

The Role of Emotion Regulation in the Relationship between Coronavirus Pandemic Impacts and Mental Health

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ABSTRACT

Introduction: The Coronavirus pandemic is causing many to experience stressful life events, which are related to the onset or worsening of depressive disorders and anxiety disorders. Emotion regulation plays an important role in responding to stressful life events and in risk for depressive/anxiety symptoms. The current paper examines pandemic-related negative life events in relation to depressive and anxiety symptoms, and whether difficulties in emotion regulation mediates this relationship.

Methods: Participants (N=307) recruited through Amazon MTurk completed questionnaires assessing pandemic-related negative life events, difficulties in emotion regulation, and depressive/anxiety symptoms. Participants (N=154) completed depression and anxiety symptom measures again 2 weeks later.

Results: Pandemic-related negative life events were associated with increased concurrent and longitudinal depression and anxiety symptoms. Emotion regulation mediated the relationships between pandemic-related negative life events and baseline depression and anxiety symptoms as well as follow-up symptoms.

Limitations: We did not assess whether participants had previously been diagnosed with a mood or anxiety disorder, so it is unclear whether individuals with these disorders are at an increased risk of worsening symptoms relative to the rest of the population.

Discussion: These findings suggest that individuals experiencing stressful events related to the pandemic are at an increased risk for lasting negative mental health outcomes, and that emotion regulation difficulties are a critical target for intervention for these individuals.

Keywords

Coronavirus, Stressful life events, Anxiety, Depression, Emotion regulation.

Introduction

The Coronavirus pandemic is having broad impact on people's lives, including increased unemployment and decreased social engagement. For many, these changes have caused a great deal of stress. Previous research has indicated that stressful life events are related to the onset of depressive disorders and anxiety disorders [1-6]. Further, for individuals with these disorders, stressful life

events often precede a relapse or worsening of symptoms [7,5]. Thus, stressful events related to the Coronavirus pandemic may lead to new onset of anxiety or depression and worsening of symptoms in those who already have these disorders.

Moreover, there is evidence that the unique stressors brought on by the Coronavirus pandemic put individuals at increased risk for depression and anxiety. For example, studies of older adults have indicated that social engagement, which is limited by the pandemic, is an important protective factor against depression [8,9]. Additionally, the pandemic has caused millions of U.S.

Americans to lose their jobs, leaving nearly 15% of the adult population unemployed in April of 2020 (Bureau of Labor Statistics, U.S. Department of Labor). A meta-analysis has shown that job loss and job insecurity are related to an increased likelihood of developing anxiety and depression [10]. Thus, the impacts of the current pandemic may be particularly salient risk factors for depression and anxiety. Examining the impact that pandemic is having on individuals' lives will help us to prevent further worsening of people's mental health and identify areas of focus for intervention.

A healthy response to stressful events requires the effective use of emotion regulation strategies. Emotion regulation has been conceptualized as a dynamic and multi-faceted process through which individuals respond to environmental events, including stressful life events [11-13]. Difficulties with emotion regulation are a central component of mental health disorders, including anxiety and depressive disorders, and are a mechanism involved in the relationship between stressful events and anxiety/depressive symptoms [14-16]. Research has indicated that individuals with emotion regulation difficulties are at an increased risk of developing depression when they face adversity, even if they have not experienced a depressive episode in the past [17]. Additionally, stressful events can lead to difficulties with emotion regulation, indicating that these events may damage the very strategies/capabilities that might mitigate their impact [18-20]. Thus, we would expect that stressful events related to the Coronavirus pandemic will lead to difficulties with emotion regulation and ultimately, mental wellness.

In the current study, we examine both the impact of stressful life events associated with the coronavirus pandemic on anxiety and depressive symptoms, concurrently and at a two week follow up, and the role of emotion regulation in this relationship. We hypothesize that (1) individuals who are experiencing increased negative impacts of the pandemic will have increased anxiety and depressive symptoms both currently and two weeks later, and (2) emotion regulation difficulties mediate this relationship. These findings would indicate that emotion regulation difficulties are an important target for intervention to help improve mental health outcomes for individuals highly impacted by the pandemic.

Methods

Participants

Participants (N = 381) were recruited between 4/15/20 and 4/19/20 through Amazon Mechanical Turk (MTurk), a crowdsourcing internet marketplace, as part of a study to test a novel intervention session. Mturk is used commonly in behavioral and psychological survey research to recruit diverse samples and has been shown to yield valid and reliable data [21-24]. The focus of the current paper is on the reported impacts of the pandemic and mental health variables during the baseline, not the intervention session. To be eligible for participation, Mturk workers were required to be age 18 or older, currently living in the United States, speak English as a first language, and have a HIT approval rate of 90 or greater. Consistent with previous Mturk research [21], participants who

completed the study in less than 60% of the projected time to complete it (N = 74) were excluded from analyses. Thus, a sample of 307 individuals (Mean age = 37.6, SD = 11.87, 63.2% female, 81.77% white, 16% Hispanic) was included for baseline analyses in the current study. Individuals excluded from analyses did not differ from individuals included in analyses on race ($\chi^2 = 6.178, p = .289$), sex ($\chi^2 = .003, p = .959$), level of education ($t(374) = -.304, p = .762$), or household income ($t(374) = -1.031, p = .303$). However, excluded participants were younger on average (M = 34.3, SD = 9.4) than included participants (M = 37.6, SD = 11.68; $t(374) = -2.230, p = .026$).

Two weeks following study completion, participants were invited via MTurk to participate in a follow-up survey. 206 individuals completed the follow-up survey. Similar to that of baseline data, participants who completed the follow-up study in less than 60% of projected time (N=52) were excluded, yielding a longitudinal follow-up sample of 154 participants for analysis in the current study. Individuals excluded from longitudinal analyses did not differ from individuals included in analyses based on race ($\chi^2 = 5.622, p = .3435$), sex ($\chi^2 = .404, p = .525$) age ($t(305) = -.247, p = .805$), education ($t(305) = 1.528, p = .128$), or household income ($t(305) = -.474, p = .636$). Additionally, of those who completed the follow-up, those who were in the intervention condition (N = 67) did not significantly differ from those who were not in the intervention condition (N = 87) on symptoms of depression ($t(152) = -.358, p = .721$) or anxiety ($t(152) = -.657, p = .657$). However, those who completed the follow-up endorsed significantly fewer symptoms of depression ($t(305) = 3.397, p < .01$) and significantly fewer symptoms of anxiety ($t(305) = 3.764, p < .01$) at baseline.

At both baseline and follow-up, Mturk workers were redirected to Qualtrics, where they were provided a written description of the study and were asked to provide online informed consent prior to study participation. Assessments of pandemic impacts and emotion regulation difficulties were completed at baseline (i.e. study entry); clinical symptom measures were collected at both baseline and 2-week follow-up. The University of Michigan Institutional Review Board reviewed the study and determined it to be exempt from IRB oversight.

Measures

Pandemic Impacts

The Epidemic – Pandemic Impacts Inventory is a self-report measure developed in the context of the Coronavirus pandemic to assess the impact on individuals' personal and family life [EPII; 25]. The survey asks individuals to indicate whether an event was experienced personally and/or by another individual in their home since the beginning of the Coronavirus pandemic with a dichotomous yes/no response. The survey consists of 92 events across several categories of impacts: work and employment, education and training, home life, social activities, economic, emotional health and well-being, physical health problems, physical distancing and quarantine, infection history, and positive changes. Events in each category were summed to yield a separate

total for events experienced by oneself and by another person in the home. Henceforth, we will refer to these events totals as: (1) work—self, (2) work—others, (3) education—self, (4) education—others, (5) Home—self, (6) home—others, (7) social—self, (8) social—others, (9) economic—self, (10) economic—others, (11) emotional health—self, (12) emotional health—others, (13) physical health—self, (14) physical health—others, (15) quarantine—self, (16) quarantine—others, (17) infection—self, (18) infection—others, (19) positive—self, (20) positive—others.

Emotion Regulation

The Difficulties in Emotion Regulation Scale is a 36-item self-report measure that assesses emotion regulation in six areas: nonacceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity [DERS; 12]. The DERS shows high internal consistency with a Cronbach's α of .93 [12]. The total score, which indexes overall difficulties in emotion regulation, was the variable of interest in the current study. Higher scores indicate more difficulties in emotion regulation.

Clinical Measures

Depression: At both baseline and follow-up, the Patient Health Questionnaire [26] was used to assess self-reported depression symptoms over the last two weeks. An 8-item version without a question on suicidal ideation was used, which has been shown to be valid in population-based studies and shows good internal reliability with a Cronbach's α of 0.82 [26,27]. Participants rate each item on how often they have experienced them in the last two weeks on a scale from 0-3 (0 = not at all, 1 = several days, 2 = more than half of the days, 4 = nearly every day). The scores of these 8 items are summed to create a total scale score. Scores of 0–4, 5–9, 10–14, 15–19, and 20–24 on the PHQ-8 indicate no/minimal depression, mild depression, moderate depression, moderately severe depression, and severe depression, respectively.

Anxiety: At both baseline and follow-up, the Generalized Anxiety Disorder 7 [28] was used to assess self-reported anxiety symptoms over the last two weeks. The GAD-7 shows good internal reliability with a Cronbach's α of .92 [28]. Participants rate seven items on how often they have experienced them in the last two weeks on a scale from 0-3 (0 = not at all, 1 = several days, 2 = more than half of the days, 4 = nearly every day). These items are then summed to create a total scale score where higher scores indicate more severe anxiety. Total GAD-7 scores of 5–9 are indicative of mild anxiety, scores of 10–14 are indicative of moderate anxiety, and scores of 15 or above are indicative of severe anxiety.

Analysis Plan

Preliminary data analysis was conducted using IBM SPSS version 26 (Statistical Package for the Social Sciences) and mediation analyses were conducted using PROCESS macro for SPSS. Bivariate correlations were performed between each of the categories of pandemic events and baseline clinical symptoms (PHQ-8 and GAD-7). The EPII categories emotional health—self

and emotional health—others were not included in these analyses due to conceptual overlap with the PHQ-8 and GAD-7. The EPII categories positive—self and positive—others were excluded given the aim of the paper to investigate negative/stressful life events. All correlations that were significant at the $p < .05$ level were followed up with mediational analyses examining whether emotion regulation difficulties (DERS total score) mediated the relationship between the given pandemic events category (separate model run for each category) and baseline clinical symptom domain (depressive or anxiety symptoms; see Table 2).

Table 1: Descriptive statistics of all variables.

		Mean	SD	Possible Range
Impacts to Self	Work-self	2.36	2.40	0-11
	Education-self	0.45	0.64	0-2
	Home-self	2.28	2.69	0-13
	Social-self	2.69	2.43	0-10
	Economic-self	0.94	1.20	0-5
	Emotion-self	1.78	1.74	0-8
	Physical-self	1.80	1.81	0-8
	Quarantine-self	1.60	2.00	0-8
	Infection-self	1.25	1.87	0-8
Impacts to Other	Work-others	3.31	2.77	0-11
	Education-others	0.68	0.70	0-2
	Home-others	3.87	3.45	0-13
	Social-others	3.08	2.68	0-10
	Economic-others	1.39	1.46	0-5
	Emotion-others	2.32	2.11	0-8
	Physical-others	2.42	2.16	0-8
	Quarantine-others	2.14	2.15	0-8
	Infection-others	1.94	2.17	0-8
Emotion Regulation	DERS Total	97.61	24.59	36-180
Baseline Symptoms	GAD Total	9.69	5.60	0-21
	PHQ Total	10.68	6.49	0-24
Follow-up Symptoms	GAD Total	8.21	5.39	0-21
	PHQ Total	9.10	6.55	0-24

Table 2: Correlations between baseline EPII events categories, total score on the Disruptions in emotion regulation scale (DERS), and baseline clinical outcomes of PHQ-8 and GAD-7.

	DERS – total score	Baseline PHQ-8	Baseline GAD-7
Work-self	.294**	.302**	.327**
Education-self	0.05	0.076	0.088
Home-Self	.380**	.365**	.357**
Social-self	0.05	0.084	0.097
Economic-self	.408**	.425**	.367**
Physical health-self	.208**	.259**	.242**
Quarantine-self	.381**	.365**	.331**
Infection-self	.439**	.426**	.382**
Work-others	.536**	.424**	.363**
Education-others	.380**	.313**	.294**
Home-others	.576**	.473**	.464**
Social-others	.479**	.417**	.372**
Economic-others	.569**	.486**	.447**
Physical health-others	.521**	.441**	.381**
Quarantine-others	.564**	.489**	.467**
Infection-others	.547**	.478**	.440**

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

To examine the longitudinal relationships between pandemic impacts and clinical symptoms, partial correlations were performed between each of the baseline categories of pandemic events and follow-up PHQ-8 and GAD-7, controlling for baseline PHQ-8 or GAD-7 symptoms, respectively. All partial correlations that were significant at the $p < .05$ level were followed up with mediational analyses examining whether emotion regulation difficulties (DERS total score) mediated the relationship between the given baseline pandemic events category (separate model run for each category) and follow-up clinical symptom domain (depressive or anxiety symptoms; see Table 3).

Results

Description of sample at baseline

Table 1 shows descriptive statistics for all variables of interest in the current study sample. Individuals in the current study sample experienced broad impacts of the pandemic, endorsing an average of 21 events out of 92 on the EPII checklist ($M = 21.01$, $SD = 16.43$) at baseline. Additionally, 90% of individuals reported that they experienced at least 1 of the 92 events on the EPII checklist. Further, 86% of participants indicated that other individuals in their household had experienced at least one event related to the pandemic as well, reporting an average of 27 of 92 events on the EPII checklist ($M = 27.29$, $SD = 21.53$). 75% of individuals reported depressive symptoms of at least mild severity and 78% of individuals reported anxiety symptoms of at least mild severity. Further, 35.9% of individuals reported moderately severe or severe depression symptoms and 57.6% of individuals reported moderate or severe anxiety.

Correlations between pandemic impacts and clinical symptoms at baseline

For all categories of events that an individual experienced themselves, with the exception of education—self and social—self, a greater number of events was significantly correlated with increased anxiety and depression symptoms (all p -values $< .01$). Furthermore, increased events experienced by other individuals in the household were also significantly positively correlated with more severe anxiety and depressive symptoms for the reporting individual (all p -values $< .01$). Correlations are summarized in Table 2.

Mediation analyses – Baseline

Baseline mediation analyses are summarized in Table 3. For EPII events that individuals reported experiencing themselves, emotion regulation difficulties fully mediated the relationships between some EPII categories (i.e., work—self, home—self, economic—self, quarantine—self) and PHQ-8 scores (all indirect effects significant at $\alpha = .05$). Further, emotion regulation difficulties partially mediated the relationship between other EPII events categories (i.e., physical health—self, infection—self) and PHQ-8 scores. Emotion regulation difficulties also fully mediated the relationships between some EPII events categories (i.e., economic—self, quarantine—self, infection—self) and GAD-7 scores (all indirect effects significant at $\alpha = .05$). Further, emotion regulation difficulties partially mediated the relationships between other EPII events categories (work—self, home—self, physical health—self) and GAD-7 scores. However, emotion regulation

Table 3: Mediation models in which DERS mediated the relationship between EPII events categories and baseline clinical outcomes of PHQ-8 and GAD-7.

Independent Variable	Effect of IV on DERS	PHQ-8			GAD-7		
		Unique effect of IV on PHQ-8	Unique effect of DERS on PHQ-8	Indirect effect of IV on PHQ-8 through DERS	Unique effect of IV on GAD-7	Unique effect of DERS on GAD-7	Indirect effect of IV on GAD-7 through DERS
Work--self	3.02*** (.56)	.17 (.10)	.21*** (.01)	.64* (.10)	.27** (.10)	.16*** (.01)	.50* (.07)
Home--self	3.47*** (.48)	.14 (.08)	.21*** (.01)	.74* (.09)	.17* (.08)	.16*** (.01)	.57* (.08)
Economic--self	8.37*** (1.07)	.56* (.18)	.21*** (.01)	1.74* (.20)	.33 (.19)	.17*** (.01)	1.39* (.17)
Physical health--self	2.81*** (.76)	.32** (.12)	.21*** (.01)	.60* (.13)	.27* (.12)	.17*** (.01)	.47* (.10)
Quarantine--self	4.69*** (.65)	.19 (.11)	.21*** (.01)	.99* (.12)	.14 (.11)	.17*** (.01)	.79* (.10)
Infection--self	5.76*** (.68)	.27* (.12)	.21*** (.01)	1.20* (.13)	.18 (.12)	.17*** (.01)	.96* (.11)
Education--self	1.97 (2.21)	--	--	--	--	--	--
Social--self	.45 (.58)	--	--	--	--	--	--
Work--others	4.76*** (.43)	-.06 (.09)	.22*** (.01)	1.05* (.10)	-.12 (.09)	.18*** (.01)	.85* (.09)
Home--others	4.10*** (.33)	-.01 (.07)	.22*** (.01)	.90* (.08)	.07 (.07)	.17*** (.01)	.68* (.07)
Economic--others	9.60*** (.79)	.10 (.17)	.22*** (.01)	2.07* (.18)	.10 (.18)	.17*** (.01)	1.62* (.15)
Education--others	13.31*** (1.86)	-.01 (.32)	.22*** (.01)	2.91* (.39)	.07 (.32)	.17*** (.01)	2.28* (.33)
Physical health --others	5.92*** (.55)	.04 (.11)	.22*** (.01)	1.28* (.12)	-.04 (.11)	.17*** (.01)	1.03* (.10)
Quarantine--others	6.44*** (.54)	.10 (.12)	.21*** (.01)	1.37* (.12)	.16 (.12)	.16*** (.01)	1.06* (.11)
Infection--others	6.21*** (.55)	.11 (.12)	.21*** (.01)	1.32* (.12)	.10 (.12)	.17*** (.01)	1.04* (.11)
Social--others	4.40*** (.46)	.07 (.08)	.21*** (.01)	.95* (.10)	.03 (.09)	.17*** (.01)	.75* (.08)

Note: Mediation models for social—self, education—self, and positive—self, were not run because they did not significantly predict DERS. DERS = Difficulties in Emotion Regulation Scale, EPII = Epidemic – Pandemic Impacts Inventory, PHQ-8 = Patient Health Questionnaire.

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

difficulties were not a significant mediator between EPII social—self and GAD-7 scores. When looking at events experienced by others in the household, emotion regulation difficulties fully mediated the relationships between all EPII events categories and PHQ-8 scores (all indirect effects significant at $\alpha = .05$). Emotion regulation difficulties also fully mediated the relationships between reported events for other individuals in the home for all EPII categories and GAD-7 scores (all indirect effects significant at $\alpha = .05$).

Description of sample at follow up

Table 1 shows descriptive statistics for depression and anxiety symptoms at follow-up. At the two-week follow-up, 69.5% of individuals reported depressive symptoms of at least mild severity and 70.1% of individuals reported anxiety symptoms of at least mild severity. Further, 23.4% of individuals reported moderately severe or severe depression symptoms and 48.7% of individuals reported moderate or severe anxiety.

Correlations between baseline pandemic impacts and follow-up clinical symptoms

At follow up, partial correlations indicated that increased reported events in home—others, economic—others, physical health—others, and quarantine—others were significantly associated with elevated follow-up depressive symptoms, while controlling for baseline depressive symptoms. Partial correlations also indicated that increased reported events in home—self, economic—self, quarantine—self, work—others, home—others, economic—others, physical health—others, quarantine—others, infection—others, and social—others were significantly associated with increased follow-up anxiety symptoms, while controlling for baseline anxiety symptoms. Partial correlations are summarized in Table 4.

Table 4: Partial correlations between baseline EPII events categories and 2-week clinical outcomes of PHQ-8 and GAD-7 controlling for baseline clinical symptoms of the same measures, respectively.

	Follow-up PHQ-8 [^]	Follow-up GAD-7 ^{^^}
Work-self	-0.06	0.087
Education-self	-0.109	-0.034
Home-Self	-0.04	.205*
Social-self	-0.172	-0.111
Economic-self	-0.01	.208**
Physical health-self	-0.152	0.034
Quarantine-self	-0.125	0.155
Infection-self	-0.13	0.136
Work-others	0.121	.193*
Education-others	0.073	0.081
Home-others	.170*	.188*
Social-others	0.074	.188*
Economic-others	.172*	.273**
Physical health-others	0.167*	.229**
Quarantine-others	.170*	.220**
Infection-others	0.12	.274**

Note: * $p < .05$, ** $p < .01$. [^]Partial correlations conducted controlling for baseline PHQ-8 scores. ^{^^}Partial correlations conducted controlling for baseline GAD-7 scores.

Mediation analyses – Follow-up

Follow-up mediation analyses are summarized in Table 5. Emotion regulation difficulties did not mediate relationships between any EPII events that individuals reported experiencing themselves and follow-up PHQ-8 scores when controlling for baseline PHQ-8 scores. However, emotion regulation difficulties fully mediated the relationships between some EPII categories that individuals experienced themselves (i.e., home—self, economic—self, quarantine—self) and follow-up GAD-7 scores while controlling for baseline GAD-7 scores (all indirect effects significant at $\alpha = .05$).

When looking at events experienced by others in the household, emotion regulation difficulties fully mediated the relationship between physical health—others and follow-up PHQ-8 scores while controlling for baseline PHQ-8 scores (indirect effect significant at $\alpha = .05$). Emotion regulation difficulties also fully mediated the relationship between some EPII event categories (i.e., work—others, home—others, economic—others, physical health—others, quarantine—others, infection—others, social—others) and follow-up GAD-7 scores when controlling for baseline GAD-7 scores. However, although home—others, economic—others, and quarantine—others were significantly correlated with follow-up PHQ-8 scores when controlling for baseline PHQ-8 scores, difficulties in emotion regulation did not significantly mediate these relationships.

Discussion

The current study examined relationships between negative impacts of the Coronavirus pandemic and both concurrent and prospective symptoms of depression and anxiety, as well as emotion regulation difficulties as a mediator of these relationships.

Associations between Pandemic Impacts and Clinical Symptoms

As expected, increased experiences of negative events related to the pandemic in nearly every category of the EPII checklist were significantly correlated to increased current symptoms of depression and anxiety. Further, several categories of impacts (i.e., home—self, economic—self, quarantine—self, work—others, home—others, social—others, economic—others, quarantine—others, infection—others), predicted increased symptoms of depression and anxiety two weeks later. This is consistent with prior literature observing relationships between stressful life events and increased symptoms of depression and anxiety [1-7,29]. Increased impacts experienced not only by oneself, but also experienced by others in the home, were significantly correlated with both concurrent and prospective depression and anxiety for the individual reporting. This indicates that increased stressful life events for other individuals in the household are also negatively affecting mental health outcomes for individuals during the pandemic.

Emotion regulation as a mediator of the relationship between increased pandemic impacts and clinical symptoms

Further, we tested emotion regulation difficulties as a mediator of the observed relationships between pandemic impacts and

Table 5: Mediation models in which DERS mediated the relationship between EPII events categories and follow-up clinical outcomes of PHQ-8 and GAD-7.

<i>Independent Variable</i>	Effect of IV on DERS controlling for baseline PHQ-8	Unique effect of IV on follow up PHQ-8	Unique effect of DERS on follow up PHQ-8	Unique effect of baseline PHQ-8 on follow up PHQ-8	Indirect effect of IV on follow up PHQ-8 through DERS
Home--others	1.70*** (.35)	.14 (.11)	.04^ (.02)	.62*** (.09)	0.07
Economic--others	3.39*** (.95)	.44 (.29)	.05^ (.02)	.60*** (.09)	.15*
Physical health --others	1.66** (.61)	.28 (.18)	.05* (.02)	.60*** (.09)	.08*
Quarantine--others	2.12*** (.62)	.29 (.18)	.05^ (.02)	.60*** (.09)	0.1
<i>Independent Variable</i>	Effect of IV on DERS controlling for baseline GAD-7	Unique effect of IV on follow up GAD-7	Unique effect of DERS on follow up GAD-7	Unique effect of baseline GAD-7 on follow up GAD-7	Indirect effect of IV on follow up GAD-7 through DERS
Home--self	1.49** (.55)	.18 (.11)	.08*** (.02)	.43*** (.07)	.12*
Economic--self	3.10* (1.44)	.53 (.28)	.08*** (.02)	.42*** (.07)	.25*
Quarantine--self	3.21*** (.73)	.18 (.15)	.08*** (.02)	.43*** (.07)	.25*
Work--others	2.86*** (.48)	.03 (.11)	.09*** (.02)	.45*** (.07)	.23*
Home--others	2.20*** (.42)	.04 (.09)	.08*** (.02)	.44*** (.07)	.18*
Economic--others	5.73*** (1.03)	.37 (.23)	.07*** (.02)	.43*** (.07)	.42*
Physical health --others	2.97*** (.69)	.20 (.14)	.08*** (.02)	.44*** (.07)	.23*
Quarantine--others	3.21*** (.73)	.19 (.16)	.08*** (.02)	.43*** (.07)	.25*
Infection--others	3.32*** (.65)	.25 (.15)	.07*** (.02)	.44*** (.07)	.25*
Social--others	2.22*** (.54)	.10 (.12)	.08*** (.02)	.44*** (.07)	.18*

^ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

clinical symptoms. As expected, emotion regulation difficulties significantly mediated the relationships between work—self, home—self, economic—self, quarantine—self, physical health—self, and symptoms of depression and anxiety at baseline. This is consistent with prior literature indicating that difficulties in emotion regulation increase the risk for developing depression and anxiety in the face of adversity [17]. Findings also indicated that emotion regulation difficulties are a significant mediator of the relationship between events related to the pandemic on others in the household and symptoms of depression and anxiety at baseline, suggesting that emotion regulation is also an important mechanism for responding to events that affect the household.

Longitudinal findings provided further evidence for the role of emotion regulation difficulties in the relationship between increased pandemic impacts and poorer anxiety outcomes. Specifically, emotion regulation difficulties mediated the relationships between home—self, economic—self, quarantine—self, work—others, home—others, economic—others, physical health—others, quarantine—others, infection—others, social—others, and follow-up anxiety symptoms above and beyond the influence of baseline anxiety symptoms. This indicates that emotion regulation difficulties may lead to increases in anxiety symptoms in the face of pandemic-related adversity, which is consistent with previous literature [7,5]. However, when looking at depression symptoms, emotion regulation difficulties only mediated the relationship between physical health—others and follow-up depression symptoms when controlling for baseline depression symptoms. Thus, it appears that the mediations observed at baseline indicate an associative effect of emotion regulation and pandemic events on depression symptoms and a direction of this effect cannot be determined.

Limitations

In this study, we did not address whether individuals had previously been diagnosed with anxiety or depression, and individuals who completed the follow-up were significantly less depressed and anxious at baseline than those who did not. Thus, we could not draw any conclusions as to whether individuals already diagnosed with these mental health conditions or have more severe symptoms are at a greater risk of developing increased symptoms, as may also be expected based on prior literature [7,5]. Further, we did not assess whether these individuals were experiencing stressful life events that were not related to the pandemic. Further research should address how pandemic-related stressors interact with other stressful life events.

Conclusion

In the current study, we found that those who are experiencing increased negative impacts of the pandemic are also experiencing increased anxiety and depression both concurrently and two weeks later, suggesting that the pandemic has lasting impacts on mental health and indicating that these individuals may need mental healthcare resources. Further, results indicated that difficulties in emotion regulation underlie this relationship. These findings suggest that emotion regulation difficulties are a critical target for intervention to help improve mental health outcomes for individuals highly impacted by the pandemic.

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