Does fear mediate the neuroticism-psychopathology link for adults living through the COVID-19 pandemic?

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ABSTRACT

BACKGROUND: COVID-19 has globally increased psychological distress. Although research has shown a clear link between neuroticism and psychopathology, pandemic fears—manifesting as fear of death and coronavirus anxiety, have not been examined as mediating factors explaining this connection during the pandemic.

METHODS: Therefore, to fill this void in the literature, this study examined 259 U.S. MTurk adult workers in May 2020 using an online questionnaire. The study used the Patient Health Questionnaire, the 8-item Big Five Inventory neuroticism subscale, a single-item fear of death measure, and the Coronavirus Anxiety Scale as well as collected demographic information to perform correlational and meditation analyses.

RESULTS: The results showed that both coronavirus anxiety and fear of death partially mediated the relationship between neuroticism and symptoms of depression and generalized anxiety. The results also found that those high in trait neuroticism who were fearful of death or had coronavirus anxiety showed heightened levels of depression and general anxiety.

CONCLUSION: This study’s findings were consistent with previous research and current work on pandemic-related distress. In addition, the results of these findings can help bring to light the connectedness of these psychopathological constructs with fears surrounding the pandemic—which can be useful to both researchers and mental health professionals alike.

KEYWORDS: Neuroticism, COVID-19, fear of death, coronavirus, anxiety, depression

Introduction

As the pandemic persists, so does the worsening of people’s mental health and well-being.¹ For example, during the first months of the pandemic, 24.4% of Americans reported clinical levels of depression, while 29.8% reported clinical levels of anxiety.² One factor that has been found to be strongly associated with depression and generalized anxiety during the COVID-19 pandemic is neuroticism.³ According to the Five-Factor model, neuroticism describes a broad dimension of personality concerned with tendencies to experience negative affect, and disturbed thoughts and behaviors that accompany emotional distress.⁴ The finding that neuroticism is associated with adjustment difficulties during the COVID-19 pandemic should not be surprising given that individuals high in this personality trait have long been known to suffer from a wide-range of mental and physical health conditions⁵ as well as psychological distress during previous pandemics.⁶,⁷ However, what is not clear is what the psychological mechanisms are that explain why individuals high in this trait are experiencing heightened levels of psychological distress during this particular global health crisis.

The COVID-19 pandemic has been shrouded by fear and anxiety with millions of people dead from this highly infectious disease. Consequently, many people living in this pandemic fear for their lives and the coronavirus itself, as the virus can lead to the death and suffering of oneself and their loved ones. Accordingly, research during this pandemic has shown that both death anxiety and coronavirus anxiety are both positively correlated with depression and generalized anxiety.⁸,⁹ Moreover, past⁷ and current research³,¹⁰ has shown that neuroticism is strongly tied to pandemic-related fears and psychopathology. That said, although research has shown a clear link between neuroticism and psychopathology (i.e., anxiety and depression), pandemic fears—such as fear of death and coronavirus anxiety, have not been examined as mediating factors for explaining this connection during the pandemic. Thus, this study will aim to address this; we anticipate that fear of death and coronavirus anxiety will mediate the relationship between neuroticism and psychopathology in a sample of adults during the COVID-19 pandemic. These causal implications can enlighten the relationships these constructs hold—helping researchers better
understand COVID-19’s psychological impacts and possible avenues for treatment.

Method

Participants and procedures

Data from 259 adult MTurk workers in the U.S. who completed an online survey on May 15 and 16, 2020 were used in this IRB approved study. The sample consisted of 116 women and 143 men, with a median age of 33.00 years (ranging from 18 to 65). Most of the participants were White (n = 165; 63.7%), had earned at least a Bachelor’s degree (n = 190; 73.4%), had not tested positive for COVID-19 (n = 227; 87.6%), and did not know someone with COVID-19 (n = 147; 56.8%). The participants provided consent and received payment ($0.50) for their involvement in this study.

Measures

Background information. Participants were asked to report their age, gender, race, level of education, diagnosis of COVID-19, and personal knowledge of someone with COVID-19.

Psychopathology. Symptoms of psychopathology were measured using the four-item Patient Health Questionnaire-4. Participants indicated how frequently they experienced symptoms of depression (e.g., feeling down, depressed, or hopeless; α = .80) and generalized anxiety (e.g., feeling nervous, anxious, or on edge; α = .78) over the last 2 weeks using a 4-point scale.

Neuroticism. The general tendency to experience negative emotions was measured using the 8-item neuroticism subscale of the Big Five Inventory. Participants indicated how much they agreed or disagreed with descriptions of neuroticism (e.g., I see myself as someone who worries a lot) using a 4-point scale (α = .81).

Fear of Death. Fear of death was measured using a single-item Fear of Death measure. Although a single-item, it has been found to reliably assess fear of death and moderately be associated with multi-item death anxiety scales. For the item, participants indicated how much they agreed or disagreed with the statement, “I am afraid of death” using a 4-point scale. Most of the participants reported that they agree a little (28.2%), followed by neither agree nor disagree (19.7%), strongly agree (18.9%), disagree a little (17.8%), and strongly disagree (15.4%) to the item.

Coronavirus anxiety. Dysfunctional anxiety over the coronavirus was measured using the 5-item Coronavirus Anxiety Scale. Participants indicated how frequently they experienced physiologically based symptoms of fear and anxiety over the coronavirus (e.g., I felt dizzy, lightheaded, or faint, when I read or listened to news about the coronavirus) over the last 2 weeks using a 4-point scale (α = .94).

Statistical procedures

Statistical analyses were calculated using SPSS version 26.0, except for the mediation analyses, which were run using AMOS version 25.0. We tested mediators one at a time to determine independent effects and employed bias-corrected bootstrap procedures using 2,000 resamples to the models. We chose a bootstrap resampling method because its calculation of confidence intervals is not biased by sample size, effect size, or level of statistical significance.

Results

Correlations

Zero-order correlations were run to examine the bivariate associations between the measures of psychopathology, neuroticism, and the proposed mediators of fear of death and coronavirus anxiety (see Table 1). The results revealed that depression was correlated with neuroticism (r = .64), fear of death (r = .40), coronavirus anxiety (r = .66), and generalized anxiety (r = .76). Generalized anxiety was also correlated with neuroticism (r = .68), fear of death (r = .47), and coronavirus anxiety (r = .62). Neuroticism was correlated with fear of death (r = .40), and coronavirus anxiety (r = .42). Fear of death was correlated with coronavirus anxiety (r = .33), supporting their related but distinct expressions of pandemic fear. These intercorrelation patterns support the inclusion of the variables in the mediation analyses.

Mediation analyses

Four mediation analyses were conducted to examine the separate influences of proposed mediators on the association between neuroticism and psychopathology (i.e., depression and generalized anxiety). The first model tested coronavirus anxiety’s mediating influence on the relationship between neuroticism and depression (see Figure 1). The bootstrap results showed that the standardized indirect (mediated) effect of neuroticism on depression was significantly different from zero (P = .001, 95% CI [.15, .27]). Therefore, this model demonstrated that coronavirus anxiety partially mediated the neuroticism–depression link (β from .64 to .44) with a standardized indirect effect of .20.

The second model tested coronavirus anxiety’s mediating influence on the relationship between neuroticism and generalized anxiety (see Figure 2). The bootstrap results showed that the standardized indirect (mediated) effect of neuroticism on generalized anxiety was significantly different from zero (P = .001, 95% CI [.12, .23]). Therefore, this model demonstrated that coronavirus anxiety partially mediated the neuroticism–generalized anxiety link (β from .68 to .51) with a standardized indirect effect of .17.

The third model tested death anxiety’s mediating influence on the relationship between neuroticism and depression (see Figure 3). The bootstrap results showed that the standardized indirect (mediated) effect of neuroticism on depression was significantly different from zero (P = .001, 95% CI [.03, .12]). Therefore, this model demonstrated that fear of death partially
Table 1. Descriptive statistics and zero-order correlations.

|       | M   | SD  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
|-------|-----|-----|----|----|----|----|----|----|----|----|----|----|
| 1     | Depression | 2.61 | 1.92 | —  |    |    |    |    |    |    |    |    |
| 2     | Generalized anxiety | 2.47 | 1.77 | .76*** | —  |    |    |    |    |    |    |    |
| 3     | Neuroticism   | 23.37| 6.15 | .64*** | .68*** | —  |    |    |    |    |    |    |
| 4     | Fear of death | 3.17 | 1.35 | .40*** | .47*** | .40*** | —  |    |    |    |    |    |
| 5     | Coronavirus anxiety | 6.04 | 5.92 | .66*** | .62*** | .42*** | .33*** | —  |    |    |    |    |
| 6     | Age           | 35.46| 11.30| —   | —12 | —21** | —09 | .01 | —   |    |    |    |
| 7     | Gender        | .55  | .50  | .03 | —.03| —21** | .02 | .14* | .01 | —   |    |    |
| 8     | Race          | .64  | .48  | .00 | .05 | .00  | —12* | —05 | .18**| —02 | —   |    |
| 9     | Education     | .73  | .44  | .14*| .22**| .04  | .15* | .28***| .04  | .14* | .07 | —   |
| 10    | Diagnosis     | .12  | .33  | .20**| .19**| .11  | .10 | .34***| .01  | .08  | —.01| .09 | —   |
| 11    | Knowledge     | .43  | .50  | .11 | .14*| .04  | .08 | .20**| —10  | .07  | —.02| —.02| 26***|

Note. N = 259; Gender (0 = male; 1 = female); Race (0 = non-White; 1 = White); Education (0 = Less than a Bachelor’s degree; 1 = Bachelor’s degree and higher); Diagnosis (0 = not diagnosed with COVID-19; 1 = diagnosed with COVID-19); Knowledge (0 = does not personally know someone with COVID-19; 1 = personally knows someone with COVID-19). *P < .05; two-tailed, **P < .01; two-tailed, ***P < .001; two-tailed.
mediated the neuroticism-depression anxiety link ($\beta$ from .64 to .57) with a standardized indirect effect of .07. The last model tested fear of death’s mediating influence on the relationship between neuroticism and generalized anxiety (see Figure 4). The bootstrap results showed that the standardized indirect (mediated) effect of neuroticism on generalized anxiety was significantly different from zero ($P = .001, 95\%$ CI [.05, .15]). Therefore, this model demonstrated that fear of death partially mediated the neuroticism-generalized anxiety link ($\beta$ from .68 to .59) with a standardized indirect effect of .09.

**Discussion**

Overall, the COVID-19 pandemic has had an impact on mental health. In addition, past literature has demonstrated that in general and during pandemic times, neuroticism may play a role in who may be more likely to experience such psychopathology (i.e., anxiety and depression).\textsuperscript{5,19-21} Our study aimed to assess what other mechanisms may help to explain this neuroticism-psychopathology relationship—by exploring pandemic fears, specifically fear of death and coronavirus anxiety. In sum, the results demonstrated that the potential mediators explained some of the reason as to why individuals high in trait neuroticism experienced elevated psychopathology symptoms during the COVID-19 crisis. Our findings are consistent with Nikčević and colleagues’ (2021) predicted model for COVID-19 anxiety as a mediator in the neuroticism-generalized anxiety and neuroticism-depression relationships; however, the results of their study did not yield significant findings between these variables.\textsuperscript{22}

Moreover, our study’s findings support past literature and provide further analysis, for using mediations to explain the fear relationships, within the pandemic context, between these commonly associated variables: neuroticism and psychopathology. In addition, the results demonstrate that those high in trait neuroticism, in particular, who are fearful of death or have coronavirus anxiety may also show these heightened levels of depression and generalized anxiety. Literature has shown such psychopathology has been increasing during COVID-19\textsuperscript{23,24} and that those high in trait neuroticism are a vulnerable population during pandemics.\textsuperscript{7,25} This study synthesizes these relationships, supporting Lee and Crunk (2020)\textsuperscript{3} in showing how fears can explain these associations. After accounting for pandemic specific fears, researchers and mental health professionals are able to understand the bigger picture as to why individuals high in trait neuroticism may be especially susceptible to such psychopathology, using these findings.

There are many possible approaches to treating people with depression, generalized anxiety, and issues associated with neuroticism during the COVID-19 pandemic. One method that has been shown to successfully treat individuals suffering from psychological distress and high in neuroticism, while considering pandemic spatial distancing practices, has been the use of...
telehealth. Hedman et al (2014) found that using internet-based cognitive behavior therapy, especially for individuals high in neuroticism, has shown to be effective in and even lessened both psychological distress and tendencies of those high in trait neuroticism. Adopting this method of therapy to address pandemic fears and psychopathology for individuals high in trait neuroticism may be both practical and beneficial, especially as the pandemic persists and mental health issues rise.

This research has a major limitation worth noting. Specifically, this study was constrained by a relatively small convenience sample. Future research would benefit from a probability sampling approach that would result in obtaining a large, representative sample where more sophisticated mediation analyses that examines both independent and simultaneous effects could be applied. In addition, fear of death was only assessed using a single item; further research could examine this construct using longer measures. Further this research was conducted using self-report measures, which could be subject to possible social desirability. Notwithstanding these limitations, our research reports important data that contribute to our understanding of the mental health consequences of the pandemic. By understanding the causal implications of this study’s findings, researchers can further explore COVID-19’s psychological effects in relation to psychopathology and pandemic fears; and mental health professionals can examine the effects of neuroticism when adopting telehealth therapy and other effective approaches to help address these fears.

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