



## Loneliness in Adults During a COVID-19 Lockdown

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### ABSTRACT

Loneliness has been frequently reported in the COVID-19 literature but rarely in the context of potential comorbidities including depression, fatigue, and sleep problems. The present study assessed the relationships between self-reported loneliness, and the potential comorbidities based on an archival database called the COVID-19 Lockdown Activities Survey (N= 260 participants). Loneliness was endorsed by 67% of the participants. Greater loneliness was related to greater depression, fatigue, and sleep problems. A regression analysis revealed that depression contributed to 47.1% of the variance in loneliness. These results highlight the multidimensionality of loneliness. The generalizability of these results is limited by the homogeneity of the sample (predominantly non-Hispanic white females). Nonetheless, they highlight the importance of designing interventional protocols that address loneliness and the associated depression, fatigue, and sleep problems rather than loneliness alone.

**Keywords:** COVID-19 Lockdown, Loneliness, Depression, Fatigue, Sleep Problems

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Mental health research on COVID-19 lockdowns suggests several prevalent problems, including anxiety and depression (Bartoszek et al., 2020; Luo et al., 2020), touch deprivation (Field, Poling, et al., 2020), sleep disorders (Partinen, 2021), higher perceived social isolation, substance use, and decreased life satisfaction (Clair et al., 2021), lower levels of spiritual wellbeing (Coppola et al., 2021), posttraumatic stress symptoms (Liu et al., 2020), fatigue (Bartoszek et al., 2020) and loneliness (Bartoszek et al., 2020; Field, et al., 2020). The mental health challenges associated with COVID-19 are significant, and specific interventions have not appeared in the literature. A recent news story suggested that a “mental health version of Dr. Anthony Fauci is missing.” (Lewinsky, 2020, p. 1).

### **Loneliness**

Although the telecommunication revolution of the 21st century has connected individuals globally (Sapolsky et al., 2020), loneliness is also on the rise (Sweet, 2020). According to a National Survey by Cigna, 61% of individuals in the US reported feeling lonely (Novotney, 2019). In another recent study, data from individuals between the ages of 16 and 99 who lived across 237 geographic regions in the world suggested a significant prevalence of loneliness (Barreto et al., 2021). The results further suggested that men experience loneliness more than women, that loneliness decreases when adolescents reach adulthood, and that participants from individualistic cultures report it more frequently. It is noteworthy that loneliness has been perceived as social isolation. However, individuals can live alone but not feel lonely or live an active social life and still feel alone. Consequently, loneliness is defined as a perceived experience of separation from others (Rokach, 2019).

Further, loneliness affects individuals' happiness, cognitive functioning, and physical health (Yeh, 2017). Centers for Disease Control and Prevention (CDC) describes loneliness and social isolation as a serious public health risk (Centers for Disease Control and Prevention

[CDC], 2021). The prevalence of loneliness worldwide highlights the importance of researching loneliness and its comorbid mental health problems.

### **Depression**

A recent study by CDC showed that fluctuations in COVID-19 cases resemble the reports of anxiety and depression from week to week (Stephenson, 2021). A meta-analysis of global community-based studies during the first seventeen weeks of 2020 documented the prevalence of depression to be about seven times higher (about 25%) than pre-COVID estimates (about 3.44%) (Bueno-Notivol et al., 2021). A review from India, Pakistan, and Bangladesh estimated the pooled prevalence of depression to be 34.1% in 28 studies (Hossain et al., 2021). Similarly, in a longitudinal study from Australia, the mean scores for depression and anxiety showed at least mild symptoms (Batterham et al., 2021). These studies suggest that the COVID-19 pandemic has been associated with depression worldwide.

### **Fatigue**

A recent meta-analysis of 15 studies (N=47,910) showed that most patients diagnosed with COVID-19 continue to report physical and cognitive symptoms during their post-viral-infection follow-up visit. Fatigue is the most reported post-COVID symptom at an estimated prevalence of 58% (Stengel et al., 2021). Fatigue has also been reportedly the most debilitating symptom that persists after the acute phase of COVID-19 (Rudroff et al., 2020). The World Health Organization-Europe reported that although most public support COVID-19 response strategies of maintaining social distance and wearing masks, pandemic fatigue is also emerging rapidly (World Health Organization [WHO], 2020). In addition, fatigue and burnout are well documented in healthcare workers during COVID-19 surges, especially in high-volume intensive care units (Sasangohar et al., 2020).

### **Sleep Problems**

A systematic review and meta-analysis involving 168 studies from 39 countries estimated that about 31% of healthcare professionals, 18% of the general population, and 57% of COVID-19 patients struggle with sleep-related issues (Alimoradi et al., 2021). Sleep problems were associated with depression in this analysis. Another study showed a prevalence of sleep problems in about 40% of the general public and health care providers (Jahrami et al., 2021).

### **Purpose of the Present Data Analyses**

The purpose of the present data analyses was to assess the relationships between self-reported loneliness, depression, fatigue, and sleep problems based on an archival database of a COVID-19 lockdown survey. In addition, analyses were conducted to determine the relative variance in loneliness that was explained by depression, fatigue, and sleep problems. Feelings of loneliness were expected to be associated with greater depression, fatigue, and sleep problems.

### **Methods**

#### **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 from 18-82 (M=47 years). Gender was distributed 79% female, 18% male and 3% other (non-specified). Ethnicity was distributed 68% Non-Hispanic White, 21% Hispanic, 3% Black and 8% other (non-specified). 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 percent lived alone.

#### **Procedure**

A flyer was posted on Facebook giving a brief description of the study, including some sample items and the age criterion being greater than 18 years. The Facebook flyer included a link to Survey Monkey, an online survey development cloud-based software. The survey was

conducted between April 1, 2020, and April 30, 2020, and the data were directly transported to SPSS for data analyses.

### **Measures**

The survey included several demographic items, including age, gender, ethnicity, profession, income, type of employment, working at home, and living alone. Depression, fatigue, and sleep problems were assessed using those subscales of the Patient-Reported Outcomes Measurement Information System (PROMIS) (Cella et al., 2010). PROMIS Depression subscale includes four items, such as "I feel depressed," rated on a 5-point Likert-type scale ranging from 1= never to 5= always with an alpha of .91 (Teresi et al., 2016). Fatigue was measured on the three-item PROMIS Fatigue subscale that includes statements such as "I felt fatigued," with a reported alpha of .88 (Ameringer et al., 2016). The PROMIS sleep subscale consist of five items on the same Likert scale with an alpha of .86 (Yu et al., 2012). These items include statements like "My sleep quality was bad". Loneliness was assessed using a single item, "I feel lonely," on a 4-point Likert scale.

### **Results**

A multiple regression analysis was conducted to determine the variance in loneliness that was explained by the PROMIS depression, sleep and fatigue subscales. As can be seen in Table 1, the three predictor variables explained 48.4% of the variance in loneliness and the model was significant ( $R^2=.484$ ,  $F(3,249)=77.81$ ,  $p<.001$ ). Depression was a significant predictor of loneliness ( $t=9.77$ ,  $p<.001$ ,  $\beta=0.17$ ) but sleep ( $t=0.67$ ,  $p=.504$ ,  $\beta=0.01$ ) and fatigue ( $t=1.80$ ,  $p=.074$ ,  $\beta=0.04$ ) were not.

To find the best model, a stepwise multiple regression was conducted. In the first model, depression as a predictor explained 47.1% of total variance,  $F(1, 251)=223.87$ ;  $p<.001$ . In the second model, introducing the fatigue variable explained an additional 1.2% of the variance in loneliness, and the change in  $R^2$  was

significant,  $F(1,250) = 5.55$ ,  $p = .019$ . The result of the third model suggests that if fatigue increases for one unit, loneliness will increase for 0.05. The nature of the predictive value of depression was as expected; if depression increases for one unit, loneliness will increase for 0.17.

A one-way ANOVA was conducted to examine

whether participants' depression, fatigue, and sleep differed depending on the level of feeling lonely (1=Not at all to 3= A lot). The results indicate differences in mean depression  $F(3, 253) = 77.34$ ,  $p < .001$ , fatigue  $F(3, 254) = 32.67$ ,  $p < .001$  and sleep  $F(3, 249) = 18.80$ ,  $p < .001$  as a function of the loneliness ratings.

**Table 1 Result of Multiple Regression Analysis**

Predictor	Unstandardized Coefficients		Standardized Coefficients		$R^2$	$F$
	$b$	$SE$	$\beta$	$t$		
<i>Model 1</i>					.484	77.81**
Constant	0.34	.17		2.00*		
Depression	0.17	.02	.59	9.77**		
Fatigue	0.04	.02	.12	1.80		
Sleep Problems	0.01	.01	.04	0.67		
<i>†Mode 2</i>					.471	223.87**
Constant	0.60	.12		4.88**		
Depression	0.20	.01	.69	14.96**		
<i>†Mode 3</i>					.483	116.74**
Constant	0.40	.15				
Depression	0.17	.02	.60	10.16**		
Fatigue	0.05	.02	.14	2.36**		

*Note.* Dependent variable is loneliness.  $b$  represents unstandardized regression weights.  $SE$  indicates standard error of  $b$ .  $\beta$  indicates the standardized regression weights.  $R^2$  indicates variances predicted by the independent variables.  $†$  Stepwise Regression \*indicates  $p < .05$  and \*\* indicates  $p < .001$ .

**Table 2 Mean scale scores for significant ANOVAs for loneliness, depression, fatigue, and sleep problems (standard deviations in parentheses).**

Variables	Loneliness Level							
	(0) Not at all		1		2		(3) a lot	
	$M(SD)$	$Pvalue$	$M(SD)$	$Pvalue$	$M(SD)$	$Pvalue$	$M(SD)$	$Pvalue$
Depression	5.61(2.21)	<.001	7.48(2.76)	<.001	9.79(3.07)	<.001	12.92(3.62)	<.001
Fatigue	6.11(2.47)	<.001	7.99(2.70)	<.001	9.09(2.50)	.04	10.55(3.02)	<.001
Sleep Problems	11.67(4.32)	<.001	13.43(3.88)	<.001	14.76(4.19)	.05	17.00(4.16)	<.001

Post Hoc tests conducted using the Tukey HSD test suggest that participants who felt lonely "a lot" ( $M=12.92$ ,  $SD=3.62$ ) had higher depression subscale scores than participants who gave ratings of 2 ( $M=9.79$ ,  $SD=3.07$ ), ( $p < .001$ ) or 1 ( $M=7.48$ ,  $SD=2.76$ ), ( $p < .001$ ) or those who did

not feel lonely ( $M=5.61$ ,  $SD=2.21$ ), ( $p=.001$ ). In addition, participants who felt lonely "a lot" ( $M=10.55$ ,  $SD=3.02$ ) resulted in significantly higher fatigue subscale scores than participants who gave ratings of 2 ( $M=9.09$ ,  $SD=2.50$ ), ( $p=.04$ ) or 1 ( $M=7.99$ ,  $SD=2.70$ ), ( $p < .001$ ), or

those who did not feel lonely ( $M=6.11$ ,  $SD=2.47$ ), ( $p<.001$ ). Finally, participants who felt lonely “a lot” ( $M=17.00$ ,  $SD=4.16$ ) experienced significantly higher sleep problems subscale scores than participants who gave ratings of 2 ( $M=14.76$ ,  $SD=4.19$ ), ( $p=.05$ ) or 1 ( $M=13.43$ ,  $SD=3.88$ ), or those who did not feel lonely ( $M=11.67$ ,  $SD=4.32$ ), ( $p<.001$ ).

## Discussion

These results show that depression explained a significant amount of variance in feelings of loneliness while fatigue and sleep problems did not. These findings correspond with the results of the previously mentioned study in which high levels of depressive symptoms and loneliness were found in a nationally representative probability sample of American adults (Rosenberg et al., 2021). Additionally, in the current study, greater loneliness was related to greater depression, fatigue, and sleep problems. These data support the previously reported relationship between fatigue, depression, sleep problems, and loneliness (Alimoradi et al., 2021; Barreto et al., 2021; Bueno-Notivol et al., 2021; Mayne et al., 2021; & Stengel et al., 2021).

These results highlight the multidimensionality of loneliness and are a part of an important trend that attempts to explore the emotional and environmental contributors of loneliness. However, it is noteworthy that participants of our study were predominantly non-Hispanic white females. Thus, the results of the non-representative sample would not be generalizable to the larger population or other countries. Future studies may utilize more heterogeneous populations or investigate more environmental variables as covariates.

Currently, the Delta variant is more infectious and is easily transmissible, even in some vaccinated individuals (Mahase, 2021). This transmissibility is causing uncertainty about the length of COVID-19 modified lifestyles. Although there is limited research on interventions to protect the psychological health of individuals who continue to quarantine and social distance, mindfulness-based interventions have

previously demonstrated a significant improvement in wellbeing ((Field et al., 2021; Zhang et al., 2021). Therefore, intervention protocols should be designed to address not only loneliness but the associated depression, fatigue, and sleep problems as well. Interventions that address this combination of variables may be more effective than focusing on loneliness alone during pandemic lockdowns like those of COVID-19.

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