

# *Coronavirus anxiety, fear of COVID-19, hope and resilience in healthcare workers: a moderated mediation model study*

## BACKGROUND

In the era of the global health crisis, mental health and well-being of people have been severely affected because of experiencing high levels of anxiety, stress, fear, and uncertainty related to COVID-19. This study investigated a moderated mediation model in which resilience mediated the link between coronavirus anxiety and fear of COVID-19, and this mediation effect was moderated by hope.

## PARTICIPANTS AND PROCEDURE

A cross-sectional study was conducted on 168 healthcare workers ( $M_{\text{age}} = 29.19 \pm 6.13$  years and 63.1% women) working at a state hospital in the eastern part of Turkey. They completed measures of coronavirus anxiety, fear of COVID-19, resilience, and hope during COVID-19 pandemic.

## RESULTS

The results indicated that resilience mediated the relationship between coronavirus anxiety and fear of COVID-19.

Hope moderated the mediating path from coronavirus anxiety to resilience. Coronavirus anxiety had a stronger effect on resilience under the moderate and high levels of hope condition, compared to the low level of hope condition.

## CONCLUSIONS

The findings suggest that resilience is an important mechanism explaining how coronavirus anxiety is associated with fear of COVID-19 and that this relation may depend on the levels of hope. Future prevention and intervention programs should focus on increasing hope and resilience when addressing mental health problems in the face of adversity.

## KEY WORDS

coronavirus anxiety; fear of COVID-19; resilience; hope; healthcare workers

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TO CITE THIS ARTICLE – Yıldırım, M., & Güler, A. (2021). Coronavirus anxiety, fear of COVID-19, hope and resilience in healthcare workers: a moderated mediation model study. *Health Psychology Report*, 9(4), 388–397. <https://doi.org/10.5114/hpr.2021.107336>

RECEIVED 15.04.2021 · REVIEWED 13.05.2021 · ACCEPTED 18.05.2021 · PUBLISHED 28.06.2021

## BACKGROUND

In December 2019, a novel coronavirus outbreak (COVID-19) emerged in Wuhan city in the province of Hubei, China and spread to the globe. As of 14 May 2021, there have been more than 161,270,910 million confirmed cases of COVID-19 with more than 3,346,880 deaths globally (Center for Systems Science and Engineering, 2021). In Turkey, the first confirmed COVID-19 case was announced on March 11, 2020 and as of 13 May, 2021 there are more than 5,083,990 confirmed cases and 44,050 deaths (Republic of Turkey Ministry of Health, 2021). Since then, the pandemic has exerted a huge strain on healthcare provision. Healthcare workers are in the frontline playing a crucial role in management of the pandemic (Lai et al., 2020). Studies showed that 5% of infected people experienced severe pneumonia and rarely multi-organ failure, which lead to anxiety and fear in the general population and among healthcare workers (Li et al., 2020). Anxiety and fear may hinder functioning of healthcare workers' ability to make decisions about effective treatment and have long-term effects on their well-being under pandemic stress (Gong et al., 2014).

The rapidity of COVID-19 is a threat to mental health of people. It causes increased negative emotions and decreased positive emotions around the world (Barari et al., 2020; Yildirim et al., 2021a). Current evidence suggests that exposure to COVID-19 has a negative impact on individuals' psychological functioning (Stremikis, 2020; Yildirim & Güler, 2020, 2021; Yildirim & Solmaz, 2020). According to a survey published by the American Psychiatric Association (APA, 2020), 36% of American reported that COVID-19 has a severe effect on their mental health and 59% of them believed that the coronavirus has a severe impact on their day-to-day activities. As a preventive measure of the virus, self-isolation may cause serious psychological outcomes (Brooks et al., 2020). Experiencing lower frequency of positive affect and high frequency of negative affect during the pandemic can lead to various negative psychological, behavioural, and health outcomes such as high risk of experiencing anxiety and depression.

During the pandemic, people may experience a wide range of psychological states. Anxiety, which is defined as feelings of tension, worried thoughts, and physical changes in the body (APA, 2020), is the most common psychological problem occurring during the pandemic. A recent study examining mental health outcomes of healthcare workers who were treating patients with COVID-19 in China documented high prevalence of depression (50.4%), being the most dominant psychological problem, followed by anxiety (44.6%), insomnia (34%) and distress (71.5%) (Lai et al., 2020). Individuals with high levels of dysfunctional anxiety associated with COVID-19 tend to

suffer from various psychological difficulties which may have a high potential to be major risk factors for subsequent psychopathology (Lee et al., 2020; Skalski et al., 2020). This raises the need for screening and addressing dysfunctional anxiety associated with COVID-19, as it is not only associated with mental health problems, but also it may be the underlying reason for other forms of physical and mental disturbance during the pandemic (Taylor, 2020). Measures taken in response to COVID-19 may possess a risk for experiencing dysfunctional anxiety. As social distancing measures have been in order globally to control the spread of the virus, people may lose social connection during the COVID-19 pandemic, and people with low levels of social connection tend to experience more mental health problems including anxiety, depression, and psychological distress in comparison to those with high social connection (Maulik et al., 2011). However, receiving supportive online connection via social networking sites can mitigate the impact of anxiety and depression on one's mental health (Seabrook et al., 2016). Previous research showed that anxiety is a significant predictor of lower quality of life (Dausch et al., 2004) and people spend a tremendous amount of time thinking about the pandemic (Petzold et al., 2020).

In the face of a traumatic event such as the COVID-19 pandemic, it is common that people experience various psychological outcomes such as fear, anxiety, and depression. Fear is operationalised as a negative emotion accompanied by high level of arousal and is evoked by a threat that is viewed to have significant outcomes for a person (Easterling & Leventhal, 1989). When people are faced with challenges during traumatic experiences, their self-esteem, trust in others, self-control, and predictability of the world can be damaged, and this can result in unpleasant attitudes about the self, others, and the world, and in turn lead to unpleasant outcomes such as fear and anxiety (Janoff-Bulman, 2010). People who experience a high level of fear tend to believe that negative things can happen to them again when they are faced with traumatic clues (Farnsworth & Sewell, 2011). Intensive exposure to such events makes it hard for individuals to divert their attention to positive outcomes and causes individuals to have poor mental health (Ying et al., 2014). Studies showed that participants experience feelings of fear, anxiety, depression, and perceived vulnerability to disease during the COVID-19 pandemic (Ahorsu et al., 2020). Highly serious problems have recently been reported about dysfunctional beliefs related to being infected with coronavirus. The first suicidal case has been reported in India due to the fear of being infected with COVID-19 (Goyal et al., 2020). Given the high risk of the COVID-19 pandemic, it is more likely that people will experience a high level of fear that has potential to cause psychological distress, which is worth

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investigating within the context of the pandemic (Yıldırım et al., 2021b). Besides general consequences, fear of COVID-19 affected social aspects of people concerned for the health of relatives and other social consequences (Petzold et al., 2020). Social support is found to be crucial for coping with fear of adverse life events and reducing hopelessness (Tham et al., 2020). Psychological strength such as resilience and hope exert a fruitful impact on posttraumatic stress disorder (PTSD) and depressive symptoms and buffer the effects of negative experiences such as fear, worry, and exposure to stressful events on PTSD and mental health problems (Yıldırım & Arslan, 2020; Ying et al., 2014).

Hope is conceptualized as “a positive motivational state that is based on an interactively derived sense of successful agency (goal-directed energy) and pathways (planning to meet goals)” (Snyder, 2000). Hope theory (Snyder, 2000, 2002) proposes that the motivational state is incurred by both sense of successful agency and pathways which are two associated but distinct structures. While the agency component makes available the willpower and initiate routes to achieve desired goals, the pathways component is the perceived capacity to create alternative routes to reach desired goals. The agency and pathways components advance one another in such a way that they are continuously affecting and being affected by each other (Snyder, 2000). In this regard, hope enables people to cope with an adverse situation by expecting a positive result. Individuals with high hope possess positive thinking that is realistic and can generate necessary routes to desired goals (Ciarrochi et al., 2007). Empirical research suggests that hope is related to satisfaction with life, buffers against negative and stressful life events (Valle et al., 2006) and leads to better health outcomes (Hawro et al., 2014; Luthans et al., 2010; Yıldırım & Arslan, 2020). Hopeful people are also found to be more creative and demonstrate greater determination in pursuing their goals (Snyder, 2000) and experience fewer psychological health problems, such as depression and anxiety (Arnau et al., 2007).

Despite the threatening impact of the coronavirus disease, there is room for hope to reduce the expected adverse outcomes for mental health by strengthening psychological resources. Within this context, resilience becomes a prominent psychological strength that can mitigate the negative impact of COVID-19 due to its characteristic of adaptability to new and stressful situations (Woods, 2006; Yıldırım & Arslan, 2020) and contribute to psychological health and well-being of individuals (Yıldırım, 2019).

Resilience is the ability to adaptively respond to hardship, stress, and adversity. Resilience has been defined as a lasting and relatively stable personality traits that allows people to cope with or adjust their behaviours based on extreme adversities (Avey

et al., 2010; Connor & Davidson, 2003). According to broaden-and-build theory (Fredrickson, 2005), positive emotions widen human cognition and stimulate people to think more freely, creatively, and thoughtfully, which in turn helps them to find a positive meaning within adversity and view the world with a wider perspective. As a consequence of this, individuals who experience high levels of positive emotions have an ability to produce various possible coping strategies in the face of adversity. Accordingly, they are able to deal with stressors more effectively and achieve greater levels of resilience. Resilient individuals are often characterized by positive attitudes and optimistic outlooks.

Previous studies have found that high resilience is related to better health, longevity, higher success, more happiness (Schneider, 2001), effectively coping with uncertainty and failure (Avey et al., 2008), and well-being (Tomás et al., 2012). Related research also documented positive links between resilience and hope (Li et al., 2016), and working experience and age (Ang et al., 2018).

A link between resilience and fear has also been documented in the relevant literature. Research underscored that resilience could buffer the effect of fear on a wide range of post-traumatic outcomes (Zhou et al., 2016). Fear was found to act as a mediator in the relationship between traumatic exposure and depression, suggesting that those who are exposed to traumatic events can experience high levels of fear, which in turn leads to greater depression. However, resilience was found to function as a moderator in the relationship between traumatic exposure and depression alongside fear and depression, meaning that fear has a significant positive impact on depression under the conditions of low resilience (Zhou et al., 2016). Additionally, resilience explained the underlying mechanism between fear of experience of positive emotions and affect balance, life satisfaction, and psychological well-being (Yıldırım, 2019). Collectively, these results suggest that hope and resilience act as psychological forces to preserve mental health and well-being of individuals. Thus, it is important to examine the positive role of resilience within the context of times of crisis such as the COVID-19 pandemic.

Within the literature and theoretical framework documented above, the present study suggests a moderated mediation model showing that resilience mediates the relationship between coronavirus anxiety and fear of COVID-19 and this mediation effect was moderated by hope. Therefore, we tested the following hypotheses: (H1) resilience mediated the relationship between coronavirus anxiety and fear of COVID-19, and (H2) hope moderated the mediating effect of resilience on the relationship between coronavirus anxiety and fear of COVID-19. The structural model is presented in Figure 1.

## PARTICIPANTS AND PROCEDURE

### PARTICIPANTS

The population included 168 healthcare workers from a state hospital from the province of Agri, Turkey. The sampling was convenience, due to accessibility. Of the full sample, 63.1% were women ( $n = 106$ ) and 36.9% men ( $n = 62$ ). The age of the participants ranged from 20 to 49 years ( $M = 29.19$ ,  $SD = 6.13$ ). Participants mainly comprised nurses (60.1%), followed by allied health personnel (35.7%) and doctors (3.6%). Of the participants, 54.8% were single and 45.2% were married. To test an indirect effect among the analysed variables, a sample of 115–285 has been recommended (Fritz & MacKinnon, 2007), meaning that the sample size in this study is adequate for the planned analysis.

### MEASURES

**Anxiety.** The Coronavirus Anxiety Scale (CAS) is used to assess the probable cases of dysfunctional anxiety related to the COVID-19 crisis (Lee et al., 2020). The CAS consists of 5 items, and each item is rated on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*nearly every day over the last 2 weeks*). A total score can be obtained by summing all items on the scale and higher total scores reflect high levels of COVID-19 anxiety. In this study, the Cronbach's  $\alpha$  was .93.

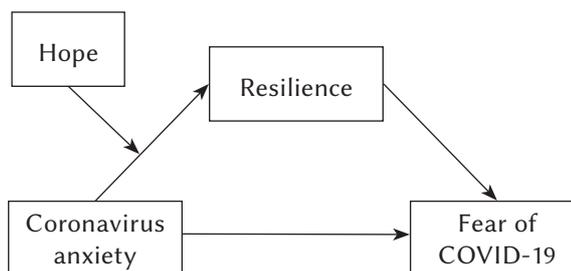
**Fear.** The Fear of COVID-19 Scale (FCV-19S) was employed to measure severity of fear associated with COVID-19 (Ahorsu et al., 2020). The FCV-19S is composed of 7 items. For each item, individuals are asked to rate their agreement and disagreement on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A total score can be computed by adding all items. Higher scores are indicative of the high severity of the fear of COVID-19. In this study, the Cronbach's  $\alpha$  was .90.

**Hope.** The Hope Scale (Snyder et al., 1991) includes 12 items: four tap the agency component, four items tap the pathways component, and four are distracters. Items are rated on an 8-point Likert scale, ranging from 1 (*definitely false*) to 8 (*definitely true*). The total score is the summation of the scores for the 8 items corresponding to agency and pathway. Higher scores refer to higher hope. In this study, the Cronbach's  $\alpha$  was .91.

**Resilience.** The Brief Resilience Scale (BRS) is utilised to measure the level of resilience reflecting to the ability to "bounce back" from stressful life events (Smith et al., 2008). The BRS includes 6 items and each of the items is scored on a 5-point Likert agreement scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The total score is the mean of item scores, after reverse coding of negatively worded items. Higher scores indicate higher levels of resilience. The Turkish

**Figure 1**

*The proposed model indicating the association between the variables of the study*



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version of the scale was translated and used by Doğan (2015) and it has good psychometric properties. In this study, the Cronbach's  $\alpha$  was .78.

### PROCEDURE

This study was a cross-sectional study in nature. A battery of the above-mentioned questionnaire was presented online using a secure electronic survey system. A link was created for the study and sent to volunteers using WhatsApp and e-mail. Due to the nature of the study, an informed consent form was placed on the first page of the online survey. Prior to the data collection, the participants gave their electronic informed consent. They were given information that no individual responses, or any information that could identify them as research participants, would be disclosed. Further, they were explicitly assured of the voluntary, anonymous, and confidential nature of the data obtained. Moreover, they were informed about the possibility of withdrawing from the study at any time, without giving any explanation. They were made aware about their rights during and after the participation in the study. No compensation was given to the participants. The study was conducted in line with the ethical principles established in the Declaration of Helsinki. The procedure was approved by the Ethical Committee of the Ağrı İbrahim Çeçen University and the Republic of Turkey Ministry of Health.

### STATISTICAL ANALYSIS

Prior to testing the proposed structural models, several confirmatory factor analyses (CFA) were conducted to assess the psychometric properties of the self-report questionnaires (i.e., CAS and FCV-19S) that have not specifically been adapted to the work context with Turkish healthcare workers yet. In order to assess model fit for CFAs, several fit indices

were used including the chi square test ( $\chi^2$ ), the standardized root mean square residual (SRMR), the root mean square error of approximation (RMSEA), and the comparative fit index (CFI). A model presents a good fit to data if the  $\chi^2$  is insignificant. In addition, values close to or smaller than 0.08 for RMSEA and SRMR, as well as values close to or greater than 0.90 for CFI, present an acceptable fit to the data (Brown, 2015). The reliability of each questionnaire was computed using Cronbach's  $\alpha$  coefficient of internal consistency. Continuous variables are presented as mean and standard deviation. The skewness and kurtosis statistics and their cut-off values were used to assess conformity with a normal distribution (D'Agostino et al., 1990; Kline, 2015). Relationships between coronavirus anxiety, fear of COVID-19, hope, and resilience were examined by Pearson correlation. A two-step analytic approach was conducted to test the proposed moderated mediation model using the PROCESS macro version 3.5 (Model 7, see Figure 1) for SPSS (Hayes, 2018). The bootstrapping method with 10,000 resamples to calculate the 95% confidence intervals was run for estimation the significance of indirect effects (Hayes, 2018; Preacher & Hayes, 2008). Data analysis was performed using IBM SPSS Statistics for Windows, version 25. *P*-values < .05 were accepted as statistically significant.

## RESULTS

### CONFIRMATORY FACTOR ANALYSIS

A CFA was carried out to examine the psychometric properties of the CAS. This model is represented with five items. The fit indices indicated a less than adequate fit to data:  $\chi^2(5) = 61.55, p < .001, RMSEA = .260, CFI = .925, SRMR = .043$ . However, a closer inspection of the modification indices revealed that an error covariance between item 4 and item 5 should be freely estimated. A new CFA was carried out, and fit indices demonstrated a good fit to data:  $\chi^2(4) = 4.45, p > .05, RMSEA = .026, CFI = .999, SRMR = .012$ . The stan-

dardized factor loadings ranged between .77 (item 5) and .92 (item 3).

Another CFA was conducted to examine the psychometric properties of the FCV-19S. In this model, FCV-19S was represented with seven items. The fit indices demonstrated a less than adequate fit to data:  $\chi^2(14) = 90.93, p < .001, RMSEA = .181, CFI = .881, SRMR = .075$ . A closer inspection of the modification indices showed that an error covariance between item 1 and item 2 should be freely estimated. A new CFA was conducted, and fit indices revealed an acceptable fit to data:  $\chi^2(12) = 40.15, p < .001, RMSEA = .119, CFI = .956, SRMR = .058$ . Following this modification, the RMSEA value was still above the recommended value. This is indeed expected because a model with a small degree of freedom and sample size could cause artificially high RMSEA values that usually incorrectly reveal a poor model fit (Kenny et al., 2015). For the final model, the standardized factor loadings ranged between .55 (item 1) and .87 (item 5).

### MODEL TESTING

Skewness values ranged between 0.21 to 1.93 and kurtosis scores ranged between -0.01 and 3.22, suggesting that all measures had relatively normal to acceptable distribution (D'Agostino et al., 1990; Kline, 2015), as presented in Table 1. Further, correlation analysis revealed that coronavirus anxiety had a significant positive correlation with fear of COVID-19 ( $r = .70, p < .01$ ) and significant negative correlations with hope ( $r = -.15, p < .05$ ) and resilience ( $r = -.31, p < .01$ ). Fear of COVID-19 also had significant negative correlations with hope ( $r = -.16, p < .05$ ) and resilience ( $r = -.41, p < .01$ ). Furthermore, hope had a significant positive correlation with resilience ( $r = .44, p < .01$ ), as seen in Table 1.

Following correlation analysis, we examined the mediating role of resilience on the relationship between coronavirus anxiety and fear of COVID-19 and tested the moderating effect of hope on the mediating role of resilience in this association using con-

**Table 1**

#### *Descriptive statistics and correlation results*

Variable	Descriptive statistics					Correlations			
	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	$\alpha$	1.	2.	3.	4.
1. Coronavirus anxiety	3.01	4.74	1.93	3.22	.93	-	.70**	-.15*	-.31**
2. Fear of COVID-19	18.88	6.91	0.52	-0.18	.90		-	-.16*	-.41**
3. Hope	48.83	10.40	-1.18	2.67	.91			-	.44**
4. Resilience	19.12	4.90	0.21	-0.01	.78				-

Note. \* $p < .05$ , \*\* $p < .01$ .

**Table 2**

*Unstandardized coefficients for the conditional process model*

Antecedent	Consequent			
	M (Resilience)			
	Coeff.	SE	t	p
X (Coronavirus anxiety)	-.28	.07	-3.99	< .001
W (Hope)	.20	.03	6.38	< .001
X × W	-.02	.01	-3.18	< .001
Constant	19.00	.32	58.92	< .001
<i>R</i> <sup>2</sup> = .30, <i>R</i> <sup>2</sup> change = .04 <i>F</i> = 22.98, <i>p</i> < .001				
Y (Fear of COVID-19)				
X (Coronavirus anxiety)	.92	.08	11.13	< .001
M (Resilience)	-.31	.08	-3.86	< .001
Constant	24.74	1.56	15.82	< .001
<i>R</i> <sup>2</sup> = .53 <i>F</i> = 91.54, <i>p</i> < .001				
Conditional indirect effects of coronavirus anxiety on Fear of COVID-19				
Hope	Coeff.	BootSE	BootLLCI	BootULCI
M - 1SD (-10.40)	.03	.04	-.04	.13
M (.00)	.08	.05	.02	.20
M + 1SD (10.40)	.14	.07	.05	.32
Index of moderated mediation				
Hope	.01	.00	.00	.01

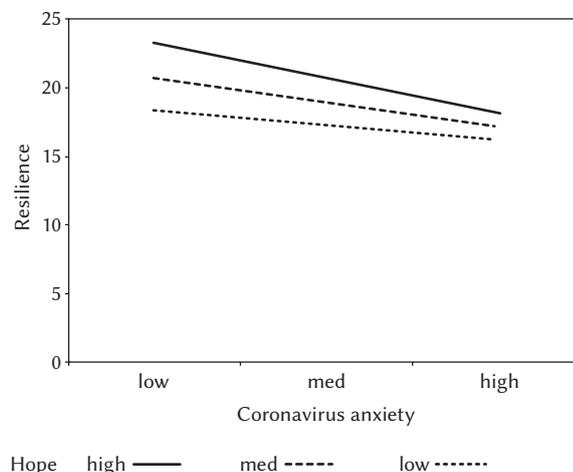
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*Note.* SE – standard error; Coeff – unstandardized coefficient; X – independent variable; M – mediator variable; W – moderator variable; Y – outcomes or dependent variable.

ditional process analysis as presented in Figure 1. Findings from this analysis indicated that coronavirus anxiety was a significant negative predictor of resilience ( $b = -.28, t = -3.99, p < .001$ ) and fear of COVID-19 ( $b = .92, t = 11.13, p < .001$ ). Hope significantly predicted resilience ( $b = .20, t = 6.38, p < .001$ ). Further, the interaction between coronavirus anxiety and hope was significant, explaining 4% of variance in the association between coronavirus anxiety and resilience, as seen in Table 2. Hope moderated this association, and the indirect effect of coronavirus anxiety on fear of COVID-19 through resilience was observed when hope was moderate (SD) and high (+1SD), yet when hope was not as low (-1SD), as presented in Figure 2. Lastly, resilience had a significant negative predictive effect on healthcare workers' fear of COVID-19 ( $b = -.31, t = -3.86, p < .001$ ) and mediated the effect of coronavirus anxiety on fear of COVID-19 of healthcare workers.

**Figure 2**

*Simple slope depicting the mediation effect*



## DISCUSSION

This study proposed a moderated mediation model to examine the mediating effect of resilience in the association between coronavirus anxiety and fear of COVID-19, and the moderating effect of hope in the relationship between coronavirus anxiety and resilience. The findings provided support for the study hypotheses. The results demonstrated that coronavirus anxiety had a significant effect on resilience and fear of COVID-19. Also, resilience had a significant effect on fear of COVID-19. This suggests that healthcare workers who report high levels of coronavirus anxiety tend to have poor ability to bounce back from a stressful situation and experience high levels of fear of COVID-19 compared to their counterparts. Furthermore, less resilient healthcare workers are more likely to experience greater fear of COVID-19. These results are in accordance with those of previously published studies. Resilience was inversely related to anxiety and depression in the context of the pandemic (Zhang et al., 2020) and fear of COVID-19 (Breakwell & Jaspal, 2021; Yıldırım et al., 2020).

Our findings confirmed that resilience is a critical mediator in the association between coronavirus anxiety and fear of COVID-19. Consistent with our hypothesis, the results of simple mediation analysis demonstrated that resilience partially mediated the association between coronavirus anxiety and fear of COVID-19. This implies that healthcare workers who experience high levels of coronavirus anxiety report poor resilience, which in turn increases the experience of fear of COVID-19. Prior research has assessed the role of clinical and functional vulnerabilities affecting fear during the COVID-19 pandemic (Wu et al., 2021). Our findings contribute to the literature by providing a process explanation based on the mediating effect of resilience. Also, the results provide support for the findings of recent research that documented negative effects on psychological health in the context of the COVID-19 pandemic (Basińska & Sołtys, 2020; Yıldırım et al., 2020; Yıldırım & Güler, 2021). The implications of these findings are important, emphasising the role of resilience and hope in healthcare workers with coronavirus anxiety.

Further findings of this research show that hope moderates the indirect influence of coronavirus anxiety on fear of COVID-19 through resilience. Healthcare workers with moderate and high levels of hope were less susceptible to the harmful effects of coronavirus anxiety on fear of COVID-19 via the activation of resilience. This finding suggests that hope, as a dispositional characteristic, allows healthcare workers to deal with the pandemic's adverse effects. Healthcare workers with moderate and high levels of hope reported high levels of resilience and, in turn, lower effects on fear of COVID-19, feeling greater success in dealing with the anxiety stimulated by the

pandemic. This result is in line with studies that analyse the importance of hope in dealing with adversities (Yıldırım & Arslan, 2020). Our confirmation of the moderating effect of hope on the impact of coronavirus anxiety on resilience adds hope as a further variable to this perspective.

## LIMITATIONS AND IMPLICATIONS

Several limitations exist in this study. First, the cross-sectional design cannot offer insight into causal relationships, despite its suitability for the type of objectives proposed here. Associations between anxiety and fear of COVID-19 may be reciprocal. Empirical evidence from Salehi et al. (2020) showed that higher fear of COVID-19 is associated with higher coronavirus anxiety, which in turn leads to mental health problems. Although the association between anxiety and fear of COVID-19 could be reciprocal, the present cross-sectional study examined the direction from coronavirus anxiety to fear of COVID-19. Future research should be longitudinal to allow us to gain a better understanding of how hope changes the association between coronavirus anxiety and resilience and how the relationship between coronavirus anxiety and fear of COVID-19 can be explained by resilience. Second, the use of self-reports carries some limitations. As such, the data are subject to biases corresponding to social desirability, recall, and common method variance. Third, data on some potentially important factors relating to coronavirus anxiety, fear of COVID-19, hope, and resilience were not collected and therefore could not be considered in the statistical analyses. For example, pre-existing mental health conditions are likely to influence healthcare workers' anxiety and fear relating to COVID-19. Fourth, participants were predominantly female and recruited from a single hospital located in a rural area in Turkey. Generalizability of the findings to the rest of the population is limited. Future research should be conducted on larger and more diverse samples.

Despite the above-mentioned limitations, the findings from the current study provide important implications for future research and practice. Determining the key mediating and moderating mechanisms provides better insights into potential intervention strategies which may help healthcare workers to cope with coronavirus anxiety. The results indicate that resilience and hope are essential psychological factors to understand and explore the effect of coronavirus anxiety on fear of COVID-19 among healthcare workers. These findings suggest that promoting resilience allows healthcare workers to cope with the adverse impacts of coronavirus anxiety, which in turn diminishes the level of fear of COVID-19. This is particularly the case under moderate and high levels of hope. As such, mental health providers could tailor

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interventions aimed at reducing healthcare workers' fear of COVID-19 in the context of coronavirus anxiety by considering the mediating role of resilience and moderating role of hope. Assisting healthcare workers to develop the capacity of resilience could be a key element of positive psychology-based interventions or other therapeutic approaches that aim to reduce fear of COVID-19. For instance, interventions based on a strengths-based approach could be useful to promote individuals' protective and promotive resources (e.g., resilience and hope) to cope with coronavirus stress and its possible outcomes.

To conclude, the present study used a moderated mediation model to examine the associations between coronavirus anxiety, fear of COVID-19, hope, and resilience. We found in this study that hope moderated the negative impact of coronavirus anxiety on resilience and that resilience mediated the relationship between coronavirus anxiety and fear of COVID-19. These findings suggest that positive characteristics such as hope and resilience may potentially mitigate and protect against mental health consequences of COVID-19 related anxiety and fear. This would have important potential as regards possible avenues for the design of treatment or even prevention options in response to the mental health challenges resulting from anxiety and fear of COVID-19.

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