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# Anxiety Symptoms in a Community During the COVID-19 Pandemic: A Self-Reported Study

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The coronavirus (COVID-19) pandemic has affected many aspects of people's lives, including their mental health. To better understand its impact, the current study looked at how demographic features and beliefs about the pandemic influenced anxiety during this time. Participants included 221 residents of Michigan who predominantly identified as female and White. They completed the Adaptation to Social Stress Questionnaire, a 105-item self-report questionnaire developed to assess participant characteristics, ability to adapt to stress and opinions, beliefs, and experiences related to the COVID-19 pandemic, and two measures of anxiety (the State-Trait Anxiety Inventory and the Generalized Anxiety Disorder scale). Pearson product-moment correlations and independent samples t-tests were used to determine the relationship between anxiety and other study variables. Results show that religious affiliation and older age were associated with lower anxiety scores while living in the subjects' close environment as an infected individual was associated with increased anxiety. Interestingly, thinking someone was to blame for the pandemic, being angered by official message regulations, and not thinking lockdown measures were sufficient increased anxiety. This latter finding implies that consistent with clinical theory, our beliefs about events are connected with our emotional experiences. Recommendations for clinical practice are noted as it is imperative for clinicians to be consistent and direct regarding any protocol changes that may help minimize client anxiety. Lastly, considerations regarding transparent communication from leaders of organizations that are adjusting their policies due to the COVID-19 pandemic are discussed.

*Keywords*: COVID-19, anxiety, Michigan, pandemic beliefs, social stress adaptation

While pandemics have caused great human suffering over many centuries (Turner, 2020), the COVID-19 pandemic may be the most carefully documented worldwide epidemic in history because of advances in healthcare and in worldwide communications. Greater attention to mental health issues has been one theme of research on the COVID-19 pandemic, and this report attempts to contribute to the literature on mental health effects within the United States, with a particular focus on the state of Michigan. The research reported here was conducted in the spring and summer of 2020, when Americans were between two peaks in disease/death rates, with vaccines only aspirational. By the fall of 2020, the U.S.A. had approximately 12 million COVID-19 cases, compared to about 58 million cases worldwide (John Hopkins University of Medicine, 2020). This was almost three million more cases than India, a country whose population is more than four times the population of the United States.

As COVID-19 spread, states varied widely in terms of their response to the epidemic. In response to the pandemic Michigan's Governor, Gretchen Whitmer, issued executive orders restricting commerce and public activity, while the state legislature (controlled by the other political party) opposed her and encouraged citizens to rebel (Jaffe & Marley, 2022). Michigan received a great deal of news coverage, not because of particularly high COVID-19 case numbers or death rates in 2020, but because of the strong reactions against the restrictions placed on Michiganders by Governor Whitmer and her Public Health officials.

One of the objections to health restrictions (e.g., mask-wearing, the closing of bars and gyms, discouraging large gatherings, moving schools to online teaching) is that they may protect against infection but create unwanted side effects such as increased levels of domestic abuse, child neglect, anxiety, depression, and other types of mental illness. This assertion is supported by a recent meta-analysis that included 15 studies (11 related to COVID-19 and four related to SARS and Influenza pandemics) on the effects of pandemics on the mental health of people with pre-existing mental illnesses (Neelam et al., 2021). All 15 studies found that people with mental illness experienced more psychiatric symptoms during pandemics compared to control groups (Neelam et al., 2021). The primary symptoms identified included increased anxiety, depression, and insomnia. Researchers hypothesized that the lack of social interaction and difficulty in maintaining a daily routine contributed to these findings (Neelam et al., 2021). Similarly, Marroquín and colleagues (2020) found

that the stay-at-home orders that were implemented in March 2020 were associated with more symptoms of depression, generalized anxiety, acute stress, and insomnia (Marroquín et al., 2020). These symptoms remained despite individuals' levels of perceived social support, which suggests that known protective factors (e.g., social interaction) did not eliminate the impact of social distancing (Marroquín et al., 2020).

**Anxiety and Predictors of Anxiety**

Research has shown that women are significantly more likely than men to develop an anxiety disorder at some point during their lifespan (Kessler et al., 1994; Pigott, 2003; Jalnapurkar et al., 2018). The National Comorbidity Survey (NCS) conducted from 1990 to 1992 found that lifetime prevalence rates for any anxiety disorder were 30.5% for women and 19.2% for men (Kessler et al., 1994). Various factors are hypothesized to be responsible for the sex differences reported in anxiety disorders, including genetic, neurodevelopmental, environmental, and neurobiological factors (Jalnapurkar et al., 2018). More specifically, fluctuations in estrogen and progesterone levels can substantially influence the severity of anxiety disorders (Jalnapurkar et al., 2018). Furthermore, women have lower gastric acidity, lower body weight, greater percentage of body fat, and lower blood volume compared with men, factors that can affect the absorption and distribution of medications (Pigott, 2003).

Across cultures, the prevalence of Generalized Anxiety Disorder (GAD) is higher in females than in males, at approximately a 1.5 to 1 ratio (Mackinaw-Koons & Vasey, 2000). In the United States, specifically, the US National Comorbidity Survey Replication found prevalence rates of 3.6% for men and 6.6% for women (Kessler et al., 2005). Importantly, these prevalence rates depend partly on age: the sex difference in prevalence rates for GAD is highest in adolescence and declines with age at a faster rate for men than it does for women (Mackinaw-Koons & Vasey, 2000).

Research suggests that age itself is also an important predictor of anxiety, with findings generally pointing to decreasing levels of anxiety as people get older. A literature review by Baxter et al. (2013), for example, found that, globally, adults over age 54 were significantly less likely to be diagnosed with anxiety than adults aged 18-54. Additionally, anxiety seemed to rise dramatically for younger adults (18-25 years of age) in the USA between the years 2008-2018; for adults 50 years of age and older, it remained steady (Goodwin et al., 2020). The researchers hypothesized that poor job prospects and student loan debt contributed to the rise in anxiety for young (emerging) adults. There is cross- sectional research evidence, however, that suggests that these findings may occur because older cohorts are less accurate at identifying and labeling symptoms of anxiety and depression (Wetherell et al., 2009).

Other predictors that have been associated with anxiety include spending increased time online (Weinstein et al., 2015), living in a European or North American country, and living in a developed rather than a developing country (Baxter et al., 2013). Conversely, religiosity is associated with lower anxiety, although results suggest that intrinsic religious orientation is more efficacious than simple religious affiliation (Shreve-Neiger & Edelstein, 2004). Volunteerism or helping others (Waite et al., 1998) and being the recipient of social support (Berkman & Syme, 1979) also predict lower anxiety.

**Unique Anxiety Findings under Pandemic Conditions**

Although it is difficult to separate anxiety reactions to government restrictions from anxiety reactions to the virus itself, this article attempts to better understand the characteristics, behaviors, and beliefs that were associated with anxiety symptoms early in the pandemic. Other research has found gender and age to be predictors of anxiety during the pandemic (Marroquín et al., 2020; Solomou & Constantinidou 2020). Marroquín and colleagues (2020) found that younger adults, women, individuals with minimal social support, and those who reported being under a stay-at-home order had higher levels of GAD symptoms compared to older adults, males, individuals who identified as having social support, and anyone not under a stay-at-home order (Marroquín et al., 2020). Similarly, Solomou and Constantinidou (2020) found women of younger age (18-29), student status, unemployment status, prior psychiatric history, and those reporting a greater negative impact of the pandemic on their quality of life were at higher risk for increased anxiety and depression.

Large-scale studies have yielded similar results; researchers have found increases in anxiety in younger adults in response to the conditions imposed by the COVID-19 pandemic (Burkova et al., 2021; Kowal et al., 2020). A survey done in June 2020 for the US

Center for Disease Control and Prevention (Czeisler et al., 2020, p. 1049) reported "considerably elevated" anxiety and depression, along with suicide ideation, in young adults aged 18 to 24. Moreover, the impact of one's social support during pandemic conditions may be complex; for example, Kowal and colleagues (2020) found that under the physical isolation mandates of COVID-19, anxiety was worse for people living alone and for people forced to live in overcrowded conditions.

**Anxiety Findings in the State of Michigan (USA)**

The current authors participated in one of the international studies cited above (Burkova et al., 2021), contributing data from across the USA that were pooled with other samples to form the USA sample for that 2021 publication. It was serendipitous that several hundred of the volunteers came from the state of Michigan. Because, as mentioned above, each state had such a different strategy for managing the pandemic, the authors realized that it might be worthwhile to analyze the Michigan data separately, paying more attention to some of the demographic data that had already been gathered, in order to better understand contextual factors.

**Hypotheses**

The aim of this cross-sectional study was to examine the characteristics, behaviors, and beliefs associated with increased anxiety during the COVID-19 pandemic. We had six hypotheses and six exploratory goals. Under pandemic conditions, the first hypothesis was that our sample would have higher anxiety levels on the Generalized Anxiety Disorder Scale (GAD-7) and the State-Trait Anxiety Inventory (STAI) compared to normative community samples. Secondly, we hypothesized that anxiety levels would be higher in older individuals because of their increased risk for severe COVID-19-related illness. Similarly, the third hypothesis was that anxiety levels would be higher in people with chronic diseases because of their increased risk for severe COVID-19-related illness. The fourth hypothesis was that higher anxiety was expected in people who identified others in their close environment who were diagnosed with COVID-19. Next, our fifth hypothesis was that anxiety would also be positively associated with the female gender. Lastly, our sixth hypothesis was that anxiety would be positively associated with an absence of religious affiliation. This research also had several exploratory goals in mind: to assess if higher anxiety was associated with living alone, having children, experiencing changes in financial well-being or lifestyle habits, social networking online, or holding certain beliefs about government officials responsible for providing leadership during the pandemic.

## Method

**Procedure**

The data analyzed below are part of a large cross-cultural study that examined possible factors that may be associated with self-reported levels of anxiety during the first wave of the COVID-19 pandemic (Burkova et al., 2021). The larger sample included 15,375 participants from 23 countries which was conceptualized by a team of researchers in Russia. They hypothesized the spread of the pandemic, isolation measures, and restrictions would result in increased depression symptoms and would exacerbate the psychological well-being of people worldwide during the first wave of the COVID-19 lockdown (Burkova et al., 2021). All co-authors of this larger study collected data from their home countries.

Participants in each country were recruited from various university listservs and social networking sites. As stated above, a significant portion of the sample was from Michigan. Thus, the current authors chose to perform a separate analysis on the Michigan sample to better understand the impact of context. Information relevant to the current study is presented below. Approval for all procedures was provided by the university's Institutional Review Board. Data were collected from May 19, 2020, through September 16, 2020.

**Participants**

Participants were members of the community recruited via convenience sampling methods (e.g. local postings on university and faculty email listservs, Facebook, Instagram, NextDoor, and word of mouth). Postings provided a brief description of the study and a link to the survey hosted on Qualtrics. Participants provided informed consent on the online survey form. There were no incentives given for participation. Participants were included in the current study if they resided in Michigan, were over the age of 18, completed all of the items in the Generalized Anxiety Disorder 7 ($N$ = 217) and/or the State-Trait Anxiety Inventory ($N$ = 200) questionnaire, and provided at least 50% responses to the other survey questions. Based on these inclusion criteria, a total of 221 participants were retained in the analyses.

Of these participants, 27.1% were male and 72.4%

were female. Regarding ethnicity, 84.2% of the sample identified as White, 5% as African American or Black, 3.2% as Hispanic or Latino, and 1.4% as Asian. Participants ranged in age from 22 to 80 years ($M$ = 45.60, $SD$ = 16.28). Regarding relationship status, 68.3% reported being married or in a committed relationship, while 31.2% reported being single, divorced, or widowed. Regarding religious affiliation, 25.3% identified as Catholic, 33.5% as Christian, 5.9% as Jewish, .9% as Muslim and 30.8% as not religious. On average, participants completed the survey 13.71 ($SD$ = 4.17) weeks after the Michigan stay-at-home order (March 23, 2020).

**Measures**

***Generalized Anxiety Disorder-7 (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006)***

The GAD-7 is a seven-item self-report questionnaire that assesses the frequency of anxiety symptoms over the past two weeks. Responses were recorded on a 4-point Likert scale from 0 to 3, where 0 is "not at all" and 3 is "nearly every day." A Cronbach's alpha coefficient of 0.89 was found in a community sample in Germany (Löwe et al., 2008). Construct validity was supported by the relationship between the GAD-7 and the PHQ-2 depression scale, the Rosenberg Self-Esteem Scale, the Questionnaire on Life Satisfaction, and the Resilience Scale (Löwe et al., 2008). Participants' scores were then summed to produce a total GAD-7 score for each participant. Internal consistency was excellent ($\alpha$ = .910).

***State-Trait Anxiety Inventory (STAI; Spielberger, 1983)***

The STAI is a 40-item self-report questionnaire comprised of 20 items assessing state anxiety and 20 items assessing trait anxiety. For the purposes of this study, the 20 items that measure state anxiety were used to assess participants' anxiety at the time of the survey. Responses were recorded on a 4-point Likert scale from 1 (not at all) to 4 (very much so). Participants' scores were summed to produce a total score for each participant. A Cronbach's alpha coefficient of 0.87 was found in a community sample (Balsamo et al., 2013). Construct validity was supported by the relationship between the STAI and the Beck Anxiety Inventory (Balsamo et al., 2013). Internal consistency was excellent ($\alpha$ = .952).

***Adaptation to Social Stress Questionnaire (ASSQ; Butovskaya & Burkova, 2021)***

The ASSQ is a 105-item self-report questionnaire assessing individuals' demographic features, ability to adapt to stress and opinions, beliefs, and experiences related to the COVID-19 pandemic (Burkova et al., 2021; Butovskaya et al., 2021; Burkova et al., 2022). Table 1 contains the relevant questions and response options for the current study. This ASSQ was designed specifically for the larger cross-cultural study that the authors participated in at the beginning of the COVID-19 pandemic. All author participants had the opportunity to critique the questionnaire, after which the agreed-upon questionnaire was translated into the local language for each country. The ASSQ included standard demographic questions (e.g., age, gender, occupation, etc.). As of this writing, three articles have been published using the ASSQ (Burkova et al., 2021, 2022; Butovskaya et al., 2021), and more studies are in progress. More information about the testing properties of the ASSQ will be forthcoming in future research reports.

**Data Analysis**

Because the current study was conducted in response to the global COVID-19 pandemic, it was not feasible to collect data from a control group. However, to provide a sense of the magnitude of the anxiety present in the current sample, single-sample $t$-tests were used to compare mean GAD-7 and STAI scores in the current sample with mean scores on the GAD-7 and STAI from comparable community samples published in the research literature (Löwe et al., 2008; Spielberger, 1983). To better understand the relationship between anxiety scores and a range of demographic, behavioral, and belief variables, bivariate analyses were conducted. Pearson product-moment correlations were used to determine the relationship between anxiety scores and continuous criterion variables like age and number of weeks into the stay-at-home order. Independent samples t-tests were used to examine the relationship between anxiety scores and dichotomous criterion variables assessed with the ASSQ.

## Results

**Hypothesis One**

In order to assess the magnitude of anxiety in our sample and the inability to have a control group, we compared scores from our sample to scores from previously published community samples. The current sample had significantly higher GAD-7 scores ($M$=6.41) than both a German sample ($M$=2.95; Löwe et al., 2008) and a United States pandemic sample ($M$=5.66;

Marroquín et al., 2020) and significantly higher STAI scores ($M$=41.79) than a community sample of working adults in the United States ($M$= 35.72; Spielberger, 1983). Importantly, scores on the GAD-7 were significantly and positively associated with scores on the STAI ($r$ = .760, $p$ <.001) in the current sample, suggesting substantial convergence across anxiety measures. Thus, regardless of measure, this Michigan sample was more anxious than comparable community samples.

**Hypotheses Two, Three, and Five**

To better understand these elevated anxiety scores, we examined their relationship with important demographic and behavioral criterion variables. Regarding demographics for our second hypothesis, both GAD-7 and STAI scores were significantly and negatively correlated with age, ($r$ = -.330, $p$ < .001) and ($r$ = -.311, $p$ < .001) for GAD-7 and STAI respectively. Thus, as age increased, anxiety scores decreased. Additionally, our third and fifth hypotheses were not supported in that having a chronic illness diagnosis and biological sex were not associated with GAD-7 or STAI anxiety scores.

**Hypotheses Four and Six**

Our fourth hypothesis was supported in that having infected people living in your environment ($t$(214) = -2.53, $p$ = .012) was associated with higher GAD-7 scores. Our sixth hypothesis was supported by the finding that those who identified as religious reported significantly lower GAD-7 scores ($t$(209) = 2.12, $p$ = .035).

**Exploratory Goals**

In terms of the exploratory goals regarding beliefs, thinking there was someone to blame (GAD-7: t(213) = -2.794, p = .00; STAI: t(194) = -2.735, p = .007), feeling angry in response to official message regulations (GAD-7: t(214) = -2.81, p = .024; STAI: t(193) = -2.55, p = .012), and believing that lockdown measures were insufficient (GAD-7: t(209) = 2.03, p = .044; STAI: t(192) = 2.66, p = .008) were associated with significantly higher anxiety scores.

**Other Findings**

Lastly, having a history of volunteering prior to the pandemic ($t$(213) = -2.16, $p$ = .032) were associated with higher GAD-7 scores. Conversely, those who changed their daily lifestyle habits and believed that virtual social networking was a valuable opportunity to connect with others reported significantly lower GAD-7 scores, $t$(211) = -2.13, $p$ = .035, and $t$(200) = 2.40, $p$ = .017 respectively. Having children, living alone, and experiencing a change in household income were not associated with GAD-7 or STAI anxiety scores. Additionally, anxiety was not significantly associated with the number of weeks since the stay-at-home order, suggesting that when participants took the survey, it did not have an effect on their scores. A summary of these findings associated with the GAD-7 can be found in Table 2.

## Discussion

As hypothesized, average GAD-7 and STAI scores were higher in the current sample than comparable scores from community samples prior to (Löwe et al., 2008; Spielberger & Gorsuch, 1983) and during (Marroquín et al., 2020) the COVID-19 pandemic. However, it is worth noting that the current sample had approximately 20% more females than the compared community samples. Thus, it is possible that gender played a role in the observed effects in the current sample. The STAI average score exceeded an established clinical cutoff of 40 (Emons et al., 2019), suggesting that state anxiety was elevated to a clinically significant degree. These findings are consistent with the increases in anxiety (Bareket-Bojmel et al., 2020; Hyland et al., 2020; Moghanibashi-Mansourieh, 2020) and other mental health problems found in the current pandemic (Hwang, 2020; Roy et al., 2020; Spoorthy et al., 2020).

To better understand this pattern of findings, we examined the association between sample characteristics, behaviors, and experiences with anxiety. In particular, hypotheses related to variables that increased the likelihood of COVID-19 infection and severe illness (Centers for Disease Control and Prevention, n.d.) were partially supported. Specifically, having infected people living in your environment was significantly associated with higher state and trait anxiety. Research suggests that people experience a fear of contamination related to COVID-19 that is similar to the fear of contamination for other viruses, such as Ebola or H1N1 Influenza (Helleringer et al., 2015; Cheung, 2015; Kim et al., 2015; Knowles & Olatunji, 2021). Therefore, it is possible that those with infected people living in their environment were not only concerned with the well-being of their loved ones but also anxious about contracting the virus themselves. Interestingly, there was not a significant relationship between anxiety and living alone.

Contrary to our hypothesis, however, a number of factors associated with increased vulnerability to COVID-19 were not associated with anxiety

as expected. In particular, age was negatively rather than positively associated with anxiety. Although unexpected, this finding is consistent with a broader literature that finds that as people age, their levels of neuroticism and negative affectivity tend to decrease (Kessler & Staudinger, 2010; Masten & Wright, 2010; Yeung & Fung, 2007; Yeung et al., 2020). Thus, age continues to be a strong protective factor even when facing a virus that disproportionately affects older adults. Similarly, chronic illness was not significantly associated with anxiety. Although past research has found associations between pre-existing conditions and negative mental health outcomes during public health crises (Gayer-Anderson et al., 2020), it is possible that the shift to working from home that occurred in the early months of COVID-19 mitigated many of these negative outcomes. Not only are individuals with disabilities more likely to work from home (which allows them to flexibly attend recurring medical appointments and have access to medical equipment), but working from home itself has become easier and less stigmatized as many workplaces were forced to broaden their views on accommodations for workers in the early months of the pandemic (Schur et al., 2020). Thus, increased flexibility and acceptance of working from home may have contributed to the nonsignificant finding for chronic illness.

Identifying as religious was associated with lower anxiety in the current sample, consistent with our hypothesis. Given that the COVID-19 environment is one in which we are physically and socially disconnected from each other, belief in a higher power might help people remain connected to others through community-specific religious activities and events and through an awareness that one is part of something bigger than oneself. This is consistent with the larger literature, which has identified religion and pro-social behavior as protective factors against psychopathology broadly and anxiety specifically (Gearing & Lizardi, 2009; Greenfield & Marks, 2004; Levin, 2009; Peteet 2020; Smith et al., 2003). Interestingly, individuals who reported a history of volunteering prior to the pandemic endorsed significantly more anxiety than participants who had not volunteered in the past. Although altruism as a whole tends to be negatively associated with anxiety (Elphick, 2020), research suggests that changes in daily lifestyle habits and identity roles can lead to a loss in well-being and the presence of psychological symptoms (Giuntella, Hyde, Saccardo, & Sadoff, 2021; Greenfield & Marks, 2004) and this is true for altruistic behaviors specifically (Feng et al., 2020). Given a stay-at-home order was put in place shortly before the data was collected, many altruistic individuals may not have been able to volunteer as they usually would. This may have changed their daily lifestyle, separated them from sources of social support, and had implications for their identity as a volunteer, leading to anxiety.

Perhaps the most intriguing pattern of results may be seen in the three questions that inquire about the perception of failures in leadership. People who endorsed blaming someone "for the current situation in your country" reported higher anxiety scores on both measures. Of the 62% of respondents who felt there was someone to blame, the vast majority identified an entity in national leadership (the CDC, President Trump, Congress, etc.) who they believed was to blame. Further, about half of the sample endorsed feeling angry about official messaging, and 34.7% said that self-isolation measures imposed by authorities were not sufficient. These beliefs similarly predicted higher anxiety. Together, these results are consistent with broader research on organizational leadership. In a meta-analysis by Costello and colleagues (2019), researchers found that the perception of poor leadership within an organization leads to higher stress; the findings were particularly striking in a dementia care home (Vogel et al., 2017), and in nursing homes (Willemse et al., 2012). Similarly, a study of industrial workers (Schmidt et al., 2014) found that leadership perceived as less supportive was associated with higher stress and lower self-perceived health among employees. These findings have been replicated across many occupations, from teaching to the military, in many different countries. As Gabriel (2014) wrote:

> We expect our leaders to lead the way, to show moral courage and to embody and articulate values beyond that of efficiency. We expect leaders to talk to us, to address our concerns and to listen to us....Sometimes, we expect our leaders to see clearly, to possess a certain conviction and resoluteness represented by that overused and abused word, vision....We expect our leaders to care – not just in an impersonal manner 'about' a project or 'about' the bottom line, but 'for' the organization and its people, indeed for each and every follower. (p. 319)

Importantly, these results are consistent with recent work by Dhanani and Franz (2020), who directly

examined trust in governmental leadership during March, 2020 of the pandemic. Their findings suggest that, at that time, there was a significantly higher level of trust in the Center for Disease Control (CDC) than in President Trump. Moreover, trust in President Trump was significantly correlated with misinformation about transmission and symptoms of the virus, as well as angry feelings towards people of Asian descent. Thus, contrary to prior research identifying mistrust in the government as a barrier to good health behaviors, Dhanani and Franz (2020) concluded that their findings "suggest that trust in governmental leadership can be a hindrance to health literacy when the messages issued by governmental leaders are at odds with those from public health organizations and emerging evidence-based practices...messaging from governmental leaders in the United States may be impeding effective public health responses to COVID-19" (Dhanani & Franz, 2020, p. 10). Together these findings suggest that the absence of clear and consistent messaging from leadership not only makes it more difficult to discern the appropriate course of action but can also directly increase anxiety and mental health symptoms.

**Clinical Implications**

These results have a number of implications for clinical theory and treatment. First, this study highlights that our beliefs about the COVID-19 pandemic can impact our emotional response and well-being. This is consistent with a major premise of cognitive-behavioral therapy: our thoughts occupy a position of central importance and largely determine our emotions, behaviors, and experiences (Beck Institute, 2021). Transference-focused psychotherapy, a psychodynamic approach, similarly acknowledges that the way an individual views themselves and others influences their interpretation of their experience and contributes to the development of distressing symptoms (Frank Yeomans, 2021). Thus, existing therapeutic approaches are well-positioned to address mental health difficulties related to this novel coronavirus.

The findings also suggest a number of specific therapy recommendations in the current setting. First, being consistent and transparent about changes to protocol and expectations during the pandemic may help minimize client anxiety. This may be particularly true if providers are navigating a shift to telehealth practice or a return to in-person services. Given that clinicians are often viewed as an authority, clear communication and consistent information can have a profound impact on clients. Additionally, asking about the impact COVID-19 has had on patient's various identities can provide important context for understanding their symptoms. If certain parts of a client's identity have been lost during the pandemic, processing that loss in therapy may be an important part of addressing patient symptoms. Additionally, the results suggest that the associations between symptoms and vulnerabilities to COVID-19 may be more complex than predicted and should be understood from the patient's perspective rather than assumed. Thus, approaching patients with a curious, caring, and empathetic attitude is likely to not only strengthen the alliance between the therapist and patient but also provide important contextual information for understanding the patient's symptoms.

Not only can these recommendations be helpful in a therapeutic setting, but they can also be implemented across all workplace environments. As many companies transitioned to remote work and are now contemplating returning to in-person, specific health and safety guidelines should be enacted. For example, guidelines regarding the requirement of in-person versus remote work, the (dis)use of masks, COVID-19 testing onsite, COVID-19 screeners, etc., should be clearly delineated for all employees. Furthermore, it would be in leadership's best interest to facilitate feedback from their employees to ascertain their level of comfort regarding the potential return to in-office work. The findings from this study clearly demonstrate the importance of transparent communication from leaders.

**Limitations and Future Directions**

The current study has several limitations. In particular, the current sample consisted primarily of Caucasian women from Michigan who were recruited through a convenience sampling approach. While this provides insight into a specific demographic, it lacks a holistic view of the population of Michigan, which includes diverse racial, ethnic, and socioeconomic backgrounds. Consequently, the results from this study are not generalizable to the whole population of Michigan. Furthermore, the study did not control for potential confounding variables. Capturing information regarding psychiatric history could have provided further information regarding the pandemic's influence on individuals' anxiety levels.

While the political unrest and worsening COVID-19 numbers in Michigan at the time of data

collection provide an interesting sample for study, findings might not be generalizable to other parts of the country where COVID-19 numbers and policies differed or to other stages of the pandemic. That said, findings from the current study are largely consistent with prior research on anxiety and mental health during COVID-19. Another limitation is that this is not an experimental study but, rather, a naturalistic field study. It documents what is happening in the real world, which is a great opportunity for understanding human behavior; however, lacking experimental controls, it provides less evidence of cause-and-effect relationships (Miller, 2017).

Additionally, the current study is part of a larger, global study involving 23 countries. Other countries used either Qualtrics or Google for their online surveys. An attempt was made to get cross-sectional data (different age groups) and diverse populations as much as possible. Readers who wish to learn more about the findings from other countries may read the already published articles from this study (Burkova et al., 2021, 2022; Butovskaya et al., 2021). Future research examining these findings in the international sample could help to clarify the generalizability of these findings.

Further, this study was developed early in the pandemic, when researchers and respondents were unaware of how long the pandemic would last and how costly it would be. Consequently, the findings presented are only applicable to the first phase of the pandemic as the results do not capture the perspectives of individuals as the pandemic progressed. To address this limitation, future work should examine whether findings persist over the course of the pandemic. To that end, a second round of data collection is being conducted. Questions about epidemiological experience, vaccination, personality characteristics, and unexpected consequences of the pandemic will be examined in the second wave of data collection.

**Conclusions**

Our study revealed factors associated with higher levels of anxiety in a sample of Michigan adults. As to be expected, those who lived with someone infected with COVID-19 had higher state and trait anxiety. Consistent with prior research on anxiety during pandemics, older age and having a religious affiliation were demonstrated to be protective factors against anxiety. Furthermore, those who identified as having volunteered prior to the pandemic denied social networking as a valuable means to connect with loved ones and had changes to their daily lifestyle habits reported higher rates of anxiety. A possible explanation is that older adults' routines may not have been as affected by the pandemic as younger adults due to their retirement status. Those who were already communicating with friends online (e.g., social media) may have noticed a smaller shift in their social lives as they still connect with friends, albeit in a slightly different context. However, for those who volunteer, consistent face-to-face contact may have been a primary form of social interaction and/or become ingrained in their routine; thus, the inability to volunteer restricted their means of communication.

The findings presented here were from the earlier stages of the pandemic, at a point when no one knew the duration of the stay-at-home orders, thus no shifts to virtual connection were yet established. But as the pandemic continued, more companies, universities, social circles, etc. had to make the adjustment to solely connecting virtually. Therefore, it is possible that had the data been collected at a later time in the pandemic, some may have adjusted to the "new normal," and, consequently, these factors would not have contributed to higher reporting of anxiety symptoms.

The results of this study should be interpreted within the context of certain limitations. One important limitation of the current study includes but is not limited to, the lack of representation from diverse racial, ethnic, and socioeconomic backgrounds. Accordingly, the results are not generalizable to the whole population of Michigan. This study, along with prior studies, demonstrates the negative impact pandemics have on individuals' mental health. The effects of the COVID-19 pandemic are far-reaching and will likely take time to fully understand. The current study adds to the conversation of the mental health sequela resulting from COVID-19 and highlights important implications for organizational leaders and clinical practice.

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**Table 1**

*Frequency of Adaptation to Social Stress Responses and Mean Anxiety Symptom Ratings by Group*

| Question | N (%) | GAD-7 | | STAI | |
|---|---|---|---|---|---|
| | | *M* | *SD* | *M* | *SD* |
| What is your biological sex? | | | | | |
| Female | 160 (72.1) | 6.57 | 5.25 | 41.76 | 12.88 |
| Male | 60 (27) | 5.97 | 4.82 | 41.67 | 13.44 |
| Which religious group do you belong to? | | | | | |
| Religious | 145 (65.3) | 5.94 | 12.78 | 40.77 | 12.78 |
| Non-religious | 70 (31.5) | 7.56 | 13.34 | 44.43 | 13.34 |
| Do you have children? | | | | | |
| Yes | 120 (54.1) | 5.81 | 4.95 | 40.34 | 12.91 |
| No | 101 (45.5) | 7.14 | 5.26 | 43.46 | 12.95 |
| Do you have any chronic diseases? | | | | | |
| Yes | 58 (26.1) | 6.54 | 5.35 | 42.0 | 12.18 |
| No | 162 (73.0) | 6.39 | 5.07 | 41.71 | 13.89 |
| Do you live alone? | | | | | |
| Yes | 42 (18.9) | 5.74 | 4.89 | 38.74 | 12.86 |
| No | 179 (80.6) | 6.59 | 5.18 | 42.55 | 12.95 |
| Have you been a volunteer before the current coronavirus situation? | | | | | |
| Yes | 137 (61.7) | 6.91 | 5.48 | 42.60 | 13.07 |
| No | 82 (36.9) | 5.39 | 4.16 | 40.41 | 12.84 |
| Has your household income increased due to restrictions from the coronavirus? | | | | | |
| Yes | 21 (9.5) | 6.10 | 5.83 | 39.83 | 15.86 |
| No/no change | 200 (90.1) | 6.45 | 5.06 | 41.99 | 12.70 |
| Has your household income decreased due to the restrictions from the coronavirus? | | | | | |
| Yes | 60 (27.0) | 7.24 | 4.68 | 43.98 | 14.12 |
| No/no change | 161 (72.5) | 6.12 | 5.26 | 40.98 | 12.54 |
| Do you have infected people infected with the coronavirus in your close environment? | | | | | |
| Yes | 41 (18.5) | 8.24 | 4.85 | 48.16 | 12.01 |
| No | 179 (80.6) | 6.03 | 5.10 | 40.44 | 12.73 |
| Have your daily lifestyle habits changed during the coronavirus period? | | | | | |
| Yes | 202 (91.0) | 6.60 | 5.08 | 42.21 | 13.29 |
| No | 15 (6.8) | 3.73 | 4.11 | 36.73 | 6.97 |
| Virtual social networking is a valuable opportunity to be with friends: | | | | | |
| Yes, I agree | 175 (78.8) | 5.89 | 4.76 | 41.14 | 12.54 |
| No, I disagree | 31 (14.0) | 8.19 | 5.74 | 45.43 | 15.14 |
| Do you think someone is to blame for the current situation in your country? | | | | | |
| Yes | 138 (62.2) | 7.07 | 5.01 | 43.68 | 13.19 |
| No | 81 (36.5) | 5.11 | 4.96 | 38.38 | 12.01 |
| Do official messages and regulations cause you to feel angered in any way? | | | | | |
| Yes | 110 (49.5) | 7.24 | 5.35 | 44.25 | 12.04 |
| No | 110 (49.5) | 5.67 | 4.77 | 39.59 | 13.46 |
| Are these lockdown measures regarding self-isolation, imposed by authorities, sufficient? | | | | | |
| Yes | 138 (62.2) | 5.89 | 4.88 | 39.88 | 12.78 |
| No | 77 (34.7) | 7.36 | 5.32 | 44.97 | 12.93 |

*Note.* *M* = mean, *SD* = standard deviation.

**Table 2**

*Group Differences in GAD-7 and STAI Anxiety Scores*

| | Comparison | GAD-7 | | STAI | |
|---|---|---|---|---|---|
| | | t | df | t | df |
| What is your biological sex? | Female vs male | -0.77 | 214 | -0.04 | 193 |
| Which religious group do you belong? | Religious vs non-religious | 2.14* | 209 | 1.81 | 189 |
| Do you have children? | Yes vs No | 1.91 | 215 | 1.68 | 194 |
| Do you have any chronic diseases? | Yes vs. No | -0.19 | 214 | -0.13 | 194 |
| Do you live alone? | Yes/No | 0.96 | 215 | 1.64 | 194 |
| Have you been a volunteer before the current coronavirus situation? | Yes/No | -2.16* | 213 | -1.15 | 194 |
| Has your household income changed due to the restrictions from the coronavirus? | | | | | |
| Increased | Yes vs No/No change | 0.30 | 215 | 0.67 | 194 |
| Decreased | Yes vs No/No change | -1.43 | 215 | -1.44 | 194 |
| Do you have people infected with the coronavirus in your close environment? | Yes/No | -2.53*** | 214 | -1.15 | 194 |
| Have your daily lifestyle habits changed during the coronavirus period? | Yes/No | -2.13* | 211 | -1.58 | 194 |
| Is virtual social networking a valuable opportunity to be with friends? | Yes/No | 2.40* | 200 | 1.67 | 193 |
| Do you think someone is to blame for the current situation in your country? | Yes/No | -2.79** | 213 | -2.76** | 194 |
| Do official messages and regulations cause you to feel angered in any way? | Yes/No | -2.28* | 214 | -2.55* | 193 |
| Are these lockdown measures regarding self-isolation, imposed by the authorities, sufficient? | Yes/No | 2.03* | 209 | 2.66** | 192 |

*Note.* $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$