



Negative Life Events Associated with COVID-19 and Psychological Distress: The Role of Irrational and Rational Beliefs

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Abstract

The current study examines possible mediating and moderating mechanisms in the relationship between negative life events associated with COVID-19 and psychological distress. A total of 450 adults (mean age = 22.11 years, SD = 3.46 years) participated in this study. The participants completed measures of negative life events, psychological distress, and irrational/rational beliefs. The present findings indicated that adverse life events associated with COVID-19 predict psychological distress in adults. The findings also indicated that indirect predictive effect of adverse life events associated with COVID-19 on psychological distress via irrational beliefs varies depending on specific value of rational beliefs. The current study contributes to existing cognitive vulnerability model by documenting when and how adverse life events associated with COVID-19 influence psychological distress.

Keywords Adverse life events · COVID-19 · Irrational/rational beliefs · Psychological distress

Introduction

Covid-19 appears to be the biggest epidemic of our age. It was first seen in Wuhan, China in December 2019 and spread to almost all countries quickly. According to the statistics published by the World Health Organization (WHO), it is seen that as of December 01, 2021 approximately 263,415,480 people were infected worldwide

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and 5,238,138 of them died due to COVID-19 (WHO, 2021). In Turkey, which is one of the countries where virus transmission rate is most common, it has been reported that 8,818,144 people were infected as of December 01, 2021 and approximately 77,038 of them died (Ministry of Health, 2021). Today, COVID-19 continues to threaten people's physical health and their mental health.

Uncertainty about the course of COVID-19, inadequate equipment for testing and treatment, restriction of personal freedoms caused by efforts to control and slow the spread of the virus, growing financial losses, unemployment, risk of virus transmission, risk of losing family members due to the virus, emotional isolation, confusion and conflicting messages from the authorities are among the stressful factors that can contribute to emotional distress and psychological distress associated with COVID-19 (Pfefferbaum & North, 2020). Indeed, to determine effects of the quarantine process on the individual's psychological health, Brooks et al. (2020) examined 3166 articles and analyzed 24 articles' findings. They found that most of the studies reviewed reported negative psychological effects such as post-traumatic stress symptoms, quarantine-related stress, depression, irritability, confusion, boredom, frustration, insomnia, fear, and anger. In addition, these studies reported factors such as a long quarantine period, insufficient supply, difficulty in obtaining medical care and medicines, insufficient information, financial loss, and stigmatization as sources of stress frequently encountered during the quarantine process (Brooks et al., 2020). Rajkumar (2020), who examined studies on this subject to determine the psychological effects of COVID-19, reported that 16–28% of psychological reactions to COVID-19 are depression and anxiety symptoms, 8% are stress and insomnia. In another systematic review study, Vindegaard and Benros (2020) stated that the participants in their study reported higher levels of depression and anxiety symptoms than before COVID-19. Briefly, the above findings support that COVID-19 and the associated pandemic process experiences have a negative effect on the individual's psychological health. Previous studies have mostly focused on the direct relationship between COVID-19 and psychological health. However, it is still unclear which mechanisms play what role in the relationship between COVID-19 and psychological problems. One of the conceptual/theoretical frameworks that can help make sense of mediating mechanisms in this process is the Stress Diathesis Model.

The Stress Diathesis Model, which is one of the approaches that deals with the effects of stressful experiences on psychological health in detail, offers us a very useful framework for making sense of people's experiences during the pandemic process. According to this model, not everyone exposed to stressful experiences shows the same reactions, and stressful events cause more psychological disturbances in individuals with certain vulnerabilities. These vulnerabilities can be related to genetic, biological, situational, and psychological factors (Ingram, 2003; Ingram & Luxton, 2005; Monroe & Simons, 1991). In other words, stressful events influence psychological distress by interacting with the vulnerability of individuals (Ingram & Luxton, 2005). Briefly, the stress diathesis model attempts to explain how genetic, biological, psychological, and situational factors interact with stressful events and generate psychological problems such as depression and anxiety. This study will test the relationship between COVID-19 and psychological distress within the Cognitive Stress Vulnerability Model framework.

The cognitive vulnerability model argues that negative attributional style, cognitive distortions, and beliefs of the individual mediate the relationship between stressful life events and emotional, physiological, and behavioral responses (Abramson et al., 1989; Beck, 2005; Ellis, 1963). In other words, the cognitive vulnerability model claims that stressful experiences influence psychological distress by interacting with people's perceptions of themselves, their environment, and the world. However, within the framework of the model, explanations of the Rational Emotional and Behavioral Therapy (REBT) approach can help us determine which mediating mechanisms are effective in the context of individual-situation interaction or what role these mechanisms play.

The REBT is an important approach that explains the relationship between stressful life events and psychological health from a cognitive perspective. This approach explains the relationship between stressful experiences and psychological health within Ellis's ABC model framework. The ABC model assumes that psychological disturbances often result from the evaluation of experiences rather than actual experiences. In the ABC model, A represents the activating event we experience (whether in the past, at present, or in the future); B represents rational or irrational beliefs that guide our interpretation or perception of the event; C represents our emotional and behavioral responses arising from our rational or irrational beliefs (David et al., 2010). REBT suggests that rational and irrational beliefs (B) mediate the relationship between negative experiences (A) and emotional and behavioral outcomes (C). As a cognitive protective factor, rational beliefs are logical, empirically supported, pragmatic, adaptable, healthy, functional, and produce healthy emotions and behavior. Rational beliefs consist of four cognitive processes: preference, non-awfulizing, high frustration tolerance, and unconditional acceptance beliefs (David et al., 2010). On the contrary, irrational beliefs as a cognitive vulnerability factor are dogmatic, non-pragmatic, maladaptive, unhealthy, dysfunctional, lack empirical support and produce maladaptive emotions and behaviors. Also, they consist of four cognitive processes that interact with each other, namely demandingness, awfulizing, low frustration tolerance, and global evaluation of self or self-downing (David et al., 2010). In short, theoretical explanations support that rational and irrational beliefs can function as a mediating mechanism in the effect of adverse life events on psychological health during COVID-19 pandemic.

According to REBT, irrational beliefs as a cognitive fragility factor may function as a mediating mechanism in the effects of the problems experienced during the pandemic process on psychological health. The positive relation between irrational beliefs and psychological distress such as depression (Balkis and Duru, 2019, 2020; Buschmann et al., 2018; Chan & Sun, 2020; Terán et al., 2020; Turner et al., 2019; Višlă et al., 2016) and anxiety (Balkis and Duru, 2019; Duru and Balkis 2021; Bushman et al., 2018; Chan & Sun, 2020; Chang & D'Zurilla, 1996; Turner et al., 2019) supports the above-mentioned explanations. For example, a person exposed to frequent and intense adverse life events during the pandemic process may make this situation catastrophic, feel frustrated and perceive himself/herself as inadequate or worthless when s/he is unable to cope with the situation. These cognitive attributes of irrational beliefs might put him/her in psychological distress. Regarding this situation, REBT claims that people disturb themselves through irrational beliefs

about their self, emotional and physical comfort (Froggatt, 2005). For example, Ellis (2003) stated that individuals who have experienced job loss, economic rout and loss of a family member or loved one are exposed to loss of status and ego anxiety. Therefore, they are likely to be prone to psychological distress such as depression. In other words, adverse events and losses experienced by the individual during the pandemic process and their lack of coping ability can lead to catastrophizing the situation and seeing herself/himself as inadequate. This can cause ego anxiety as it triggers the individual's need for survival and security. Ellis (2003) also claimed that people who lack these emotional and economic resources might have low frustration tolerance and discomfort anxiety, pushing them into psychological distress. For example, if the individual does not have the economic, social, and psychological resources to maintain her/his comfort during the pandemic process, s/he may not be able to tolerate frustration and may experience discomfort anxiety. A high level of discomfort anxiety can also facilitate the individual's psychological distress. In light of the above-mentioned theoretical explanations and previous findings, it can be concluded that high level of adverse life events is associated with high levels of irrational beliefs and that high levels of irrational beliefs may facilitate the individual's psychological distress.

Similarly, it can be expected that adverse life events may, directly and indirectly, affect psychological health through irrational beliefs. Previous findings confirmed that irrational beliefs mediated the relationship between adverse life events, depression, and anxiety. For example, the Duru and Balkis (2021) found that irrational beliefs mediate the relationship between childhood traumatic experiences and depression. In another study, Balkis and Duru (2019) stated that irrational beliefs mediate the connection between adverse life experiences and anxiety.

Like the possible role of irrational beliefs, rational beliefs can be viewed as a cognitive protective factor in understanding the impact of adverse life events on psychological health during the pandemic process. Indeed, previous evidence has shown that rational beliefs have a positive relationship with psychological distress such as depression (Balkis and Duru, 2019, 2020; Duru and Balkis, 2021; DiGuseppe et al., 2021; Oltean & David, 2017; Oltean & David, 2017) and anxiety (Balkis and Duru, 2019; Balkis and Duru, 2019; DiGuseppe et al., 2021; Oltean et al., 2017). In other words, as the level of rational belief increases, psychological distress such as depression and anxiety, which disrupt the psychological adjustment of the person, decreases. Therefore, it can be concluded that rational beliefs can function as a moderating variable in the relations between adverse experiences, irrational beliefs, and psychological problems. In other words, the relationship between adverse life experiences, irrational beliefs, and psychological health may differ according to the level of rational belief. More specifically, indirect impact of COVID-19 related adverse life events on psychological distress through irrational beliefs may differ depending on the level of rational belief. For example, this effect is stronger when the level of rational belief is low, while it may weaken when it is high. Indeed, previous findings have shown that rational beliefs could moderate the indirect effects of adverse life events on psychological distress such as depression (Duru and Balkis, 2021) and anxiety (Balkis and Duru, 2019; Popov et al., 2016) via irrational beliefs.

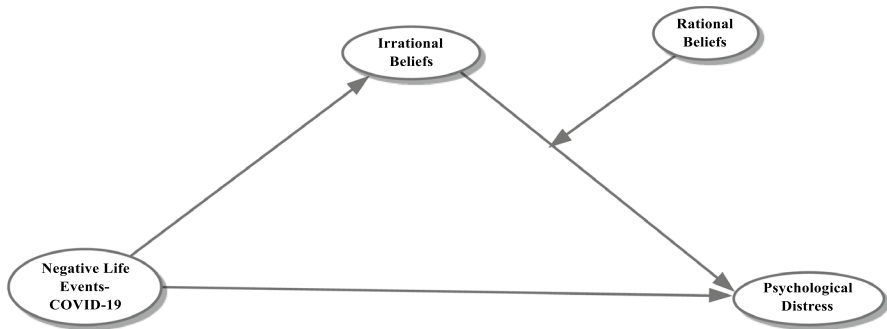


Fig. 1 Proposed model

Concerning secondary rational cognitive process, Popov et al. (2016) found that unconditional acceptance as second rational beliefs process moderates the effect of adverse feedback provoking an individual's ego on depression and anxiety. In other study, Hyland, Maguire, et al. (2014), Hyland, Shevlin, et al. (2014)) reported that unconditional acceptance as secondary rational belief process moderates the predictive effect of irrational beliefs on post-traumatic stress. Finally, Balkis and Duru (2020) found that non-awfulizing beliefs moderate the indirect effect demandingness on depressive symptoms via global evaluation of self. In the same context, one could expect that the secondary rational cognitive process (non-awfulizing, high frustration tolerance, and unconditional self-acceptance) play a similar role in the relationship between COVID-19 related adverse life events, irrational beliefs, and psychological distress. In the present study, we aimed to test the relationship between adverse life events and psychological distress experienced during the COVID-19 pandemic within the theoretical framework provided by REBT.

The Current Study

The main aim of the current study was to determine the possible moderating or mediating mechanisms that play a role in the connection between adverse life events associated with COVID-19 and psychological distress. Regarding the cognitive vulnerability role of irrational beliefs as presented in the afore-mentioned studies, we hypothesized that irrational beliefs would mediate the relationship between adverse life experiences associated with the COVID-19 pandemic process and psychological distress (*Hypothesis 1*). Concerning the protective role of rational beliefs, we hypothesized that the indirect effect of adverse life events associated with COVID-19 on psychological distress through irrational beliefs would vary depending on the level of rational beliefs (*Hypothesis 2*, Fig. 1).

Method

Participants

A total of 450 adults (358 females and 92 males), aged between 18 and 45 (mean age = 22.11 years, $SD = 3.46$ years), participated in this study. Most of the participants were undergraduate students. Regarding COVID-19 experiences, 20% of the participants reported that they were infected with COVID-19, and 33.8% reported that at least one family member was infected with COVID-19. Also, 2.7% of the participants reported being hospitalized due to COVID-19 while 12.2% reported that their family members were hospitalized due to COVID-19. Finally, 6.7% of the participants reported losing a family member, and 23.8% reported losing close relatives and friends due to COVID-19. We recruited participants by personal communication through e-mail. The e-mail message contains information about the purpose of the study and a link to the questionnaire. The questionnaire includes the informed consent form, demographic information page, and Turkish version of the current study's measurements. We declare that participation in the study was voluntary and completely anonymous, and we informed the participants about their right to withdraw from the survey at any time.

Measurements

Negative Life Events Associated with COVID-19.

We created a 23-item negative life events checklist with two response options from 0 (no) to 1 (yes) to determine the participants' adverse life events that they experienced during the COVID-19 period. We asked the participants to report the number of adverse life events they had been exposed to during the COVID-19 period. We used the K-R 21 formula to calculate the internal consistency reliability for COVID-19 related negative life events (NLEs). The findings showed that the K-R21 coefficient was 0.82 for this sample.

Psychological Distress (GHQ-12; Goldberg & Williams, 1988)

We used General Health Questionnaire-12 (GHQ-12; Goldberg & Williams, 1988) to determine the participants' psychological distress. The GHQ-12 contains 12 items that assess the severity of a mental problem over the past few weeks using a 4-point Likert-type scale (from 0 to 3). Kılıç (1996) examined the validity and reliability of GHQ-12 for the Turkish sample, and reported that the validity and reliability sensitivity was 0.74, and the specificity was 0.84. In this study, Cronbach's alpha coefficients was 0.85 for the current sample.

Irrational and Rational Beliefs

We utilized the Abbreviate Version–Attitudes and Beliefs Scale-2 (AV-ABS 2 developed by Hyland, Maguire, et al., 2014; Hyland, Shevlin, et al., 2014; adapted into Turkish by Duru and Balkis, 2021) to determine the participants' irrational and rational beliefs. AV-ABS-2 contains 24 items determining four irrational (DEM, AWF, LFT, and GES) and rational (PRE, N-AWF, HFT, and USA) cognitive processes. AV-ABS-2 is a 5-point Likert-type scale. Participants rate each item on a scale from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha coefficients for the sub-dimensions are $\alpha=0.66$ – 0.83 for the irrational beliefs sub-dimension and 0.68 – 0.85 for the rational beliefs sub-dimension (Duru and Balkis, 2021).

Data Analysis

We analyzed the gathered data using SPSS 22.0 and SPSS PROCESS macro (Hayes, 2013) in three stages. In the first stage, we conducted descriptive statistics to describe the mean, standard deviation, skewness, and kurtosis of the variables. In the second stage, we performed correlational analyses to examine relationships between adverse life events, irrational/rational beliefs, and psychological distress. In the third stage, we conducted a moderated mediation analysis to test the mediating role of irrational beliefs and the moderator role of rational beliefs in the relationship between adverse life events and psychological distress on a single model (Hayes' model 14). As Hayes (2013) suggested, we performed the bootstrapped confidence interval (CI) to test whether these indirect effects were significant at certain values of the moderator.

Findings

Preliminary Analysis

We analyzed descriptive details of all variables, including the means, standard deviation, skewness, and kurtosis. We also performed bivariate correlations among variables. The relevant findings are presented in Table 1. The findings from correlation analyses indicated that adverse life events are positively related to psychological distress and irrational beliefs. Rational beliefs, on the other hand, are negatively associated with adverse life events, irrational beliefs, and psychological distress.

Moderated Mediation Analyses

We test the mediating role of irrational beliefs and moderating role of rational beliefs in the relationship between adverse life events and psychological distress using moderated mediation analyses (Model 14). In other words, we examine

Table 1 Correlations and Descriptive Statistics (N= 450)

	1	2	3	4	5	6	7	8	9	10	11	12
1-PD	-											
95% of CI		.61**	.34**	.14*	.32**	.27**	.26**	-.26**	-.08	-.21**	-.29**	-.27**
		[.60,.70]	[.24,.43]	[.03,.24]	[.23,.41]	[.18,.36]	[.17,.36]	[-.37,-.14]	[-.19,.03]	[-.39,-.13]	[-.33,-.10]	[-.38,-.15]
2-NLE		-	.28**	.16**	.26**	.23**	.19**	-.10*	.00	-.12**	-.13**	-.09
95% of CI			[.23,.39]	[.06,.26]	[.20,.37]	[.17,.34]	[.12,.30]	[-.21,.01]	[-.10,.11]	[-.22,-.03]	[-.22,-.02]	[-.21,.02]
3-IB			-	.68**	.84**	.81**	.65**	-.38**	-.24**	-.33**	-.31**	-.38**
95% of CI				[.63,.73]	[.81,.86]	[.77,.84]	[.59,.71]	[-.47,-.28]	[-.34,-.14]	[-.40,-.21]	[-.42,-.22]	[-.46,-.28]
4-DEM				-	.37**	.52**	.15**	-.19**	-.16**	-.21**	-.17**	-.07
95% of CI					[.29,.45]	[.44,.59]	[.07,.23]	[-.29,-.08]	[-.26,-.05]	[-.26,-.07]	[-.31,-.11]	[-.18,.03]
5-AWF					-	.56**	.53**	-.31**	-.17**	-.25**	-.26**	-.36**
95% of CI						[.49,.63]	[.45,.60]	[-.41,-.20]	[-.28,-.07]	[-.36,-.16]	[-.35,-.14]	[-.45,-.26]
6-LFT						-	.30**	-.26**	-.14**	-.29**	-.21**	-.20**
95% of CI							[.21,.38]	[-.35,-.16]	[-.24,-.04]	[-.31,-.11]	[-.38,-.20]	[-.29,-.11]
7-GES							-	-.38**	-.25**	-.22**	-.29**	-.50**
95% of CI								[-.48,-.27]	[-.35,-.15]	[-.39,-.19]	[-.33,-.11]	[-.59,-.40]
8-RB								-	.78**	.83**	.86**	.80**
95% of CI									[.73,.82]	[.83,.88]	[.80,.86]	[.75,.84]
9-PRE									-	.48**	.55**	.48**
95% of CI										[.46,.63]	[.38,.57]	[.39,.56]
10-N-AWF										-	.66**	.59**
95% of CI											[.60,.73]	[.51,.66]
11-HFT											-	.59**
95% of CI												[.52,.66]
12-USA												-
Mean	29.07	9.72	33.46	10.86	8.10	9.53	4.94	47.18	11.67	11.06	11.45	12.99

Table 1 (continued)

	1	2	3	4	5	6	7	8	9	10	11	12
Standard Deviation	7.05	4.32	9.09	2.94	3.24	3.12	2.85	8.90	2.87	2.67	2.79	2.45
Skewness	.291	.010	.134	-.501	.376	-.180	1.59	-.862	-.759	-.278	-.517	-1.36
Kurtosis	-.190	-.330	-.010	-.094	-.577	-.612	1.77	.974	.041	-.162	-.132	1.76

* $p < .05$, ** $p < .001$

PD psychological distress, *NLE* negative life event, *IB* irrational belief, *DEM* demandingness, *AWF* awfulizing, *LFT* low frustration tolerance, *GES* global evaluation of self, *RB* rational beliefs, *PRE* preference, *N-AWF* non-awfulizing, *HFT* high frustration tolerance, *USA* unconditional self-acceptance *CI* confidence interval

whether significant indirect effect of adverse life events associated with COVID-19 on psychological distress through irrational beliefs depends on the special value of rational beliefs (Fig. 1).

The results from moderated mediation analyses indicated that adverse life events directly predicted irrational beliefs ($p < .001$). The moderated mediation analyses also revealed that psychological distress was directly predicted by adverse life events associated with COVID-19 ($p < 0.001$), irrational beliefs ($p = 0.002$), rational beliefs ($p = 0.002$), and the interaction of irrational and rational beliefs ($B = -0.01$, $SE = 0.003$, $\Delta R^2 = 0.01$, $p = .005$). Next, we examined whether a significant indirect effect of adverse life events associated with COVID-19 on psychological distress via irrational beliefs depends on rational beliefs using bootstrapping ($N = 5,000$). The findings demonstrated that the indirect effect of adverse life events associated with COVID-19 on psychological distress through irrational beliefs was stronger when the level of RBs is low ($ab = 0.10$, $SE = 0.03$, $95\% CI = 0.04, 0.16$) rather than it is medium ($ab = 0.06$, $SE = 0.02$, $95\% CI = 0.02, 0.10$) or high ($ab = 0.02$, $SE = 0.02$, $95\% CI = -0.03, 0.07$). These results affirmed the postulation that irrational beliefs play a mediating role in the relationship between adverse life events associated with COVID-19 and psychological distress and that rational belief have a protecting role (Table 2, Figs. 1 and 2). Next, we repeated moderated mediation analysis for secondary rational cognitive processes separately. The findings from moderated mediation analyses indicated that the predictive indirect effect of adverse life events on psychological distress through irrational beliefs are stronger when the level of non-awfulizing is low ($ab = 0.09$, $SE = 0.03$, $95\% CI = 0.03, 0.15$) rather than it is medium ($ab = 0.06$, $SE = 0.02$, $95\% CI = 0.02, 0.10$) and high ($ab = 0.02$, $SE = 0.02$, $95\% CI = -0.02, 0.08$). Its indirect effect via irrational beliefs on the psychological distress are also stronger when the level of high frustration tolerance is low ($ab = 0.11$, $SE = 0.03$, $95\% CI = 0.04, 0.18$) rather than it is medium ($ab = 0.07$, $SE = 0.02$, $95\% CI = 0.03, 0.13$) and high ($ab = 0.04$, $SE = 0.03$, $95\% CI = -0.01, 0.09$). Finally, moderated mediation analyses revealed that the indirect effect of adverse life events on psychological distress through irrational beliefs are stronger when the level of unconditional self-acceptance is low ($ab = 0.09$, $SE = 0.03$, $95\% CI = 0.02, 0.15$) rather than it is medium ($ab = 0.05$, $SE = 0.02$, $95\% CI = 0.01, 0.10$) and high ($ab = 0.02$, $SE = 0.02$, $95\% CI = -0.02, 0.07$). The moderated mediation analyses suggested that secondary RBs processes (non-awfulizing, high frustration tolerance, and unconditional self-acceptance) have a protecting role in the indirect relation between adverse life events associated with COVID-19 and psychological distress via irrational beliefs (Table 2).

Discussion

This study aimed to reveal the possible mediating or moderating mechanisms that influence the relation between adverse life events experienced during the pandemic and psychological distress. The current findings indicate that adverse life events, psychological distress, and irrational beliefs are positively correlated, while rational beliefs are negatively related. In other words, higher levels

Table 2 Moderated mediation statistics (N = 450)

Predictor variables	B	Boot CI	Outcome: irrational beliefs		Model R ²
			SE	t	
Negative life events	.60	[-.41 – .79]	.10	6.28***	.08***
Negative life events	.90	[-.78 – 1.01]	.03	14.68***	.43***
Irrational beliefs	.10	[.04 – .16]	.03	3.11**	
Rational beliefs	-.10	[-.16 – -.04]	.03	-3.11**	
Irrational x Rational Bs	-.01	[-.01 – -.002]	.003	-2.85**	
Negative life events	.90	[-.78 – 1.02]	.06	14.78***	.44***
Irrational beliefs	.10	[.04 – .16]	.03	3.20**	
Non awfulizing	-.43	[-.62 – -.24]	.10	-4.44***	
Irrational Bs.x Non awfulizing	-.02	[-.04 – -.003]	.01	-2.31*	
Negative life events	.90	[.77 – 1.01]	.06	14.31***	.42***
Irrational beliefs	.12	[.06 – .19]	.03	4.00***	
High frustration tolerance	-.19	[-.39 – -.02]	.10	-1.81*	
Irrational Bs.x High frust. tolerance	-.02	[-.04 – -.004]	.01	-2.42*	
Negative life events	.90	[-.78 – 1.01]	.06	14.64***	.43***
Irrational beliefs	.08	[.03 – .15]	.03	2.79**	
Unconditional self-acceptance	-.41	[-.64 – -.17]	.12	-3.41***	
Irrational Bs.x Uncon. self-accept	-.02	[-.04 – -.004]	.01	-2.37*	
<i>Conditional indirect effect analysis</i>					
Rational beliefs	ab		Boot SE	Boot CI	
Low	.10		.03	[.04 – .16]	
Med	.06		.02	[.02 – .10]	
High	.02		.02	[-.03 – -.07]	

Table 2 (continued)

Predictor variables	B	Boot CI	Outcome: irrational beliefs		Model R ²
			SE	t	
Non-awfulizing					
Low	.09		.03	[.03-.15] [.02-.10] [-.02-.08]	
Med	.06		.02		
High	.00		.02		
High frustration tolerance					
Low	.11		.03	[.04-.18] [.03-.13] [-.01-.09]	
Med	.07		.02		
High	.04		.03		
Unconditional self-acceptance					
Low	.09		.03	[.02-.15] [.01-.10] [-.02-.07]	
Med	.05		.02		
High	.02		.02		

Unstandardized regression coefficients were reported. Bootstrap sample size = 5000

* $p < .05$, ** $p < .01$, *** $p < .001$

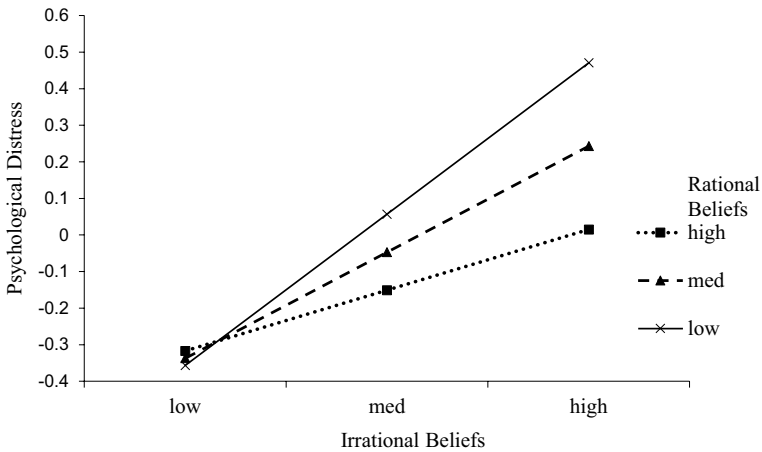


Fig. 2 Moderation role of rational beliefs

of adverse life events and psychological distress are associated with higher levels of irrational belief and lower levels of rational belief. These findings are consistent with those of earlier studies indicating that psychological distress is positively related to adverse life events (Jackson & Finney, 2002; Marum et al., 2014; Och Dag et al., 2020), irrational beliefs (Balkis and Duru, 2020; Chan & Sun, 2020; Terán et al., 2020; Turner et al., 2019), and negatively correlated with rational beliefs (Balkis and Duru, 2020; Duru and Balkis, 2021; DiGuseppe et al., 2021; Oltean & David, 2017).

The findings regarding whether irrational beliefs have a mediator role in the relationship between adverse life events experienced in the pandemic and psychological distress indicate that irrational beliefs partially mediate this relationship. Also, adverse life events predict irrational beliefs, and then irrational beliefs predict psychological distress. This means that adverse life events, directly and indirectly, predict psychological distress through irrational beliefs. This finding is consistent with REBT's assumption that beliefs mediate the link between adverse life events and psychological distress (Balkis and Duru, 2019; Duru and Balkis 2021; David et al., 2010). For example, the Duru and Balkis (2021) stated that irrational beliefs mediate the connection between childhood traumatic experiences and depressive symptoms. This finding suggests that the individual's exposure to frequent and intense adverse life events may lead the individual to catastrophize the situation, feel frustrated, and perceive himself/herself as someone who cannot cope with the situation, is inadequate or worthless. These findings also support the claim that cognitive attributes of irrational beliefs may facilitate the individual to be in psychological distress. Ellis (2003) suggests that the following beliefs make the individual vulnerable to psychological distress. These beliefs are:

- (1) "I must succeed at the important things that I do in life and win the approval of significant people in my life; and isn't it awful when I don't. I am therefore not as good as I should be, and I am therefore worthless."
- (2) "The conditions under which I live must be easy, or at least not too difficult, and must give me all the things I really want quickly and without too much of a hassle; and isn't it terrible when they aren't that way. The world is a really rotten place in which to live and should not be the way it indubitably is." (Ellis, 2003, p.186).

The current findings support the theoretical explanations of REBT regarding the mediating function of irrational beliefs as a cognitive vulnerability factor (Balkis and Duru, 2019; Duru and Balkis, 2021; David & Szentagotai, 2006; David et al., 2010; Hyland & Boduszek, 2012).

In the present study, we also investigated the role of rational beliefs in the relationship between adverse life events, irrational beliefs, and psychological distress during the pandemic process. The present findings indicate that the mediating role of irrational beliefs in the connection between adverse life events and psychological distress differs depending on the specific value of rational beliefs. In other words, these findings suggest that a low level of rational beliefs makes the indirect predictive power of adverse life events on psychological distress more powerful via irrational beliefs. These findings support previous research studies showing that rational beliefs have a similar function in moderating the indirect impact of adverse life events on symptoms of depression (Duru and Balkis, 2021) and anxiety (Balkis and Duru, 2019) through irrational beliefs. For example, the Balkis and Duru (2019) found that a high level of rational beliefs reduces the indirect effect of adverse life events on anxiety symptoms through irrational beliefs. The present study also shows that rational beliefs as a protective factor function as a moderating role in the relationship between adverse life events, irrational beliefs, and psychological distress. These findings corroborate with REBT's explanations in that rational beliefs increase the individual's resilience in stressful situations (Caserta et al., 2010).

Detailed analyzes show that secondary rational processes moderate the indirect effect of adverse life events on psychological distress through irrational beliefs. In other words, the indirect effect of adverse life events on psychological distress through irrational beliefs differs depending on the level of high frustration tolerance, non-awfulizing, and unconditional self-acceptance. The indirect effect of adverse life events on psychological distress decreases when levels of non-awfulizing, high frustration tolerance, and unconditional self-acceptance are high. That is to say, when the individual realistically evaluates the situation, tolerates the difficulties experienced, and unconditionally accepts herself/himself as someone who cannot cope with them, the indirect effect of adverse life events on psychological distress through irrational beliefs decreases. The Balkis and Duru (2021) found that young adults had lower depressive symptoms when they were exposed to traumatic life events in childhood if they evaluated these negative experiences realistically, and when they saw themselves as valuable individuals despite these negative experiences. In another study, Balkis and Duru (2019) emphasized that individuals exposed to adverse life events had lower anxiety symptoms when they realistically

evaluated these negativities. Similarly, Popow et al. (2016) reported that individuals exposed to negative ego-provoking feedback are less likely to experience psychological problems such as anxiety and depression when they accept themselves unconditionally. Finally, previous studies in the current literature have shown that rational beliefs also reduce the negative impact of irrational beliefs on post-traumatic stress symptoms, anxiety, and depression (Balkis and Duru, 2019; Duru and Balkis 2021; Hyland, Maguire, et al., 2014; Hyland, Shevlin, et al., 2014). These results support the theoretical explanations of REBT regarding the protective role of rational beliefs and the research results on this subject.

All in all, the present study is subject to several potential limitations. First, the current study is a cross-sectional study and does not offer causal relationships between the variables. There is also a need for controlled experimental or longitudinal studies for this issue. Future research should investigate the role of rational/irrational beliefs in an experimental task (e.g., stressful situation) to verify the function of irrational/rational beliefs and their temporal role. Therefore, the findings should be interpreted with caution. Second, this study was conducted on an adult study group. The model can be tested with new studies on different developmental periods or age groups. Third, the present study has been conducted on a normal adult population. Testing the model with new studies on clinical samples may contribute to the generalizability of the findings. Finally, another limitation of this study relates to the scale employed to identify rational and irrational beliefs. Although Av-ABS-2 successfully detects cognitive processes, it is seen that the items in the scale do not show a balanced distribution in terms of cognitive content. For example, while all items in the preference determination scale are related to achievements, all items that measure frustration tolerance are related to comfort. A similar problem exists in the subscales of irrational beliefs. Thus, future studies may help us better understand the organizational structure of these cognitive processes in psychological distress by using another scale with a balanced distribution of cognitive content to identify rational/irrational cognitive processes.

Conclusion

This study has investigated the mediating and moderating factors contributing to the relationship between adverse life events associated with COVID-19 and psychological distress. The findings from this study make several contributions to the current literature. First, the findings support the conceptual/theoretical explanations of both the cognitive vulnerability model and REBT. Our findings contribute to the literature on psychological distress in terms of its relationship with the experience of adverse life events. The present findings show that stressful life experiences, as suggested by the cognitive vulnerability model, interact with the individual's perceptions of himself/herself, his/her environment, and the world, all of which affect psychological distress. This study also indicates that rational and irrational beliefs play an important role in this process, as REBT suggests. Second, the findings of the current study suggest that rational and irrational beliefs are intermediate (mediating and moderating) cognitive mechanisms with different functions in the connection

between adverse life events associated with COVID-19 and psychological distress. More specifically, while irrational beliefs mediate the indirect effect of adverse life events experienced during the pandemic on psychological distress, rational beliefs as a moderator variable moderate this indirect effect and this effect increases when the rational belief level is low. Therefore, it can be concluded that considering irrational and rational beliefs is important in reducing the negative effects of adverse life events on psychological health. Clinicians and psychological counselors should consider the role of recent adverse life events and rational/irrational beliefs in helping their clients who suffer from psychological distress during the pandemic process. In the psychological counseling process, clinicians should help their clients (a) to recognize their irrational beliefs, (b) to distinguish between rational and irrational beliefs, and (c) to question irrational beliefs via Socratic questioning and replace them with rational beliefs.

Data Availability The data that support the findings of this study are available from the first author upon reasonable request.

Declarations

Conflict of interest The authors declare that they have no conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Also, all procedures performed in this study involving human participants were in accordance with the ethical standards of the Social and Human Sciences Research and Publication Ethics Committee of University with the decision no 68282350/2021/G10.

Informed consent Informed consent was obtained from all individual participants included in the study.

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