

# DEPRESSION, RESILIENCE AND INTOLERANCE OF UNCERTAINTY: THE MEDIATING ROLE OF RUMINATION AND COVID-19 BURNOUT

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## Summary

**Background:** This study aims at investigating the mediating role of rumination and COVID-19 burnout in the relationship among depression, resilience and intolerance of uncertainty.

**Subjects and methods:** This is a correlational study. The study sample is composed of 436 (F=259, M=177) Turkish university students recruited via convenience sampling method. The participants responded to the Depression Scale, COVID-19 Burnout Scale, Rumination Scale, Resilience Scale and Intolerance of Uncertainty Scale face to face. The model that was developed within the scope of the current study was tested via path analysis, which is a technique of Structural Equation Modelling (SEM).

**Results:** The study findings show that resilience and intolerance of uncertainty predict depression and rumination at a statistically significant level. Moreover, rumination directly predicts COVID-19 burnout, while COVID-19 burnout predicts depression. On the other hand, indirect effect modelling shows that resilience predicts depression with the mediating effect of rumination and COVID-19 burnout at a statistically significant level. Lastly, intolerance of uncertainty predicts depression with the mediating effect of rumination and COVID-19 burnout at a statistically significant level.

**Conclusion:** The current findings suggest that an increase in the level of intolerance of uncertainty and a decrease in the level of resilience increase rumination, which in turn increases depression by increasing COVID-19 burnout.

**Key Words:** Depression, Resilience, Intolerance of Uncertainty, Rumination, COVID-19 Burnout

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## INTRODUCTION

University students compose the most active and mobile age group (Ghazawy et al. 2021). When considered from a developmental perspective, university students face unique stress factors and financial pressure. Stressors that increase the risk of mental health problems include leaving nuclear family behind as well as moving into a new, competitive and demanding environment where they are supposed to develop a sense of responsibility, make important life choices and establish new social networks (King et al. 2021). In addition to these developmental stressors, the COVID-19 pandemic has turned out to be a problem for people of these ages (Šljivo et al. 2020). Following the uncertainty brought about by the COVID-19 pandemic and its treatment, governments and healthcare institutions began to introduce severe measures and restrictions that broke the usual daily routine and had the potential to affect mental health seriously. Moreover, university students had to switch from traditional face-to-face education to distance education without any prior planning. On top of that, individuals were directly affected by staying home, not seeing friends, not

doing exercise, not travelling, the fear of being infected or transmitting the virus to family and friends. These policies adopted for the sake of struggling with COVID-19 had a serious impact on people's mental health (Ghazawy et al. 2021; Sazakli et al. 2021). However, as was the case in most pandemics, although the effect of COVID-19 on the general population is very well-known, the impact of this problem on youngsters' mental health has received too little attention (Tran et al. 2020).

Taking some precautions due to the pandemic such as social isolation affected most people psychologically (Karaşar & Canlı 2020). Previous studies in the literature reveal that especially long-term social isolation and quarantine increase the risk of depression among general population (Ge et al. 2017, Karataş 2020, Le et al. 2020, Matthews et al. 2016, Qiu et al. 2020). A study conducted in the USA found out that the rate of depression was 8.5% before the COVID-19 pandemic, whereas it rose to 27.8% with the pandemic (Ettman et al. 2020). Likewise, another study carried out in Spain showed that the rate of depression among people rose throughout the pandemic (Ozamiz-Etxebarria et al. 2020). Studies conducted in different cultures came up with similar results

(Dilmen-Bayar et al. 2020, Nelson et al. 2020). Although there are a number of reasons presented for the increase in depression from the start of the pandemic until the end, the related literature points out that COVID-19 burnout is one of the leading factors (Alahmari et al. 2021, Yıldırım & Solmaz 2020). Burnout is described as a state of physical, mental and emotional exhaustion caused by excessive and prolonged stress (Schaufeli et al. 2001). Burnout can affect psychological health, resulting in psychosomatic symptomatology and depression as well as decreasing the well-being (Chirico et al. 2020, Sriharan et al. 2020). The worldwide prevalence of the COVID-19 pandemic for about two years is the most significant factor affecting the level of burnout (Franza et al. 2020, Yıldırım & Solmaz 2022). Moreover, it is highly probable that the COVID-19 burnout is mostly affected by the uncertainty brought about by the pandemic (Huang et al. 2020). It is obvious that ruminative thinking accompanied by different forms of non-functional thinking about the course of the pandemic leads to burnout and depression among individuals (Nikolova 2021, Ye et al. 2020).

It is a known fact that rumination causes depression by means of weakening the cognitive resources (Nolen-Hoeksema & Girgus 1994). Having developed the response styles theory of depression, Nolen-Hoeksema (1991) describes the possible symptoms of depression as a way of passive and repetitive thinking within the context of reason and result. The relationship between rumination and depression according to the response styles theory suggests that "Rumination aggravates depression, reinforces negative thinking, prevents problem-solving and activating behaviours, and weakens social support." Moreover, the relationship between rumination and depression was triggered by the uncertainty brought by the COVID-19 pandemic. Studies on rumination show that individuals with a high level of rumination experience negative emotions and hopelessness more than others (Moberly & Watkins 2008, Sarin et al. 2005). While vaccination was considered as a hopeful step to end the pandemic at first, the early hope for a fully-influential vaccine and treatment was destroyed by learning more about the long-term effects and seeing new variants as well as neurological diseases and other symptoms notified by COVID-19 patients. In the light of this emerging situation, the probability of the pandemic to reach uncontrollable levels started to draw attention in the literature (Özkan-Oktay et al. 2021). Although many countries have COVID-19 vaccines, it does not seem possible to fully wipe out the crisis caused by the pandemic. Therefore, there is still a great uncertainty about the future course of the pandemic (Skegg et al. 2021).

While this uncertainty led by the pandemic did not give a hard time to some individuals, some others were deeply affected by it. Literature review shows that especially those who had a high level of intolerance of uncertainty were really disturbed by this situation (Bartoszek et al. 2022, Yao et al. 2022). Individuals with a high level of intolerance of uncertainty give more negative responses to uncertain situations within the framework of emotional, behavioural and cognitive criteria (Buhr & Dugas 2002, Dugas et al. 2004). Uncertainty about the course of the pandemic and what those who have been infected with COVID-19 will face in the future gives a hard time to those with a high level of intolerance of uncertainty (Del Valle et al. 2020).

The uncertainty caused by the pandemic not only affected the individuals with a high level of intolerance of uncertainty but also those with a low level of resilience. Resilience is one of the most significant factors that influence mental health (Jakovljevic 2017) and resilience played an important role during the pandemic, when there was a high level of uncertainty (Jakovljevic et al. 2020). Resilient individuals have a strong head for stressful life events. Moreover, they consider such events as an opportunity, not as a threat (Hisli Şahin 2010). Having a high level of resilience in this process helps to decrease the intolerance of uncertainty (Bozdağ & Ergün 2020). Also, a low level of resilience causes depression and ruminative thinking (Armutlu 2019). That's why, individuals with a high level of resilience are better at recovering after a bad event, which makes them more resistant against depression and rumination. However, although it is known that there are direct relationships among depression, intolerance of uncertainty and resilience, it is not known which variables mediate these relationships especially during the pandemic.

In this context, the current study aims at investigating the mediating role of rumination and COVID-19 burnout in the relationship among depression, intolerance of uncertainty and resilience. In this line, the study findings are expected to contribute to investigating depression and related factors during the pandemic, managing the process better and conducting preventive actions.

## SUBJECTS AND METHODS

### Participants and Procedures

The study sample is composed of 436 (F=259, M=177) Turkish university students studying at Yozgat Bozok University recruited via convenience sampling method. The participants' ages varied between 18-29,

while the average was 21.34 (SD= 1.20). The inclusion criteria were being over 18 years of age and volunteering to participate in the study. In the study, 18 observations were excluded because they did not respond to the measurement tools in the study. In addition, 14 observations were excluded for statistical reasons (such as normality, extreme value etc.). 65 of the participants were diagnosed with COVID-19, while 144 of them had a family member who was infected. Moreover, 99 of the participants lost a close person because of COVID-19.

The study data were gathered face-to-face in a class environment at the beginning of 2021-2022 Academic year, when face-to-face education re-started following the distance education. All the participants were informed about the study purpose and the confidentiality of their responses. Moreover, the data were gathered from the participants on a voluntary basis.

Path analysis was used in the research. According to Kline (2011) the sample adequacy of the study states that 5 to 10 times the total number of measurement tools in the study is sufficient in terms of data saturation. In this context, the total number of samples included in the study was determined to be sufficient for the study (55 items and 436 observations). All the study procedures were approved by the ethical commission of the related university, and conducted in line with Helsinki Declaration.

## Instruments

**The Resilience Scale:** The Resilience Scale was developed by Smith and colleagues (2008) in order to measure individuals' level of resilience. It is a 5-point Likert-type scale consisting of 6 items. Three of the items in the scale are reverse items. Getting a high score refers to a high level of resilience. The analysis showed that internal consistency coefficient of the scale varied between .80 and .91. The internal consistency coefficient was found to be .78 in the current study.

**The Intolerance of Uncertainty Scale:** The Intolerance of Uncertainty Scale was developed by Carleton and colleagues (2007) in order to measure individuals' level of intolerance against uncertain situations. The scale is composed of two sub-dimensions, which are inhibitory anxiety subscale and prospective anxiety subscale. It is possible to get a total score of intolerance from the scale. It is a 5-point Likert-type scale consisting of 12 items. Internal consistency coefficient was found to be .88 for the total score, .77 for the inhibitory anxiety subscale and .84 for the prospective anxiety subscale. In the current study, we found out that it was .81 for the total score, .75 for the inhibitory anxiety and .80 for the prospective anxiety.

**The Rumination Scale:** The Rumination Scale was developed by Brinker and Dozois (2009) in order to assess ruminative thinking types. It is 7-point Likert-type scale consisting of 20 items, and it has a one-factor construct. The internal consistency coefficient was found to be .91. In the current study, we found out that internal consistency coefficient was .94.

**The COVID-19 Burnout Scale:** The COVID-19 Burnout Scale was developed by Yıldırım and Solmaz (2020) in order to assess individuals' level of burnout related to COVID-19 pandemic depending on the burnout scale developed by Malach-Pines. It is a 5-point Likert-type scale consisting of 10 items. Getting a high score from the scale refers to a high level of burnout. Internal consistency coefficient was found to be .92. In the current study, we found out that internal consistency coefficient was .93.

**The Depression-Anxiety-Stress Scale (DAS-21):** The Depression-Anxiety-Stress Scale was developed by Lovinond and Lovibond (1995) in order to measure individuals' level of depression, anxiety and stress. In the current study, we used the depression subscale. In the scale, there are 7 items that assess the level of depression. It is a 4-point Likert-type subscale. Internal consistency coefficient was found to be .88 for the depression subscale. In the current study, we found out that internal consistency coefficient was .89.

## Data Analyses

The study data were analysed via SPSS 23.0 and AMOS 24.0 statistical packet programs. The data analysis started with summarizing the data by using descriptive statistical techniques. In the next step, we addressed the prerequisite analysis. In this scope, we assessed the univariate and multivariate normal distribution assumptions as well as skewness and kurtosis values. We calculated Pearson Product-Moments Multiplication Coefficient to test the correlations among study variables. Lastly, we conducted path analysis, which is a technique of Structural Equation Modelling (SEM), in order to test the hypothesized model. According to Kline (2011), it is necessary to report at least four values which are chi-square, RMSEA, CFI and SRMR to assess the goodness of fit of the model. The indices and relevant reference values used to assess the model fit are as below: Ratio of  $\chi^2$  to the degree of freedom ( $\chi^2/df$ , <5), goodness of fit index (GFI, >.95), comparative fit index (CFI, >.95), Tucker-Lewis index (TLI, >.90), the root mean square error of approximation (RMSEA, <.08), standard root mean square residual (SRMR, <.09) (Bryne 2013; Hu &

Bentler 1999). Also, bootstrapping procedure was used to assess the statistical significance of indirect effects in the hypothesized model.

## RESULTS

Table 1 below presents the descriptive statistics and zero-order correlations regarding the study variables. In the descriptive statistics, average values were 45.99 ( $\pm 1.97$ ) for the intolerance of uncertainty, 17.71 ( $\pm 1.28$ ) for resilience, 86.08 ( $\pm 1.48$ ) for rumination, 26.99 ( $\pm 1.53$ ) for COVID-19 burnout and 9.05 ( $\pm 0.97$ ) for depression. Skewness and kurtosis values were between +1.5 and -1.5, which are accepted to be cut off values (Tabachnick & Fidell 2013). Mardia's multivariate coefficient was lower

than 5 (Byrne, 2013), which showed that the assumptions of univariate and multivariate normality were met.

According to the correlational analysis, there was a statistically significant relationship between intolerance of uncertainty and rumination ( $r=.68$ ,  $p<.01$ ) as well as resilience and rumination ( $r=-.50$ ,  $p<.01$ ). There were positive relationships between rumination and COVID-19 burnout ( $r=.53$ ,  $p<.01$ ) as well as COVID-19 burnout and depression ( $r=.57$ ,  $p<.01$ ). The intolerance of uncertainty was also significantly related to COVID-19 burnout ( $r=.42$ ,  $p<.01$ ) and depression ( $r=.25$ ,  $p<.01$ ). Resilience was significantly related to COVID-19 burnout ( $r=-.33$ ,  $p<.01$ ) and depression ( $r=-.42$ ,  $p<.01$ ). Lastly, there was a statistically significant relationship between rumination and depression ( $r=.42$ ,  $p<.01$ ). Results are shown in Table 1.

Figure 1. Path model

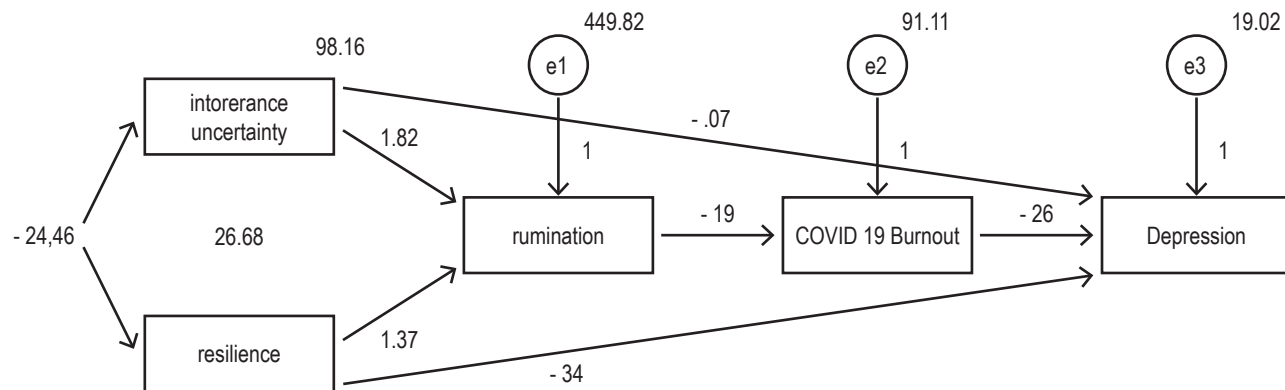


Table 1. Descriptive statistics and correlations among study variables

	1	2	3	4	5
1.IntorelanceUncertainty	-				
2.Reisilience	-.48**	-			
3.Rumination	.68**	-.50**	-		
4.COVID-19 Burnout	.42**	-.33**	.53**	-	
5.Depression	.25**	-.42**	.42**	.57**	-
Mean	45.99	17.71	86.08	26.99	9.05
SD	1.97	1.28	1.48	1.53	0.97
Skewness	-.1287	-.193	.500	.38	-.032
Kurtosis	.1187	-.289	.463	-.40	.1065

\*\* $p<.01$ , \* $p<.05$ , SD: Standard deviation

**Table 2.** Standardized direct effects

Structural Relations	$\beta$	S.E	CR (t)
intoleranceuncertainty → rumination	.59	.117	15.56**
resilience → rumination	-.23	.224	-6.11**
rumination → COVID19Burnout	.52	.015	12.53**
COVID19Burnout → Depression	.53	.020	13.01**
intoleranceuncertainty → Depression	-.12	.025	-2.68*
resilience → Depression	-.31	.046	-7.30**

Results of Bootstrapping Test Regarding Mediating Effects				
Structural Relations	B	% 95 GPA		S.E (β)
		Lower	Upper	
intoleranceuncertainty → rumination → COVID19Burnout → Depression	0.16	0.122	0.200	0.14**
resilience → rumination → COVID19Burnout → Depression	-0.06	-0.091	-0.037	0.020*

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

We conducted a path analysis via maximum likelihood estimation method to test the hypothesized model. Fitness of good indices in the model referred to a good fit ( $\chi^2/df=3.31$ ; GFI=.99; CFI=.99; TLI=.97; RMSEA=.071,  $p<.05$ , %90 CI [.200, .014; -.091-.037]; SRMR=.032) and this model was approved (Fig. 1). According to the model, resilience and intolerance of uncertainty explained 53% of the variance regarding rumination, rumination explained 27% of the variance regarding COVID-19 burnout and COVID-19 burnout explained 39% of the variance regarding depression. It was also found out that all the path coefficients in the model were statistically significant. Bootstrapping procedure was carried out with a confidence interval of 95% and 5000 bootstrap sample in order to test the statistical significance of indirect effects. The results showed that all the indirect effects in the model were statistically significant at a level of .05. Table 2 below presents the standardized direct and indirect effects as well as related 95% confidence intervals.

## DISCUSSION

The COVID-19 pandemic is a global pandemic that affects not only the physical health but also the mental health at individual, familial and societal level (Jakovljević et al. 2020). Due to this feature of the COVID-19 pandemic, it seems important to carry out studies on the individual and social effects of the pandemic. The rise in the number of people suffering from depression

following the breakout of the pandemic as well as the limitations about its effect on younger people make it even more important to get deeper into this issue. In this light, we aimed at investigating the mediating role of rumination and COVID-19 burnout in the relationship between depression and resilience together with intolerance of uncertainty among university students.

As we expected, we found out at the end of the current study that depression was negatively related to resilience, while it was positively related to intolerance of uncertainty and rumination. Likewise, literature review shows that individuals with a low level of resilience are more likely to suffer from depression (Höltge et al. 2022, Karaşar & Canlı 2020, QG To et al. 2022). On the other hand, it is obvious that individuals with a low level of resilience are more likely to have the tendency to think ruminatively (Amani et al. 2022; Vadi et al. 2022). The current study findings also show that the direct relationship between resilience and depression is accompanied by some other factors that mediate this relationship. Within the scope of this study, it is possible to indicate that resilience predicts COVID-19 burnout not directly but with the mediating effect of rumination. In the light of this finding, it is possible to state that individuals with a low level of resilience and a high tendency to suffer from depression are more likely to have ruminative thinking, which in turn increases the risk of depression. We think that one of the most important factors that lead to this finding is the uncertainty brought by the COVID-19 pandemic as well as its prolonged



effect lasting for two years. It seems possible to say that considering the time period when the current study data were gathered, a long period of distance education and restrictions enforced with some intervals (lockdown, closure of entertainment venues, etc.) might have been influential in having this result. This can be interpreted that the COVID-19 pandemic caused burnout. Related studies show that COVID burnout is closely related to many mental health problems, being depression the first (Kuriyama et al. 2022; Tabur et al. 2022). Therefore, the fact that the COVID pandemic is still influential and the there is an ambiguity about vaccine and treatment might be triggering burnout and depression (Jaber et al. 2022; Lluch et al. 2022).

Another important finding of the current study is that there were positive relationships among intolerance of uncertainty, rumination and depression. Moreover, we found out that intolerance of uncertainty predicted depression with the mediating effect of rumination and COVID-19 burnout at a statistically significant level. Individuals with a low level of intolerance of uncertainty tend to have a higher level of depression. Individuals with a high level of intolerance of uncertainty might have been negatively affected more by the uncertainty led by the COVID-19 pandemic, appearance of variants and not having the expected results of vaccination (Giordano et al. 2021; Vitiello et al. 2021). This can be considered as a factor that increases the level of depression. On the other hand, studies also reveal the relationship between rumination and depression (Huang et al., 2022; Jandrić et al. 2021). Because individuals with a high level of rumination often ruminate about past experiences, especially those with negative content. These repetitive thoughts can interfere with cognitive processes related to attention and conflict tracking. This situation can be considered as an increasing factor on depression. In particular, repetitive thoughts about the COVID-19 pandemic and its effects may increase COVID burnout and cause depressive tendencies through this burnout. Moreover, the study findings show that the relationship between depression and intolerance of uncertainty was mediated by rumination and COVID-19 burnout, which can be interpreted that they can be the determinant factors in the relationship between depression and intolerance of uncertainty. At this point, it can be stated that individuals with a high level of intolerance of uncertainty are more likely to have ruminative thinking, which increases the level of burnout, and this in turn increases the tendency for depression.

In this study, the relationship between rumination and burnout, depression and psychological resilience, and intolerance to uncertainty were examined. However, different studies reveal the effect of social support on

psychological health in general. For example, Fradelos et al. (2014) examined the relationship between social support, burnout and quality of life among nurses. According to the results obtained, while social support increases the quality of life; decreased burnout. In a different study, while social support reduces loneliness; it has been found to increase psychological capital (Ren & Ji 2019). On the other hand, in a study conducted by Kaya et al. (2021), regarding the impact of the COVID-19 pandemic, it was determined that social support reduces COVID-19 burnout.

Studies conducted outside of the COVID-19 pandemic and in different developmental periods also clarify depression. For example, a study by Giannoulis and Giannouli (2020) revealed the relationship between the religious beliefs of older individuals and their mental health. On the other hand, a comparative study of nurses' anxiety, stress and depression levels before the first wave of COVID-19 and during the first wave of COVID-19 (Zakeri et al. 2021) showed that burnout during the first wave of the COVID-19 pandemic did not change significantly compared to pre-COVID-19. However, in the same study, it was determined that anxiety, stress and depression levels increased significantly in the first wave of the COVID-19 pandemic. In a study examining the burnout, hope and fatigue of compassion levels of health care workers in general, it was determined that the burnout, hope and fatigue of compassion levels of health workers were higher during the pandemic period, although it was similar to the results obtained from studies before COVID-19 (Franza et al. 2020). Studies conducted before the COVID-19 pandemic also reveal the effect of burnout on nurses' depressive levels (Vasconcelos et al. 2018).

## Limitations

The current study has some limitations. Firstly, this study was conducted in Turkey, which means that it has some limitations about generalizing the study results. This can make it more difficult to confirm the validity of the results in terms of different cultural contexts. Secondly, the current study is a correlational study. By nature, correlational studies are not appropriate to establish a reason and result relation. In this case, the validity of the current study results can be supported by empirical studies. In addition, a non-clinical sample was used in this study. Therefore, the research can be repeated with a clinical sample. Lastly, the study data were gathered from university students. As it is, it can be difficult to generalize the study results for individuals going through different developmental stages.

## CONCLUSION

Consequently, the current study findings show that the level of depression rose during the pandemic time, which especially affected individuals with a low level of resilience and high level of intolerance of uncertainty. Moreover, it seems possible to state about the relationship among depression, resilience and intolerance of uncertainty that the tendency to have a ruminative thinking style increases COVID-19 burnout, which in turn increases depression. At this point, from the perspective of preventive health behaviours, resilience can be considered as a preventive factor, intolerance of uncertainty can be considered as a risk factor, and COVID-19 burnout can be considered as a facilitator factor. These results can

be helpful to develop more effective policies to decrease the negative effects of the pandemic.

**Ethical Approval:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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**Conflict of interest:** None to declare.

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