

## Original Research

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# Posttraumatic Stress Symptoms, Physical Illness, and Social Adjustment Among Disaster Victims

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### Abstract

**Objective:** Posttraumatic stress disorder is one of the most studied outcomes after a disaster. Posttraumatic stress symptoms (PTSS) are maladaptive and disabling and can severely impair affected individuals' psychosocial functioning and quality of life. Consequently, the objective of this research is to investigate the prevalence of PTSS and physical illness among disaster victims.

**Methods:** We analyzed disaster victims' survey data in South Korea 1 year after a natural disaster (n = 1659). Then, we performed multivariable comparisons of social and work adjustments between individuals with PTSS and individuals with physical illness to examine the association between PTSS and functional impairment.

**Results:** Individuals with PTSS had a significant association with work and social maladjustments whether or not they had a physical illness; PTSS (+) physical illness (-) group (OR: 1.18, CI: 1.12–1.26,  $P < 0.001$ ) and PTSS (+) physical illness (+) group (OR: 1.16, CI: 1.08–1.23,  $P < 0.001$ ). Interestingly, this association was not significant in the group that exclusively presented physical illness.

**Conclusions:** Our results suggest that PTSS might be a critical factor in social maladjustment during the post-disaster period. Subsequently, an assessment of disaster victims' PTSS would help ensure effective medical and governmental approaches to assist disaster victims.

Disasters can have physical, psychological, and social impacts on the affected population.<sup>1–3</sup> Sudden and overwhelming social disorganization, such as displacements or deaths, induces social support disruptions, occupational and economic stress, and health problems.<sup>2–5</sup> All these factors make it difficult for disaster victims to return to their daily lives and influence individuals' functionality after a disaster.<sup>6</sup>

After disasters, different factors create functional impairment and a poor quality of life.<sup>6–8</sup> Disaster exposure can lead to negative physical health consequences, which cause deteriorated daily functioning.<sup>9</sup> Disasters also directly give rise to injuries or physical illness<sup>10–13</sup> through accidents that produce structural collapse<sup>10</sup> and can cause long-term health impacts. Difficulties in health care accessibility or shortages of basic needs lead to an increased prevalence of chronic diseases such as respiratory health, diabetes, and cancer among disaster victims.<sup>10–14</sup>

Additionally, posttraumatic stress symptoms (PTSS), which frequently occur among disaster victims,<sup>2,6,7</sup> can lead to social maladaptation.<sup>15,16</sup> PTSS include intrusive re-experiencing, avoidance of trauma memories, disturbances in cognition and mood, and hyperarousal.<sup>17</sup> These symptoms are maladaptive and disabling and can severely impair the affected individuals' psychosocial functioning and quality of life.<sup>16,18</sup> Likewise, posttraumatic stress disorder (PTSD) is frequently comorbid with depression and anxiety, which can delay recovery and worsen daily life functioning.<sup>16,19–21</sup>

Research has indicated that PTSD severity is more associated with global functional impairment after trauma exposure than other specific aspects of traumatic experiences or physical injuries.<sup>22</sup> Subsequently, PTSD can be considered a mechanism for functional impairment observed after traumatic exposure.<sup>22,23</sup> However, physical illness or concomitant mental disorders are frequently not included in the analyses, which could lead to bias in the variance of functional impairment assessments.<sup>22</sup>

In the present study, we aimed to investigate the prevalence of PTSS and physical illness in a large sample of South Korean disaster victims 1 year after the occurrence of a natural disaster. Our goal was to compare social and work adjustments between individuals with PTSS and individuals with physical illness to examine the importance of PTSS in disaster victims' functional impairment. To our knowledge, this is the first study that evaluated social and work maladjustments 1-year post-disaster in victims who present PTSS compared to those with physical illnesses.

## Methods

### Participants and Procedures

All the participants were selected and surveyed from the National Disaster Safety Research Institute list of disaster victims who were provided financial assistance from the Disaster Relief Donation Fund designated by the government from 2012 to 2017 in South Korea. This funding is government capital destined for humanitarian aid to assist and revive the economies of disaster victims. The types of disaster events experienced by the subjects included floods, typhoons, earthquakes, and fires and are detailed in Table 1.<sup>24</sup> The data were obtained over 5 months, from September 2017 to January 2018, through surveys that were stratified by sex and residence province. The study areas included Seoul, Incheon, Gyeonggi, Gangwon, Daejeon, Sejong, Chungbuk, Chungnam, Gwangju, Jeonbuk, Jeonnam, Jeju, and Daegu. Survey teams were established with a total of 60 people who were trained specifically for this research. Face-to-face interviews were performed to complete the questionnaires and clinical scales.

In total, 1822 individuals were surveyed, and 1659 completed the evaluation (response rate: 91.1%). Participants of ages between 19 and 69 who did not have physical or psychiatric illnesses before the disasters were selected for the study. Participants who presented missing data were excluded, giving a total of  $n = 988$ . Ethics committee approval was obtained for this study from the National Center for Mental Health, Seoul, South Korea (IRB File No. 11627-2019-31). Participation in the study was voluntary, and informed written consent was obtained from all participants.

### Instruments

Data were obtained by a self-report questionnaire and clinically validated scales that included information related to demographic participant profile, characteristics of the disaster exposure, PTSD symptoms, general health, resilience, and work and social adjustments. The specific scales and questionnaires used are listed below.

#### Demographic and disaster exposure characteristics

Age, sex, education, and economic status were included as demographic characteristics. Education level was divided into elementary school or below, middle school, high school, and university studies. Economic status was divided into 5 groups depending on monthly income (Won): < 1 million, 1–3 million, 3–5 million, 5–7 million, > 7 million. Injury and the perceived life threat levels were assessed and divided into 3 groups: none, low injury, and high injury. Self-report questionnaires were used to assess the following variables: (1) prevalence and persistence of injuries and diseases after the disaster (short-answer rating), (2) physical damage after the disaster (multiple ratings), (3) scale of damage loss after the disaster (short-answer rating), (4) witnessed damage after the disaster (multiple ratings), (5) experienced life-threatening disaster (short-answer rating), (6) assisted identifying victims and persons (multiple ratings), (7) experienced separation after the disaster (multiple ratings), and (8) experienced moving residence after the disaster (multiple ratings).

#### Depression

Depression was assessed using the Korean version of the Patient Health Questionnaire depression module 9 (PHQ-9).<sup>25,26</sup> The PHQ-9 is a self-report questionnaire with 9 items that correspond to DSM-IV criteria for depressive disorders and measures

**Table 1.** Types of disaster events experienced by subjects

Disaster type		Disaster scale <sup>24</sup>	N	%
Natural disaster ( $n = 916$ )	Typhoon & flooding (2012.8.–9.)	Wind: >186 km/h, rain: 150 mm	332	92.7
	Flooding (2013.7.)	Wind: 75 km/h, rain: 70 mm	59	
	Flooding (2014.8.)	Wind: 151 km/h, rain: 150 mm	146	
	Typhoon & flooding (2015.7.)	Wind 93 km/h, rain: 125 mm	50	
	Chaba typhoon & flooding (2016.9)	Wind: 120 km/h, rain: 280 mm	120	
	9.12 Gyeongju earthquake (2016.9)	Magnitude: 5.8	87	
	The central and southeastern regions flooding (2017.7~9)	Wind: 85 km/h	122	
Anthropogenic disaster ( $n = 72$ )	Uijeongbu apartment fire (2015.1)	4 death, 101 injured	35	7.3
	Daegu Seomun market fire (2016.11)	800 stores damaged	21	
	Yeosu fish market fire (2017.1)	116 stores damaged	11	
	Incheon Sorae fish market fire (2017.3.)	20 stores damaged	5	
Total			988	100

symptom severity.<sup>25</sup> Each item is scored on a 3-point Likert scale with a total score ranging between 0 and 27.

#### Posttraumatic stress symptoms (PTSS)

PTSS were assessed using the Impact of Event Scale–Revised<sup>27</sup>—Korean version (IES-R-K).<sup>28</sup> IES-R-K is a 22-item, 4-point Likert scale, ranging from 0 (“not at all”) to 4 (“extremely”), and assesses subjective distress in response to traumatic events during the previous week.<sup>27</sup> The total score ranges from 0 to 88 and is divided into 3 subscales that evaluate intrusion (8 items), avoidance (8 items), and hyperarousal (6 items).<sup>27,29</sup> Higher scores correspond to more significant subjective distress.<sup>27,30</sup>

#### Physical illness

The presence of physical illness was assessed by self-report questionnaires that included digestive system illnesses, chronic headaches, dental diseases, hypertension, obstetrics or gynecological illnesses, neoplasia, cerebral vascular disease, and others.

#### Resilience

Resilience was assessed using the Brief Resilience Scale (BRS),<sup>31</sup> which is a self-report questionnaire including 6 items to measure the capability to recover from difficulties. Each item is evaluated by participants, with 5 agreement levels—from 1 (“strongly disagree”) to 5 (“strongly agree”).<sup>31</sup>

#### Work and social adjustments

Work and social adjustments were assessed using the Work and Social Adjustment Scale (WSAS),<sup>32</sup> which is a 5-item scale that

assesses functional impairment attributable to an identified problem. Each item is rated on an 8-point Likert scale—from 1 (“not at all”) to 8 (“very severely”).<sup>32</sup> The total scores are interpreted as > 20 severe impairment and symptomatology, 10–20 significant impairment but less symptomatology, and < 10 subclinical presentation.<sup>32</sup>

### Statistical Analysis

For the statistical analysis, 3 groups were constructed based on PTSS and physical illness incidence 1-year post-disaster: (1) PTSS (-) physical illness (+); (2) PTSS (+) physical illness (-); and (3) PTSS (+) physical illness (+). A cross-sectional descriptive analysis was performed with the IBM Statistical Package for Social Sciences (SPSS; Armonk, NY) software. The mean, standard deviation, and range of variables were calculated as descriptive statistics. An analysis of variance (ANOVA) test was performed to compare the sociodemographic data, resilience, injury, perceived life threat level, and work and social adjustments in the 3 groups. A *P*-value of 0.05 was thought to be statistically significant. A post-hoc Bonferroni analysis was performed for the covariates (sex, age, education, injury, perceived life threat, and resilience) correction. Corrected means and standard deviations were re-calculated to compare social and work adjustments between the 3 groups. Likewise, a multiple comparison analysis was applied to confirm the differences between the 3 groups mentioned above. To evaluate the odds ratio for the associations with social/work adjustments in each group, we performed a multiple logistic regression using PTSS (-) and physical illness (-) as reference groups. To select potential covariates for the final model, a simple logistic regression was performed for each variable.

### Results

Table 2 presents the prevalence of physical illness among participants 1-year post-disaster. A total of 305 (30.36%) participants presented post-disaster physical illnesses. The most prevalent physical illness was related to the musculoskeletal system (28.94%), followed by hypertension (18.84%), digestive system-related illnesses (12.33%), diabetes (8.56%), chronic headaches (5.99%), and dental health problems (5.65%). Other less prevalent illnesses were related to the cardiovascular system (3.77%), dermatology (3.77%), obstetrics and gynecology (2.05%), neoplasia (1.54%), cerebrovascular disease (1.54%), and urogenital system illnesses (1.03%). Differences in sociodemographic characteristics, the type of disaster exposure, mental health problems, quality of life, and work and social adjustments between the group PTSS (+) and the group PTSS (-) are illustrated in Table 3.

From the total sample, 347 individuals presented PTSS. A greater proportion of the PTSS (+) group were women (56.4%) compared to the PTSS (-) group (43.6%):  $F_{1,987} = 7.21, P < 0.01$ . The mean age in the PTSS (+) group was higher (52.71 years) than in the PTSS (-) group (49.72 years):  $F_{1,987} = 3.18, P < 0.01$ . Among the PTSS (+) group, a significantly greater proportion of participants (12.5%) presented the lowest assessed income (< 1 million Won):  $F_{1,987} = 34.6, P < 0.001$ ; and a lower proportion (14.4%) had completed the highest education level (> university):  $F_{1,987} = 11.3, P < 0.01$ , compared to the PTSS (-) group. Regarding the type of disaster exposure, the PTSS (+) group had significantly more exposure to anthropogenic disasters (11.8%) compared to the PTSS (-) group (5.3%):  $F_{1,987} = 13.3, P < 0.001$ . Furthermore, the PTSS (+) group presented a

**Table 2.** Prevalence of physical illness 1-year post-disaster

Physical illness N (%)		
Digestive system	72	12.33
Musculoskeletal system	169	28.94
Chronic headache	35	5.99
Dental	33	5.65
Skin disease	22	3.77
Hypertension (high blood pressure)	110	18.84
Obstetrics and gynecology	12	2.05
Urogenital system	6	1.03
Diabetes	50	8.56
Cardiovascular system	22	3.77
Neoplasia	9	1.54
Cerebrovascular disease	9	1.54
Others	35	5.99
Total	584	100

significantly higher proportion of injury experience (12.1%) compared to the PTSS (-) group (5.2%):  $F_{1,987} = 17.66, P < 0.001$ . There were no statistically significant differences between the PTSS (+) and PTSS (-) groups in alcohol and tobacco abuse rates.

Depression scores were significantly higher in the PTSS (+) group (20.7% presented moderate or severe scores) compared to the PTSS (-) group (8.8% presented moderate or severe scores):  $F_{1,987} = 15.61, P < 0.001$ . Likewise, the PTSS (+) group presented worse scores in sleep quality in the last month, while 8.2% of the PTSS (+) group participants scored “very bad” in this variable compared to 1.2% of the PTSS (-) group:  $F_{1,987} = 107.58, P < 0.001$ . Moreover, the PTSS (+) group experienced more physical illness (45.9%) than the PTSS (-) group (30.3%):  $F_{1,987} = 22.50, P < 0.001$ . The PTSS (+) group reported significantly worse scores in quality of life (20.07) compared to the PTSS (-) group (23.1):  $F_{1,987} = 10.65, P < 0.001$ . Similarly, work/social adjustment scores were worse in the PTSS (+) group (4.39) than in the PTSS (-) group (1.12):  $F_{1,987} = 13.61, P < 0.001$ .

Next, we present odds ratios for the associations between the constructed groups (based on the incidence of PTSS and physical illness in the year post-disaster, using PTSS [-] and physical illness [-] as reference groups) and sociodemographic characteristics, disaster exposure characteristics, alcohol and tobacco abuse, depression, sleep quality, physical illness, quality of life, and work and social adjustment variables. The results of the simple logistic regression are illustrated in Table 4.

As sex, education, disaster type, injury exposure, and alcohol and tobacco abuse did not have significant associations in all 3 groups, they were excluded in the final logistic regression model (Table 5). Work and social maladjustments presented significant odds ratios in both the PTSS (+) physical illness (-) group (OR: 1.18, CI: 1.12–1.26,  $P < 0.001$ ) and PTSS (+) physical illness (+) group (OR: 1.16, CI: 1.08–1.23,  $P < 0.001$ ) but not the PTSS (-) physical illness (+) group.

### Discussion

To our knowledge, this is the first study that has compared social and work adjustments 1-year post-disaster between victims who had physical illnesses and those with PTSS. We found that groups who presented PTSS (+), regardless of whether they had physical illnesses, had a significant association with work and social

**Table 3.** The result of chi-square test and ANOVA of sociodemographic, numeric variables in group based on the course of PTSS

Variables	Total N = 988		Group				F (or)
	M or n	SD or %	PTSS (-) n = 683		PTSS (+) n = 305		
			M or n	SD or %	M or n	SD or %	
<b>Sex</b>							7.21**
Male	494	50.0	361	52.9	133	43.6	
Female	494	50.0	322	47.1	172	56.4	
<b>Age (19–69 years)</b>	50.64	13.74	49.72	14.46	52.71	11.74	-3.18**
<b>Income (Won)</b>							34.62***
<1 million	64	6.5	26	3.8	38	12.5	
1–3 million	464	47.0	311	45.5	153	50.2	
3–5 million	359	36.3	266	38.9	93	30.5	
5–7 million	82	8.3	66	9.7	16	5.2	
>7 million	19	1.9	14	2.0	5	1.6	
<b>Education N (%)</b>							11.29**
< Middle	284	28.7	194	28.4	90	29.5	
< High	499	50.5	328	48.0	171	56.1	
< University	205	20.7	161	23.6	44	14.4	
<b>Disaster type</b>							13.32***
Natural	916	92.7	647	94.7	269	88.2	
Human-made	72	7.3	36	5.3	36	11.8	
<b>Injury experience</b>							17.66***
No	914	92.5	693	94.8	355	87.9	
Yes	74	7.5	38	5.2	49	12.1	
<b>Depression</b>	2.51	4.08	1.30	2.42	5.22	5.49	-15.61***
<b>Alcohol</b>							3.75
Yes	447	45.2	323	47.3	124	40.7	
No	541	54.8	360	52.7	181	59.3	
<b>Smoking</b>							1.18
Yes	206	20.9	136	19.9	70	23.0	
No	782	79.1	547	80.1	235	77.0	
<b>Sleep quality in the last month</b>							107.58***
Very bad	33	3.3	8	1.2	25	8.2	
Bad	207	21.0	98	14.3	109	35.7	
Good	583	59.0	435	63.7	148	48.5	
Very good	165	16.7	142	20.8	23	7.5	
<b>Physical illness</b>							22.50***
No	641	64.9	476	69.7	165	54.1	
Yes	347	35.1	207	30.3	140	45.9	
<b>Quality of life</b>	22.13	4.30	23.05	4.21	20.07	3.75	10.65***
<b>Work and social adjustments</b>	2.13	3.79	1.12	2.59	4.39	4.93	-13.61***

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

maladjustments. Interestingly, this association was not found in the group that exclusively presented physical illnesses. Our results are consistent with previous research that has demonstrated that PTSD might mediate the association between disaster exposure, functional impairment,<sup>25</sup> or quality of life.<sup>18</sup> Increased odds ratios of work and social maladjustments in individuals with PTSS have been strongly supported by different hypotheses in previous research.<sup>33–37</sup> The hypotheses, detailed below, include clinical, social, and medical mediations of PTSS in work and social maladjustments.<sup>23,33,38</sup>

Solberg et al. reported clinical impacts due to dysphoric arousal symptoms and emotional numbing related to PTSD, which were

associated with functional impairment over time.<sup>38</sup> Similarly, individual functionality decreased due to interpersonal social difficulties.<sup>39</sup> Individuals who experience PTSS may avoid social interactions to elude traumatic experiences and increase safety.<sup>33,40</sup> Additionally, their experience could lead to frustration and a loss of confidence in support networks.<sup>40</sup> Combining these factors may adversely influence individual social attachment and decrease social support resources.<sup>34</sup>

Regarding medical impact, disaster exposure can lead to negative physical health consequences, which cause deteriorated daily functioning.<sup>9</sup> Among the various factors aggravating physical health status, psychological trauma, such as experiencing disasters,

**Table 4.** Simple logistic regression analysis (Reference group: PTSS [-] physical illness [-])

	PTSS (-) Physical illness (+)			PTSS (+) Physical illness (-)			PTSS (+) Physical illness (+)		
	OR	95% CI		OR	95% CI		OR	95% CI	
		Lower	Upper		Lower	Upper		Lower	Upper
Sex	1.45*	1.05	2.02	1.44*	1.01	2.05	1.88**	1.28	2.76
Age	2.25***	1.90	2.68	1.18*	1.03	1.34	1.91***	1.60	2.29
Income	0.536***	0.43	0.67	0.639***	0.51	0.81	0.422***	0.32	0.55
Education	0.239***	0.18	0.32	0.768	0.59	1.00	0.330***	0.243	0.447
Disaster type	0.444	0.182	1.08	2.05*	1.13	3.72	1.92*	1.01	3.63
Injury	0.64	0.29	1.44	1.14	0.56	2.35	3.82***	2.17	6.74
Depression group	2.58***	1.70	3.89	4.68***	3.18	6.91	8.38***	5.67	12.38
Alcohol	1.61**	1.15	2.24	1.13	0.79	1.61	2.18***	1.47	3.25
Smoking	1.78*	1.14	2.79	0.73	0.49	1.09	1.48	0.90	2.42
Sleep quality in the last month	0.40***	0.31	0.52	0.32***	0.24	0.43	0.18***	0.13	0.25
Work and social maladjustments	1.08*	1.02	1.15	1.27***	1.21	1.34	1.32***	1.25	1.40
Quality of life	0.89***	0.85	0.93	0.85***	0.81	0.89	0.76***	0.72	0.80
-2 Log-likelihood	1872.783								
Nagelkerke	0.466								
Model chi-square	552.233***								

\*P < 0.05; \*\*P < 0.01; \*\*\*P < 0.001.

**Table 5.** Multinomial logistic regression analysis (Reference group: PTSS [-] physical illness [-])

	PTSS (-) Physical illness (+)			PTSS (+) Physical illness (-)			PTSS (+) Physical illness (+)		
	OR	95% CI		OR	95% CI		OR	95% CI	
		Lower	Upper		Lower	Upper		Lower	Upper
<b>Age</b>	1.639***	1.353	1.985	1.097	0.925	1.301	1.482**	1.176	1.869
<b>Income</b>	0.769*	0.600	0.984	0.765	0.585	1.002	0.674*	0.488	0.930
<b>Education</b>	0.403***	0.291	0.558	1.030	0.730	1.454	0.594*	0.392	0.900
<b>Depression group</b>	1.936**	1.213	3.089	2.653***	1.720	4.094	4.492***	2.879	7.008
<b>Smoking</b>	1.441	0.882	2.353	0.705	0.451	1.100	1.381	0.756	2.523
<b>Sleep quality in the last month</b>	0.582**	0.424	0.800	0.567**	0.402	0.800	0.543**	0.367	0.803
<b>Work and social maladjustments</b>	1.013	0.946	1.086	1.189***	1.123	1.258	1.157***	1.084	1.234
<b>Quality of life</b>	0.964	0.915	1.014	0.938*	0.889	0.989	0.885***	0.831	0.942
<b>-2 log-likelihood</b>	1850.09								
<b>Nagelkerke</b>	0.454								
<b>Model chi-square</b>	532.996***								

\*P < 0.05; \*\*P < 0.01; \*\*\*P < 0.001.

may affect functioning. PTSD has been associated with the decline of good health habits and increased behaviors that could compromise health, such as the use of alcohol and other psychoactive substances.<sup>41</sup> Finally, PTSD could affect immunocompetence due to neurochemical and physiological changes that accelerate aging in the epigenome and affect both the immune and inflammation systems.<sup>42</sup> The experience of psychological trauma per se has been associated with increased self-reports of health problems, increased use of medication and medical consultations, and ultimately higher mortality rates.<sup>23</sup> Thus, psychological trauma after disasters may result in an even greater cost to individuals and health care systems than previously suspected.<sup>23</sup>

In this research, other possible factors implicated in poor functional adjustment after a disaster, such as depression,

sleeping disturbances, alcohol/tobacco use, and socio-demographic characteristics, were also examined.<sup>15,19,43</sup> Depression, considered one of the most impairing mental health disorders,<sup>15</sup> presented higher scores in all 3 groups and scored 4 points more in the PHQ-9<sup>25</sup> compared to the PTSS (-). Furthermore, more participants in the PTSS (+) group presented serious sleeping disturbances than in the PTSS (-) group. However, after adjusting for depression and sleeping disturbances as covariates, associations with social and work maladjustments remained in all PTSS groups but not in the PTSS (-) groups. Our results might indicate that PTSS (+) is independently associated with work and social maladjustments, even considering the effects of depression or sleep disturbances 1-year post-disaster.

Additionally, and contrary to expectations, no significant differences in alcohol and tobacco use were found between the PTSS (+) and PTSS (-) groups. As mentioned above, this result is inconsistent with previous research, which found substance use is increased in the presence of PTSD after a disaster.<sup>41</sup> This could be explained by the survey responders withholding this information due to social stigmatization related to psychoactive substance use.

Finally, when comparing PTSS (+) and PTSS (-) groups globally, significant sociodemographic differences were evident without considering the presence of physical illnesses. The PTSS (+) group had a higher mean age (52.71 years), consistent with previous research, as anxiety disorders with a strong autonomic nervous system component like PTSD might be at their highest prevalence in adulthood.<sup>44</sup> Another significant difference was that the PTSS (+) group had a greater number of women. This is similar to Stein et al.'s results that demonstrated that women had a significantly increased risk of developing PTSD following exposure to traumatic events.<sup>43</sup> Regarding additional sociodemographic differences, lower incomes and education were more likely to be related to the PTSS (+) group. These results indicate that older adults, women, and those with lower socioeconomic status are disadvantaged after a major disaster and more susceptible to social and work maladjustments.

### Limitations

The current study has several limitations. First, the sample was assessed with self-reported questionnaires, which could lead to recall biases. Accordingly, the time distance between disaster experience and our assessment (in some cases, up to 5 years) could interfere with the reliability of the results. Likewise, due to the nature of surveys, short scales were used, which could result in less accurate information and the dismissal of other important variables, such as psychiatric comorbidities, loss of family, and social support. Finally, no survey was performed "pre-disaster" in this population, so it is difficult to measure the outcomes caused by the disaster. Moreover, the cross-sectional study design may limit the interpretations of the causal role of PTSS in work and social dysfunction; however, a multivariable analysis was performed to compensate for this limitation. Further research must be performed considering all these limitations to improve the consistency of the outcomes.

### Conclusions

This research demonstrates the importance of considering PTSS in post-disaster assistance management. According to our results, individuals who present PTSS criteria after a disaster have worse social and work adjustments than those who present with physical illnesses. Considering that the global incidence of natural and human-made disasters remains persistently high and the importance of effective medical response, it is important to start focusing on PTSS presence in these victims.

Our results contribute by providing empirical evidence to identify the association between PTSS and related variables, as well as psychological interventions and mental health promotions necessary to improve disaster management effectiveness. Therefore, psychological support programs, including early screening and proper management of PTSS, could minimize social and work maladaptation after disasters.

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