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Assessment of Post-Traumatic Stress Disorder in Survivors of the Al Haouz Earthquake

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Abstract **Original Research Article**

On September 8, 2023, the Al Haouz region was hit by an earthquake measuring 7.1 on the Richter scale. It has been described as one of the most violent in Moroccan history. The latest report shows 2,946 dead and 5,674 injured, with nearly 90% of victims recorded in the provinces of Al Haouz and Taroudant alone. During our work as a psychiatrist in the field hospital in the Tafingoult region (Taroudant Region), we collected 35 cases of acute stress disorder (ASD) among the survivors, during the first month after the onset trembling. We investigated the psychometric properties of PCL-5 scores (Post-Traumatic Stress Disorder (PTSD) Check List for Diagnostic and statistical Manual of Mental Disorders (DSM-5)) in this population of 35 earthquake survivors. We also listed sociodemographic and biographical data, as well as psychiatric history in this population, while assessing the intensity of human and material damage among them. With the aim of identifying the factors responsible for the appearance of each group of symptoms. The main findings identify being trapped under rubble or having deceased children as factors influencing the onset of PTSD. They are responsible specifically for avoidance symptoms.

Keywords: PTSD, Survivors, Al Haouz earthquake, Morocco.

1. INTRODUCTION

On September 8, 2023, the Al Haouz region was hit by an earthquake measuring 7.1 on the Richter scale. It has been described as one of the most violent in Moroccan history.

The latest report shows 2,946 dead and 5,674 injured, with nearly 90% of victims recorded in the provinces of Al Haouz and Taroudant alone.

A disaster like this causes suffering that exceeds the coping capacity of the affected community. It also leads to short, medium and long term impacts on all dimensions: ecological, political, economic, developmental, social, physical and especially psychological [1]. Although physical problems are detected, many psychological problems can go unnoticed. A few hours after the earthquake, several Multidisciplinary Field Medical-Surgical Hospitals were deployed in the heart of the disaster areas.

It has been shown that post-traumatic stress disorder, including acute stress disorder and post-traumatic stress disorder, constitutes the most common psychiatric complication after such a disaster [2]. It is in this context, and through our early intervention within the field hospital in the Tafingoult region, that we tried to detect the precursor elements of PTSD, to identify the factors influencing its appearance, and this with the aim of intervening in an active, precise and effective manner.

2. METHODOLOGY

We conducted a cross-sectional, prevalence study design, both descriptive and analytical, to make a predictive diagnosis of post-traumatic stress disorder among survivors of the Al Haouz earthquake, and evaluate its risk factors.

The data was collected during the first month following the earthquake, through a questionnaire made up of 4 parts including: Socio-demographic data, medico-psychiatric field, Circumstances and socio-economic impact of the earthquake and the PCL 5 scale version Arab.

The study focused on adults over 18 years old, from the local population and who presented for a psychiatric consultation at the Tafingoult field hospital, directly or referred for another doctor. These are patients who speak Arabic and who present an acute stress

disorder according to the diagnostic criteria of the DSM-5.

For the statistical study we used the IBM SPSS Statistics software.

The PCL-5 scale which was used for the study makes it possible to assess the presence and severity of PTSD in 20 items. The questionnaire is available in different languages. Items refer to symptoms occurring in the past month. The score for PTSD severity ranges from 0 (not present at all) to 4 (Extremely), giving a total score between 0 and 80. A score greater than 38 indicates presence of a predictive PTSD diagnosis. A lower benchmark may be considered to help increase case detection. For each DSM-5 diagnostic criterion we have questions to assess its severity. For criterion B which corresponds to intrusive symptoms we have 5 questions for a total score of 20 and for criterion C which corresponds to avoidance symptoms we have 2 questions for a total score of 8. Concerning criterion D which is related with changes in cognitions and mood we have 7 questions for a total score of 28, and finally for criterion E (neurovegetative hyperactivation symptoms) we have 6 questions for a total score of 24. The PCL5 scale also makes it possible to monitor the evolution of PTSD symptoms before, during and after treatment with EMDR therapy [2].

3. RESULTS

A) Descriptive Statistics (Table 1)

Concerning the descriptive statistics of this study, 35 patients were included, the average age was 42 years and women represented 2/3 of the sample.

The majority of patients were married with 2 to 3 children. And 1 in 5 patients had a history of anxiety disorder.

More than half of the consultants had a deceased close victim in the family and among these patients half had lost at least one child.

Almost all homes were totally or partially destroyed and 1 in 4 patients remained trapped under the rubble before help arrived.

For the PCL5 questionnaire, the mean scores for avoidance symptoms and intrusive symptoms were the highest.

Table 1: Table of descriptive statistics

Features		**Value (N=35)**
Sociodemographic	**Age (years)**	**41.8+/-13.5**
	Female gender	**22 (62.9%)**
	Married	30 (85.7%)
	Number of children	2.74 +/-2.11
Medical-psychiatric field	History of anxiety disorder	7 (20%)
	History of depressive disorder	0
	History of psychotic disorder	1 (2.9%)
	Medical and surgical history	2 (5.7%)
Impact Socioeconomic of the earthquake	Deceased loved ones	18(51.42%)
	Deceased children	10(28.57%)
	Damage	32 (91.4%)
	Stuck under the rubble	10 (28.6%)
PCL-5 score	Intrusive symptoms (20)	13.4 +/-2.54
	Avoidance symptoms (8)	5.83+/-1.42
	Changes in cognitions and mood (28)	15.5+/-4.05
	Neurovegetative hyperactivity (24)	11.4+/-2.74
	PCL-5 score (80)	46.1+/-8.11
	PTSD forecast	30 (**85.7%**)

B) Analytical Statistics (Figure 1 and Table 2)

We calculated through the table the Pearson correlation (Figure 1), the entanglement links between each pair of factors, focusing specifically on the PTSD symptoms studied in the PCL-5 scale (Intrusive symptoms, Symptoms d avoidance, Modification of cognitions and mood, Neurovegetative hyperactivity) and the socio-economic circumstances and impact of the earthquake (Deceased loved ones, Deceased children, Material damage, Blocked under the rubble).

We found that the factors influencing the appearance of PTSD with a significant P are being stuck under rubble or having deceased children, which are specifically responsible for avoidance symptoms (Table 2).

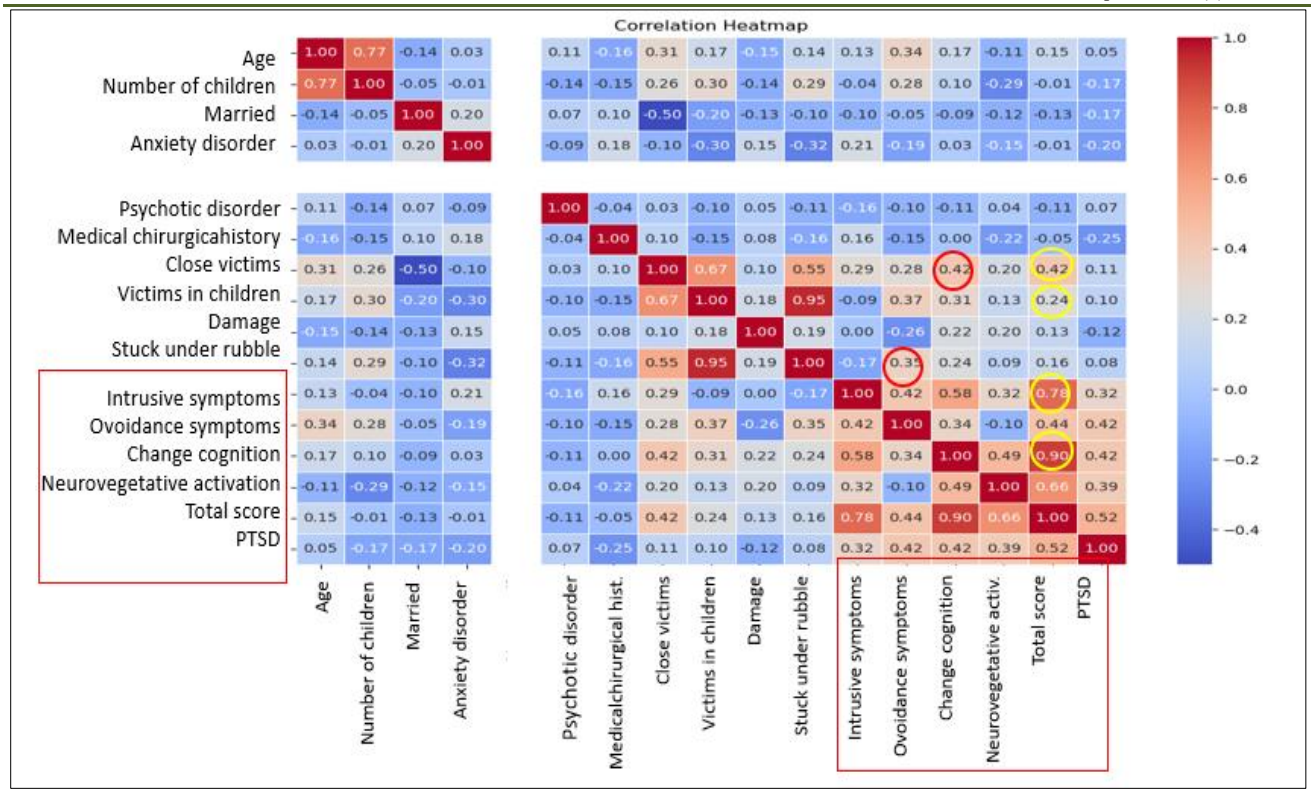

Figure 1: Pearson correlation table between each pair of factors

Table 2: Table showing factors associated with each specific PTSD symptom in the PCL-5 scale

	Intrusive symptoms	Avoidance symptoms	Changes in mood and cognition	Neurovegetative hyperactivation
Deceased loved ones	P=0.097	P=0.104	0.097	P=0.238
Deceased children	P=0.611	P=0.028	0.067	P=0.444
Presence of material damage	P=0.979	P = 0.138	0.213	P=0.257
Stuck under the rubble	P=0.331	P=0.041	0.165	P=0.592

4. DISCUSSION

When we examine our study, we see that 85.7% of patients with Acute Stress Disorder (ASD) obtained scores predictive of Post-Traumatic Stress Disorder (PTSD). These results are consistent with several previous studies which highlight the frequent transition between these two psychological states after a major traumatic event [3]. These symptoms of PTSD are experienced by survivors during the first weeks after the traumatic event, requiring rapid and specific diagnosis and intervention in order to prevent long-term psychiatric complications.

A gender disparity in the prevalence of PTSD was observed in this study with a frequency of 62.9% in females. We can infer that women are more vulnerable to PTSD than men. Results consistent with ours have been found in almost all other studies of PTSD in relation to sex [4, 5]. This risk may be due to a greater perception of threat and loss of control among women, and the impression that social support resources are insufficient. The literature even explains gender differences in neuroendocrine response that lead to a higher risk of PTSD in women [4].

Consistent with the existing evidence base [6, 7], PTSD scores were elevated in our sample. The mean scores for avoidance symptoms and intrusive symptoms were largest. In other studies found in the literature, Lai *et al*., [8], found that in their sample of survivors of the 1999 Taiwan earthquake (7.3 on the Richter scale), scores for intrusive symptoms, autonomic hyperactivation symptoms, and autonomic hyperactivation symptoms avoidance/numbing were highest. Another study of survivors of the previous earthquake in Turkey in 1999 (7.4 on the Richter scale) reported lower scores on these symptom groups [9]. The high scores found in our study can be attributed to the very significant material and human damage. In fact, more than half of the consultants had a close victim who died in the family and among these patients, half lost at least one child and almost all of the homes were totally or partially destroyed. The results can also be explained by our early intervention during the first month after the earthquake.

The results of the study also revealed that having been trapped under rubble or having deceased children would be statistically significantly involved in

the appearance of avoidance symptoms and could constitute important risk factors for post-earthquake PTSD, which requires diagnosis and specific management of these avoidance symptoms in these groups of patients. In other studies [6-10], bodily injury as well as that of family or loved ones have been identified as significant correlates of PTSD, but without specification on the PTSD symptom cluster. The results of our work are more specific to the type of PTSD symptom, which suggests an active search for its symptoms in this group of patients.

The current study was unable to account for prior traumatic experiences when examining the association between earthquake-related traumatic events and PTSD risk. Research has demonstrated that prior exposure to trauma and pre-traumatic psychopathology represent significant risk factors for the development of PTSD [11]. This has also been highlighted in studies investigating risk factors for PTSD in survivors of the Pakistan earthquake [12], where prior exposure to trauma was shown to play an important role in the development and onset of PTSD. Therefore, it is not possible to rule out the possibility that the increased risk of PTSD in some participants may be due to pre-existing trauma. Additionally, complex PTSD typically develops in response to exposure to multiple, repeated, and prolonged interpersonal trauma [13].

5. CONCLUSION

During the first month after the El Haouz earthquake in Morocco, the majority of participants with ASD presented the score of predicted PTSD. Advanced age, female gender, bereavement, loss of loved ones and especially children, being trapped under rubble, were risk factors associated with the onset of PTSD.

The results of this study provide an empirical basis for recognizing the existence of psychological distress among adult survivors of this earthquake, suggesting the need for effective, early screening and rapid and specific treatment.

The results of the study recommend running other, larger surveys in other regions for better generalization of the results.

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Disclosures of Conflicts of Interest: None of the authors has any conflict of interest to disclose in link with the present study.

Ethical Approval: There is no ethical issue.

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