

Research Article

PTSD Symptoms, Comorbid Mental Health, and Health Behaviors during a COVID-19 Lockdown

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Abstract

This study explored the effects of PTSD symptoms on health behaviors of participants (N=260), responding to the COVID-19 Lockdown Activities Survey. The survey included questions like "I was being reminded of a traumatic experience" and "do you have a daily routine during this crisis." A correlation analysis suggested that trauma symptoms were negatively related to health behaviors and positively correlated with anxiety, depression, and sleep symptoms. An analysis of variance comparing no symptom, mild to moderate symptom, and high-level symptom responders yielded a significant group effect on health behavior scale scores suggesting that health scale scores were higher for the no PTSD symptom group. In a multiple regression analysis, anxiety, depression, and sleep scale scores contributed to a significant amount of the variance in PTSD symptoms scale scores. A factor analysis on the health behaviors scale suggested that self/spiritual care, touch, and exercise items explained the majority of the variance on the health behaviors scale scores. Further, anxiety, depression, PTSD, and sleep symptoms scale scores contributed to significant variance in self/spiritual care and exercise ratings. These results highlight the importance of self/spiritual care, touch, and exercise for those with high PTSD symptoms scores during pandemics.

INTRODUCTION**Trauma Symptoms and Health behaviors during a COVID-19 Lockdown**

Pandemics over the last twenty years (i.e., SARS in 2003, A/H1N1 in 2009, Ebola 2014), coupled with a growing awareness of the negative health effects during pandemics, have influenced the current public response to COVID-19. However, COVID-19 has been different from these past pandemics in that large numbers of the population have either been forced or encouraged to engage in a lockdown to avoid spread of the virus. These lockdown environments have had broad effects on the lifestyle of those affected. The pandemic will likely impact the health (including mental and physical health) of large numbers of people. For those with pre-existing mental and physical health conditions, the potential for a negative effect on health may be even greater. It is useful to determine factors that could ameliorate or worsen the negative health effects of being in lockdown including negative and positive health behaviors.

Pandemic effects on Mental Health and Trauma Symptoms

While the negative health effects of contracting a disease, such as COVID-19, are easily identifiable, there are also negative psychological effects due to pandemics. The limited research on

pandemics highlights the recognition of the possible negative psychological effects. In a study on caregivers in Mexico during the A/H1N1 pandemic, the researchers reported elevated levels of perceived stress, depression, and moderate levels of death anxiety compared to the normative population [1].

Given the increased awareness and potential for harm during the COVID-19 lockdown, it is likely that people previously exposed to trauma would experience heightened Posttraumatic Stress Disorder (PTSD) symptoms and mental health comorbidity. Research on healthcare workers during the Toronto SARS outbreak found that a history of a psychiatric disorder prior to SARS was directly associated with a new psychiatric episode following the outbreak [2]. In a COVID-19 sample in China, clinically significant levels of PTSD symptoms were noted, as well as moderate to severe levels of stress [3]. Increased PTSD symptoms have also been notably associated with co-morbid symptoms of anxiety and depression in a non-pandemic sample [4].

PTSD Symptom effects on Health Behaviors

Those with pre-existing PTSD symptoms are also less likely to engage in positive health behaviors. A recent review highlighted the impact of both trauma exposure and PTSD symptoms on engagement in preventative health behaviors, specifically

physical activity, diet, and exercise [5]. A combined community and veteran sample on health behaviors, found those with PTSD had increased alcohol use and engaged in less physical activity than those without PTSD; and those with PTSD had higher BMIs compared to participants without PTSD [6]. Less healthy diets were also noted for the PTSD group [6].

Other research has suggested that the impact of PTSD on health behaviors is more nuanced. Some research has focused on the detrimental effects of sleep disturbance, showing that health behaviors are impacted more by sleep disturbance, as a component of PTSD [7,8]. Others have focused on comorbid symptoms of anxiety and depression, and they have found that health behaviors are influenced differently by PTSD symptoms versus comorbid symptoms of anxiety and depression [9]. These findings highlight the importance of researching the effects of PTSD and comorbid symptoms on health behaviors during the COVID-19 lockdown.

The current study surveyed a COVID-19 lockdown sample to assess the effects of PTSD symptoms and comorbid conditions including anxiety, depression, and sleep disturbances on health behaviors.

MATERIALS AND METHODS

Sample

Participants were recruited via Facebook posts using a snowball sampling method. The Facebook post gave a short description of the study's aims to measure adjustment and activities during the COVID-19 lockdown. The only inclusion criterion was being at least 18 years of age. The survey was administered via Survey Monkey and **data** were collected for four weeks during the month of April 2020.

The participants included a sample (N= 260), of individuals ranging from 18-82 years (M=47). Gender of the sample was 79% female, 18 % male, and 3% non-binary. The distribution of ethnicity was 68% Non-Hispanic White, 21% Hispanic, 3% Black, and 8% not identified ethnically. Other demographic information included type of work with 35% reporting office work, 30% academic work, 15% managerial, 12% medical, and 8% labor. Twenty-eight percent identified as being currently unemployed, 69% that they worked at home, 60% that they usually worked from home, and 61% that they were working from home now.

Survey

The survey created for this study was entitled "COVID-19 Lockdown Activities Survey". It included demographic information discussed above, five scales created specifically for the survey and two standardized measures, including The Patient Reported Outcomes Measurement Information System (PROMIS) [10], and the PTSD-8 [11]. The five scales created for the survey included the Health Scale, Media/Communication Scale, Connecting Scale, Working Scale, and Stress Scale [12]. Items on these five scales were rated from zero (not at all) to three (a lot). The **Health Scale** (15 items), (Cronbach's alpha=.66), included exercise (inside exercise, outside exercise, and outside exercise with others), and open ended questions asking the participant to list the types of exercise), touching (touching partner, kids and

self, and open ended questions asking the participant to list the types of touching (e.g., massage, hugging)), COVID- 19-related safety practices including washing hands and social distancing, self-care, spiritual activities (e.g., meditating and feeling spiritual), and liking being at home. The **Media/Communication Scale** (10 items), (Cronbach's alpha=.58), included talking on the phone, texting, on Internet, gaming, on Facebook/Instagram, spending time receiving and sending messages/media about the virus, engaging in Zoom/Skype/Facetime activities (e.g. Yoga, meditation), watching the news, watching other TV programs and watching movies. The **Connecting Scale** (4 items), (Cronbach's alpha =.41), included connecting with friends, trying to connect with old friends, helping children do homework and receiving support from others. The **Working Scale** (6 items) (Cronbach's alpha=.61), included cooking, caregiving, housekeeping, paperwork, creative work and working on projects/hobbies. The **Stress Scale** (11 items) (Cronbach's alpha =.78), included worrying about getting a virus, worrying about your financial status, wanting this experience to end, feeling isolated, feeling lonely, feeling bored, feeling touch deprived, snacking, drinking alcohol, napping, and getting "cabin fever".

The standardized scales on the survey included 4 PROMIS Subscales (each item was rated on a 5-point scale as 1= never, 2= rarely, 3= sometimes, 4= often and 5=always) which included: 1), the **PROMIS Anxiety Subscale** (4 items) (Cronbach's alpha=.88), which included I felt fearful, I found it hard to focus on anything other than my anxiety, my worries overwhelmed me, and I felt uneasy; 2) the **PROMIS Depression Subscale** (4 items) (Cronbach's alpha =.91) including I felt worthless, helpless, depressed, and hopeless; 3) the **PROMIS Fatigue Subscale** (3 items) (Lai et al., 2011) (Cronbach's alpha=.92) including I felt fatigued, I had trouble starting things because I'm tired, and I felt run-down; 4) the **PROMIS Sleep Disturbance Subscale** (4 items) (Cronbach's alpha =.86) which included my sleep quality was bad, my sleep is not refreshing, I had a problem with my sleep, and I had difficulty falling asleep (Table 1).

The second standardized scale was the **PTSD-8 Inventory** (8 items) (Cronbach's alpha=.92). An item preceded the inventory asking if participants were reminded of a traumatic experience, and then the inventory was introduced by the statement "If you're being reminded of a traumatic experience, please rate how much the following have bothered you during the lockdown" as: 0) not at all, 1) rarely, 2) sometimes and 3) most of the time. The items are: recurrent thoughts and memories of the event, feeling as though the event is happening again, recurrent nightmares about the event, sudden emotional or physical reactions when reminded of the event, avoiding activities that remind you of the event, avoiding thoughts or feelings associated with the event, feeling jumpy/easily startled and feeling on guard. The PTSD-8 Inventory is based on DSM-IV criteria and measures the intrusion, avoidance, numbing, and hypervigilance symptoms clusters. It does not measure the negative mood and cognition criteria from DSM-V. Without the latter criteria, the inventory has differentiated PTSD from PTSD comorbid with depression¹⁰. The inventory has been found to have adequate diagnostic efficiency when cut-off scores are adjusted for specific samples, and the cutoff-scores have ranged between 17and 22 [10]. The cutoff-score used for the current study was 24.

Table 1: Multiple Comparisons Post-Hoc Test.

Condition One PTSD	Condition Two PTSD	Mean Difference	Standard Error	Significance	95% CI Lower Bound	95% CI Upper Bound
No Symptom	Mild-Moderate Symptoms	1.87	.99	.14	-.47	4.21
	Severe Symptoms	3.08	1.09	.01	.50	5.65
Mild-Moderate Symptoms	No Symptom	-1.87	.99	.14	-4.21	.47
	Severe Symptoms	1.21	.97	.43	-1.09	3.50
Severe PTSD Symptoms	No Symptom	-3.08	1.09	.01	-5.65	-.50
	Mild-Moderate Symptoms	-1.21	.97	.43	-3.50	1.09

Dependent Variable: Health Scale

RESULTS

Trauma symptoms

Participants were asked to indicate if they were reminded of a traumatic experience and of the sample of 260, 99% of participants completed this question. Participants indicated they were never reminded at 47%, rarely reminded at 21%, sometimes reminded at 22%, often reminded at 8%, and always reminded at 1%, for a total of 53% of respondents who reported being reminded. Seventy-two percent of the sample completed the PTSD-8 Inventory. According to responses, 28% were characterized as having clinically significant symptoms based on a cutoff score of 24 or higher. Three groups were formed based on the PTSD-8 Inventory including those reporting no symptoms 27%, mild to moderate symptoms 48%, and severe symptoms 28%.

The impact of trauma and mental health symptoms on both positive and negative health behaviors was examined using the **Health Scale**. An ANOVA was conducted on the Health Scale, yielding a significant group effect [$F(2, 183)=4.06, p=.02$]. A Tukey post hoc test suggested that Health Scale scores were significantly higher for the no PTSD symptoms ($33.0, \pm 4.9$) group compared to the high PTSD symptoms group ($29.9, \pm 6.2$), $p=.01$, 95% CI [50, 5.65] (Table 1).

Comorbid Symptoms

A correlation analysis was conducted on the PTSD-8 Inventory and the PROMIS-anxiety, PROMIS-depression, and PROMIS-sleep. Total scores on the PTSD-8 Inventory were positively correlated with the PROMIS-anxiety subscale score $r(186) = .77, p<.001$, the PROMIS-depression subscale score $r(185) = .54, p<.001$, and the PROMIS-sleep disturbances subscale score $r(186) = .60, p<.001$.

A multiple regression was conducted to determine the amount of variance on the PTSD 8 Inventory scores that were explained by the PROMIS-anxiety, PROMIS-depression and PROMIS-sleep disturbance subscale scores. These PROMIS subscale scores contributed to 48% of the variance on the PTSD-Inventory scores ($F(3, 174)=54.61, p<.001, R^2=.48$).

Trauma Symptoms, Mental Health Symptoms, and Health Behaviors

The Health Scale was submitted to a factor analysis to determine which variables primarily contributed to the variance. The analysis yielded three factors contributing to 47% of the variance on the Health Scale score: **Factor 1 Self/Spiritual Care-**

Meditating (.74), Self-Care (.68), and Feeling Spiritual (.77)- 23 % of the variance; **Factor 2 Touching-** Touching your kids (.75), and Touching your partner or friend (.72)- 14% of variance; **Factor 3 Exercise-** Outside exercise (-.89), and Exercise outside with someone else (-.76)- 10% of variance.

Three separate Multiple Regressions were conducted with each of the three Health Scale Factors (Self-Spiritual Care, Touching, and Exercise) as the outcome variables. The predictor variables included the PTSD-8 Inventory score, PROMIS-Anxiety Subscale score, PROMIS-Depression Subscale score, and PROMIS-Sleep Subscale score. The first regression indicated that these variables contributed to a significant amount of the variance on Self/Spiritual Care, $F(4, 177) = 8.67, p<.001, R^2 = .16$. The two variables of PROMIS-depression and PROMIS-sleep contributed significantly to the prediction, $p<.05$. The second multiple regression yielded no significant variance on the touching factor. The third multiple regression suggested that these variables explained 9% of the variance on the Exercise factor, $F(4, 178) = 4.24, p=.003, R^2 = .09$. The two variables of PROMIS-depression and PROMIS-anxiety contributed significantly to the prediction, $p<.05$.

DISCUSSION

These findings highlight the prevalence of trauma symptoms occurring during a COVID-19 lockdown including that 53% of the sample were reminded of a previous trauma during this time. Further, 28% of the participants who completed the PTSD-8 Inventory [5], screened positively on the PTSD-8 Inventory [5].

In terms of the relationship of PTSD symptoms to anxiety, depression, and sleep, the results confirmed prior research which has shown the significant relationship between PTSD and comorbid mental health symptoms [2-4]. PTSD was significantly correlated with depression, anxiety, and sleep. Depression, anxiety, and sleep symptoms were significant predictors of PTSD-8 Inventory⁵ scores.

The results confirmed previous research [5,6], findings that PTSD symptoms impact health behaviors. Participants in this survey, with no PTSD symptoms had higher scores on the Health Scale, which measures positive health behaviors of self-spiritual care, touching, and exercise. However, as in previous research [7-9], the results indicated that the impact of PTSD on health behaviors is more nuanced when considering common comorbid symptoms of sleep disturbance, anxiety, and depression. The current results indicated that sleep and depression were more important predictors, as compared to PTSD and anxiety, of

engagement in self-care. While anxiety and depression, as compared to PTSD and sleep, were more important predictors of engagement in exercise in the current sample.

The current study has methodological limitations that should be noted including that it is based on a non-representative sample that is majority non-Hispanic White, female, and middle-class. This sample is not generalizable to the larger population. In addition, self-report data is subject to memory and bias effects. Further, the multiple regressions surprisingly did not explain much of the variance for self-spiritual care, touching, and exercise, suggesting that additional measures need to be included in future studies of PTSD and health. Also, since these data are cross-sectional, the direction of the effects or causality cannot be determined. Nonetheless, these data suggest that self-spiritual care, touch, and exercise are important for those with high PTSD symptom scores during pandemics.

CONCLUSION

These results added to the literature examining the relationship of mental and physical health. The results suggested that those with high PTSD symptoms scores were less likely to engage in positive health behaviors like self-spiritual care, touch, and exercise. However, when symptoms of PTSD, depression, anxiety, and sleep were used to predict engagement in such health behaviors, sleep and anxiety were significant predictors of engagement in self-care, and anxiety and depression were significant predictors of engagement in exercise. This supports previous research which has found that PTSD does impact engagement in health [5,6], and that it is also important to consider how comorbid symptoms may be playing a role in such engagement [7-9]. These results highlight the importance of interventions designed to help ameliorate distress and mental health symptoms during pandemics as such distress is impacting engagement in health behaviors which may serve as buffers to such distress.

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