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The Relationship between Fear of COVID-19 and Sleeping Disorder in Higher Education: Mediator Effect of Psychological Resilience

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COVID-19, which is a new type of coronavirus and turned into a pandemic in a short time, has affected the whole world and caused many different psychological problems, especially fear, anxiety and sleeping disorder, in individuals. The psychological symptoms caused by COVID-19 negatively affect individuals of all ages. One of the groups in which these negative effects are seen is higher education students. In terms of coping with these problems, it is crucial to determine the protective factors. It is thought that one of the protective factors for mental health is psychological resilience, which is one of the important concepts of positive psychology. The aim of this study is to test the mediating effect of psychological resilience in the relationship between fear of COVID-19 and sleep disorders in higher education. The study group consists of 322 individuals, 220 (76.3%) women and 102 (31.7%) men in Zonguldak province of Turkey. The data were collected online with Personal Information Form, Fear of COVID-19 Scale, The Brief Resilience Scale and Sleep Disorders Scale. Pearson Correlation Analysis and Hayes' PROCESS Model based on Bootstrapping method were used in data analysis. According to analysis results, a positive association was found between the fear of COVID-19 and sleep disorders, while a negative association was found between psychological resilience, fear of COVID-19 and sleep disorders. It was also found that psychological resilience partially mediated the relationship between fear of COVID-19 and sleep disorders. The results obtained were discussed in the light of literature and recommendations were made.

Keywords: Fear of Covid 19, psychological resilience, sleep disorders, mediating role

INTRODUCTION

COVID-19, the novel type of coronavirus that started in China and turned into a pandemic in a short time (Bao et al., 2020), spread all over the world and caused negative effects in many different areas. Due to the pandemic which brought many restrictions in daily life, countries had to take strict measures and this situation caused countries to go through many new experiences that they haven't experienced in the recent past (Duman, 2020). Turkey, where this research was carried out, is one of the countries affected by COVID-19. As of July 7, 2021, 5,454,763 cases were detected in Turkey, where the first COVID-19 case was reported on March 11, 2020. The death rate in Turkey was 0.92 in the pandemic, where the worldwide death rate was 2.16 (Worldometer, 2021).

Social isolation is the leading measure taken to reduce the transmission rate of the epidemic since the pandemic started. People are asked not to come together and not to socialize as much as possible during this process. This in turn confines people to home and drives them to loneliness (Pietrabissa & Simpson, 2020). It is inevitable for such sudden and new changes to create negative effects on people's mental health. The transmission rate of the epidemic, its being lethal, the absence of a fully effective vaccine or treatment method and uncertainties about the future (Guan et al., 2020) or uncertainties regarding the efficiency of the existing treatment methods and vaccines increase people's levels of anxiety and fear.

Fear is defined as an emotion experienced by the human mind as a reflex when confronted with unexpected and unpredictable situations (Furedi & Yıldırım, 2001). In every period of history, people have experienced worry, restlessness and fear in the face of sudden and unexpected situations (Memiş Doğan & Düzel, 2020). Since outbreaks occur suddenly and unexpectedly and spread rapidly, they cause a sense of fear in societies. Studies conducted after COVID-19 outbreak showed that people's depression, anxiety, post trauma stress and fear levels increased significantly (Cowan, 2020; Huang & Zhao, 2020; Qiu et al., 2020; Sonderskov, Dinesen, Santini, & Ostergaard, 2020; Stankovska, Memedi, & Dimitrovski, 2020). In addition, there is a negative association between COVID-19 and psychological resilience (Barzilay et al., 2020). It is important to investigate the variables that COVID-19 affects and that affect COVID-19 in order to reduce the negative psychological effects of COVID-19 on the individual. Therefore, the present study investigates the mediating effect of psychological resilience in the relationship between COVID-19 and sleep problems.

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COVID-19 and Sleep Problems

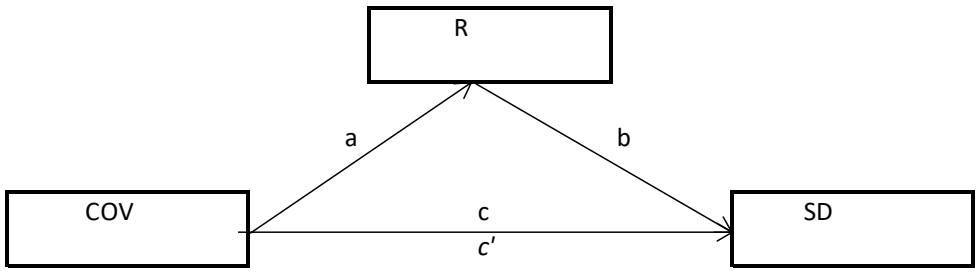
It may be stated that the increase in the level of fear due to COVID-19 will cause many different problems in individuals. One of these problems is sleep. Sleep is defined as a state of unconsciousness in which the individual can be awakened with sensory or other stimuli. Sleep has different levels ranging from very light to very deep . Although the time, duration and quality vary in healthy people and there may be age-related differences, most adults sleep 7-8 hours a night (Mayda et al., 2012). According to Karakaş, Gönültaş and Okanlı (2017), sleep is an indispensable life activity that affects the life quality and health of the individual, and it is a concept that has physiological, psychological and social dimensions. It might be argued that any sleep problem may have negative effects on the individual's daily life activities, family, social and business life. When the literature is reviewed, it can be said that sleep disorders are associated with depression, anxiety, post-traumatic stress disorder and fear (Aydın, 2016; Buysse et al., 2006; Gronfier et al., 1999; Tsuno, Besset & Ritchie, 2005; Van Reeth et al., 2000). Considering the negative psychological effects of COVID-19 pandemic on people, particularlythat individuals may experience sleep problems in this process. When studies conducted are examined, it has been reported that individuals' sleep quality is negatively affected and they have sleep problems during the COVID-19 process (Fu et al., 2020; Gupta et al., 2020; Huang & Zhao, 2020; Marelli et al., 2020).

Psychological Resilience as Mediating Variable

Direct or indirect negative effects caused by COVID-19 on people vary from person to person, although some people are greatly affected by the pandemic process, others are not affected much. Besides that one of the most important determinants of individuals'being affected differently by this process is psychological resilience. Psychological resilience is defined as the ability to recover quickly after changes, bad events, illnesses or mental diseases such as depression; easy recovery and flexibility (Ramirez, 2007). In other words, psychological resilience is the ability of an individual to successfully overcome and adapt to negative situations despite very difficult conditions (Masten & Coatsworth, 1998).

Based on these definitions, it can be stated that individuals should have high psychological resilience in order to quickly get rid of sudden changes and negative psychological effects caused by COVID-19. Lots of studies were conducted to investigate the relationship between mental problems such as anxiety, worry, depression and fear and psychological resilience (Kasapoğlu, 2020; Bilge & Bilge, 2020; Artan et al., 2020). Kimhi et al. (2020) found a negative association between psychological resilience and feeling of danger and mental symptoms during the COVID-19 process. Similarly, Barzilay et al. (2020) found a negative association between psychological resilience and COVID-19 anxiety. To sum up in the studies conducted that during the COVID-19 process, individuals with high psychological resilience have lower psychological symptom levels. In line with the explanations in literature, it can be said that psychological resilience has a protective effect on mental health. In this context, it becomes important to investigate whether it has a mediating role in the relationship between COVID-19 and sleep disorders.

When the literature is reviewed, COVID-19 increases individuals' depression, anxiety, post-traumatic stress and fear levels (Cowan, 2020; Huang & Zhao, 2020; Qiu et al., 2020; Sonderskov, Dinesen, Santini, & Ostergaard, 2020; Stankovska, Memedi, & Dimitrovski, 2020) and causes sleep problems by affecting sleep quality negatively (Fu et al., 2020; Huang & Zhao, 2020; Gupta et al., 2020; Marelli et al., 2020). At the same time, the fear of COVID-19, which is positively associated with mental health problems, on the contrary which is negatively associated with psychological resilience (Barzilay et al., 2020). In the light of all this information in literature, individuals are psychologically negatively affected by this extraordinary epidemic process we are going through and that these effects directly or indirectly affect individuals from different aspects. Although there are some studies in which the concepts of fear of Covid, psychological resilience and sleep disorders, which are discussed in the present study, are discussed separately, no studies have been found in which all these concepts are discussed together. In addition, the fact that there are no studies in Turkey in which these concepts are discussed together can be thought as a novelty this study will add to literature. For this purpose, the following model was proposed in the light of literature and the proposed model was tested.



COV: COVID-19; R: Resilience; SD: Sleeping Disorder

Figure 1. The model proposed for the mediating effect of psychological resilience in the relationship between COVID-19 and sleep disorder

Four hypotheses have been put forward in line with the research model:

- H1: The fear of COVID-19 predicts psychological resilience (path "a").
- H2: Psychological resilience predicts sleep disorders (path "b").
- H3: The fear of COVID-19 predicts sleep disorders (path "c").
- H4: Psychological resilience mediates the relationship between the fear of COVID-19 and sleep problems (path "c' ").

METHOD

Research Model

Correlational survey model was used in the study. The relationship between the variables was analysed by using the mediation modelMediation analysis is a statistical method used to evaluate evidence from studies designed to test hypotheses about how some causal antecedent variable X transmits its effect on a consequent variable Y) (Hayes, 2018). Simple mediation model is any causal system in which at least one causal antecedent X variable is suggested as influencing a result Y through a single intervening variable M.

To sum up, mediation analysis (MA) is a statistical process to test whether the effect of an independent variable X on a dependent variable Y (i.e., X→Y) is at least partly clarified by a chain of effects of the independent variable on an intervening mediator variable Z and of the intervening variable on the dependent variable (i.e., X→Z→Y) (Fiedler, Schott & Meiser, 2011). Since there are many reasons for a behavior in the social sciences, partial mediation is considered a more reasonable case than the full mediation model (MacKinnon, 2012).

Study Group

The study group of the research consists of 322 individuals. 220 (68.3%) of the participants are female, while 102 (31.7%) are male. The ages of the participants range between 20 and 45 and a verage age is 24.40. The study group was chosen from Zonguldak province of Turkey. COVID-19 restrictions in Turkey first started in big cities. Although Zonguldak is not a big city, it is the only city in which COVID-19 restrictions are valid. Since it is a city which was affected by COVID-19 restrictions, the study group was chosen especially from this city.

Data Collection Instruments

The Fear of COVID-19 Scale

The scale was developed by Ahorsu et al. (2020) and adapted to Turkish culture by Bakioğlu, F., Korkmaz, O., & Ercan, H. (2020). It is a 7-item single dimension scale. It has a 5 point Likert type rating system (1: Totally disagree and 5: Totally agree). Item factor loads of the original scale vary between .66 and .74 and item-total correlations vary between .47 and .56. Cronbach alpha internal consistency coefficient of the scale is .82. A positive and significant correlation was found between the scale's total score and depression (r = .43), anxiety (r = .51), perceived infectability (r = .48) and germ aversion (r = .46). Within the scope of the study, Cronbach alpha internal consistency coefficient of the scale was found as .85.

Sleep Disorders Scale

DSM-5 Sleep Disorders Scale was developed by Yüzeren, S., Herdem, A., & Aydemir, Ö. (2017). Internal consistency of the scale was found as 0.91, while item-total score correlation coefficients were found to be between 0.61 and 0.81. In the exploratory factor analysis of DSM-5 Sleep Disorders Scale, KMO coefficient was found as 0.91 and Bartlett coefficient was found as 1.54 for sampling adequacy. Single-factor solution was obtained and its eigenvalue was 5.07, explaining 63.4% of the variance. Factor loads of the scale items were found to be between 0.69 and 0.8. In correlation analysis with PDCA, coefficient was calculated as r=0.727. In the ROC analysis conducted to distinguish the sleep disorder group from the healthy group, the area under the curve was calculated as 0.76. Within the scope of the study, Cronbach alpha internal consistency coefficient of the scale was found as .90.

Brief Resilience Scale

The scale, which was developed by Smith et al. (2008) to measure individuals' psychological resilience, was adapted to Turkish culture by Doğan (2015). The 5-Likert type scale consists of a total of 6 items. High scores from the scale show high level of psychological resilience. As a result of exploratory factor analysis, a single factor structure explaining 54% of the total variance was obtained. Factor loads of the scale items range between .63 and .79. Cronbach alpha internal consistency coefficient of the scale was found as .83. Within the scope of the study, Cronbach alpha internal consistency coefficient of the scale was found as .86.

Data Collection and Analysis

The data were collected online on a voluntary basis. The participants were told that the data obtained would be used only for scientific purposes and confidentiality principle would be complied with. Ethics committee permission was taken for the study (Bülent Ecevit University Ethics Committee….). SPSS package program and PROCESS program that Works as an add-on to this program were used in data analysis. Mediating variable effect was tested with PROCESS model 4, which is a macro added to SPSS program by Hayes (2012). This add-on, which uses Bootstrap method, performs analysis with a 95% confidence interval on a sample of 5000 people with resampling method. The effect of the independent variable on dependent variable was calculated with direct effect, indirect effect and total effect scores. The effectiveness of the mediating variable is measured with bootstrap confidence interval. Confidence interval upper limit (BootLLCI-BootULCI) being below or above zero and absence of "0" between both values shows that the mediating variable does mediate. In this case, insignificance of the relationship between the dependent variable and the independent variable means full mediation, while its decrease means partial mediation. Reducing Type II error is the strength of Bootstrap method (Preacher & Hayes, 2008).

RESULTS

In this section, the hypotheses of the study were tested and the results obtained as a result of the analyses were included. Table 1 includes descriptive statistics of the variables and correlation coefficients and Table 2 shows whether the fear of COVID-19, sleep disorders, and resilience variables differ according to gender, work status and age.

Table 1. Descriptive statistics and correlation coefficients

Variables	N	M/Se	Sd	Skewness	Kurtosis	COV	SD	R	A
COV	322	18.00/.31	5.51	.409	.264	-			
SD	322	19.18/.25	4.57	-.061	.082	.326**	-		
R	322	19.81/.36	6.46	-.400	.377	-.328**	-.346**	-	

COV: COVID-19; SD: Sleep Disorders; R: Resilience

Table 2. Analysis results of some variables

Variables	N=322 f, n (/%)	M/SD	t *Gender	p	F*Age	Post Hoc
Gender						
Female(F)	220 (68.3)					
Male(M)	102 (31.7)					
Age						
20-25 (1)	251(78)					
26-30 (2)	32(9.9)					
31-… (3)	39(12.1)					
COV		18.00/5.52	2.68*	F>M	15.24*	2 and 3 >1
R		19.18/4.57	-3.14*	M>F	4.80**	3>1 and 2
SD		19.81/6.46	.191	-	3.70***	3>1 and 2

*p<.001, **p<.01, ***p<.05 COV:1, R:2, SD:3

According to Table 2, fear of COVID-19 differs significantly by gender. Accordingly, women's fear of COVID-19 was found to be significantly higher than men's fear. Psychological resilience was determined to be higher in men than in women. It was checked whether the variables differed significantly according to the age variable and it was determined that all the variables differed significantly according to the age variable. Fear of COVID-19 was found to be significantly higher in the 26-30 and 31 and above category compared to the 20-25 age category. Psychological resilience was seen to be significantly higher in the 31 and over age category compared to other categories. When the age variable was investigated in terms of sleep disorders, it was revealed that the sleep disorders of those in the age category of 31 and above were significantly higher than those in the category between 20-25 and 26-30.

Mediation Analysis

Factor analysis of the scales used in the study was performed before mediation model. As a result of the confirmatory factor analysis conducted, it was found that COVID-19 scale (x^2/sd = 2.00, RMESEA = .056, RMR = .036, GFI = .98, AGFI: .95, CFI = .99), Sleep disorders scale (x^2/sd = 3.66, RMESEA = .056, RMR = .039, GFI = .95, AGFI: .90, CFI = .97) and resilience scale (x^2/sd = 2.52, RMESEA = .069, RMR = .024, GFI = .98, AGFI: .95, CFI = .99) fit indices showed good fit. After this stage, the proposed model was tested. The model for the mediating effect of psychological resilience in the relationship between fear of COVID-19 and sleep disorder is shown below.

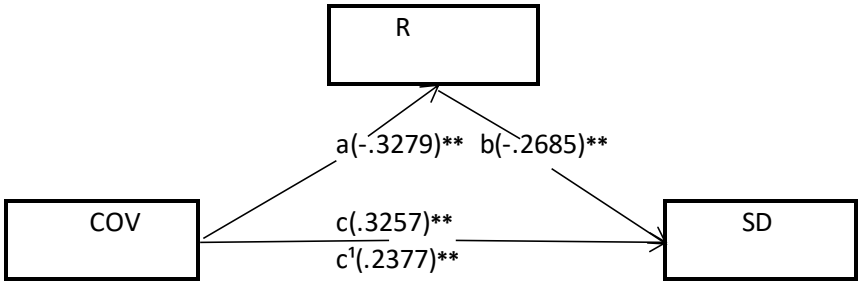


Figure 2. The model regarding the mediating effect of psychological resilience in the relationship between COVID-19 and sleep disorder

Figure 2 shows a,b,c and c^1 paths and the standardized regression coefficients of these paths regarding the mediating effect of psychological resilience in the relationship betweenCOVID-19 and sleep disorder. Four conditions are put forward for testing the mediating model. According to this, a) the independent variable should predict the dependent variable, b) the independent variable should predict the mediating variable, c) the mediating variable should predict the dependent variable, d) when the mediating variable is included in the analysis with the independent variable, the effect of the independent variable on the dependent variable should decrease to zero or should decrease significantly. The effect of the independent variable decreasing to zero (0) after the mediating variable is included in the analysis shows that the variable is a full mediator, while significant decrease of the effect shows partial mediation (Baron & Kenny, 1986). According to this, when the model is examined, the fear of COVID-19 predicts psychological resilience negatively (a= -.3279** ; 95% CI [-.3580, -.1857]); psychological resilience predicts sleep disorders negatively (b= -.2685** ; 95% CI [-.5297, -.2294]); and the fear of COVID-19 predicts sleep disorders positively (c= 3257** ; 95% CI [.2599, .5036]). When the mediating variable (psychological resilience) is added in the analysis with the fear of COVID-19, it can be seen that the regression coefficient of the relationship between the fear of Covid and sleep disorders is (c^1= 2377** ; 95% CI [.1541, 4030]). A significant decrease (from c=.3257 to c^1=.2377) is found in regression coefficient with the inclusion of psychological resilience in the mediation model. In order to test whether the decrease that occurred after adding the mediating variable in the model was due to the effect of the mediating variable, direct effect, indirect effect, total effect and bootstrap confidence interval were examined and the results were given in Table 2.

Table 3. Direct, indirect and total effect data and bootstrap confidence interval data of the independent variable on dependent variable

Theeffect mediatedby psychological resilience	Total Effect	Direct Effect	Indirect Effect	Bootstrap Confidence Interval BootLLCI-BootULCI	Mediation type
COV-SD	.3817	.2785	.1032	.0532, .1613	Partial

According to the results in Table 3, total effect of the fear of COVID-19 on sleep disorders was .2785 p< .000, its direct effect was .2785 p< .000 and its indirect effect was .1032 p< .000. It was seen that Bootstrap confidence interval was above zero (.0532-1613) and '0' was not between the two values. According to this result, psychological resilience is a partial mediator between the fear of COVID-19 and sleep disorders.

CONCLUSION and DISCUSSION

The present study examines the mediating effect of psychological resilience in the relationship between fear of COVID-19 and sleep disorders. According to the results in the study; it was determined that fear of Covid 19 predicted resilience significantly and negatively, resilience predicted sleep disorders in a negative way, and fear of Covid 19 predicted sleep disorders positively and significantly. In addition, it was found that psychological resilience partially mediated the relationship between fear of Covid 19 and sleep disorders.

The first hypothesis of the study was "The fear of COVID-19 predicts psychological resilience". In the analysis conducted, it was found that the first hypothesis was confirmed and the fear of COVID-19 significantly predicted psychological resilience negatively. Similar result was found in a study by Barzilay et al. (2020). Kasapoğlu (2020) examined the relationship between anxiety and psychological resilience during COVID-19 period and found that psychological resilience significantly predicted anxiety negatively. It can be seen that the symptoms of COVID-19, which has affected the whole world, are seen in a short time of 2-14 days. Although symptoms differ each day, the common symptoms are high fever, fatigue, dry cough, muscle pain and shortness of breath (Wang et al. 2020). Fear is defined as an unpleasant mood triggered by a threatening situation (de Hoog, et al., 2008). Fear of COVID-19 means the fear of being affected by this epidemic. Psychological resilience is defined as the ability to overcome negative conditions and to adapt despite difficult conditions (Masten & Coatsworth, 1998). In this sense, psychological resilience is an important variable in coping with the negative mood created by COVID-19 and adapting to the new social life style (restriction, life with the mask, prevention of interpersonal communication) which is not very suitable

for the historical development of mankind. The result obtained from the study that COVID-19 predicts psychological resilience negatively is a predictable result.

The second hypothesis of the study was "Psychological resilience predicts sleep disorders". In the analysis conducted, it was found that the second hypothesis was confirmed and psychological resilience significantly predicted sleep disorders negatively. Insufficient sleep, which is described as a reversible state in which the organism's response to external stimuli decreases (Algın, Akdağ, & Erdinç, 2016), causes problems such as distractibility, irritability, decreased tolerance, unwillingness in social activities, unhappiness and weakness to fight (Korkmaz, Dönmez, & Yeşilyaprak, 2018). Individuals with quality sleep have higher body perception, self-respect and mental and general health condition, while individuals with high level of depression, anxiety and stress have very bad sleep quality (İyigün et all., 2017). In addition, the individuals with social and family problems, physical and mental problems and physical ailments, sleep quality is significantly low (Şenol, Soyuer, Akçe, & Argün, 2012). Psychological resilience which occurs with the interaction of risky experiences and relatively positive psychological experiences (Rutter, 2006), is defined as the individual's ability to overcome negative situations successfully and to adapt to new situations (Doğan, 2015). It can be seen that sleep problems and psychological problems are positively associated. However, psychological resilience is positively associated with mental health (Öz & Yılmaz, 2009). The fact that sleep problems are associated with variables such as depression, anxiety, stress and family problems and the fact that psychological resilience is associated with overcoming negative conditions and mental health support the results of the study. Thus, individuals with high psychological resilience level will have lower sleep disorders.

The third hypothesis of the study was "Fear of COVID-19 predicts sleep disorders". In the analysis conducted, it was found that the third hypothesis was confirmed and fear of COVID-19 significantly predicted sleep disorders positively. When the literature is reviewed, it can be seen that individuals have reported sleep problems during the COVID-19 process (Fu et al., 2020; Huang & Zhao, 2020; Gupta et al., 2020; Marelli et al., 2020). In APA psychology dictionary, the concept of pandemic is defined as a disease or disorder affecting a significant proportion of the population in a wide area (a few countries) (APA Dictionary, 2020). Infectious diseases do not only affect individuals' physical health, but they also affect the psychological health and well-being of the whole population, whether they are infected or not (Aşkın, Bozkurt, & Zeybek, 2020). Epidemics can be traumatic in terms of their impact and cause psychological symptoms in people such as stress, anxiety and depression. One of the obvious consequences of post-traumatic disorder is sleep disorders (Akçay et all., 2013). There is an association between sleep disorders and anxiety, perceived stress, and depression (Deveci, Çalmaz, & Açık, 2012 ; Lafcı, 2018; Pınar et all., 2014; Türkçapar, 2004). COVID-19, the fatality of which was 3.6% in China and 1.5% outside China as of March 2020 (Baud et al., 2020), creates fear with these rates. In addition, the fact that the long-term damage COVID-19 will create in the body even if people recover from it may cause negative feelings about the future in addition to the fear of death. So COVID-19 causes sleep problems with the psychological and social effects it creates.

The fourth hypothesis of the study was "Psychological resilience mediates the relationship between the fear of COVID-19 and sleep problems". In the analysis conducted, it was found that psychological resilience was a partial mediator in the relationship between the fear of COVID-19 and sleep problems. In other words, during the pandemic process, partly fear of COVID-19 and partly low psychological resilience are effective on sleep disorders. This result of the study is in parallel with the study conducted by Li et al. (2016) which shows that psychological resilience is a mediator in the relationship between prenatal maternal stress and sleep quality. The result was also in parallel with the results of the studies which showed that psychological resilience is negatively associated with low sleep quality and negative mood (McCuistion, 2016) and low psychological resilience is associated with sleep disorders and stress related sleep activities (Palagin et al., 2018). So we can conclude that the fear of COVID-19 has effects on humans and causes some psycho-social problems. Also the individuals with COVID-19 fear, those who have low psychological resilience levels could experience more sleep disorders.

To sum up, when studies in different countries are examined, it is seen that Covid-19 causes very different psychological problems. At this point, it is important to identify the protective factors and to minimize the psychological problems that may occur during the Covid-19 process. In this study, the relationship between the concepts of fear and sleep disorder, which causes people to be negatively affected during the pandemic process, was discussed and the mediating effect of psychological resilience in this relationship was examined.

It is thought that the findings in the study may be important in terms of determining the negative psychological factors and coping strategies created by Covid-19 in the future.

COVID-19 continues to take people's lives and affect them psychologically and socially, regardless of city, country and race. It can be seen that psychological resilience is an important variable in reducing the negative effects COVID-19 causes in people. For this reason, during this period when people are restricted and trying to adapt to new normal, trying to increase psychological resilience with various tools (TV programs, radio programs, online programs, etc.) can alleviate the effects of the fear of COVID-19 and also facilitate adapting to new normal. Increasing psychological resilience can also reduce sleep problems, therefore reducing the emotional, cognitive and social problems caused by sleep problems.

This study was conducted on people of a certain age range and living in a certain region. In future studies, people from different age groups and living in different regions can form the study group.

As a result of this study, it has been determined that psychological resilience is a protective factor for mental health in the period of COVID-19, in accordance with the literature. In this context, various studies can be carried out to increase psychological resilience throughout the country.

Declarations

Approval

The formal ethics approval was granted by the Social and Human Sciences Research and Publication Ethics Committee of Zonguldak Bülent Ecevit University. We conducted the study in accordance with the Helsinki Declaration in 1975.

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Research and Publication Ethics Statement

The study was approved by the research team's university ethics committee of the Zonguldak Bulent Ecevit University (Approval Number/ID: 965). Hereby, we as the authors consciously assure that for the manuscript "

" the following is fulfilled:

- This material is the authors' own original work, which has not been previously published elsewhere.
- The paper reflects the authors' own research and analysis in a truthful and complete manner.
- The results are appropriately placed in the context of prior and existing research.
- All sources used are properly disclosed.

Contribution Rates of Authors to the Article

The authors provide equal contribution to this work.

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