Post-traumatic stress spectrum in the DSM-5 era: what we learned from the L'Aquila experience

Lo spettro post-traumatico da stress nell'era del DSM-5: cosa abbiamo imparato dall'esperienza di L'Aquila

Introduction

Earthquakes represent one of the most frequent mass trauma affecting large populations worldwide, striking suddenly, with severe, often chronic, physical and psychological consequences. High rates of mental disorders, and in particular, of post-traumatic stress disorder (PTSD), can be detected in the aftermath of exposure, so that there is now general agreement on the need of mental health professionals support in earthquake surivors [1 2]. On April 6th 2009, at 3:32 a.m., an earthquake (Richter magnitude 6.3) struck L'Aquila, Italy, a town with a population of 72,000 residents and a health district of 105,000 residents. In the town of L'Aquila, many buildings collapsed and large parts of the town were destroyed. The L'Aquila earthquake caused the death of 309 people, with more than 1,600 individuals injured, among whom 200 were severely injured and hospitalised, and 66,000 were displaced. Today, signs of this devastating event are still visible as the majority of buildings is still needing to be rebuilt and restored, and a large part of the population is still living in prefabricated homes: an estimated 30,000 people are, in fact, currently living in temporary accommodations. As a result of this natural disaster, psychological care of the affected population became a matter of great concern and focus.

Post-traumatic stress reactions, including PTSD, both in its full-blown and partial manifestations, often represent a problem not only during the acute phase but also across extended periods of time after exposure [3 4]. Since 2010, we conducted large-scale surveys, involving over 2,000 people affected by the L'Aquila earthquake, using a specific spectrum assessment for post-traumatic stress spectrum symptoms, named the Trauma and Loss Spectrum Self-Report (TALS-SR) [5]. This instrument, as well as its structured interview version [6], was developed within the Italy-USA research project called the *Spectrum Project*, and is aimed at developing a spectrum concept of DSM mental disorders [7-9]. According to this view, the spectrum refers to a dimensional view of psychopathology that includes a broad array of manifestations of the target disorder, including its core and most severe symptoms as well as a range of more subtle features related to the core condition. These latter may include temperamental traits, prodromal indicators, or residual symptoms. The TALS-SR explores the trauma and loss spectrum by a multidimensional approach that considers three major dimensions: the potentially traumatic events, including losses and the so-called low magnitude events; the acute/peri-traumatic reaction; and post-traumatic stress spectrum symptoms.

Accordingly to the increasing evidence of the relevance of maladaptive behaviours as a possible manifestation of PTSD, an emerging concept at the time of TALS-SR development, a specific section for these behaviours was included in the questionnaire that addresses behaviours such as self-cutting, dangerous driving, or promiscuous sex. It's important to note that the DSM-5 recently recognised these behaviours, including them among the symptoms of PTSD. Two, in fact, are the most important changes adopted by the DSM-5 *Post-traumatic and dissociative disorders sub-group* concerning PTSD: first, the inclusion of this disorder in a separate chapter from other anxiety disorders, *Trauma and Stress Related Disorders* (with *Reactive Attachment Disorder*, *Disinhibited Social Engagement Disorder*, *Acute Stress Disorder*, *Adjustment Disorder* and *Trauma-or-Stressor-Related Disorder Not Elsewhere Classified)*; second, the deletion of the DSM-IV-TR A2 criterion and the inclusion of new symptoms, among which the above-mentioned maladaptive behaviours, among the diagnostic criteria [10-12].

The purpose of this brief article is to review the lessons we learned from studies on the Italian population surviving the L'Aquila earthquake assessed by the TALS-SR and how they contributed to a better understanding of post-traumatic stress spectrum including PTSD, along with its potential risk factors and features. In particular, we will focus on the following aspects: the role of potential risk factors (such as age, gender, degree of earthquake exposure including loss events); the relevance of maladaptive behaviours as part of a post-traumatic stress reaction; the relationship between mood disorders and PTSD. Thanks to the presence of items exploring maladaptive behaviours and the dimensional structure of the TALS-SR, including a broad range of symptoms among which the newly introduced among the DSM-5 PTSD criteria, we could also explore the prevalence of DSM-5 PTSD in the same population previously assessed by DSM-IV-TR criteria, and compare the two proposed criteria sets.

Role of risk factors

The studies we conducted among the survivors of the L'Aquila 2009 earthquake offered us an opportunity to evaluate the possible impact of factors such gender, severity of trauma, and age at the time of exposure on this population.

On a sample of 475 students attending the last year of high school in L'Aquila, we first explored the prevalence and specific features of full and partial PTSD, with particular attention to gender differences. Consistently with the literature [13 14], we found significantly higher rates of PTSD among women compared to men despite no significant gender differences in partial PTSD rates [15]. Furthermore, we confirmed previous anecdotal data [13 16] suggesting women to be more symptomatic than men. More recently, we confirmed these results in a larger sample of 900 survivors [17], where we found significantly higher TALS-SR domain scores and symptoms in women than men.

Another interesting finding regarded age differences, as documented in previous studies. In our studies, age differences in PTSD rates emerged only among women, with younger females being the most affected. An additional interaction between age and exposure was found in younger subjects where significantly higher symptom levels were reported only among less-exposed subjects, while there was no significant age difference in the proximity of the epicenter [17 18]. Proximity to the epicenter represented a major risk factor for PTSD in survivors involved in the earthquake.

Another potential risk factor for PTSD explored in the L'Aquila population, was the presence of a loss experience related to the earthquake. More than 300 people were, in fact, killed in the town of L'Aquila because of the earthquake. Thus, we investigated whether the loss of a relative or a close friend could be related to higher rates of PTSD or to its severity. Among the 475 students enrolled 10 months after exposure, we observed significantly higher PTSD rates and post-traumatic stress symptom levels among bereaved compared to non-bereaved subjects [19].

Based on these data, we thus confirmed the pervasive effect that these disasters have on the population, corroborating evidence that risk factors such as age, gender and life events can play a role in developing post-traumatic stress symptoms.

Maladaptive behaviours: a due acknowledgment

Reckless or self-destructive behaviours represent one of the three new criteria included in DSM-5 for PTSD diagnosis as part of the criterion E, exploring alterations in arousal and reactivity [10]. As already mentioned, since the TALS-SR includes a specific domain dedicated to maladaptive behaviours, we were able to study their role in the clinical presentation of PTSD years before the DSM-5 acknowledgment.

Among the 475 senior high school students explored 10 months after exposure, we showed that a significantly higher number of women (almost double) reported to have stopped taking care of themselves, while the contrary was reported for the use of alcohol or medication to calm themselves or engaging in risk-taking behaviours or suicide attempts [15].

Suicide is considered the worst and most worrying complication of PTSD. There is agreement in the literature regarding the high rates of suicidality in survivors of a natural disaster [20]. Investigating 426 subjects exposed to the L'Aquila earthquake, compared to 522 less-exposed individuals (living at a greater distance from the epicenter), we found an increased suicidality in the former. Furthermore, among earthquake survivors, females reported increased suicidal ideation compared to males. Negative religious coping, such as feeling abandoned, punished by God and lack of relying on God, was also associated with suicidal ideation [21]. More recently, a correlation between emotional coping and suicidality was found in a sample of 343 adolescent survivors of the earthquake two years earlier [22].

Accordingly to existing data on young adults or adolescents exposed to traumatic events [23 24], gender differences were further investigated in a larger sample including 900 residents of the town of L'Aquila who experienced the earthquake on April 6, 2009. Significantly higher maladaptive behaviour rates were found among subjects with PTSD. A statistically-significant association was found between male gender and the presence of at least one maladaptive behaviour among PTSD survivors. Additionally, among survivors with PTSD significant correlations emerged between maladaptive coping and symptoms of re-experiencing, avoidance and numbing, and arousal in women, while only between maladaptive coping and avoidance and numbing in men [25].

After the DSM-5 was published, we first adopted the new diagnostic criteria using an algorithm including symptomatic criteria for PTSD diagnosis encoded in TALS-SR items. Exploring the TALS-SR of the students of the last year of high school, we showed that maladaptive behaviours were endorsed by 36.8% of PTSD cases, and were found to be essential in satisfying DSM-5 E2 diagnostic criterion threshold in 14.2% of PTSD diagnoses. Exploring gender differences, we confirmed previous data referring to DSM-IV-TR diagnostic criteria, as a significant difference was found for criterion E2, with men (63.6%) reporting higher rates of endorsement than females (20.5%). Furthermore, maladaptive behaviours were crucial in 31.17% of males, but in only 3.94% of females [26 27].

PTSD and mood spectrum

The relevance of mood disorders and PTSD comorbidity had been highlighted by a growing number of studies [28 29]. Increasing evidence, in fact, suggests that bipolar patients are at higher risk of trauma exposure and, when exposed, are more vulnerable to developing PTSD and its complications [30-34]. In a previous study, we showed significant correlations between lifetime manic symptoms and increased suicidality in PTSD patients [35]. Exploring L'Aquila survivors, we found higher rates of lifetime and mood spectrum symptoms among survivors who developed PTSD. Therefore, we took the chance to explore such relationships with the Moods Spectrum-Self Report MOODS-SR [36], a mood spectrum assessment, and the TALS-SR [37]. Our results showed a positive association between PTSD and both the depressive and manic components of the MOOD-SR. In particular, concerning the manic component (that includes manic mood, energy and cognition symptoms), a significant association was found only for the energy manic domain, suggesting a possible role of hyperarousal in the severity and course of PTSD symptoms [38 39].

Another interesting finding was the relationship that emerged between lifetime subthreshold mood symptoms and increased trauma exposure and post-traumatic stress spectrum symptomatology. Our data on maladaptive behaviours, in particular, highlighted a correlation between the manic-hypomanic component of the MOODS-SR and an increased attitude towards maladaptive behaviours, which was significantly more pervasive among survivors with PTSD compared to those without [37].

Conclusions

Even if additional data in larger and more representative samples are needed, these results provide strong support for the relevance of assessing post-traumatic stress symptoms in earthquake survivors, suggesting the need for appropriate and efficacious interventions. Furthermore, the inclusion of maladaptive behaviours among the TALS-SR spectrum symptoms provided us with an important tool to assess the prevalence of these behaviours (recently ascribed among diagnostic criteria by the DSM-5) in this population. In a future perspective, it is possible that the strong correlations between PTSD and substance use disorders (particularly heroin addiction) in the light of the idea that PTSD spectrum should be considered as an integral part of the psychopathology of addiction [40]. In this regard, post-traumatic stress spectrum could provide important data considering the latest assumptions of the DSM-5: "Scientific evidence now places many, if not most, disorders on a spectrum with closely related disorders that have shared symptoms, neural substrates, genetic and environmental risk factors" [10].

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