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Anxiety, Depression, and Stressors Related to a COVID-19 Lockdown

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Abstract

Anxiety, depression, stress, PTSD symptoms, fatigue and sleep disturbances have been associated with COVID-19 lockdowns in several countries. In the current Survey Monkey study on 260 individuals (18-82 years), all of these conditions were significantly correlated with each other. Stepwise regression analysis suggested that depression, stress, PTSD symptoms and fatigue scale scores contributed to 64% of the variance on anxiety scale scores. And, in a similar stepwise regression analysis, 67% of the variance on the depression scale scores was explained by anxiety, stress, PTSD symptoms and fatigue scale scores. These data highlight the effects of anxiety and depression on each other and the effects of stress, PTSD symptoms and fatigue on both anxiety and depression. Positive correlations between both anxiety and depression and Media Scale ratings on internet, Facebook and communications about the virus suggested that those activities may have exacerbated the negative symptoms, while negative correlations with Health Scale ratings on exercise, self-care, and spirituality suggested that those activities may buffer the effects of anxiety and depression during a COVID-19 lockdown.

Keywords: ***COVID-19; Anxiety; Depression; Stress; PTSD; Fatigue; Media; Sleep disturbance***

1. Introduction

Several negative effects of COVID-19 have been noted on the psychological well-being of individuals experiencing lockdowns in different parts of the world. Anxiety and depression have been the most frequently studied problems, although stress and PTSD symptoms as well as fatigue and sleep disturbances have also been reported. Most of these studies have focused on the prevalence of these problems. For example, in a sample from China, 35% experienced anxiety, 20% depression and 8% sleep disturbances [1]. Similar levels were reported in another lockdown sample from China for anxiety at 29%, depression at 17%, and stress at 8% [2]. And, in a sample from Italy, similar prevalence data were noted including 33% for anxiety and 24% for depression, although both sleep disturbances and stress were notably more prevalent in this sample at 52% and 50% respectively [3].

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In some COVID-19 studies, relationships between these conditions have been explored. For example, in a sample from China, anxiety, depression and comorbid anxiety and depression reportedly occurred in 20% of the sample [4]. Anxiety was associated with sleep disturbances in 38% of another sample [5]. And in a COVID-19 sample from the UK, anxiety was related to fatigue [6] Anxiety and depression have also been associated with greater stress in a lockdown study from Italy [7]. And, stress, in turn, was associated with sleep disturbances in an Australian survey, suggesting that sleep quality was compromised in 41% of the sample [8]. Further, in a survey from the China pandemic, sleep problems were related to PTSD symptoms [9] which have been as prevalent as 30% in one other sample [10]. Although these studies did not include longitudinal data, at least one COVID-19 study from China reported that there were no decreases in anxiety or depression symptoms across a one-month lockdown period, [2] highlighting the significance of these lockdown problems.

Standardized measures were invariably used to assess these problems in these studies, for example, the Depression, Anxiety, and Stress Scale by a group in China [2]. And, the degree to which they relate to each other has rarely been assessed. Further, stressors that specifically relate to COVID-19 lockdowns, as for example feeling isolated, worrying about getting the virus and worrying about finances, were not surveyed in these studies. An exception was research from China that assessed worries about the virus and finances as they related to anxiety levels [4]. In addition, these studies did not include measures of potential buffers for the COVID-19 stressors, although some suggested that media and "digital use", which might have been expected buffers for isolation stress, actually exacerbated lockdown stress [4,7,11]. Identifying stressors that relate to a lockdown as well as potential buffers for those stressors might help inform interventions.

The present research focused on anxiety and depression inasmuch as they have been the most frequently reported psychological problems during COVID-19 lockdowns. Their relationships to each other and to other notable problems were assessed including fatigue, sleep problems and PTSD symptoms. Further, specific COVID-19 related stressors and potential buffers for the stressors were assessed by scales designed for this survey. Stressors that were identified in a previous analysis on COVID-19 lockdown data included worrying about the virus, worrying about financial status, feeling isolated, lonely, bored, and touch deprived as well as having "cabin fever" [12]. And, in other data analyses, exercise and spirituality were identified as potential buffers [13,14]. To further assess these relationships, data analyses were conducted to determine:

a. The degree to which stress, sleep disturbances, fatigue and PTSD symptoms contributed to the variance in anxiety and depression scale scores;
b. The relationships between anxiety and depression and, in turn, their relationships to specific lockdown stressors including feeling isolated and worrying about the virus; and
c. The relationships between anxiety and depression and those potential buffers that had been previously identified, including exercise [13] and spirituality [14].

2. Methods

2.1 Participants

A G* power analysis indicated that a sample size of 224 was required for an alpha of .05 and 80% power. The participants included individuals (N=260) who ranged in age from 18-82 (M=47 years). Gender was distributed 79% female, 18% male and 3% other (not identified). Ethnicity was distributed 68% Non-Hispanic White, 21% Hispanic, 3% Black and 8% other

(not identified). Professions were distributed 35% office worker, 30% academic, 15% managerial, 12% medical and 8% labor. The average income was $72,572, 28% were unemployed and 69% worked at home. Twenty-three per cent lived alone.

2.2 Procedure

A flyer was posted on Facebook giving a brief description of the study including some sample items and the age criterion (i.e. being greater than 18 years). The Facebook flyer included a link to the survey on Survey Monkey which included 11 scales for a total of 87 items. The survey was four weeks duration (April 1-30, 2020) corresponding to the Florida lockdown (location of survey research group), and the data were directly transported to SPSS for data analyses.

2.3 Measures

The survey included a demographic scale on several items already mentioned (age, gender, ethnicity, profession, income, type of employment, working at home and living alone). The following five scales were created specifically for this survey to relate to activities and stressors associated with the COVID-19 lockdown [13]. The participants rated the items on the scales from zero meaning "not at all" to three meaning "a lot" including:

i. The **Health Scale** (15 items) (Cronbach's alpha=.66) which included exercise (inside exercise, outside exercise and outside exercise with others as well as the types of exercise), touching (touching partner, kids and self as well as the types of touching), COVID- 19-related safety practices (including washing hands and social distancing), self-care, spiritual activities (meditating and feeling spiritual) and liking being at home. A factor 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 the variance;
   Factor 3: Exercise- Outside exercise (-.89) and Exercise outside with someone else (-.76) - 10% of the variance;
ii. The **Media/Communication Scale** (10 items) (Cronbach's alpha=.58) including talking on the phone, texting, on the 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;
iii. The **Connecting Scale** (4 items) (Cronbach's alpha =.41) which included connecting with friends, trying to connect with old friends, helping children do homework and receiving support from others;
iv. The **Working Scale** (6 items) (Cronbach's alpha=.61) including cooking, caregiving, housekeeping, paperwork, creative work and working on projects/hobbies; and
v. The **Stress Scale** (11 items) (Cronbach's alpha =.78) which 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". A factor analysis yielded three factors contributing to 56% of the variance on the Stress Scale score:
   Factor 1: Stimulation deprivation- Feeling Isolated (.86), Feeling lonely (.86), Feeling bored (.74),Getting cabin fever (.70) and Feeling touch deprived (.65) - 34 % of the variance;

Factor 2: Worrying- Worried about finances (.67) and Worried about the virus (.47) - 12% of the variance; and Factor 3: Stress behaviors- Napping (.68) and Snacking (.53) - 10% of the variance.

The standardized scales on the survey included 4 **PROMIS Subscales [**15] (each item rated on a 5-point scale as 1=never, 2=rarely, 3=sometimes, 4=often, and 5=always) that included:

i. The **PROMIS Anxiety Subscale** (4 items) (Cronbach's alpha=.88) that included I felt fearful, I found it hard to focus on anything other than my anxiety, my worries overwhelmed me and I felt uneasy;
ii. The **PROMIS Depression Subscale** (4 items) (Cronbach's alpha =.91) including I felt worthless, helpless, depressed and hopeless;
iii. The **PROMIS Fatigue Subscale** (3 items) (Cronbach's alpha=.92) including I felt fatigued, I had trouble starting things because I'm tired and I felt run-down; and
iv. The **PROMIS Sleep Disturbance Subscale** (4 items) (Cronbach's alpha =.86) that included my sleep quality was bad, my sleep is not refreshing, I had a problem with my sleep and I had difficulty falling asleep.

The second standardized scale was a PTSD Screener entitled "**PTSD-8: A Short PTSD Inventory**" (8 items) (Cronbach's alpha=.92) [16]. This inventory is 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 last item on the COVID-19 Lockdown Activities survey was an open-ended question "Please tell us about anything you feel that has been positive about the lockdown." Survey Monkey then provided a listing of the most frequently used words and their percentiles for that item.

3. Results

3.1 Correlation analyses yielding significant coefficients for the PROMIS anxiety scale scores

The Survey Monkey data were first submitted to correlation analyses for the Anxiety Subscale scores and the other scale scores and items on the survey. Those analyses yielded a number of significant correlation coefficients (at the $p<.05$ level and almost all at $p<.001$ level) for the Anxiety Subscale scores including positive correlations between anxiety scores and being younger and being male as well as the following (see TABLE 1 for the correlation coefficients for the Anxiety Subscale and the other scales):

i. negative correlations between anxiety and the **Health Scale** total score and for the following items indicating that greater anxiety was related to less indoor exercise, outdoor exercise, liking being home, self-care and feeling spiritual;
ii. positive coefficients on the **Media/Communication Scale** total score and its items indicating that greater anxiety was related to more time on the internet, Facebook, and messaging regarding the virus;
iii. negative coefficients for **Working Scale** items indicating that greater anxiety was related to less cooking and housework;

iv. positive coefficients for the **Stress Scale** total score and most of its items indicating that greater anxiety was related to a greater prevalence of worrying about the virus, worrying about finances, wanting this experience to end, feeling isolated, lonely, bored and touch deprived and more frequent snacking and cabin fever;

v. positive coefficients for all the PROMIS **Anxiety Subscale** items indicating that greater anxiety was associated with feeling fearful, focus on anxiety, overwhelming worries and feeling uneasy;

vi. positive coefficients for the total score on the **PROMIS Depression Subscale** and all its items indicating significant associations between anxiety and feeling worthless, helpless, depressed and hopeless;

vii. positive coefficients for the total score on the **PROMIS Fatigue Subscale** and all its items indicating a greater incidence of fatigue, being tired and run–down for those with greater anxiety;

viii. positive coefficients for the total score on the **PROMIS Sleep Disturbance Subscale** and its items indicating that those with greater anxiety reported problems with quality of sleep, problems with sleep, and falling asleep;

ix. a positive coefficient between anxiety and being reminded of a traumatic experience; and

x. positive coefficients for the total score on the **PTSD-8 Inventory** and all its items indicating associations between anxiety and recurrent thoughts or memories of the event, feeling the event is happening again, recurrent nightmares, sudden emotional and physical reactions, avoiding thoughts and feelings associated with the event, feeling jumpy/easily startled, and feeling on guard.

TABLE 1. **Correlation coefficients and p levels for significant relationships between PROMIS Anxiety Subscale Scores and other scores on the Survey scales and subscales.**

Measure	Correlation coefficient	p level
Health Scale Score	-.24	.001
Media Communications Scale Score	.19	.005
Stress Scale	.61	.001
PROMIS Depression Subscale Score	.77	.001
PROMIS Fatigue Subscale Score	.62	.001
PROMIS Sleep Disturbance Subscale Score	.55	.001
PTSD-8 Score	.59	.001

3.2 Stepwise regression analysis on the COVID-19 anxiety subscale scores

The scale and subscale scores that were significantly correlated with the Anxiety Subscale scores (see TABLE 1 for those correlations) were then entered into a stepwise regression analysis on the Anxiety Subscale Scores including the Health Scale, the Media/Communication Scale, the Stress Scale, the PROMIS Depression Subscale, the PROMIS Fatigue Subscale, the PROMIS Sleep Disturbance Subscale and the PTSD-8 Inventory. The Stepwise Regression yielded four steps on scales that made significant contributions to the variance including the PROMIS Depression Subscale that contributed to 59% of the

variance, the Stress Scale that added 2%, the PTSD-8 Inventory that added another 2% and the PROMIS Fatigue Subscale that added 1% for a total of 64% of the variance in the PROMIS Anxiety Subscale score (see TABLE 2).

TABLE 2. **Stepwise regression for PROMIS Anxiety Subscale.**

Model	R	R^2	F change value	p level
PROMIS Depression	.77	.59	244.65	.001
Stress	.78	.61	12.61	.001
PTSD-8	.80	.63	10.86	.001
PROMIS Fatigue	.81	.64	5.71	.001

3.3 Correlation analyses yielding significant coefficients for the PROMIS depression sub-scale scores

The Survey Monkey data were submitted to correlation analyses to determine those scales and items that were significantly correlated with the PROMIS Depression Subscale Scores. Those analyses revealed a number of significant correlation coefficients (at least at the $p<.05$ level and most at the $p<.001$ level) for the Depression Subscale scores for being male and for living alone and for the following (see TABLE 3 for the correlation coefficients for the Depression Subscale and the other scales):

i. a negative coefficient for the **Health Scale** total score and its items indicating that greater depression was related to less indoor exercise, outdoor exercise, exercise with others, liking being home, self-care, and feeling spiritual;
ii. a positive coefficient for **Media Scale** items indicating that greater depression was associated with more time on internet, Facebook and communications regarding the virus;
iii. a negative coefficient for the **Working Scale** total score suggesting less cooking and housework for those with greater depression;
iv. a positive coefficient for the **Stress Scale** total score and all its items except the worrying about finances and drinking alcohol items but including greater worrying about the virus, wanting this experience to end, feeling isolated, lonely, bored and touch deprived as well as greater snacking, napping and cabin fever;
v. a positive correlation between the depression subscale scores and the **PROMIS Anxiety Subscale** total score and all its items (feeling fearful, focus on anxiety, overwhelming worries and feeling uneasy);
vi. a positive coefficient between the total **PROMIS Depression Subscale** and all its items including feeling worthless, helpless, depressed and hopeless;
vii. a positive correlation between the depression subscale score and the total score on the **PROMIS Fatigue Subscale** and all its items (fatigue, tired and run–down);

viii. a positive coefficient between the depression subscale score and the total score on the **PROMIS Sleep Disturbance Subscale** and positive correlations for all its items (quality of sleep, refreshing sleep, problems with sleep, and falling asleep); and

ix. a positive correlation between the depression subscale score and the total score on the **PTSD Inventory** as well as positive correlations with all its items (recurrent thoughts or memories, feeling the event is happening again, recurrent nightmares, sudden emotional and physical reactions, avoiding activities that remind you of the event as well thoughts and feelings associated with the event, feeling jumpy/easily startled and feeling on guard).

TABLE 3. **Correlation coefficients for significant relationships between PROMIS Depression Sub-Scale Scores and other scores on the Survey scales and subscales.**

Measure	Correlation coefficient	p level
Health Scale	-.40	.001
Working	-.17	.005
Stress	.61	.001
PROMIS Anxiety	.77	.001
PROMIS Fatigue	.64	.001
PROMIS Sleep Disturbance	.53	.001
PTSD-8	.61	.001

3.4 Stepwise regression analysis on the PROMIS depression subscale scores

The scale and subscale scores that were significantly correlated with the **PROMIS Depression Subscale** scores (**see TABLE 3 for those correlations**) were entered into a stepwise regression analysis including the Health Scale, the Working Scale, the Stress Scale, the PROMIS Anxiety Subscale, the PROMIS Fatigue Subscale, the PROMIS Sleep Disturbances Subscale and the PTSD-8 Inventory. The Stepwise Regression yielded four steps on four scales that made significant contributions to the variance including the PROMIS Anxiety Subscale scores that contributed to 59% of the variance in the PROMIS Depression Subscale scores, the Stress Scale that added 4% to the variance, the PTSD-8 Inventory scores that added another 3% to the variance and the PROMIS Fatigue Subscale score that added 1% to the variance for a total of 67% of the variance on the PROMIS Depression Subscale scores (see TABLE 4).

TABLE 4. **Stepwise regressions for PROMIS Depression Subscale Scores.**

Model	R	R^2	F change value	p level
PROMIS Depression	.77	.59	244.65	.001
Stress	.79	.63	18.88	.001
PTSD-8	.81	.66	14.05	.001
PROMIS Fatigue	.82	.67	7.48	.001

3.5 Analyses of variance (ANOVAs) on high and low anxiety groups based on a median split

To provide confirmatory data, high and low anxiety groups were formed by a median split on the PROMIS Anxiety Subscale scores. Group comparisons by ANOVAs yielded similar effects as those noted for the correlation analyses (see TABLE 5 for the ANOVAs for the high and low anxiety groups). The only exceptions were that some of the significant correlations were not replicated in the ANOVAs on the group comparisons, and some significant effects emerged for group comparisons that had not been significantly correlated. These exceptions included that:

i. On the **Health Scale,** the feeling spiritual item did not differ across the two groups even though it was correlated with anxiety scores and the self-touch item which was not correlated did differentiate the groups on the ANOVA;
ii. The **Media Scale** total score did not differentiate the groups although it was positively correlated with anxiety and spending time on the internet did not differentiate the groups although it was significantly correlated with anxiety;
iii. On the **Working Scale,** caregiving emerged as a significant group difference although it was not correlated with the anxiety scale and housekeeping was correlated with the anxiety scale scores but did not differentiate the groups; and
iv. On the **Stress Scale,** feeling isolated, lonely and bored significantly differentiated the groups on the median split ANOVA on anxiety although they were not significantly correlated with the Anxiety Scale total score.

TABLE 5. **Mean scale scores for significant ANOVAs for high versus low anxiety groups (standard deviations in parentheses).**

Measure	Low anxiety	High Anxiety	F value	p level	eta^2
Health	32.51(5.50)	30.19 (5.22)	8.92	. 05	.02
Stress	25.09(5.52)	31.66 (5.53)	78.73	.001	.18
Depression	6.61 (2.73)	12.10 (3.48)	188.13	.001	.38
Fatigue	7.05 (2.79)	10.23 (2.66)	74.82	.001	.14
Sleep Disturbance	12.45 (4.08)	16.73 (4.04)	61.32	.001	.12
PTSD-8	12.27 (4.89)	18.71 (5.14)	69.32	.001	.12

Other than those exceptions, all the items and total scale scores that were significantly correlated with the Anxiety Scale scores also significantly differentiated the high anxiety from the low anxiety groups on the median split ANOVAs at the p<.05 level, and almost all of the group differences were significant at the p<.000 level. The MANOVA for this analysis was significant (Wilks' Lambda F=7.65, p<.05).

3.6 Analyses of Variance (ANOVAs) on high and low PROMIS depression scores based on a median split

High and low depression groups were formed by a median split on the PROMIS Depression Subscale scores. Group comparisons by ANOVAs yielded similar effects as were noted for the correlation analyses (see TABLE 6 for the ANOVAs for the high and low depression groups). The only exceptions were that some of the significant correlations were not replicated in the ANOVAs on the group comparisons and some significant effects emerged for group comparisons that had not been significantly correlated. These exceptions included:

i. The Facebook item did not differ across the two groups even though it was correlated with depression scores and the gaming and connecting with old friends' items on the **Media Scale** significantly differentiated the groups although those items were not significantly correlated with depression scale scores;
ii. The **Stress Scale** item "worrying about finances" differentiated the two groups although it was not correlated with depression scale scores; and
iii. The **Working Scale** total score did not differ across the two groups although it was correlated with depression scale scores.

Other than those exceptions, all the total scores and individual items that were significantly correlated with depression scores significantly differentiated the high depression from the low depression groups at least at the p<.05 level, and almost all of the group differences were significant at the p<.000 level. The MANOVA for this analysis was significant (Wilks' Lambda F=21.53, p<.05).

TABLE 6. **Mean scale scores for significant ANOVAs for high versus low depression groups (standard deviations in parentheses).**

Measure	Low Depression	High Depression	F value	p level	eta^2
Health	32.64 (5.19)	29.00 (5.54)	19.55	.001	.08
Stress	25.57 (5.67)	32.67 (5.20)	73.02	.001	.22
Anxiety	6.65 (2.32)	14.22 (2.32)	91.69	.001	.27
Fatigue	7.23 (2.86)	10.90 (2.23)	81.40	.001	.24
Sleep Disturbance	12.82 (4.28)	17.14 (3.81)	47.76	.001	.17
PTSD-8	12.80 (5.06)	19.53 (5.08)	61.59	.001	.26

4. Discussion

Depression explained most of the variance in anxiety (59%) and anxiety explained most of the variance in depression (also 59%). These findings were not surprising inasmuch as anxiety and depression have been comorbid in many studies including a recent COVID-19 survey [4]. In that survey, 20% of the participants had anxiety and depression or both. The comorbidity of anxiety and depression has been well-established in the pre-COVID literature, supporting the current findings. However, surprisingly, exactly the same scales contributed to the variance in the same order of entry into both the stepwise regressions on anxiety scores and on depression scores, i.e. anxiety or depression at step 1, the Stress Scale scores at step 2 followed by the PTSD-8. Inventory scores at step 3 and the Fatigue Subscale scores at step 4. That the last 3 steps contributed to the variance is not surprising given their high correlations with anxiety and depression, although together they only added to a small percent of the variance (5%-8%).

The significant relationship between anxiety and stress has been reported in an earlier lockdown study in Italy [7]. A similar association was reported in Australia during the COVID-19 pandemic [8]. In still another pandemic survey, 24% of the samples were experiencing moderate to severe depression and 50% reported moderate to severe stress levels [3]. When examining the individual items on the Stress Scale, those items that were highly correlated with anxiety and depression or differentiated the groups on the ANOVAs were worrying about the virus, feeling isolated, feeling lonely, and feeling touch deprived (range of correlation coefficients =.46-.69). In an earlier factor analysis on the Stress Scale, the first two factors that together explained 56% of the variance included a factor labeled feelings (feeling isolated, lonely, and touch deprived) and a COVID worries factor (worried about the virus and worried about finances) [12]. In addition, feeling touch deprived, isolated and lonely have been previously reported as significant COVID-19 lockdown experiences [13,17]. Although other researchers have reported anxiety, depression and stress during COVID-19 lockdowns, those studies have not included these specific lockdown stressors (touch deprivation, isolation and loneliness), even though those would be predictable experiences [1-3].

Even the small contribution of the third step in the stepwise regressions on anxiety and depression, namely the PTSD-8 Inventory score, was not surprising given that PTSD symptoms have been noted previously in at least 30% of a COVID-19 lockdown sample [10]. And, high PTSD-8 Scale scores have had negative effects on health activities in an earlier report on this database [14]. Fatigue, as the fourth step in the stepwise regressions, is not surprising inasmuch as the Fatigue Scale items including, I felt fatigued, I had trouble starting things because I'm tired, and I felt run down were highly correlated with both anxiety and depression scores in this database. And, those symptoms have often been referred to as somatic symptoms at least for depression and were significantly associated with anxiety in the UK COVID-19 lockdown database [6].

Demographic items including male gender and younger age were also correlated with Anxiety and Depression Scale scores in the current data analyses. Young age and male gender were significantly correlated with anxiety, and male gender and living alone were significantly related to depression. Being young and living alone have previously been identified as risk factors for stress, anxiety, depression, fatigue, sleep disturbances, and PTSD symptoms [18]. And, young age has been a notable risk factor in another lockdown sample [19]. Surprisingly, male gender was significantly correlated with both anxiety and depression in the current study. That was not expected inasmuch as male gender was not previously reported as a risk factor during lockdowns. However, male gender is a tentative risk factor in the current sample and needs replication given that male

gender was not sufficiently represented in this sample (only 18% of the sample). Some recruiting parameters would need to be specified in future surveys inasmuch as women are reputedly more represented on social media recruiting sites as, for example, the Facebook recruitment procedure used in this survey.

The Media Scale scores and Media Scale items including being on the Internet, being on Facebook, and sending messages about the virus were also positively correlated with anxiety and depression in this survey, suggesting that they may have been exacerbating those negative mood states. These were surprising findings given that living alone; feelings of isolation and loneliness might be expected to lead to the use of social media in an attempt to be socially connected [20]. However, they also exacerbated stress in other COVID-19 samples, [4,7,11] suggesting that social media activities may not be effective buffers for the stressors experienced during lockdowns.

The lockdown stressors and risk factors and their relationships to anxiety and depression reported here are collectively disconcerting inasmuch as they are related to somatic symptoms and health problems. The Health Scale did not enter the stepwise regressions in the current study, possibly because of its relatively low correlations with anxiety and depression and because of its low internal consistency as a scale (Cronbach's alpha=.66). However, a few of its items including inside exercise, outside exercise, self-care, and feeling spiritual were significantly negatively correlated with both anxiety and depression. These findings are not surprising because self–care/ spiritual care was the primary factor in a factor analysis on the Health Scale [14]. In that data analysis, touching was the second factor and exercise was the third factor. Exercise has also been a significant factor in reducing anxiety [8] and touch deprivation [13]. These health activities might be considered buffers for the stressors noted in this study.

More sophisticated analyses such as mediation/moderation analysis or structural equation models might be used in future studies to understand the interrelationships between these variables. For example, the correlation analyses suggest a path between depression and stress which, in turn, may contribute to fatigue. In addition, further research is needed on underlying mechanisms for both anxiety and depression. Not surprisingly, being young was related to greater anxiety and living alone was related to greater depression because they had already been documented as lockdown risk factors [18,19]. In a different set of analyses on these COVID-19 data, the young group had the most problematic scores on all the variables [18]. But, surprisingly, being male gender was correlated with higher scores on both anxiety and depression. These demographic risk factors may help identify those needing intervention during lockdowns like COVID-19.

Other potential underlying mechanisms for anxiety and depression in this Survey Monkey sample may be touch deprivation and the lack of exercise. In another analysis of this dataset, touch deprivation was correlated with anxiety, depression and stress [13]. And, touch has been noted to decrease these problems [21]. Exercise was also inversely related to these problems in an earlier analysis of these COVID-19 data [22]. Other studies have specifically suggested that exercise can reduce depression [22]. And other researchers have recommended physical exercise along with cognitive interventions and relaxation techniques [23]. But, surprisingly, the COVID-19 literature is lacking publications on intervention studies.

The current study has a number of methodological limitations including that the data are based on a sample of predominantly non-Hispanic white females. Although this ethnic and gender distribution is reputedly representative of Survey Monkey samples, the data would not be generalizable to the larger population. In addition, they are self-report data, although their

anonymity may contribute to their veridicality. And, directionality of effects cannot be determined from cross-sectional data. The selection of outcome variables is arbitrary. For example, treating anxiety as an outcome variable in a regression analysis would predictably yield the depression variable as explaining most of its variance and vice versa. Nonetheless, the prevalence data and the regression analyses are suggestive that anxiety and depression and the lockdown stressors of feeling isolated, lonely, and touch deprived are significant lockdown problems that highlight the need for prevention/intervention protocols. The need for intervention research is further highlighted by the data suggesting an increased prevalence of these problems across this lockdown period [17].

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