The Mediator Role of Psychological Resilience in the Relationship of Cognitive Flexibility and Fear of COVID-19

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Abstract

The COVID-19 pandemic causes many short- or long-term mental disorders. In order to reduce these problems the pandemic will create to minimum, it is believed that psychological resilience and cognitive flexibility have an important function. In this respect, the direct and indirect relationships and the mediating role between the psychological resilience, cognitive flexibility and fear of COVID-19 were examined in a Turkish sample consisting of 511 people. This group consists of 308 (%60.3) women and 203 (% 39.7) men. The data obtained from this sample group were analyzed by structural equality model. The data of the study were collected using the "Cognitive Flexibility Scale", "Brief Psychological Resilience Scale" and "Fear of COVID-19 Scale". Indirect effect estimate of psychological resilience for was tested with the SPSS Macro Process application on the basis of the bootstrap test. As a result of the analysis found that, mediating role of psychological resilience is significant in the relationship between cognitive flexibility and COVID-19 fear. Researchers should pay attention to the effect of psychological resilience and cognitive flexibility in intervention programs to be prepared for individual and social problems.

Keywords: COVID-19 Fear, Flexibilty, Psychological Resilience

Introduction

In December 2019, the coronavirus (COVID-19), emerged in China thus soon becoming a global pandemic by spreading to the whole world. It caused the World Health Organization to declare it a pandemic, which can lead to serious health problems for individuals (Singh et al., 2020; Torales et al., 2020). However, it has been declared with various studies that this pandemic not only causes health problems but also has negative effects on the mental health of individuals (Shigemura, et al., 2020; Wang, et al., 2020). Although the psychological dimension of the pandemic was not talked about much at first (Li & Zhang, 2020), in the days to come, with the various research conducted, this side of it was examined. The factors such as the anxiety of being infected by COVID-19; financial problems, social isolation, loneliness, unpredictable future, the possibility of the lovers' getting sick even the anxiety of losing them can cause various psychological problems (Bao et al., 2020; Gupta et al., 2020; Kroska et al., 2020). In the research conducted in such countries as China, Germany, Portugal, and Brazil, it is stated that a pandemic can cause moderate or severe psychological effects in a number of people (Passos et al., 2020; Petzold et al., 2020; Rajkumar, 2020). Among these effects, symptoms of anxiety, stress, and depression are frequently observed (Vahedian Azimi, 2020). Studies conducted in Turkey support the findings of other studies. In these studies, it was reported that following the COVID-19 outbreak, the psychological symptoms (Bilge &

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Bilge, 2020), perceived stress levels (Torun & Torun, 2020), perceived stress (Peker & Cengiz, 2021), and fear levels of individuals increased (Çifçi & Demir, 2020).

Fear, which is one of these symptoms is an emotion that is characterized by infectious diseases, and in case of danger, it has a response feature that facilitates the adaptation to the new conditions. However, in the course of the COVID-19 pandemic, the uncertainty of the danger can affect the realism levels of the given reactions by turning the fears into chronic and compelling situations (Martinez et al., 2020; Memiş-Doğan & Düzel, 2020; Mertens et al., 2020). This can cause various changes in the cognitive system of individuals (Dozois et al., 2019). If people can learn how to redesign their thoughts about negative events, they can make these thoughts more active during the recovery process by making them suitable to their memories and beliefs about the event (Iacoviello & Charney, 2014). When this situation is considered for the COVID-19 outbreak, it is known that there are various relationships between the situation that the disease represents in the mind of individuals, the reactions to the disease, and the adaptation created by the disease (Hekler et al., 2008). In such kind of situation, individuals can analyze alternative options for reactions instead of having a strict and unchangeable perception. This, in turn, requires the cognitive flexibility that contributes to the skills to adapt and to cope with new situations in addition to changing the existing cognitions and the value and meaning perceived (Cañas et al., 2003; Dennis & Vander Wal, 2010; İnözü et al., 2022; Iacoviello & Charney, 2020; Martin & Rubin, 1995). Because cognitive flexibility, it helps individuals better distinguish between threatening and non-threatening situations. In addition, flexibility also contributes to improving the level of knowledge acquisition, classifying information, and adapting more flexibly to changes in the environment (Ben-Zion et al., 2018).

Therefore, when people experience stressful and adverse life events, their cognitive flexibility affects their reactions and helping them to reevaluate their situations and emotions (Cheng et al., 2014). It is stated that there is a negative relationship between fear and cognitive flexibility that people feel in the face of negative situations (Landrani, 2021). The COVID 19 pandemic is also one of the situations that cause anxiety and fear for individuals (Ahorsu et al., 2020). In this context, Afshari et al. (2020) stated that cognitive flexibility has an important role in emerging professional concerns in COVID-19. Similarly, it has been expressed that cognitive flexibility and the perceived threat based on COVID-19 have a mediating role between negative childhood experiences and anxiety (Kalia et al., 2020). As seen in the research, cognitive flexibility; helps people to produce alternative thoughts instead of negative and destructive thoughts in the face of anxiety, stress, or fear. In summary, cognitive flexibility plays an important role in problems such as anxiety, fear and stress in the research conducted.

The Mediating Role of Psychological Resilience

Psychological resilience is the ability of individuals to actively cope and manage adaptation when faced with risky and stressful situations that may affect their physical, cognitive, and emotional states (American Psychological Association, [APA], 2012; Ferreira et al., 2020; Mangham et al., 1999). This adaptation and avoidance of negative experiences help individuals become strong in difficult times by affecting not only their existing but also subsequent emotional states (Bozdağ & Ergün, 2020; Jackson et al., 2007). One of the times in which the necessity for individuals to become strong increases is during the COVID-19 process. In this process, developing more resilience against stress situations is among the factors that can prevent COVID-19 fear from forming (Satıcı et al., 2020). In various studies, it is observed that psychological resilience is an important variable in reducing and preventing the negative

psychological effects the pandemic causes (Blanc et al., 2021; Ran et al., 2020). Yıldırım and Solmaz (2020), explained that in the findings of a study conducted on Turkish adults, resilience partially mediates the relationship between COVID-19 stress and COVID-19 exhaustion. In another study, it was stated that psychological resilience helps reduce stress caused by COVID-19 and increases happiness (Peker & Cengiz, 2021).

As it can be understood from the studies conducted, around the world, in Turkey, too, many people are affected physically and mentally very much by the pandemic and suffer from it emotionally. The reactions of humans against these kinds of negative events, their ways of overcoming them, and the period to return to normal life may differ from each other. Psychological resilience, one of the factors affecting this situation, is a dynamic mechanism to ease the effect of negative events (Doğan, 2015; Karaşar & Canlı, 2020; Killgore et al., 2020). Being sensitive to the mental health risks that arise during the pandemic is also a situation that should be examined in terms of the cognitive flexibility levels of people (Seiter & Curran, 2021).

In addition to cognitive flexibility, resilience plays an important role in coping with difficulties and stress (Yağan & Kaya, 2022). There are many studies in the literature explaining the positive effects of cognitive flexibility on negative life events and resilience (Ram et al., 2019; Soltani et al., 2013). In line with this information, individuals with higher cognitive flexibility are expected to have higher levels of psychological resilience (Erden-Çınar, et al., 2022). Cognitive flexibility makes it easier for people to see alternatives and find new solutions in the face of these events. It accelerates recovery by producing more alternative solutions in the face of difficulties (Çelikkaleli, 2014; Deveney & Deldin, 2006). Besides, individuals with high flexibility control their physical and emotional reactions, which positively affects their psychological resilience (Waugh et al., 2011). Thus, people's coping skills increase in stressful situations, and their fear and anxiety decrease (Chen & Qi, 2022). It is stated in studies that the increase in individuals' psychological resilience and cognitive flexibility levels is effective in their ability to cope with stress (Koç, 2020). Similarly, another study explains that cognitive flexibility contributes to life satisfaction and also plays a mediating role in this resilience process (Odacı et al., 2022).

This study, carried out in this direction, makes it important to examine negative emotions such as anxiety and fear that arise as a result of the COVID-19 pandemic, which has taken the whole world under its influence. Both resilience and cognitive flexibility are included in the theory of positive psychology. Positive psychology focuses on the strengths of the individual and focuses on the power a solution in the face of problems (Seligman, 2002). For this reason, it is very important to focus on the cognitive flexibility of individuals in order to manage their anxiety, depression, and fears and to examine the mediating role of psychological resilience in this process. In addition, these negative situations have been seen not only in the COVID-19 pandemic but also in past epidemics such as SARS and EBOLA (Bozdağ & Ergün, 2020; Person et al., 2004; Shultz et al., 2016). Therefore, this research is important in terms of protective factors for possible disasters and epidemics that may occur in the future.

For all these reasons, the effect of cognitive flexibility and psychological resilience which are considered within the scope of positive psychology (Golestanibakht et al., 2022; Luthar et al., 2014),, on the fear caused by COVID-19 is examined using the structural equation model. In conclusion, an answer to the following research question is sought.

1. Does the cognitive flexibility of individuals significantly predict the fear of COVID-19?

2. In the relationship between the cognitive flexibility of individulas and the fear of COVID-19, is there of the mediating role of the psychological resilience?

Method

Participants

This study in Turkey was conducted with the data obtained from a total of 511 participants; 203 of whom are men (% 39.7) and 308 of whom are women (% 60.3) by the appropriate sampling method. The research was done with 294 people aged 18-28 (57,5 %), 101 people aged 29-39 (19,8%), 70 people aged 40-50 (13,7 %), and 46 people aged 51 ages and over (9,0 %). While 54 of them (10,6 %) have a chronic disease, 457 of them (89,4%) don't have any chronic disease. While 25 of the participants caught COVID-19, 486 were not yet caught COVID-19. At least one of the 59 participants' family members caught COVID-19, and none of the family members of 452 of them have been infected with COVID-19.

Measurements

The Cognitive Flexibility Inventory

In order to measure the skills of individuals to produce coherent, alternative, appropriate, and balanced thoughts in case of difficult situations, The Cognitive Flexibility Scale was developed by Dennis and Vander Wal (2010). In this original scale, alternatives and control sub-dimension, Cronbach α coefficients were found .91, and .86 respectively. The scale whose validity and reliability were made by Gülüm and Dağ (2012), was adapted to Turkish. With such examples as the one 'When I face difficult situations, I feel as if I lose my control.' the scale which consists of control and alternatives, includes 2 sub-dimensions. Cronbach α factor calculated for the reliability of the scale was found .90, .89, and .85 respectively for, the whole inventory, alternatives, and control sub-dimension. As the score obtained from the scale increases, the cognitive flexibility levels of individual's increase are thought to increase. The scores to be obtained from the scale range from 20-100. Also in this study, for the whole of this scale for the Turkish sampling group consisting of 511 people, alternatives, and control sub-dimension, Cronbach α coefficients were found .87, .85, and .82 respectively.

The Brief Resilience Scale

The Brief Psychological Resilience Scale was developed Smith and his friends (2008) in order to measure the psychological resilience levels of individuals. In the original scale Cronbach α coefficient was calculated ranging from .80-.91. Doğan (2015), by doing the validity and reliability studies, adapted it to the Turkish. The scale consists of 6 items the one 'After the depressing times, I can restore myself easily' is single dimensional. On the 5-point likert-type scale, there is a reversible item and the high scores obtained from the scale indicate that the psychological resilience level of individuals is high. Cronbach α coefficient calculated for the scale's reliability was found to be .83. In this study, the Cronbach α coefficient of the whole scale belonging to the Turkish Sample Group was found to be .75.

The Fear of COVID-19 Scale

The COVID-19 Fear Scale was developed by Ahorsu, Lin, Imani, Saffari, Griffiths, and Pakpour (2020), to measure the fear levels of individuals who have against coronavirus. This original scale Cronbach α coefficient was calculated at .82. By carrying out validity and reliability studies, Bakioğlu, Korkmaz and

Ercan (2020) adapted the scale to Turkish. The scale consisting of 7 items such as 'I am very scared of Corona virus (COVID-19) is one dimension and in a 5-point likert type. Higher scores obtained from this scale indicate high levels of COVID-19 fear. The Cronbach α coefficient calculated for the scale's reliability was found to be .88. In this study, the Cronbach α coefficient of the whole scale belonging to the Turkish Sample Group was found to be .83.

Data Collection

In order to collect data and conduct the research, permits were obtained from the Atatürk University Research Ethics Committee. Then, the scales were prepared via Google Forms with an online connection and sent to the participants. Data were collected between 30.01.2021 and 15.03.2021 from individuals who wanted to participate in the research voluntarily. For the use of these scales, necessary permissions were obtained from the people who developed or adapted the scale.

Analysis of the Data

There were no missing data in the data set. Therefore, without editing the missing data, normal distribution, homogeneity, and extreme value were analyzed. For this reason, kurtosis-skewness values (see Table 1) were examined for univariate and multivariate normality analysis of the data. The data which belong to the 37 individuals with extreme values and not providing parametric conditions were not included in the analysis. Thinking that the kurtosis and skewness values as to the variables are between -2 and +2 are accepted as a signal that data has a normal distribution, the values obtained in our study were analyzed accordingly (Tabachnick et al., 2007). At the end of these examinations, it has been decided that our data set meets the assumptions necessary for correlation and mediation analysis. In this study, Pearson correlation analysis has been conducted in order to determine the relationships between COVID-19, cognitive flexibility, and psychological resilience. Amos statistical analysis program was used to test the mediation of the psychological resilience variable in the relationship between cognitive flexibility and fear of COVID-19. With the bootstrap analysis in which 5,000 resampling and 95% confidence interval were used, the confidence interval of indirect effects was examined.

Findings

Correlation Analysis

The correlation analysis was conducted in order to determine whether there is relationship between the variables of the study. The results of the correlation analysis are shown in Table 1. According to the analysis conducted, it was found that there was a negative moderate-level significant relationship between the fear of COVID-19 and psychological resilience (r = -.30 p<.001). And there is a negative low-level significant relationship between the fear of COVID-19 and cognitive flexibility (r =-.25 p<.001). Also, there is a positive, moderate-level significant relationship between cognitive flexibility and psychological resilience (r = .58 p<.001).

Table 1

Descriptive Statistics and Pearson Correlation Results

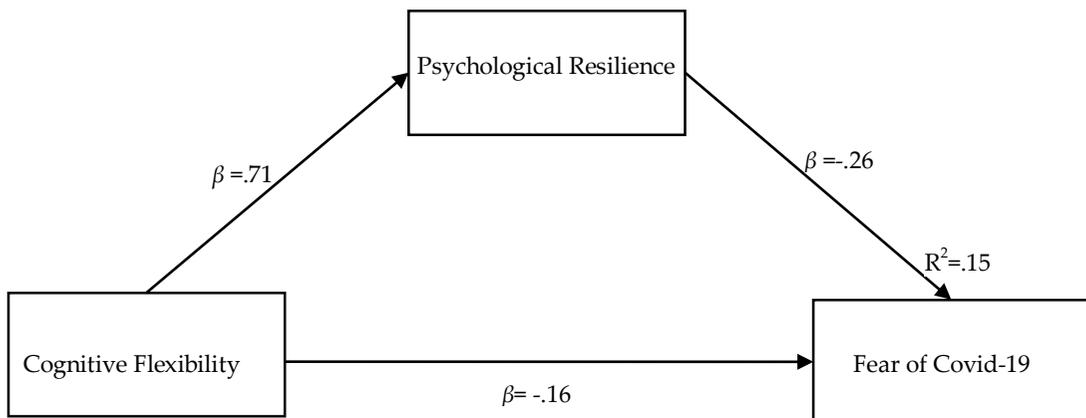|	Mean	SD	Skewness	Kurtosis	1	2	3
Psychological Resilience	3.29	.62	.09	-.14	-	.58**	-.30**
Cognitive Flexibility	3.78	.44	.14	-.00		-	-.25**
Fear COVID-19	2.58	.73	.09	-.25			-

* *p* <.001

Model Testing

The mediating role of psychological resilience in the relationship between individuals' cognitive flexibility and fear of COVID-19 was tested with the structural model. The mediating analysis based on regression was conducted in order to analyze the mediating role in the relationship between cognitive flexibility and fear of COVID-19. The results of the analysis are presented in Figure 1.

Figure 1

The Mediating Role in the Relationship Between the Cognitive Flexibility and Fear of COVID-19

Note: *The coefficients used between the variables belong to the standardized coefficients.*

In this context, firstly, the path coefficient between cognitive flexibility and fear of COVID-19 was found to be statistically significant (β = -.16, p < .05). The path coefficients between cognitive flexibility and resilience (β =.71, p < .001) and between resilience and fear of COVID 19 (β = −.26, p < .05) were also statistically significant. Cognitive flexibility and psychological resilience predicted 15 % fear of COVID-19. Then in order to test the structural equation model fit indices of the measurement model were examined. Structural equation model goodness of fit indexes was acceptable (χ^2/df = 2,82, p < .001; GFI = .94; CFI = .93; NFI = .90, RMSEA = .06).

In this direction, in the relationship between the cognitive flexibility and fear of COVID-19, the path analysis based on Bootstrap model was conducted to determine whether there was a mediating role of psychological resilience. The coefficients and confidence interval related to the direct and indirect paths created as a result of Bootstrapping analysis have been presented in the Table 2.

Table 2

Standardized Bootstrap Analysis Values of the Model

	β	Boot SE	BootLLCI	BootULCI
Total Effect				
CF → FC19	-.34	.05	-.43	-.25
Direct Effect				
CF → FC19	-.16	.08	-.32	-.00
CF → PR	.71	.05	.60	.80
PR → FC19	-.26	.09	-.42	-.07
Indirect Effect				
CF → PR → FC19	-.18	.06	-.30	-.05

Note: *CF= Cognitive Flexiblity, FC19= Fear of COVID 19, PR= Psychological Resilience*

In path analysis based on the Bootstrap method, the 5,000 resampling options were preferred. It is vital that the lower and upper values at the 95 % confidence interval obtained as a result of analysis in order to support the hypothesis should not contain zero (0). There being zero between the lower and upper confidence interval means the mediating relationship is significant; there being zero means the mediating relationship is not significant. According to the Bootstrap results, it was found that cognitive flexibility has a significant indirect effect on the fear of COVID-19 through psychological resilience. Accordingly, it was concluded that psychological resilience has a mediating role in the relationship between cognitive flexibility and fear of COVID-19. While the total effect of the mediating role and cognitive flexibility of the psychological resilience on the fear of COVID-19 is -.34, when psychological resilience is added to the model, this effect is seen to decrease to -.16.

Discussion

The aim of this study is to test the mediating role of psychological resilience in the relationship between cognitive flexibility and fear of COVID-19. Within the scope of this research, firstly, the cognitive flexibility levels of individuals are a significant negative predictor of the fear of COVID 19. In another finding, psychological resilience was found to have a partial mediating role between cognitive flexibility and fear of COVID-19.

According to the first finding of the study, the increase in the cognitive flexibility of people may affect the reduction of the fear of COVID 19. In this process of COVID 19, individuals have met many difficulties such as adapting to a new lifestyle, being unemployed, closing the workplace, being infected, and losing their lovers. Individuals should be able to adapt to the existing situation in order to cope with these stressful life events efficiently. For this, it is important that they have cognitive flexibility. Individuals with cognitive flexibility are very effective in considering and activating various coping strategies to reduce and solve the problem they feel (Johnson, 2016). As a matter of fact, it is observed in the studies

that the cognitive flexibility of the the individuals who have the symptoms of fear and depression is quite low (Deveney & Deldin, 2006). One of the stressful events such as COVID 19 is being exposed to the earthquake and its adverse effects. It is seen that individuals with high cognitive flexibility after the earthquake tolerate uncertainty better, think more positively about their experiences, and cope better with these difficulties (Afshari et al., 2020; Fu & Chow, 2017; Koesten et al., 2009). Similarly, cognitive flexibility is an important determinant of PTSD symptom severity in individuals exposed to trauma (Ben-Zion et al. 2018). Accordingly, this shows that cognitive flexibility can minimize the negative effects of traumatic events. Considering these results, it can be said that individuals with high cognitive flexibility tolerate the negative situations caused by COVID-19 as well as many traumas. It can be said that the findings we reached in our study have made an important contribution to the literature in this direction.

Another finding of this study is the mediator role of psychological resilience between cognitive flexibility and fear of COVID-19. Accordingly, individuals' cognitive flexibility levels, reduce the fear of COVID 19, and psychological resilience contributes positively to this effect. Like cognitive flexibility, one of the factors that increase people's ability to cope and adapt to stressful life conditions is psychological resilience. Therefore, APA (2020) emphasizes that it is very important to increase the psychological resilience of individuals in order to protect their mental health during the COVID-19 pandemic and to be less affected by the negative effects of this situation. Because the level of resilience can affect people's reactions to negative situations by affecting their ability to cope (Arslan et al., 2021). As a matter of fact, previous studies have also emphasized that psychological resilience is important to alleviate the negative effects that can be caused by stress (Poole et al., 2017; Ran et al., 2020; Sheerin et al., 2018).

As previously stated, fear of COVID-19 can also cause several important emotional, behavioral, and cognitive problems as lonely, hopelessness, avoidance, depression, stress, irrational thoughts, anger, anxiety, sleeping disorders, and adjustment disorders (Ahorsu et al., 2020; Satıcı et al., 2020; Zhang et al., 2020). Many studies have been conducted to examine the contribution of psychological resilience and cognitive flexibility to reduce the fear of COVID-19, which may cause these negative consequences (Peker & Cengiz, 2021; Şahin & Töre, 2022). When viewed from cognitive flexibility is seen as an antecedent for the formation of resilience, and these two variables help control the stress level of individuals (Johnson, 2008; Rademacher et al., 2022). Şahin and Töre (2022), were stated that cognitive flexibility and resilience have the potential to affect individuals' subjective well-being in the face of COVID-19 fears. Similarly, it was stated that cognitive flexibility contributed to the relationship between post-traumatic growth and resilience (Erden-Çınar et al., 2022). Arıcı-Özcan et al., (2019) stated that cognitive flexibility mediates between distress tolerance and resilience. One of the negative factors caused by the COVID-19 epidemic is the increase in people's impulsive behaviors and suicide attempts (Pathirathna et al.,2022). For these reasons, a study cognitive flexibility and resilience have also been reported to have a predictive effect on individuals' suicide attempts (Ram et al., 2019). As can be seen, in many studies, cognitive flexibility is a predictive variable for resilience. Accordingly, there is a parallel relationship between the increase in the cognitive flexibility of individuals and the increase in their psychological resilience. As a result, it can be said that cognitive flexibility and psychological resilience which are included in the theory of positive psychology, are effective factors in the fear of COVID-19. Therefore, the result we have reached is thought to contribute to the literature significantly in terms of showing these complex relationships.

Limitations

In our study, in addition to the important findings, we have reached, there are some limitations. That the data collected from the participants constitute only quantitative data consists of the limitation of this study. Another limitation of our study is using convenient sampling, one sampling technique.

Conclusion

As a result, in this study, in the relationship between cognitive flexibility and fear of COVID-19, it was found that the mediating role of psychological resilience was significant. In the studies on COVID-19, while often examining the effect of psychological flexibility, it is seen that studies examining the effect of cognitive flexibility are limited. In addition, it is seen that there are a lot of studies in which the fear of COVID-19 is considered as an independent variable but the studies are limited when it is considered as a dependent variable. A contribution was brought to this gap in the literature with the model we set up and the variables we have dealt with in our study. As a result of the findings obtained from this study, preparing intervention programs to increase the psychological resilience and cognitive flexibility of individuals, both during the COVID-19 pandemic process, in the following global epidemics, and in traumatic disasters and will minimize the short and long-term negative psychological effects. In the following studies, conducting experimental studies to test the effect of intervention programs to increase psychological resilience and cognitive flexibility will enable this study to go further and in an important contribution to the literature.

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