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# The effect of pre-pandemic PTSD and depression symptoms on mental distress among older adults during COVID-19

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## ARTICLE INFO

### Keywords:

Trauma  
Coronavirus  
Mental health  
Psychological distress  
Loneliness

## ABSTRACT

**Objectives:** To explore the extent that pre-COVID-19 comorbid PTSD-depression symptoms prospectively predict mental distress among older adults during COVID-19.

**Methods:** We used the Israeli component of the Survey of Health, Ageing and Retirement in Europe (SHARE-Israel), and focused on older adults who participated in 2015 and 2020 and were aged 60 years old or above in 2020 (N = 754). Mental distress was measured via symptoms of depression, feeling anxious/nervous, and loneliness.

**Results:** Older adults who suffered from PTSD-depression comorbidity prior to the pandemic showed the highest risk of feeling more depressed, anxious/nervous, and lonelier than those with no pre-pandemic symptoms.

**Conclusions:** This study suggests that it would be beneficial to prioritize those older adults with a comorbid PTSD-depression diagnosis for interventions, as they are at the highest risk for mental distress in the event of a new stressor.

## 1. Introduction

The coronavirus disease 2019 (COVID-19) has created a worldwide life-threatening pandemic. It poses increased health risk for older adults, and in order to protect their health, they were encouraged to practice social distancing (Choi et al., 2021). Thus, the pandemic itself was perceived by many older adults as a significant stressor that comprised many challenges and may lead to decreased mental health and increased loneliness (Cohn-Schwartz et al., 2022; Tilburg et al., 2020). In this context, it is important to reveal relevant predictors of such mental health vulnerability, i.e., one's level of mental distress. Pre-COVID-19 post-traumatic stress disorder (PTSD) was found to be such a risk factor as it was linked with more loneliness among specific groups of older adults, such as Holocaust survivors (Maytles et al., 2021), and with reactivation of PTSD symptoms among older adult former prisoners of war (Solomon et al., 2021), although some evidence showed a more complex pattern (Rutherford et al., 2021).

Depression is one of the most common comorbid conditions of PTSD (Horesh et al., 2017), and may appear in 50% of those diagnosed with PTSD (Radell et al., 2020). Thus, although PTSD prevalence among older adults is lower compared to other age groups, comorbidity with

depression remains high for older adults with PTSD (Fox et al., 2020; Shrira and Hoffman, 2021). When such depression stems from trauma exposure and co-occurs with PTSD it constitutes an even heavier burden and leads to more mental distress than either PTSD alone or depression alone (Flory and Yehuda, 2015; Radell et al., 2020). For example, older adults with PTSD-depression comorbidity suffer from multiple past depressive episodes, more chronic physical health conditions and lower quality of life (Pless Kaiser et al., 2019).

Since the pandemic itself may constitute a stressor, older adults entering this pandemic whilst carrying the heavier weight of a previous comorbid PTSD-depression condition should fare worse than those who, for example, suffer from PTSD alone (Radell et al., 2020; Shrira et al., 2020). Thus, the goal of the current study is to examine if older adults suffering from pre-COVID-19 comorbidity of PTSD along with depression fare worse when faced with COVID-19 challenges when compared to those without such comorbidity. The study used a longitudinal dataset to examine this issue of PTSD-depression comorbidity with regard to feeling more depressed, more anxious/nervous and lonelier during the pandemic than those older adults without a pre-COVID-19 diagnosis.

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<https://doi.org/10.1016/j.jpsychires.2022.05.022>

Received 11 January 2022; Received in revised form 19 April 2022; Accepted 19 May 2022

Available online 23 May 2022

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## 2. Methods

### 2.1. Data

This study is based on data from the Israeli component of the Survey of Health, Ageing and Retirement in Europe (SHARE-Israel), a panel survey of community-dwelling adults aged 50 and above (Börsch-Supan et al., 2013; Schwartz and Shrira, 2019). SHARE-Israel received ethical approval from the Institutional Review Board (IRB) of the Hebrew University of Jerusalem. All participants provided informed consent. Data for the current study was collected in 2015 and in 2020. We used the 2015 wave due to its implementation of a unique paper-and-pencil questionnaire which addressed exposure to potentially warfare-related traumatic events. The COVID-19 dataset is based on interviews of a sub-sample of SHARE's panel respondents via a Computer Assisted Telephone Interview (CATI), which were carried out from June until August 2020 (Scherpenzeel et al., 2020). This data collection began three months after the first lockdown instated in Israel in March 2020 in response to the pandemic. Following previous research (e.g., Hoffmann and Wolf, 2021; World Health Organization, 2020) we limited our sample to adults who were 60 years old and above in 2020, since this age group was considered a high-risk group for COVID-19 complications. The study sample focused on adults who supplied information on all study variables, thus totaling 754 participants.

### 2.2. Measures

#### 2.2.1. Pre-pandemic PTSD symptoms

Participants at baseline (2015) were asked about exposure to warfare traumatic events during the 2014 Israel-Gaza conflict. They were asked to indicate which potential twelve events they experienced during the conflict or in the preceding period, in which missile attacks were sporadically launched from Gaza towards Israel. The events listed included injuries and danger to self and to a close other, and damage or danger to one's personal property or workplace (Schwartz and Shrira, 2019). Participants who reported exposure to these events were directed to the 4-item SPAN measure of PTSD symptoms (Meltzer-Brody et al., 1999), which has been shown to be as sensitive as longer measures of PTSD (Brewin, 2005). Respondents were asked to rate their emotions during the past week in relation to the noted events on a scale of 0–4, and their responses were summed. The measure had good reliability in the current sample ( $\alpha = 0.79$ ). A cutoff score of 5 was used to determine PTSD, as it was established in previous research to provide high sensitivity, specificity and efficiency (Meltzer-Brody et al., 1999).

#### 2.2.2. Pre-pandemic depressive symptoms

We assessed depressive symptoms at baseline via the Euro-D scale (Prince et al., 1999). The scale consists of 12 yes/no questions about symptoms experienced in the past month (e.g., depressed mood). The measure has good reliability in the current sample ( $\alpha = 0.70$ ). We used this scale as a dichotomous variable with the recommended threshold at 4 (Courtin et al., 2015).

#### 2.2.3. Pre-pandemic PTSD-depression comorbidity

We combined the binary PTSD and depression variables in 2015 to create a measure of comorbidity. This measure was divided into four categories – no-disorder, PTSD-alone, depression-alone, and comorbid PTSD-depression.

In the COVID-19 wave, respondents were asked about feeling depressed, anxious/nervous and lonely with the following items:

#### 2.2.4. Feeling depressed

Respondents were asked a single yes/no question to assess depression, which inquired whether participants felt “sad or depressed” in the last month. Participants who responded positively were also asked whether they were feeling more or less depressed since the outbreak of

the pandemic. In the past, this and other single items which were used in SHARE also revealed sufficient sensitivity to cross-wave variance (Grossman et al., 2017; Van Winkle et al., 2021).

#### 2.2.5. Feeling anxious/nervous

Respondents were asked a single yes/no question about whether they felt “nervous, anxious, or on edge” in the last month. Participants who responded positively were also asked whether they were feeling more or less nervous, anxious, or on edge since the outbreak of the pandemic.

#### 2.2.6. Loneliness

Respondents were asked “How much of the time do you feel lonely?” with response options being 1 “Often”, 2 “Some of the time”, 3 “Hardly ever or never”. We converted this item to a binary measure by merging the categories of “Often” and “Some of the time”. Participants who responded positively were also asked whether they were feeling more or less lonely since the outbreak of the pandemic.

#### 2.2.7. Mental distress following the outbreak

Based on the three variables (depression, anxious/nervous, and loneliness), participants were divided into three categories: 1. Adults who did not feel depressed/nervous/lonely; 2. Adults who felt depressed/nervous/lonely since the outbreak, but it was at a constant or a lower level compared to before the outbreak; 3. Adults who felt more depressed/nervous/lonely since the outbreak. Thus, each participant received three separate scores - one score corresponding to change in depression, another score corresponding to change in feeling anxiety/nervousness and a final score addressing the change in loneliness.

#### 2.2.8. Covariates

Most of the covariates were measured at baseline (2015). These were: age (continuous), gender, education (high school or below vs. high education), group of origin (veteran-Jews, Israeli-Arabs, immigrants from the former USSR), mobility limitations (range: 0–10), self-rated health (range: 1–5), chronic conditions (range: 0–11), feeling lonely (yes/no). We also controlled for COVID-19 exposure via a positive COVID-19 test by the respondent or anyone close in 2020. We controlled for depression in 2013 to rule out prior unrelated depression not driven by trauma. This measure was based on the EURO-D depression scale, using a dichotomous variable with a cutoff of 4+ symptoms for depression.

### 2.3. Data analysis

We carried out the main data analysis using multivariable multinomial logistic regression models, since the outcome variables of mental distress during COVID-19 were divided into three categories. Each model showed the association of pre-pandemic PTSD and depression symptoms with mental distress, while controlling for the covariates. We present results in terms of relative risk ratios (RRR). These are estimates of the change in the relative risk of being in a particular category rather than the base category, net of other variables in the model. VIF scores were lower than 2 for the three regression models, indicating no multicollinearity.

## 3. Results

Table 1 presents descriptive data for the study variables. Most participants reported not feeling depressed, anxious/nervous or lonely since the outbreak. However, under a fifth (15%–19%) reported feeling worse since the outbreak. A majority of participants reported no PTSD or depression at baseline, while a fifth reported depression without PTSD and 6% reported both PTSD and depression. The sample was aged 68 on average, with a majority of women and in relatively good health.

Table 2 presents the three study models, one model per outcome, after controlling for covariates. The first model showed that older adults

**Table 1**  
Descriptive characteristics of the study sample.

	Percentage	Mean (SD)
<i>Depression in 2020</i>		
Not depressed	77.7%	
Depressed	7.6%	
More depressed	14.7%	
<i>Anxious\nervous in 2020</i>		
Not anxious\nervous	71.6%	
Anxious\nervous	9.1%	
More anxious\nervous	19.2%	
<i>Loneliness in 2020</i>		
Not lonely	68.2%	
Lonely	16.8%	
Lonelier	14.9%	
<i>PTSD-depression comorbidity in 2015</i>		
No PTSD, no depression	68.8%	
No PTSD, depression	19.4%	
PTSD, no depression	5.4%	
PTSD & depression	6.4%	
Age		68.4 (8.1)
Gender (women)	59.7%	
Education (High education)	45.6%	
<i>Origin</i>		
Veteran Israeli	77.6%	
Israeli-Arabs	7.2%	
USSR immigrants	15.3%	
COVID-19 exposure (anyone tested positive for COVID-19 in 2020)	6.6%	
Mobility limitations		1.3 (2.2)
Self-rated health		3.2 (1.1)
Chronic conditions		1.8 (1.8)
Loneliness (yes)	34.9%	
Depression in 2013 (yes)	22.7%	

who were depressed-alone in 2015 were more likely to report feeling depressed in 2020 and that their depression worsened during the pandemic, compared to those without depression or PTSD. Adults with PTSD-depression comorbidity (the “Comorbid” group in Table 2) in 2015 were almost three times more likely to report that they felt increased depression (with a coefficient of RRR = 2.76, referring to the association with the “more depressed” outcome) following the COVID-19 pandemic, compared to the reference category of those with no prior PTSD and depression.

The second model predicted feeling anxious\nervous, showing that older adults with PTSD-depression comorbidity in 2015 (the “Comorbid” group) were almost four times more likely to report that they felt more anxious\nervous during the pandemic compared to the reference category of those with no prior PTSD and depression. The third model predicted loneliness, and showed that older adults with depression-only reported increased loneliness during the pandemic. Older adults with comorbid PTSD-depression diagnosis in 2015 were three times more likely to report increased loneliness. To rule out an alternative explanation that some of the effect stems from adults with comorbidity having more PTSD symptoms, we ran an ANOVA test to compare the PTSD symptoms among the categories of the PTSD-depressive comorbidity indicator. This analysis indicated that adults with PTSD-only did not significantly differ from those with comorbid PTSD-depression in their number of PTSD symptoms ( $p > .05$ ).

**4. Discussion**

This study set out to explore whether pre-COVID-19 comorbid PTSD-depressive symptoms prospectively predict mental distress during the pandemic. Prior to addressing the predicted findings, it should be noted that in line with previous literature (see review in Hoffman et al., in press) the vast majority of the sample did not suffer from PTSD. To reiterate, the findings primarily focus on those who suffer from both

**Table 2**  
Multinomial regression models of mental distress during the COVID-19 pandemic and PTSD-depression comorbidity in 2015.

	Model 1			Model 2			Model 3							
	Depressed <sup>1</sup>			Anxious\nervous <sup>2</sup>			Lonely <sup>3</sup>							
	RRR (SE)	p		RRR (SE)	p		RRR (SE)	p						
<i>PTSD-depression comorbidity:</i>														
Depression-only <sup>4</sup>	2.39*	(0.90)	0.021	1.89*	(0.55)	0.028	1.63	(0.61)	0.193	(0.31)	0.981	2.14*	(0.64)	0.011
PTSD-only <sup>4</sup>	1.40	(0.87)	0.587	0.70	(0.45)	0.576	1.84	(0.97)	0.246	(0.56)	0.078	0.54	(0.42)	0.428
Comorbid <sup>4</sup>	1.06	(0.66)	0.926	2.76*	(1.17)	0.017	0.73	(0.47)	0.624	(1.46)	0.935	3.23*	(1.46)	0.010
Age	1.00	(0.02)	0.909	1.00	(0.01)	0.911	0.99	(0.02)	0.590	(0.01)	<0.001	1.03*	(0.02)	0.032
Gender (women)	1.57	(0.52)	0.176	1.75*	(0.42)	0.020	1.51	(0.47)	0.192	(0.38)	0.008	1.80*	(0.45)	0.020
Education (High)	0.56	(0.20)	0.098	0.48**	(0.12)	0.004	0.60	(0.21)	0.144	(0.16)	0.139	0.70	(0.19)	0.188
Origin: Israeli-Arabs <sup>5</sup>	0.62	(0.42)	0.476	0.39	(0.20)	0.065	1.01	(0.68)	0.986	(0.56)	0.272	2.63	(1.31)	0.052
Origin: USSR immigrants <sup>5</sup>	2.02	(0.91)	0.120	6.96***	(2.94)	<0.001	1.25	(0.44)	0.517	(0.44)	0.517	2.26*	(0.78)	0.017
COVID-19 exposure	1.63	(0.96)	0.410	1.90	(0.73)	0.092	0.70	(0.54)	0.643	(0.47)	0.584	0.42	(0.24)	0.10*
Mobility limitations	0.94	(0.07)	0.440	0.96	(0.06)	0.479	0.94	(0.07)	0.428	(0.05)	0.075	0.89	(0.06)	0.073
Self-rated health	1.01	(0.19)	0.960	0.73*	(0.10)	0.018	1.13	(0.21)	0.515	(0.11)	0.292	1.03	(0.14)	0.822
Chronic conditions	1.10	(0.11)	0.337	0.92	(0.08)	0.351	1.30**	(0.12)	0.006	(0.08)	0.214	1.22*	(0.10)	0.012
Depression in 2013	3.65***	(1.24)	<0.001	1.73*	(0.47)	0.044	2.64**	(0.86)	0.003	(0.46)	0.010	1.72*	(0.47)	2.11**
Loneliness	1.69	(0.52)	0.088	1.08	(0.25)	0.745	2.23**	(0.68)	0.008	(0.26)	0.341	3.66***	(0.84)	0.044

Notes: <sup>1</sup> Reference: not depressed; <sup>2</sup> Reference: not anxious\nervous; <sup>3</sup> Reference: not lonely; <sup>4</sup> Reference: No PTSD, no depression; <sup>5</sup> Reference: Origin Veteran Jews; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ; RRR = relative risk ratio; Comorbid = PTSD-Depression comorbidity.

PTSD and depression as their difficulty seems to be significant and hitherto overlooked to some extent. The results indicate that older adults who suffered from PTSD-depression comorbidity prior to the pandemic showed the highest risk of feeling more depressed, anxious/nervous, and lonely than those with no pre-pandemic symptoms. These findings extend previous studies which indicated increased psychological distress during the COVID-19 pandemic among older adults with previous traumatic exposure and PTSD symptoms (Maytles et al., 2021; Solomon et al., 2021).

Specific attention should be paid to this PTSD-depression comorbidity as it does not appear to be an artifact of overlapping symptoms, but rather a unique trauma-related phenotype (Radell et al., 2020). Indeed, earlier results showed that PTSD-depression comorbidity depends, at least in part, on separate biological mechanisms than PTSD-alone (Radell et al., 2020). Our results suggest that it would be beneficial to prioritize those older adults with a comorbid PTSD-depression diagnosis for interventions, since they are at the highest risk for mental distress in the face of a new stressor. As both researchers and clinicians often treat PTSD diagnoses as a single entity, they may miss this important distinctive vulnerability.

This study has several limitations. First, we used self-report brief questionnaires, due to the need to decrease participant burden in telephone interviews. Our outcome variables are each based on two questions about feeling depressed, anxious/nervous or lonely. While it is possible to assume that many individuals living through the pandemic would endorse feeling these negative emotions, we found that this was not the case for most respondents, in line with accumulating evidence on the relative resilience of older adults during the pandemic (Vahia et al., 2020). Second, even although we controlled for pre-COVID-19 depression and loneliness, feeling anxious/nervous was not available in earlier waves. Finally, the type of trauma was limited to warfare-related events. Future research could focus on extensions to other traumas. For example, will the current findings - showing the additional burden of the comorbid PTSD-Depression vis-à-vis mental distress outcomes - also manifest across different traumas?

In summary, our results suggest that older adults suffering from a pre-COVID-19 PTSD-depression comorbidity are at significantly higher risk for feeling more depressed, anxious/nervous or lonely during the COVID-19 pandemic. Practitioners should consider prioritizing adults with this comorbid diagnosis for receiving suitable treatment. Although most older adults displayed relative resilience, under a fifth reported increased mental distress during the pandemic. Practitioners and policy makers should pay specific attention to these more vulnerable adults. Potentially, addressing both PTSD and depression in some of these adults could promote positive outcomes and improvements to mental health levels in stressful times.

### Description of authors' roles

E. Cohn-Schwartz: Conceptualization; Formal analysis; Methodology; Writing - original draft. Y. Hoffman: Conceptualization; Writing - original draft. A. Shrira: Conceptualization; Writing - review & editing.

### Declarations of interest

None.

### Acknowledgment

This paper uses data from SHARE COVID-19 data (DOIs: 10.6103/SHARE.w8cabela.001). The SHARE data collection has been funded by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA

N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221, SSHOC: GA N°823782) and by DG Employment, Social Affairs & Inclusion. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U. S. National Institute on Aging (U01\_AG09740-13S2, P01\_AG005842, P01\_AG08291, P30\_AG12815, R21\_AG025169, Y1-AG-4553-01, IAG\_BSR06-11, OGHA\_04-064, HHSN271201300071C) and from various national funding sources is gratefully acknowledged (see [www.share-project.org](http://www.share-project.org)).

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