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**Impact of pre-trauma recreational drug use on mental health outcomes among survivors of the Israeli Nova Festival terrorist attack. World Psychiatry.**

Supplementary Information

**Table 1: Drugs used by participants (self-reports)**

<b>Drug used</b>	<b>N</b>
Alcohol only	12
Cannabis only	6
LSD only	9
MDMA (3,4-methylenedioxy methamphetamine) only	7
DOSA only	1
MDMA + cannabis + MMC	1
Methyl meth cathinone (MMC)	3
Alcohol + cannabis	5
Alcohol + cannabis + MDMA	4
Alcohol + LSD	2
Alcohol + cocaine + MMC	2
Alcohol + MDMA + DOSA	1
Alcohol + MDMA + cocaine	1
MDMA + cannabis	2
MDMA + ketamine <sup>1</sup>	1
MDMA + cocaine	1
MDMA + DOSA	1
MMC + DOSA	1
MMC + hallucinogenic mushroom <sup>1</sup>	1
MMC + DOSA	1
Cannabis + LSD	6
Cannabis + LSD + hallucinogenic mushroom <sup>1</sup>	1
DOSA polydrug (DOSA + more than four other drugs)	6
Total	71

<sup>1</sup>Excluded from analysis

## QUESTIONNAIRES:

**Visual Analog Scale (VAS)-Anxiety :** VAS-A is a single-item version of the visual analogue scale for measuring state anxiety, which has been empirically found to be reliable, valid, and sensitive to change in state anxiety. The participants were asked to indicate their anxiety level at a given moment using the VAS-A (1), a 10-cm horizontal line (from 0 to 10 points), which measured from left to right, absence or less intensity of anxiety to highest intensity of anxiety. A positive score was observed as equal to or higher than 6 points (2).

**The Peritraumatic Dissociative Experiences Questionnaire (PDEQ)** is a self-report inventory used for retrospective measurement of the perception of dissociation during and immediately after a threatening event (3, 4). The questionnaire is composed of 10 items, 5-point-Likert-scaled, which include the following experiences: losing track of what is going on or experiencing a “blank out”; sensation of doing things that the person has not actively decided to do; change in the sense of time; sensation of unrealism – as though the person was in a movie or dream; sensation of being a spectator; and sensation of body size distortion. The clinical threshold for this instrument is 15 points or higher (5, 6).

**Generalized Anxiety Disorder 7 scale (GAD-7) (7):** The GAD-7 is a well-validated 7-item questionnaire for generalized anxiety disorder, describing the key diagnostic criteria for GAD according to DSM-IV-TR (APA, 2000): Criterion A (fear and anxiety related to a series of events or activities), Criterion B (difficulties in controlling concerns), and Criterion C (anxiety and worry accompanied by at least three additional symptoms, such as restlessness, mild fatigue, difficulty concentrating, irritability, muscle tension, and sleep problems). The GAD-7 assesses the frequency of experiencing the seven core symptoms of GAD over the past two weeks. Response options include 'not at all,' 'on some days,' 'on more than half of the days,' and 'almost every day,' each scored from 0 to 3. The total score ranges from 0 to 21. Using the threshold score of 10, the GAD-7 has a sensitivity of 89% and a specificity of 82% for GAD-7 (Spitzer et al., 2006).

**Patient Health Questionnaire 9 (PHQ-9) (8):** The PH-9 is the 9-item depression module from the full PHQ. As a severity measure, the PHQ-9 score can range from 0 to 27, since each of the 9 items can be scored from 0 (not at all) to 3 (nearly every day). PHQ-9 scores of 5, 10, 15, and 20 represent valid and easy-to-remember thresholds demarcating the lower limits of mild, moderate, moderately severe, and severe depression. In particular, scores less than 10 seldom occur in individuals with major depression while scores of 15 or greater usually signify the presence of major depression (8).

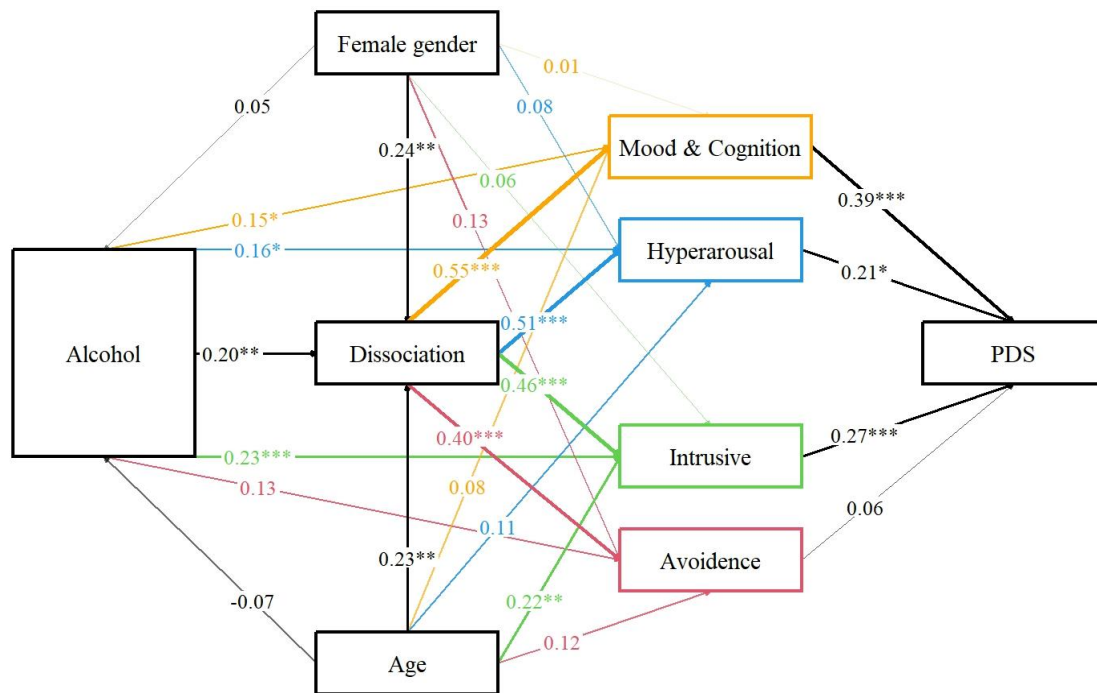
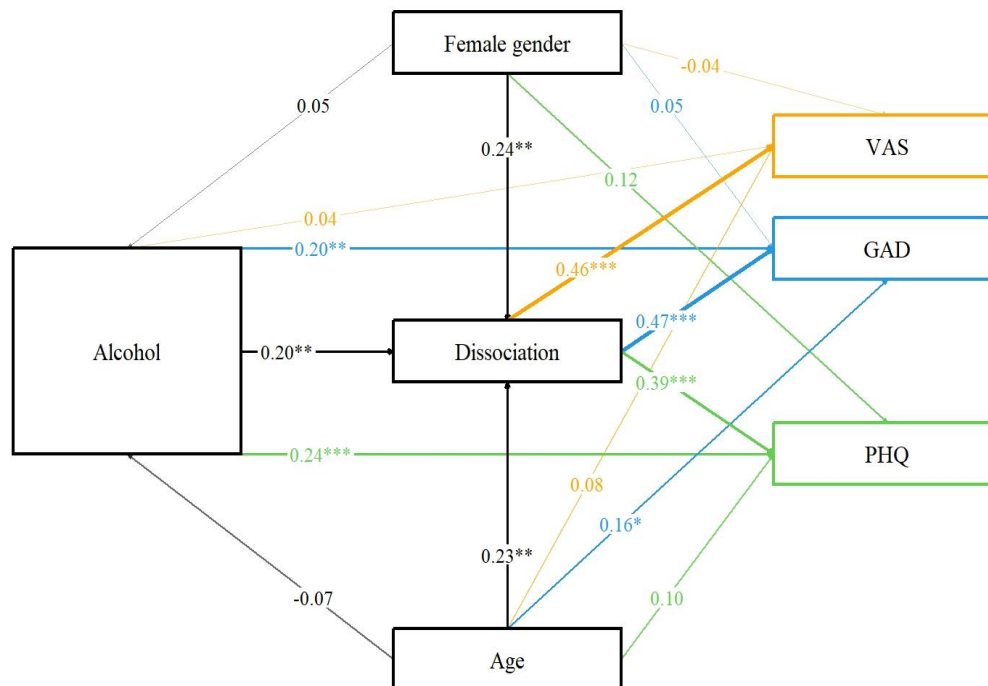
**Posttraumatic Diagnostic Scale (PDS-5) (9):** The PDS-5 is a 20-item self-report measure that assesses PTSD symptom severity in the last month according to *DSM-5* criteria. Symptom items are rated on a 5-point scale of frequency and severity ranging from 0 (Not at all) to 4 (6 or more times a week / severe). All questions assess the presence and severity of the PTSD symptoms in relation to the index trauma; symptom questions are based on the *DSM-5* symptom clusters intrusion (Items 1–5), avoidance (Items 6–7), changes in mood and cognition (Items 8–14), and arousal and hyperreactivity (Items 15–20). The final score is calculated by summing the scores of the individual items, which range from 0 to 80; a higher total score indicates a more severe case of PTSD. A cut-off score of 28 was used to distinguish between persons with a probable PTSD diagnosis ( $\text{PDS-5} \geq 28$ ) and persons without a probable PTSD diagnosis ( $\text{PDS-5} < 28$ ) (9).

**Table 2: Multiple regression analysis predicting mental health consequences among survivors of the Nova Festival**

Dependent variable	Independent variable	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	$\beta$	Std. Err. $\beta$	- 95% CI	+ 95% CI	p-value
<b>VAS-A</b>	<b>F(9, 91)=1.2, p = 0.3</b>	<b>0.33</b>	<b>0.11</b>	<b>0.02</b>					
	Dosa				0.03	0.11	-0.19	0.25	0.781
	Cannabis				-0.03	0.10	-0.24	0.18	0.771
	MMC				0.00	0.10	-0.20	0.20	0.994
	MDMA				-0.07	0.11	-0.28	0.14	0.530
	LSD				0.01	0.10	-0.20	0.21	0.959
	<b>Alcohol</b>				<b>0.27</b>	<b>0.10</b>	<b>0.07</b>	<b>0.48</b>	<b>0.010</b>
	Cocaine				0.03	0.11	-0.19	0.25	0.793
	Gender				-0.15	0.10	-0.35	0.05	0.148
	Age				0.01	0.10	-0.20	0.21	0.940
<b>PDEQ</b>	<b>F(9,109)=2.4, p= 0.018</b>	<b>0.40</b>	<b>0.16</b>	<b>0.09</b>					
	Dosa				0.00	0.10	-0.19	0.19	0.988
	<u>Cannabis</u>				-0.16	0.09	-0.34	0.02	<u>0.089</u>
	MMC				-0.07	0.09	-0.25	0.11	0.420
	MDMA				0.09	0.09	-0.09	0.28	0.318
	LSD				0.09	0.09	-0.08	0.27	0.293
	<b>Alcohol</b>				<b>0.25</b>	<b>0.09</b>	<b>0.07</b>	<b>0.43</b>	<b>0.008</b>
	Cocaine				0.05	0.09	-0.13	0.24	0.571
	<b>Gender</b>				<b>-0.22</b>	<b>0.09</b>	<b>-0.40</b>	<b>-0.05</b>	<b>0.014</b>
	Age				-0.03	0.09	-0.21	0.16	0.781
<b>GAD-7</b>	<b>F(9,112)=2.05, p = 0.04</b>	<b>0.38</b>	<b>0.14</b>	<b>0.073</b>					
	Dosa				0.10	0.10	-0.09	0.29	0.309
	Cannabis				-0.03	0.09	-0.21	0.16	0.772
	MMC				0.11	0.09	-0.07	0.29	0.226
	MDMA				0.04	0.09	-0.15	0.23	0.664
	LSD				0.11	0.09	-0.07	0.29	0.230
	<b>Alcohol</b>				<b>0.29</b>	<b>0.09</b>	<b>0.11</b>	<b>0.47</b>	<b>0.002</b>
	Cocaine				-0.03	0.09	-0.22	0.16	0.753
	<b>Gender</b>				<b>-0.13</b>	<b>0.09</b>	<b>-0.31</b>	<b>0.05</b>	<b>0.160</b>
	Age				0.16	0.09	-0.02	0.34	<u>0.080</u>
<b>PHQ-9</b>	<b>F=(9,112)=2.3, p=0.02</b>	<b>0.40</b>	<b>0.15</b>	<b>0.09</b>					
	Dosa				0.08	0.10	-0.11	0.27	0.402
	Cannabis				0.01	0.09	-0.17	0.19	0.924
	MMC				0.09	0.09	-0.08	0.27	0.294
	MDMA				-0.07	0.09	-0.26	0.11	0.428
	LSD				0.12	0.09	-0.06	0.29	0.197
	<b>Alcohol</b>				<b>0.32</b>	<b>0.09</b>	<b>0.14</b>	<b>0.50</b>	<b>0.001</b>
	Cocaine				-0.02	0.09	-0.21	0.16	0.813
	Gender				-0.15	0.09	-0.33	0.03	<u>0.098</u>
	Age				0.05	0.09	-0.13	0.23	0.593
<b>PDS-5 total</b>	<b>F=(9,112)=1.2, p = 0.3</b>	<b>0.3</b>	<b>0.085</b>	<b>0.012</b>					
	Dosa				-0.03	0.10	-0.23	0.17	0.778
	Cannabis				-0.12	0.10	-0.30	0.07	0.230
	MMC				0.09	0.09	-0.09	0.28	0.311
	MDMA				0.05	0.10	-0.14	0.25	0.594
	LSD				0.11	0.09	-0.08	0.29	0.244
	<b>Alcohol</b>				<b>0.24</b>	<b>0.09</b>	<b>0.05</b>	<b>0.42</b>	<b>0.013</b>
	Cocaine				0.03	0.10	-0.17	0.22	0.789
	Gender				-0.06	0.09	-0.24	0.13	0.528
	Age				0.05	0.09	-0.14	0.24	0.610
<b>PDS-5: Intrusive</b>	<b>F=(9,109)=1.9, p= 0.05</b>	<b>0.4</b>	<b>0.14</b>	<b>0.066</b>					
	Dosa				0.12	0.10	-0.08	0.31	0.238
	Cannabis								

	MMC				-0.07	0.09	-0.26	0.12	0.456
	MDMA				0.08	0.09	-0.10	0.26	0.393
	LSD				-0.01	0.10	-0.20	0.18	0.949
	<b>Alcohol</b>				-0.01	0.09	-0.19	0.18	0.952
	Cocaine				0.33	0.09	0.14	0.51	0.001
	Gender				-0.03	0.10	-0.22	0.16	0.787
	Age				-0.10	0.09	-0.29	0.08	0.266
					0.14	0.09	-0.04	0.33	0.127
<b>PDS-5: Avoidance</b>	<b>F=(9,109)=1.4, p= 0.18</b>	<b>0.4</b>	<b>0.14</b>	<b>0.06</b>					
	Dosa				-0.08	0.10	-0.28	0.12	0.419
	Cannabis				-0.03	0.10	-0.22	0.16	0.750
	MMC				-0.10	0.09	-0.29	0.08	0.276
	MDMA				-0.07	0.10	-0.26	0.13	0.492
	LSD				0.14	0.09	-0.05	0.32	0.148
	<b>Alcohol</b>				0.17	0.09	-0.01	0.36	0.069
	Cocaine				0.05	0.10	-0.14	0.24	0.608
	Gender				-0.15	0.09	-0.34	0.03	0.107
	Age				0.02	0.09	-0.17	0.20	0.873
<b>PDS-5: Mood</b>	<b>F=(9,109)=1.3, p= 0.25</b>	<b>0.31</b>	<b>0.10</b>	<b>0.02</b>					
	Dosa				-0.03	0.10	-0.23	0.17	0.767
	Cannabis				-0.11	0.10	-0.30	0.08	0.254
	MMC				0.05	0.09	-0.14	0.23	0.612
	MDMA				0.14	0.10	-0.06	0.33	0.171
	LSD				0.13	0.09	-0.06	0.31	0.171
	<b>Alcohol</b>				0.23	0.09	0.05	0.42	0.014
	Cocaine				0.03	0.10	-0.16	0.23	0.753
	Sex				-0.07	0.09	-0.26	0.11	0.443
	Age				0.04	0.10	-0.15	0.22	0.709
<b>PDS-5: Hyperarousal</b>	<b>F=(9,109)=2.12, p = 0.03</b>	<b>0.39</b>	<b>0.15</b>	<b>0.08</b>					
	Dosa				0.01	0.10	-0.18	0.21	0.884
	Cannabis				-0.03	0.09	-0.22	0.15	0.744
	<b>MMC</b>				0.24	0.09	0.06	0.42	0.011
	MDMA				0.08	0.10	-0.11	0.27	0.405
	LSD				0.18	0.09	-0.00	0.36	0.055
	<b>Alcohol</b>				0.24	0.09	0.06	0.42	0.011
	Cocaine				-0.02	0.10	-0.21	0.17	0.849
	Gender				-0.13	0.09	-0.31	0.05	0.155
	Age				0.03	0.09	-0.16	0.21	0.763
<b>Peritraumatic Dissociation (PDEQ scale)</b>	<b>F(9, 89)=10.1, p = 0.0001</b>	<b>0.71</b>	<b>0.51</b>	<b>0.46</b>					
	<b>VAS-A</b>				0.31	0.12	0.06	0.55	0.016
	<b>GAD-7</b>				0.07	0.15	-0.23	0.36	0.650
	<b>PHQ</b>				0.16	0.11	-0.07	0.39	0.169
	<b>Intrusive</b>				-0.16	0.14	-0.44	0.13	0.270
	<b>Avoidance</b>				0.01	0.10	-0.19	0.21	0.928
	<b>Mood</b>				0.28	0.13	0.01	0.54	0.040
	<b>Arousal</b>				0.12	0.13	-0.14	0.38	0.367
	<b>Sex</b>				-0.11	0.08	-0.26	0.04	0.162
	<b>Age</b>				-0.03	0.08	-0.19	0.13	0.690

Multicollinearity, which was assessed to test the stability and reliability of the regression models, did not reveal any significant issues and the within tolerances ranged between 0.78 and 0.95, indicating independence among the predictor variables. This finding supports the validity of the regression analyses.

**Figure 1****A:****B)**

**Figure 1:** The path diagram of the model suggests that peri-traumatic dissociation mediates the relationship between pre-trauma alcohol consumption and post-trauma mood, cognition, arousal, hyperactivity, and intrusive PDS-5 subscales (A), as well as anxiety and depression symptoms (B). In the diagram, significant paths are represented by bolder lines, while non-significant paths are depicted with thinner lines.

\*\*\*standardized path coefficient ( $\beta$ ) is significant at  $p < 0.001$ , two-tailed; \*\* standardized path coefficient is significant at  $p < 0.01$ , two-tailed; \*standardized path coefficient is significant at  $p < 0.05$ , two-tailed.

A mediation model was tested using the criteria proposed by Baron and Kenny (11). As shown in Figures 1-2, a mediation analysis showed that pre-trauma alcohol consumption positively predicted PDS-5 mood scores ( $\beta = 0.15$ ,  $p = 0.03$ ), PDS-5 arousal scores ( $\beta = 0.16$ ,  $p = 0.015$ ), PDS-5 intrusive scores ( $\beta = 0.23$ ,  $p = 0.001$ ), GAD-7 anxiety scores ( $\beta = 0.2$ ,  $p = 0.0015$ ), PHQ-9 depression scores ( $\beta = 0.24$ ,  $p = 0.00025$ ), and PDEQ peri-traumatic dissociation scores ( $\beta = 0.2$ ,  $p = 0.01$ ), i.e., the direct paths. Additionally, with the introduction of the peri-traumatic dissociation variable into the model as a potential mediator, the association between alcohol consumption and PDS-5 mood, PDS-5 intrusive, GAD-7 anxiety, and PHQ-9 depressive scores was attenuated and the direct effect became less significant ( $p < 0.04$ ,  $p < 0.015$ ,  $p < 0.015$ , and  $p < 0.02$ , respectively), i.e., the indirect paths. This finding suggests that peri-traumatic dissociation partially mediated the association between alcohol consumption and mood, intrusion, anxiety, and depressive symptoms. Zero was not included in a bias-corrected bootstrap-confidence interval, indicating that the indirect effects were significant (Table 3). It is noteworthy that none of the other drugs consumed prior to the traumatic event was associated with dissociation scores.

**Table 3: Mediating role of peri-traumatic dissociation in the relationship between pre-trauma alcohol consumption and post-trauma anxiety, depression, and acute stress disorder.**

Dependent variables	Alcohol consumption			Peritraumatic Dissociation (Mediator)			Indirect effects	Bootstrap		
	Direct effect $\beta \pm SE$	95% CI	p-value	Direct effect $\beta \pm SE$	95% CI	p-value		$\beta \pm SE$	95% CI	p-value
<b>PDS-5 Mood</b>	0.146 $\pm$ 0.067	0.0141 – 0.278	0.0301	0.109 $\pm$ 0.043	0.024 – 0.194	<b>0.042</b>	42.75 %	0.111 $\pm$ 0.073	0.111 – 0.397	0.001
<b>PDS-5 Arousal</b>	0.159 $\pm$ 0.064	0.0335 – 0.284	0.0130	0.103 $\pm$ 0.041	0.022 – 0.183	0.013	39.46 %	0.129 $\pm$ 0.067	0.129 – 0.395	0.0001
<b>PDS-5 Intrusive</b>	0.230 $\pm$ 0.067	0.0989 – 0.362	0.0006	0.091 $\pm$ 0.037	0.018 – 0.164	<b>0.014</b>	28.35 %	0.184 $\pm$ 0.068	0.184 – 0.451	0.0001
<b>PDS-5 Avoidance</b>	0.129 $\pm$ 0.074	-0.0154 – 0.273	0.0800	0.079 $\pm$ 0.034	0.013 – 0.146	0.020	37.98 %	0.076 $\pm$ 0.069	0.076 -0.343	0.003
<b>VAS-A</b>	0.043 $\pm$ 0.064	-0.1030 – 0.188	0.5659	0.092 $\pm$ 0.039	0.017 – 0.168	0.017	68.15 %	-0.041 $\pm$ 0.088	-0.041 – 0.302	0.132
<b>GAD-7</b>	0.204 $\pm$ 0.064	0.0789 – 0.329	0.0014	0.094 $\pm$ 0.038	0.019 – 0.168	<b>0.013</b>	31.54 %	0.166 $\pm$ 0.065	0.166 – 0.418	0.0001
<b>PHQ-9</b>	0.243 $\pm$ 0.074	0.1174 – 0.369	0.0002	0.078 $\pm$ 0.033	0.014 – 0.142	<b>0.017</b>	24.30 %	0.149 $\pm$ 0.074	0.149 – 0.443	0.000
<b>PDEQ</b>	0.199 $\pm$ 0.076	0.0499 – 0.349	0.0090							



## REFERENCES

1. Bernstein GA, Garfinkel BD. The Visual Analogue Scale for Anxiety—Revised: Psychometric properties. *Journal of Anxiety Disorders*. 1992;6(3):223–39.
2. Boonstra AM, Schiphorst Preuper HR, Balk GA, Stewart RE. Cut-off points for mild, moderate, and severe pain on the visual analogue scale for pain in patients with chronic musculoskeletal pain. *Pain*. 2014;155(12):2545-50.
3. Marmar CR, Weiss DS, Metzler TJ. The Peritraumatic Dissociative Experiences Questionnaire. Assessing psychological trauma and PTSD. New York, NY, US: The Guilford Press; 1997. p. 412-28.
4. Agorastos A, Nash WP, Nunnink S, Yurgil KA, Goldsmith A, Litz BT, et al. The Peritraumatic Behavior Questionnaire: development and initial validation of a new measure for combat-related peritraumatic reactions. *BMC psychiatry*. 2013;13:9.
5. Birmes P, Brunet A, Benoit M, Defer S, Hatton L, Sztulman H, et al. Validation of the Peritraumatic Dissociative Experiences Questionnaire self-report version in two samples of French-speaking individuals exposed to trauma. *European psychiatry : the journal of the Association of European Psychiatrists*. 2005;20(2):145-51.
6. deMello RAF, Coimbra BM, Pedro BDM, Benvenuti IM, Yeh MSL, Mello AF, et al. Peritraumatic Dissociation and Tonic Immobility as Severity Predictors of Posttraumatic Stress Disorder After Rape. *Journal of interpersonal violence*. 2023;38(3-4):4240-66.
7. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*. 2006;166(10):1092-7.
8. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *Journal of general internal medicine*. 2001;16(9):606-13.
9. Foa EB, McLean CP, Zang Y, Zhong J, Powers MB, Kauffman BY, et al. Psychometric properties of the Posttraumatic Diagnostic Scale for DSM-5 (PDS-5). *Psychological assessment*. 2016;28(10):1166-71.