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Self-blame Regret, Fear of COVID-19 and Mental Health During Post-Peak Pandemic

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ABSTRACT

The novel Coronavirus pandemic caused strong negative emotions including fear, and stress and impacted the mental health of individuals worldwide. One of the emotions linked with mental health and infectious disease is self-blame regret. Thus, the current study investigated the role of fear of COVID-19 and perceived stress in the relationship between self-blame regret and depression. As a means of such investigation, the current research was conducted based on quantitative data and the research sample was recruited via a convenient sampling method. A community sample of 352 individuals in Turkey (71 % female and 29 % males), ranged between in age 18 and 63 ($M=28.90\pm 8.90$), completed Fear of COVID-19 Scale (FCV-19S), Perceived Stress Scale (PSS-10), Depression, Anxiety, and Stress Scale (DASS-21), and responded to one item concerning the self-blame regret. Results demonstrated that self-blame regret is positively correlated with fear of COVID-19, perceived stress, and depressive symptoms. Moreover, serial multiple mediation analyses demonstrated that both fear of COVID-19 and perceived stress mediated the relationship between self-blame regret and depression. The findings showed that self-blame regret, fear of COVID-19, and perceived stress are determinants of depressive symptoms, suggesting that such factors are important in understanding these issues.

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Keywords:

Self-blame regret, fear of COVID-19, perceived stress, depression, serial mediation

1. Introduction

Pandemics are large-scale outbreaks that pose serious potential health risks to the affected community. The first outbreak of the “once-in-a-century pandemic” in December 2019 affected people globally, with a case fatality rate comparable with the 1918 influenza pandemic (Gates, 2020). The disease’s (COVID-19) impact is severe to an extent that, as of December 31, approximately 15 million infected cases have been recorded, with 1.5 million deaths globally (European Centre for Disease Prevention and Control, 2020).

Considering the fast transmission of the virus between humans, high mortality rates, and strict prevention measures including travel bans, home confinements, social distancing, compulsory face mask wear, school suspensions, this time of global crisis is characterized by strong negative emotions and deteriorated mental health. Several studies reported the heightened negative affectivity symptoms due to the pandemic (Limcaoco et al., 2020) and documented that the COVID-19 pandemic exacerbated mental health issues including depression across the world (Bäuerle et al., 2020; Choi, Hui & Wan, 2020; Nickell et al., 2004; Tsang, Scudds, & Chan, 2004).

One of the common responses to adversity and life-threatening situations is surely stress. Stress arises when an individual perceives that environmental challenges are beyond the individual’s capacity to cope (Cohen, Janicki-Deverts & Miller, 2007). Brooks and colleagues (2020) suggested that the COVID-19 pandemic and associated quarantines call forth substantial and long-lasting psychological impact including increased stress.

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As such, previous research concerning the current pandemic revealed heightened stress among individuals due to fear of infection, transmitting the virus to loved ones, lack of information and boredom, and loss of social communication (Zandifar & Badrfam, 2020; Zhang et al., 2020). In support, several studies documented that perceived stress is an important concept to investigate during the pandemic (Du et al., 2020; McAlonan et al., 2007; Mo et al., 2020; Preti et al., 2020) and might be impactful on developing depression symptoms (e.g., Gotlib et al., 2020; Montano & Acebes, 2020).

Similar to previous epidemics, the COVID-19 pandemic caused strong negative emotions among individuals. Several studies reported greater levels of frustration and boredom (Zhang et al., 2020), increased anxiety and depression (e.g., Nickell et al., 2004; Tsang, Scudds, & Chan, 2004), heightened fear, and particularly elevated levels of fear of COVID-19 (e.g., Belen, 2020; Reznik et al., 2020). Research regarding the current pandemic highlighted that fear of COVID-19 is associated with critical aspects of mental health (Harper et al., 2020; Pakpour & Griffiths, 2020; Satici et al., 2020). Thus, as a vital emotion during such a pandemic, exploring this is certainly worth studying.

1.1. Self-blame Regret and Mental Health

As noted, strong negative emotions exacerbate mental health issues. Research regarding emotions and mental health in the context of infectious diseases is still scarce. Yet, one of the researched emotions linked with mental health during the pandemic is regret (Limcaoco et al., 2020). Regret is an emotional experience elicited when an individual is unsatisfied with the acquired outcome among the possibility of better options (Shepherd & O'Carroll, 2014). Despite the frequency of experiencing anxiety outweighs the regret in daily life, the negative influence of regret is far greater than that of anxiety in terms of mental health (Brewer, DeFrank & Gilkey, 2016). An array of studies documented that increased levels of regret associates with increased levels of depression (e.g., Bruine de Bruin et al., 2016; Yu, Chen, Zhao, & Yu, 2017). Another vein of regret studies focused on the role of regret in decision-making processes highlighting that regret is one of the vital emotions in the context of decision-making. One recent model concerning the regret-decision-making process is Decision Justification Theory that considered regret as two important components (DJT; Connolly & Zeelenberg, 2002). Among the components, self-blame regret is strongly linked with mental health, particularly depression. In support, one crucial study demonstrated that currently depressed individuals reported greater levels of self-blame regret in response to hypothetical scenarios (Kraines, Krug & Wells, 2017). Self-blame regret conveys the emotion when the individuals experience regret and blame themselves for the poorer decision (Wu & Wang, 2017) and this component of regret focuses on self-responsibility for not selecting the better option (Nicolle, Bach, Frith & Dolan, 2011). During such a pandemic, self-blame regret is off important to explore in terms of understanding the emotion and its relationship with mental health, specifically after the normalization process began. Such a period is crucial as prior to the normalization process, prevention measures were maintained mainly by governments, and home confinements and face mask wear were compulsory. Yet, the normalization process eased some of the restrictions during the post-peak pandemic, and self-responsibility in taking preventive measures became more important. In this regard, individuals are more prone to experience self-blame regret not taking enough cautions in case of contracting the virus during the post-peak pandemic.

1.2. Present Study

As noted, research is scarce in terms of documenting the relationship between self-blame regret and mental health, specifically depression. To the best of the knowledge, there is only one study to report such a link (Kraines, Krug & Wells, 2017). Yet, more variables are needed to be examined to understand emotion and its relationship with mental health. In this regard, fear of COVID-19 and perceived stress are potential mediators during the post-peak pandemic. Thus, the main aim of this study was to test the relationship between self-blame regret and depression as a mental health indicator with a Turkish sample as mediated by individuals' levels of fear of COVID-19 and perceived stress. The hypotheses of the study included:

- H1.* Self-blame regret will be positively related to depression
- H2.* The relationship between self-blame regret and depression will be mediated by fear of COVID-19
- H3.* The relationship between self-blame regret and depression will be mediated by perceived stress
- H4.* The relationship between self-blame regret and depression will be serially mediated by fear of COVID-19 and perceived stress.

2. Methodology

2.1. Research Model

The present study was designed as correlational research in the quantitative realm. Literature indicates that studies in educational settings often employ survey research methods and use test scores and self-report measures to describe the data (descriptive approach) or confirm the proposed hypothesis and research models (analytical approach) (Cohen et al., 2018). To examine the research hypotheses, the present study used an analytical approach to test the mediator roles of fear of COVID-19 and perceived stress in the relationship between self-blame regret and depression during the post-peak pandemic.

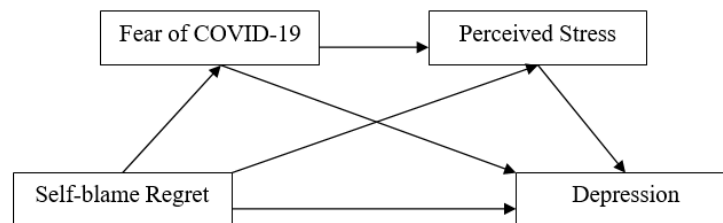


Figure 1. Proposed Research Model

2.2. Participants

Participants were drawn from a public university located in the Northeast of Turkey using online Google Forms. To recruit the participants, a convenient sampling method was used to prevent the loss of time, money, and labor as the COVID-19 pandemic demanded urgent investigations regarding the mental health of university students. To evaluate the adequate sample size, five observations for each parameter were determined as recommended by Bentler and Chou (1987). In this regard, the research sample encompassed three hundred fifty-two individuals (71 % female and 29 % males) and ranged between age 18 and 63 ($M=28.90\pm 8.90$). Their socioeconomic levels ranged from medium (70.5%), high (15.1%), very high (0.9%) low (12.2%) and very low (1.4%). Participants reported that the maximum number of people (friends and relatives) they lost to COVID-19 is 2 while the acknowledged number of people who tested positive is 38.

2.3. Data Collection Tools

Fear of COVID-19 Scale (FCV-19S). FCV-19S is composed of seven items assessing the extent to which individuals fear COVID-19 (Ahorsu et al., 2020) and rated based on a five-point rating scale. The sum of the item scores provides the total score of the scale, wherein higher scores indicate higher levels of fear of COVID-19. The psychometric properties of the Turkish form of the scale (Satici et al., 2020) have been widely supported and Cronbach's alpha reliability for the scale in this study was excellent ($\alpha= .90$).

Perceived Stress Scale (PSS-10). PSS-10 comprises ten items measuring the extent to which situations in individual life are perceived as stressful (Cohen et al., 1983) and rated based on a five-point rating scale. Sum of the item scores after reversing the negatively keyed items provide the total score of the scale with higher scores indicative of higher levels of perceived stress. The psychometric properties of the Turkish form of the scale (Kaya et al., 2019) have been widely supported and Cronbach's alpha reliability for the scale in this study was good ($\alpha= .81$).

DASS-21 Depression Subscale (DASS-21). DASS-21 is comprised of twenty-one items evaluating the severity and the frequency of the symptoms over the past week and rated based on a four-point rating scale (Lovibond & Lovibond, 1995). The scale consists of three subscales of depression, anxiety, and stress, and the subscale scores are obtained via the sum of the item scores of the relevant dimensions with higher scores indicative of higher levels of depression, anxiety, and stress. The psychometric properties of the Turkish form of the scale (Yıldırım et al., 2018) have been widely supported and Cronbach's alpha reliability for the scale in this study was good ($\alpha= .89$).

Self-blame Regret. Self-blame regret was evaluated with one item asking participants "How much would you blame yourself for not taking enough prevention measures if you catch the Coronavirus-19?" The item was

rated based on a 5-point Likert scale (1=not at all, 5= extremely). Higher scores demonstrated higher levels of self-blame regret.

Process: Sample was reached through word of mouth and advertisement of the study on social media sites (Facebook, WhatsApp groups, etc.). Data collection started after the normalization process was declared by the government. Responses to the scales were collected via an online survey webpage, and the consent form to partake in the study was obtained via the first page of the online survey.

The study procedure was approved by Bursa Uludag University Ethics Committee (10/07/2020, 92662996-044/E.20325).

2.4. Data Analysis

In terms of main analyses, serial multiple mediation analysis was performed with PROCESS macro for SPSS (Hayes, 2018) to test the mediation effects of how self-blame regret affects fear of COVID-19, how fear of COVID-19 affects perceived stress, and how perceived stress affects depression. Using 5000 bootstrap samples with 95% confidence intervals (CI), the paths that do not include zero were considered as evidence of a significant indirect effect (Preacher & Hayes, 2008).

3. Findings

Table 1 demonstrates Cronbach's alpha reliability coefficients, the minimum, maximum, mean, standard deviation, skewness, kurtosis statistics for main study variables, and Pearson Product-Moment correlations between the variables. As shown in Table 1, no severe violations of normal hypotheses were encountered (e.g., skewness from 0.10 to 0.47, kurtosis from -0.94 to 0.03) (West, Finch, & Curran, 1995). Bivariate correlations between variables were computed and results demonstrated that self-blame regret was positively correlated with depression, fear of COVID-19, and perceived stress coefficients ranging between $r = .35$ and $r = .20$.

Table 1. Descriptive Statistics and Intercorrelations between Main Study Variables

	1	2	3	α	Min	Max	M	SD	Skew	Kurt
1. Self-blame R	1			-	1.00	5.00	2.92	1.35	0.14	-0.94
2. Depression	.30**	1		.89	0.00	21.00	9.68	5.76	0.10	-0.92
3. Fear of COVID	.35**	.32**	1	.90	7.00	35.00	17.42	6.77	0.47	-0.41
4. Per. Stress	.20**	.68**	.21**	.81	14.00	48.00	28.67	6.69	0.24	0.03

Note. Min= Minimum, Max=Maximum, M=Mean, SD= Standard Deviation, Skew=Skewness, Kurt= Kurtosis**. $p < .001$

3.1. Serial Multiple Mediation

To test the mediating effect of fear of COVID-19 and perceived stress in the relationship between self-blame regret and depressive symptoms, a serial multiple mediation analysis was conducted. Results of the serial mediation analyses revealed a positive direct effect of self-blame regret on depression supporting Hypothesis 1 ($\beta = .30$, $p < .001$). Including mediators of fear of COVID-19 and perceived stress in the model, this coefficient was reduced though it was still significant ($\beta = .12$, $p < .05$). Moreover, self-blame regret positively predicted both fear of COVID-19 ($\beta = .35$, $p < .001$) and perceived stress ($\beta = .14$, $p < .05$). Figure 2 demonstrates the results of serial mediation estimations.

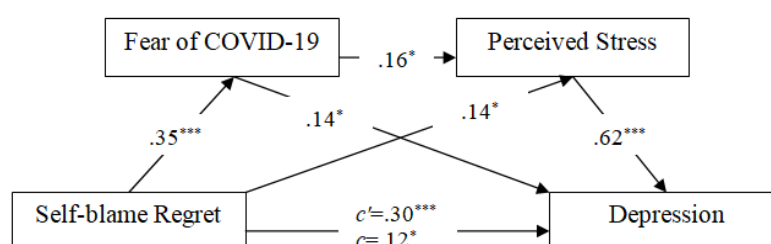


Figure 2. Serial Multiple Mediation Model. Path Coefficients Were Standardised

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

Serial mediation estimations also indicated significant indirect effect of self-blame regret on depression through fear of COVID-19 ($\beta = .05$, $SE = .02$, 95% CI = [.017, .087]) and perceived stress ($\beta = .09$, $SE = .04$, 95% CI = [.013, .161]) supporting Hypothesis 2 and 3. Confirming hypothesis 4, the indirect effect of self-blame regret on depression via fear of COVID-19 and perceived stress was tested and indirect effect was 0.04 ($SE = .01$, 95% CI = [.013, .065]). Table 2 shows standardized indirect effect of fear of COVID-19 and perceived stress on depression.

Table 2. The Standardized Indirect Effect of Fear of COVID-19 and Perceived Stress on Depression

Path	Coefficient	95% CI	
		UL	LL
Self-blame regret → Fear of Covid-19 → Depression	.05	.017	.087
Self-blame regret → Perceived Stress → Depression	.09	.013	.161
Self-blame regret → Fear of Covid-19 → Perceived Stress → Depression	.04	.013	.065
Total Indirect Effect	.17	.093	.253

Note. CI= Confidence Interval, LL= Lower Limit, UL= Upper Limit

4. Discussion, Conclusion, and Recommendations

The covid-19 pandemic caused strong negative emotions worldwide due to the strict measures to prevent the disease including compulsory home confinements, face mask wear, and social distancing. Yet, the normalization process eased government-related restrictions during the post-peak pandemic that called upon self-responsibility to take preventive behaviors. Thus, individuals will be more prone to experience self-blame regret not taking enough cautions in case of contracting the virus during such critical times. In this regard, the current study sought to understand the role of self-blame regret on mental health issues during the post-peak pandemic and hypothesized that a) self-blame regret will be positively related to depression b) the relationship between self-blame regret and depression will be mediated by fear of COVID-19 c) the relationship between self-blame regret and depression will be mediated by perceived stress d) the relationship between self-blame regret and depression will be serially mediated by fear of COVID-19 and perceived stress.

In support of the first hypothesis, the findings demonstrated that self-blame regret was positively related to depression conveying that individuals high in levels of blaming themselves in case of virus contraction also demonstrated higher levels of depressive symptoms. Such results are in line with the previous literature. For instance, an array number of studies revealed that increased levels of regret is associated with elevated levels of depression (Chase et al., 2010; Lecci, Okun & Karoly, 1994; Monroe, Skowronski, MacDonald & Wood, 2005; Roesse et al., 2009). In support and more importantly, one critical study revealed that clinically depressed individuals reported greater levels of self-blame regret compared to the healthy and previously depressed individuals (Kraines, Krug & Wells, 2017).

Concerning the second hypothesis, the results revealed that fear of COVID-19 mediated in the relationship between self-blame regret and depression suggesting higher levels of self-blame regret contributes to increased levels of fear of COVID-19, which in turn contributes to elevated depressive symptoms. Essentially, fear of COVID-19 is a recent concept although its literature is rapidly expanding. Yet, no studies per se documented the link between self-blame regret and fear of COVID-19 and no study to support the findings of the current study. Despite this, the finding is congruent in terms of the conceptual frameworks of the constructs. For instance, individuals who perceive that they will considerably blame themselves in case of catching the disease will also experience higher levels of fear concerning the virus. In a similar vein, empirical studies also supported that cancer patients' decisional regret scores predicted fear of recurrence of the disease (Maguire, Hanly, Drummond, Gavin & Sharp, 2017). In regards to fear of COVID-19 and depressive symptoms, a growing body of pandemic research indicated that fear of COVID-19 impacts depressive symptoms confirming the findings of the current study (Fitzpatrick, Harris & Drawve, 2020).

Regarding the third hypothesis, the findings of this study reported that perceived stress mediated the link between self-blame regret and depression. The findings concur with the previous literature documenting the link between self-blame and psychological stress (Martin & Dahlen, 2005; Straud & McNaughton-Cassill,

2019). Moreover, current pandemic studies also revealed that changes in stress levels were found correlated with changes in depressive symptoms (de Quervain et al., 2020).

In accordance with the main hypothesis, fear of COVID-19 and perceived stress mediated the relationship between self-blame regret and depression. In line with this hypothesis, previous studies reported that fear of COVID-19 inflates perceived stress (Bakioğlu, Korkmaz & Ercan, 2020); perceived stress (e.g., Zhang, Peters & Chen, 2018) and particularly pandemic related stress contributes to elevated levels of depressive symptoms (Montano & Acebes, 2020). Taking together, within the framework of all discussed findings, it can be concluded that self-blame regret impacts depression through fear of COVID-19 and psychological stress.

There are central things to be highlighted in the present study. First, this is the first study to report the positive association between self-blame regret and fear of COVID-19. Essentially, the literature for self-blame regret is scarce though the current study reported its vitality on one of the pandemic-related concepts, namely fear of COVID-19. Second, the current study provided a comprehensive model to dismantle the relationships between emotion self-blame regret and depressive symptoms through fear of COVID-19 and perceived stress. Though, several limitations should be taken into consideration. Chief among these limitations, the current study was cross-sectional and self-report in nature. Thus, future studies should employ other methods such as qualitative and longitudinal designs. Another limitation included the number of participants represented within the sample in terms of gender. Despite the recruitment procedure targeted a homogenous sample; the number of females superseded the number of males within the sample. Thus, future studies should aim to include a similar number of participants from both genders to support the generalizability of the results. Notwithstanding these limitations, this study illuminates the underlying mechanism behind the relationship between self-blame regret, fear of COVID-19, perceived stress, and depressive symptoms.

5. Implications and Recommendations

The findings of the current study provide some implications for research and practice, especially in terms of the mental health of university students. According to recent studies, university students are one of the most affected communities by the COVID-19 outbreak and associated consequences (Kaparounaki et al., 2020). Thus, the findings of this study are insightful to understand the factors behind university students' dysfunctional responses to the pandemic. With further studies, understanding the causal role of such factors on mental health might contribute to important avenues of future research. Second, findings from the present study demonstrated that self-blame regret had a predictive effect on fear of COVID-19, perceived stress, and levels of depression university students experienced. Although such findings do not propose causal inferences, those results nevertheless highlight that self-blame regret plays a key role in the development of depressive symptoms through mediators. Considering one of the mediators is a well-documented concept impactful on the mental health of the individuals during times of COVID-19 crisis (fear of COVID-19), present findings implicate the potential critical impact of self-blame regret on depressive symptoms. Thus, further studies might include the elements of self-blame regret as well as fear of COVID-19 and perceived stress in interventions and treatments to reduce depression levels of university students during global emergencies such as the COVID-19 outbreak. Moreover, especially mental health providers might use strategies to diminish self-blame regret, pandemic-related fear, and stress to promote better mental health in universities. Specifically, strategies targeting self-blame regret could be key to eliminate the negative effects of the COVID-19 pandemic on students' mental health and help them to improve their mental well-being.

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