The toll of a second lockdown: A longitudinal study

Lockdown plays an important role in helping prevent outbreaks of COVID-19 (Atalan,2020). Full lockdowns decrease a country's the risk of biological threats and are positively associated with patient recovery (Chaudhry and colleagues, 2020). Those countries that rapidly applied lockdowns reported reduced deaths compared to countries that delayed the application of this containment (Balmford and colleagues, 2020). Nevertheless, lockdown has also been found to have direct, long lasting consequences for mental health and health-related behaviours (Niedzwiedz et al., 2020). Multiple strains associated with lockdown, including health-related and work-related stressors, can increase the prevalence of adjustment disorder.

In ICD-11, adjustment disorder (AjD) is recognized as a stress-response syndrome. The symptom profile of AjD in ICD-11 is defined via two symptom categories of: (1) excessive worry, distressing thoughts and rumination related to a stressor, and (2) significant impairment in major social, family or occupational life (Zelviene, and Kazlauskas, 2018). Additionally, research suggests that intolerance of uncertainty (IU) may play a central role in the etiology and maintenance of worry and rumination, which may explain its transdiagnostic associations with a variety of psychological disorders (Yook et al., 2020). IU has been found to be a risk factor for depression and anxiety (Glowacz & Schmits, 2020) but has yet to be studied in the context of stress related disorders, such as AjD.

The Israeli government applied two lockdowns following the first diagnosis of COVID-19 in Israel (21, February 2020). The first lockdown was between March 14th to April 19th 2020, the second five months later (September 18th to November 8th). Using a longitudinal design, the

current study explored associations between background variables, stress-related events, intolerance of uncertainty (IU) and probable depression just before the second lockdown (Time 1) and its association with AjD at Time 2 (just after the second lockdown).

1. Methods

1.1. Participants and Procedure

We used The Israel's Ipanel company to deploy a COVID-19 Mental Health Survey. The panel is a probability-based panel with 100,000 members designed to be representative of the adult population in Israel. Data were collected from August 3 to August 30, 2020 for the first wave and November 15th to December 3rd for the second wave. The sample was administered online, and all participants signed an electronic informed consent. The study was approved by Ariel University Institutional Review Board (AU-SOC-YHR-20200616). In the first wave, out of 1351 invitations sent, 1029 responded (response rate = 76.17%); in the second wave, out of 1029 participants in baseline, 764 responded (response rate = 74.24%). We conducted a-priory sensitivity analyses for each wave targeting the demographic variables of age, sex, relationship status. No significant differences were found between those who answered the survey and those who did not in both waves. The sample mean age was 40.75 (SD = 14.75; range 18-71) with 520 (50.5%) women, 600 (58.3%) who are in a committed relationship.

1.2. Measures

Participants completed the following self-report questionnaires:

COVID-19 occupational stressful event, measured by the question: "Following COVID-19 pandemic, have you lost your job, being fired or been furlough (Yes/ No).

COVID-19 health related stressful event, indicated by the question: "Following COVID-19 pandemic, has your health deteriorated or were you have been diagnosed with a new illness, injury of disability (Yes/ No).

Depression was measured using the Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001); α was .88.

Intolerance of uncertainty was assessed through the Intolerance of Uncertainty Scale (IUS-12) (Carleton et al., 2007); α was 0.91.

The predicted variable was probable *Adjustment Disorder* (AjD) based on the ICD-11, post-lockdowns. AjD was measured by the International Adjustment Disorder Questionnaire (IADQ) (Shevlin et al., 2020); α was .94.

2. Results

Table 1 presents descriptive statistics and correlations for the study variables. The results showed that COVID-19 occupational related problems, female sex COVID-19 health related problems, intolerance uncertainty and having probable depression positively correlated with AjD post lockdown.

[Insert Table 1 about here]

The analytic plan used a logistic regression with the outcome variable ICD-11 probable AjD (time 1). The predictors variables at time 1 were: age, sex, relationship status, COVID-19 occupational problems, Intolerance uncertainty and probable depression (PHQ-9 cut-off ≥10). The results showed that AjD before lockdown was predicted by female sex (OR = 2.11 [95CI 1.47-3.05]; p = <.001), having COVID-19 occupational related problems (OR = 3.60 [95CI 2.52-

5.14]; p < .001), having COVID-19 health related problems (OR = 2.12 [95CI 1.40-3.22]; p <.001), higher rate of intolerance uncertainty (OR = 1.07 [95CI 1.05-1.09]; p < .001) and having probable depression (GHQ-9 ≥ 10) (OR = 2.31 [95CI 1.54-3.45]; p < .001).

[Insert Table 2 about here]

The results of ICD-11 probable AjD (time 2). The predictors variables at time 1 were: age, sex, relationship status, COVID-19 occupational problems, Intolerance uncertainty and probable depression (PHQ-9 cut-off ≥10). The results showed that AjD post lockdown was predicted by female sex (OR = 1.82 [95CI 1.21-2.74]; p = .004), having COVID-19 occupational related problems (OR = 3.13 [95CI 2.10-4.67]; p < .001), having COVID-19 health related problems (OR = 1.77 [95CI 1.10-2.84]; p = .019), higher rate of intolerance uncertainty (OR = 1.05 [95CI 1.03-1.07]; p < .001) and having probable depression (GHQ-9 ≥ 10) (OR = 2.83 [95CI 1.79-4.46]; p < .001).

[Insert Table 3 about here]

3. Discussion

This study provides new insights into the impact of lockdown following COVID-19, with a focus on the incidence of adjustment disorder. Our results are consistent with recent Lithuanian findings associating work-related and health-related stressors and AjD (Shevlin et al., 2020). This suggests lockdowns, alongside the other stressors associated with a novel zoonotic threat such as COVID-19, should be related as life stressors experience that might cause stress-related disorders, especially among those who suffer from occupational and health problems as a result of the lockdown. Previous work on intolerance uncertainty has viewed this primarily as associated with generalized anxiety and emotional disorders (Rettie and Daniels, 2020). The present study suggests this uncertainty is an additional predictor of stress related disorders, such

as AjD, and which may hence influence coping response. Associations between depression symptoms and AjD stress the importance of treatments targeted towards potential vulnerable groups, such as females and individuals with pre-existing mental health difficulties. As AjD has been associated with higher suicide risk (Casey et al., 2015), governments and health care providers need to consider the consequences of applying several lockdowns when responding to future COVID-19 outbreaks, carefully balancing the reduction in infection vs. the risk of exacerbating economic difficulties and worsening mental health. E-health interventions such as the Brief Adjustment Disorder Intervention (BADI) for the treatment of ICD-11 adjustment disorder (Eimontas et al., 2018) and Skills for Life Adjustment and Resilience (SOLAR) (O'Donnell et al., 2019) might lessen the incidence of AjD found after applying lockdown.

We recognize possible response bias may be introduced by participation through an online application. In addition, we did not have pre COVID-19 assessments of mental health condition, suggesting caution when interpreting the present findings.

In summary, our findings indicate that the application of lockdowns to tackle novel zoonotic threats (such as COVID-19) can potentially induce significant psychological work-related and health-related stress, intolerance uncertainty and depression, which in turn may result in AjD. Care must be taken when applying additional lockdowns to address the risk of further adjustment disorders.

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Table 1. Descriptive Statistics and Correlations for Study Variables

	M/n	SD/%	1	2	3	4	5	6	7	8
1. Age	40.75	14.75	1							
2. Sex	520	50.5	-.058	1						
3. Relationship Status	600	58.3	.424***	-.021	1					
4. COVID-19 occupational related stressful event	335	32.6	-.094**	.020	-.098**	1	.			
5. COVID-19 health related stressful event	183	17.8	.094**	-.018	-.019	.143***	1			
6. Uncertainty (IUS-12)	31.15	10.06	-.138***	.094**	-.101**	.171***	.180***	1		
7. Probable Depression (PHQ9 ≥10)	211	20.5	-.119***	.031	-.176***	.151***	.236***	.398***	1	
8. Probable Adjustment Disorder (Wave 2)	151	19.8	-.066	.107**	-.060	.271***	.175***	.286***	.302***	1

Table 2. Logistic Regression from Predicting AjD in Wave 1 Based on factors in Wave 1.

	B	S.E.	Wald	Sig.	OR (95% C.I)
Age	-.003	.007	.183	.669	.997 (.983-1.011)
Sex	.748	.187	16.088	<.001	2.114*** (1.466-3.047)
Relationship Status	-.078	.201	.150	.698	.925 (.623-1.372)
COVID-19 occupational related stressful event	1.280	.182	49.556	<.001	3.597*** (2.519-5.138)
COVID-19 health related stressful event	.753	.212	12.587	<.001	2.124*** (1.401-3.220)
Uncertainty (IUS-12)	.068	.010	46.386	<.001	1.070*** (1.049-1.091)
Probable Depression (PHQ9 ≥10)	.836	.206	16.436	<.001	2.306*** (1.540-3.454)

Table 3. Logistic Regression from Predicting AjD in Wave 2 Based on factors in Wave 1.

	B	S.E.	Wald	Sig.	OR (95% C.I)
Age	-.002	.008	.036	.849	.998 (.983-1.014)
Sex	.625	.214	8.541	.003	1.868** (1.229-2.841)
Relationship Status	.115	.233	.245	.621	1.122 (.711-1.771)
COVID-19 occupational related stressful event	1.049	.209	25.134	<.001	2.855*** (1.894-4.302)
COVID-19 health related stressful event	.463	.249	3.446	.063	1.588 (.974-2.589)
Uncertainty (IUS-12)	1.501	.228	43.189	<.001	4.485*** (2.867-7.017)
Probable Depression (PHQ9 ≥10)	.924	.234	15.571	<.001	2.520*** (1.592-3.987)