconfirm this finding, this difference may be explained by the fact that persons from high SES usually have means to purchase necessary supplies to sustain them for more extended period of time.

We also found that individuals from middle SES showed significantly higher fear of coronavirus than low SES. It is possible that individuals from low SES are more prone to stressful events due to being exposed to more adverse conditions than the other two groups, such as financial problems, food and medicine safety. This situation may be explained by Maslow's Hierarchy of Needs (Maslow, 1943). Maslow suggested that individuals usually seek to fulfill specific needs before being motivated to fulfill higher-level needs. He suggests that physiological needs are the most essential needs (e.g. shelter, food). Individuals not fulfilling these needs are less motivated to seek higher level needs, such as safety and social needs. Considering Maslow's Hierarchy of Needs (1943), it is possible that individuals from lower SES have physiological needs, which is at the very bottom of the pyramid, and safety is not their current priority.

Implications of study 1 and study 2

We believe that our results can be of help to mental health providers, researchers, and policy makers. First, mental health providers (e.g. counselors, psychiatrists, psychologists) can utilize the FCVS-T to understand the levels of coronavirus related fear of Turkish speaking individuals. We believe that once the infection rate of COVID-19 subsides, mental health providers will be serving in the frontlines. Subsequently, from a mental health perspective, understanding persons' perceptions of coronavirus will be more critical. Once this is understood, it can guide one's treatment plan as to what kind of interventions may be needed. Second, it is imperative to identify the populations that may be more vulnerable to coronavirus related fear, such as women. Through the use of this instrument, researchers can identify other populations (e.g. medical workers) that are more prone to coronavirus-related stressors. Finally, once more vulnerable groups are identified, using our findings, policymakers can make data-driven decisions to take preventative measures in a larger scale to prevent exacerbation of the mental health problems.

Limitations and recommendations for future studies of Study 1 and Study 2

Although the results of our investigation showed the FCVS-T to be a promising instrument, our findings are not without limitations. First, scale development studies are a process with an infinite cycle (Kline, 2011). Thus, these results should be regarded as preliminary. Therefore, future studies should maintain investigation of the psychometric properties of the FCVS-T. Second, though all our factor loadings exceeded the minimum benchmark suggested by researchers (e.g. Dimitrov, 2012), we had items with a factor loading of 0.50. Therefore, future researchers can reevaluate the factor structure of the current instrument. Third, we had difficulty reaching out to some sub-groups. For example, due to the lower rates of smartphone and internet use in older adults in Turkey, this particular subgroup had a limited sample size. We recommend that researchers investigate this phenomenon with more equally represented sub-groups. Moreover, when self-report assessments are utilized, social desirability bias is always a risk. Lastly, data were collected from an average Turkish population using a convenience and snowball sampling methods. In other words, we did not specifically recruit individuals with a psychiatric diagnosis (e.g. anxiety) and it is possible the experiences of the participants may not represent those of general population. Thus, future studies can use different sampling methods to be more inclusive.

Conclusions

In this study, we investigated the psychometric properties of the Turkish version of the FCV-19S with 668 Turkish participants representing various age groups, socioeconomic status, and educational levels. Our final model showed the single-factor structure of the instrument to be valid with Turkish speaking populations. Additionally, group comparison analysis revealed significant difference on coronavirus related fear between men and women as well as individuals from the middle economic class and other two (i.e. low and high), yet no significant differences across age levels, chronic illness status, and educational level. Our findings prove the FCVS-T to be a promising instrument that can be used with Turkish speaking groups as well as contain significant information to better understand the fear of COVID-19 across different groups.

Ethical approval

All procedures employed in the current investigation were in accordance with the ethics committee application and with the Belmont Report-1979.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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