ABSTRACT

Background: Considering recent changes in the diagnostic guidelines for posttraumatic stress disorder (PTSD), it has become imperative to review their influence, especially on the symptoms related to children and adolescent victims of disasters. We intended to assess the profile of posttraumatic stress symptoms (PTSS) of adolescents following an earthquake, especially the gender differences, in relation to the changing diagnostic guidelines, particularly ICD-11.

Methods: In a cross-sectional study, PTSS and functional impairments were evaluated in school-going adolescents in Nepal, one year after the 2015 earthquake, using the Child Posttraumatic Stress Scale (CPSS).

Results: A considerable proportion of adolescent survivors of the earthquake had PTSS. Most common ones were intrusive thoughts (46.7%), avoiding thoughts, conversations and feelings about the disaster (44.2%), decreased interest in activities (40.0%), distress with reminders (35.6%), and concentration problems (35.6%). Females had a higher prevalence for all the PTSS compared with males, except for avoiding thought, conversations, feelings, and being overly careful/vigilant. Proportion of adolescents who met symptomatic criteria for PTSD diagnosis in different systems ranged from 14.7% in DSM-5 to 15.6% in ICD-11 three-factor model, and 22.2% in DSM-IV and 31.7% in ICD-10. Inclusion of the criterion of significant functional impairment changed the proportions to 10.0%, 10.3%, 12.8%, and 16.4%, respectively. In all of the diagnostic systems, higher proportions of females had possible PTSD.

Conclusion: Adolescent females had a higher prevalence for most of the PTSS and at the diagnostic level. It appears that for adolescents, diagnosis of PTSD in ICD-11 has become more robust with a focus on core symptoms and having a functional impairment criterion.

Keywords: adolescents, classification, disaster, posttraumatic stress, posttraumatic stress disorder

Key Messages: Posttraumatic stress symptoms following earthquakes are common in adolescents, and a higher proportion of females experience these compared to males. Following changes in diagnostic criteria for PTSD, fewer survivors qualify for the diagnosis based on ICD-11 and DSM-5 criteria, compared with their previous editions. Epidemiological studies screening for posttraumatic stress symptoms need to update their approach.
has been commented that the diagnostic threshold for PTSD was rather low in DSM-IV and ICD-10. The symptoms described under each of the clusters can be combined in many ways to arrive at a PTSD diagnosis,2 considering the polythetic nature of the psychiatric diagnoses. As a result, multiple combinations lead to numerous possibilities for diagnoses. There are a few other issues related to PTSD diagnosis, including cultural appropriateness of PTSD3–5 and the possibility of overuse or misdiagnosis in low resource and humanitarian settings.2 PTSD is among the most widely used diagnoses in mental health care used by clinicians, epidemiologists, public health planners, and humanitarian aid workers worldwide. This study explores proposals that aim to maximize clinical utility for the classification and grouping of disorders specifically associated with stress in the forthcoming 11th revision of the International Classification of Diseases (ICD-11).

Age-wise, adults, adolescents, and young children may present in different ways in response to catastrophic stress. By being in a period of development, inadequately established coping strategies mean greater vulnerability and differences in resilience; therefore, children and adolescents may react differently to similar kinds of stressful events. In fact, variations in the type of posttraumatic stress symptoms (PTSS) in different age groups of children and adolescents have been reported.6,7 Epidemiological studies report different prevalence figures of PTSS in adolescents, following various types of trauma.1,3–6,9,12 The findings also suggest gender differences in PTSS reflective of different factors such as trauma type, stress perception, and responses. The impact of PTSD leading to school failure and regressed or delayed development in children and adolescents makes it a relevant area to study.7

There are age-specific features in the diagnostic criteria for PTSD; DSM-5 has different criteria for PTSD for children 6 years or under.1 Considering the variability in the presentation and the ongoing debate about the applicability of adult diagnostic criteria for PTSD for children and adolescents,14,15 there is a need for more evidence regarding symptom structure of PTSD in the younger people. Based on these observations, over the years, concepts and diagnostic methods have changed in the newer diagnostic systems, DSM-5 and ICD-11.1,3–5

Consequent to this, it is prudent to evaluate the impact of the changing diagnostic methods on the prevalence figures based on the observed symptoms in adolescents. As studies on PTSD symptom structure in children and adolescents are scarce, especially from low- and middle-income countries,10 it may be better to study PTSS in different cultures and age groups. The specific objective of this study was to explore the profile of PTSS in adolescents, following the 2015 Nepal earthquake, focusing on the nature of symptoms, gender differences, and variations based on the different diagnostic guidelines. We tried to ascertain the proportion of children who would meet the suggested diagnostic criteria of PTSD in ICD-11, compared with those in DSM-IV and 5 and ICD-10.

Methodology

Data for this study was obtained from a project evaluating the psychosocial status of adolescents after the April 2015 Nepal earthquake, which affected around eight million people, with 8,659 deaths and over 100,000 injured people.16–18 The project was a cross-sectional survey of adolescents in 8th to 10th class, studying in ten schools spread over the two affected districts of Nepal. The schools were selected using purpose sampling, and one class out of three classes (8-10) was randomly selected per school. All students in that class were included in the study. Further details are available in an earlier paper from the project.19

PTSS were assessed by the Child Posttraumatic Stress Scale (CPSS). This scale was developed as the child version of the Postrraumatic Diagnostic Scale.13,14 A total of 17 items directly correspond to the criteria for DSM-IV. The responses are on a Likert scale from 0 to 3, with a possible maximum score equaling 51. There are seven additional items about the effect of the symptoms on functioning, which have a dichotomized response of yes or no. A higher score is suggestive of greater functional impairment. The CPSS has been validated in Nepali language, and a score of 220 suggests the need for intervention.19

Analysis

Internal consistency figures in the three subscales and the whole scale for this sample were as follows: Cronbach’s alpha for intrusive items 1–5 in CPSS was 0.75, avoidance items 6–12 was 0.69, arousal items 0.73, and for the full scale was 0.86. For this study, we considered response scores of 2 and 3 in CPSS items as meeting the symptom criteria for the PTSD diagnosis. The prevalence of these symptoms in different genders was analyzed in percentages and 95% confidence interval (CI).

Ethics

Ethical approval for the project was obtained from Research Committee of Maharajgunj Nursing Campus and the Institutional Review Board of Institute of Medicine, Kathmandu. Permission was also obtained from individual schools where data were collected. Written informed consent was taken from the parents. Students were informed that they could withdraw from participating in the study anytime without giving any reason. Information about the effect of trauma on mental health and the support available was provided to the students and school teachers. Psychological help was accessible through the Integrated Community Development Centres in the districts, which had counseling services. These centers could refer cases to psychiatric services when appropriate. Support of a clinical psychologist was available, and the referral methods were explained to the school teachers.

Results

The sample consisted of 360 adolescents: 168 males (46.6%) and 192 females (53.3%) with a mean age ± SD of 15.2 ± 1.32 and...
The adolescents were studying in 8th to 10th class, with around one-third of sample in each class. More than half of the adolescents were from a nuclear family background (59.4%) and 47.2% reported financial problems at home. There was no significant difference in the demographic profile of different genders.

Disaster experience such as damaged housing (32.8%), damaged but habitable housing (39.7%), displacement (48.6%), starvation (38.1%), being injured/trapped (15.8%), injury to the family (4.2%), death in the family (1.4%), and damage to livelihood (42.5%) were comparable between the two genders. Significantly, more females (83.9%) were afraid of death during the earthquake compared with males (69.0%, \( P < 0.01 \)). Availability and perceived adequacy of support after the earthquake were comparable between the genders.

PTSS meeting symptom criteria for PTSD (scores of 2 or 3 per item in CPSS) in the two genders are given in Table 2. The items of CPSS are matched to the three-factor model of DSM-IV: items 1–5 relate to re-experiencing, items 6–12 are for avoidance, and items 13–17 are for arousal clusters. Mean ± standard deviation (SD) of the CPSS score for males (18.0 ± 7.6) was significantly less (\( P < 0.001 \)) than that for females (21.7 ± 8.7).

The prevalence of functional impairments is given in Table 3. Mean ± SD for functional impairment score for males was 3.1 ± 2.4 and for females 3.2 ± 2.3 (not significant). Besides the presence or absence of any functional impairment in the seven areas, we considered an impairment of functioning to be significant, in this study, when the score was in the upper range of 4 or more, from a possible 7.

Based on the symptom criteria and presence of impairment, possibilities of prevalence rates in different genders are given in Table 4. For comparison, the impairment criterion was also applied to ICD-10 criteria to observe the changes in rates. Considering the cutoff score of CPSS as 20 and above (validated in Nepal), 39.9% of the males and 57.3% of the females (\( P < 0.01 \)) were above this score, which suggest that they had a need for intervention.

| TABLE 1. Sample Characteristics | Male (n = 168) | Female (n = 192) | Total (n = 360) |
|---------------------------------|---------------|-----------------|-----------------|
| Class                           | n | %     | n | %     | n | %     |
| 8                               | 8 | 61.3 | 68 | 35.4 | 129 | 35.8 |
| 9                               | 9 | 57.9 | 69 | 35.9 | 126 | 35.0 |
| 10                              | 10| 50.0 | 55 | 28.6 | 105 | 29.2 |
| Family type                     |   |       |   |       |     |       |
| Nuclear                         | 100 | 59.5 | 114 | 59.4 | 214 | 59.4 |
| Joint                           | 68 | 40.5 | 78 | 40.6 | 146 | 40.6 |
| Financial problem at home       |   |       |   |       |     |       |
| No                              | 95 | 56.5 | 95 | 49.5 | 190 | 52.8 |
| Yes                             | 73 | 43.5 | 97 | 50.5 | 170 | 47.2 |

Note: All gender differences were non-significant.

| TABLE 2. Prevalence of PTSS in the Two Genders, Based on CPSS |
|---------------------------------------------------------------|
| PTSS                                                          | Male (%) | Female (%) | Total (%) | 95% CI | P       |
| Re-experiencing cluster                                       |          |            |           |        |         |
| • Intrusive thoughts                                          | 45.2     | 47.9       | 46.7      | 41.5–51.8 | 0.611  |
| • Nightmares                                                  | 23.8     | 33.9       | 29.2      | 24.5–33.9 | 0.036  |
| • Flashbacks                                                  | 18.5     | 32.3       | 25.8      | 21.3–30.4 | 0.003  |
| • Distress with reminders                                     | 34.5     | 36.5       | 35.6      | 30.6–40.5 | 0.702  |
| • Somatic distress                                            | 23.2     | 37.5       | 30.8      | 26.1–35.6 | 0.003  |
| Avoidance cluster                                             |          |            |           |        |         |
| • Avoiding thought, conversation, feelings                    | 44.6     | 43.8       | 44.2      | 39.0–49.3 | 0.865  |
| • Avoiding activities                                         | 23.8     | 32.3       | 28.3      | 23.7–33.0 | 0.075  |
| • Not able to remember important part of event                | 28.6     | 40.1       | 34.7      | 29.8–39.6 | 0.022  |
| • Less interest in activities                                 | 34.5     | 44.8       | 40.0      | 34.9–45.1 | 0.047  |
| • Not feeling close to people                                 | 12.5     | 25.5       | 19.4      | 15.4–23.5 | 0.002  |
| • No strong feelings (unable to cry, to feel happy)           | 11.3     | 17.2       | 14.4      | 10.8–18.1 | 0.113  |
| • Foreshortened future                                       | 28.6     | 39.6       | 34.4      | 29.5–39.4 | 0.028  |
| Hyperarousal cluster                                          |          |            |           |        |         |
| • Sleep difficulties                                          | 25.0     | 36.5       | 31.1      | 26.3–35.9 | 0.019  |
| • Irritable/angry                                             | 22.0     | 35.4       | 29.2      | 24.5–33.9 | 0.005  |
| • Concentration problems                                      | 31.5     | 39.1       | 35.6      | 30.6–40.5 | 0.137  |
| • Overly careful/vigilant                                      | 22.0     | 20.3       | 21.1      | 16.9–25.3 | 0.691  |
| • Easily startled                                             | 24.4     | 36.5       | 30.8      | 26.1–35.6 | 0.013  |

PTSS: posttraumatic stress symptoms; CPSS: childhood PTSD symptom scale; CI: confidence interval; Note: Considering multiple chi-square tests at the symptom level comparison, Bonferroni correction was applied, and the significance level was adjusted to \( P < 0.00294 \).
**TABLE 3.**

Prevalence of Functional Impairments in Different Genders

| Impairment areas                      | Male (%) | Female (%) | Total (%) | 95% CI        | P     |
|--------------------------------------|----------|------------|-----------|---------------|-------|
| Doing prayers                        | 32.7     | 37.0       | 35.0      | 30.1–39.9     | 0.400 |
| Chores and duties at home            | 50.0     | 49.5       | 49.7      | 44.8–54.9     | 0.021 |
| Relationship with friends            | 38.7     | 37.5       | 38.1      | 33.0–43.1     | 0.816 |
| Fun and hobbies activities           | 42.9     | 45.9       | 45.0      | 39.9–50.1     | 0.445 |
| Schoolwork                           | 57.7     | 57.8       | 57.8      | 52.7–62.9     | 0.689 |
| Relationship with family             | 42.9     | 40.6       | 41.7      | 36.6–46.8     | 0.668 |
| General happiness with life          | 44.6     | 53.6       | 49.4      | 44.3–54.6     | 0.088 |

Any functional impairment

|                               | Male (%) | Female (%) | Total (%) | 95% CI        | P     |
|-------------------------------|----------|------------|-----------|---------------|-------|
| No impairment (score 0)       | 17.9     | 18.2       | 18.1      | 14.1–22.0     |       |
| Impairment (score 1–7)        | 82.1     | 81.8       | 81.9      | 78.0–85.9     | 0.927 |

Significant functional impairment

|                               | Male (%) | Female (%) | Total (%) | 95% CI        | P     |
|-------------------------------|----------|------------|-----------|---------------|-------|
| No significant impairment     | 57.1     | 56.8       | 56.9      | 51.8–62.1     |       |
| Significant functional impairment (score 4–7) | 42.9     | 43.2       | 43.1      | 37.9–48.2     | 0.943 |

CI: confidence interval.

**TABLE 4.**

Probable PTSD Diagnoses Based on Different Diagnostic Systems

| Diagnostic system               | Male (%) | Female (%) | Total (%) | 95% CI        | P     |
|---------------------------------|----------|------------|-----------|---------------|-------|
| ICD-11 (three-factor model)     |          |            |           |               |       |
| Symptom criterion               | 13.1     | 17.7       | 15.6      | 11.8–19.3     | 0.228 |
| Symptom and impairment          | 11.9     | 17.2       | 14.7      | 11.1–18.4     | 0.158 |
| Symptom and significant impairment | 7.7     | 12.5       | 10.3      | 7.1–13.4      | 0.138 |
| ICD-11 (two-factor model)       |          |            |           |               |       |
| Symptom criterion               | 17.9     | 22.4       | 20.3      | 16.1–24.4     | 0.285 |
| Symptom and impairment          | 16.7     | 21.4       | 19.2      | 15.1–23.2     | 0.260 |
| Symptom and significant impairment | 10.7    | 14.1       | 12.5      | 9.1–15.9      | 0.338 |
| ICD-10                          |          |            |           |               |       |
| Symptom criterion               | 27.4     | 35.4       | 31.7      | 26.9–36.5     | 0.102 |
| Symptom and impairment          | 24.4     | 32.3       | 28.6      | 23.9–33.3     | 0.099 |
| Symptom and significant impairment | 13.7    | 18.8       | 16.4      | 12.6–20.2     | 0.196 |
| DSM-5                           |          |            |           |               |       |
| Symptom criterion               | 8.9      | 19.8       | 14.7      | 11.1–18.4     | 0.004 |
| Symptom and impairment          | 8.9      | 18.8       | 14.2      | 10.6–17.8     | 0.008 |
| Symptom and significant impairment | 7.7     | 12.0       | 10.0      | 6.9–13.1      | 0.181 |
| DSM-IV                          |          |            |           |               |       |
| Symptom criterion               | 14.3     | 29.2       | 22.2      | 17.9–26.5     | 0.001 |
| Symptom and impairment          | 14.3     | 26.6       | 20.8      | 16.6–25.0     | 0.004 |
| Symptom and significant impairment | 10.1    | 15.1       | 12.8      | 9.3–16.2      | 0.158 |

PTSD: posttraumatic stress disorder; ICD: International Classification of Diseases; DSM: Diagnostic and Statistical Manual of Mental Disorders.

**Discussion**

The results of this study suggested that a considerable proportion of adolescent victims of the earthquake had PTSS. The most common amongst them was intrusive thought (46.7%), followed by avoiding thoughts, conversations, or feelings about the disaster (44.2%); decreased interest in activities (40.0%); distress with reminders (35.6%); and concentration problems (35.6%). Compared with males, females reported all the PTSS more frequently, except the symptoms of avoiding thoughts, conversations or feelings and being overly careful or vigilant. The gender difference of the proportions of each PTSS was comparable; however, not feeling close to people was reported significantly ($P = 0.002$) more by the females at a revised significance level following Bonferroni correction (Table 2).

In all the diagnostic systems (Table 4), higher percentages of females had possible PTSD, compared with that of males. Most post-disaster or posttrauma studies have found the females to be more vulnerable for PTSD. Various possible reasons both biological and psychosocial have been suggested for the increased prevalence of PTSD in females after the disaster. For example, females report a greater sense of threat from the trauma than males, and that perceived threat predicts psychological distress in women, but not in men. Females appear to have more peritraumatic dissociation that is known to be linked to PTSD. The reasons also include the difference in the type of trauma exposure, and differences in neuroanatomical and physiological responses to traumatic experience between the genders. In this study, significantly more females, compared with males, were afraid of death during the disaster. Fear of death in a situation suggests the magnitude of stress experience, and this could be linked to more PTSS and PTSD in females.

**Applying Diagnostic Criteria for PTSD in Different Systems**

The changes in diagnostic criteria in ICD-11 and DSM-5 can be summarized as follows. The ICD-11 three-factor model of diagnosis requires the stressor criterion,
one of two of re-experiencing symptoms, one of two avoidance symptoms, one of two hyperarousal symptoms, and impairment. IC-11 two-factor model of diagnosis requires the stressor criterion, two of four of re-experiencing symptoms or avoidance symptoms, one of two hyperarousal symptoms, and impairment. Impairment has been specified as significant impairment in personal, family, social, educational, occupational, or other important areas of functioning.

In ICD-10, the criteria for a stressful event to qualify for PTSD are described as exceptionally threatening or catastrophic, which would be likely to cause pervasive distress in almost anyone. PTSD diagnosis in ICD-10 required the stressor criterion, one re-experiencing symptom, one avoidance symptom, and specific amnesia or two of five hyperarousal symptoms. However, ICD-10 does not specify an impairment criterion. A delayed onset of PTSD beyond six months of the event has been recognized in ICD-10 and IC-11.

DSM-IV required both stressor and response to stressor for the stressor criterion, as well as one of five of re-experiencing symptoms, three of seven avoidance symptoms, and distress or impairment. DSM-5 recognizes four clusters of symptoms: intrusion, avoidance, negative alterations in cognition and mood, and alteration in arousal and reactivity. Diagnosis is arrived at with ≥1 intrusion symptom, ≥1 avoidance symptom, ≥2 symptoms of negative alteration of cognition and mood, and ≥2 arousal and reactivity symptoms. While the general criteria apply to anyone older than 6 years, DSM-5 has a subtype for children 6 years and younger. PTSD diagnosis in DSM requires the impairment in functioning criterion. Both DSM-IV and DSM-5 require clinically significant distress or impairment in social occupational or other important areas of functioning.

Applying the diagnostic criteria based on different systems, the proportions of adolescents who could be diagnosed to have PTSD in the newer systems (DSM-5, ICD-11) were less than those in their predecessors. A similar observation has been reported in studies involving adults in the developed countries. The prevalence had ranged from 10.0% (DSM-5, with significant impairment) to 31.7% (ICD-10, without considering any functional impairment). Based on the three-factor model of IC-11, with significant impairment, 10.3% could be considered for PTSD, which is comparable to the DSM-5 proportion. In a meta-analysis of 46 studies involving earthquakes, the range of PTSD incidence was 1.2–82.6%, whereas a combined incidence rate of PTSD diagnosed more than nine months after the earthquake was 19.5%. Variations of rates of PTSD following disasters are contributed to by many factors such as the nature of trauma exposure and an individual’s meaning of personal loss. The proportions of adolescents with diagnostic possibilities both in ICD and DSM systems were less than the proportion with the cutoff score for CPSS for intervention. Therefore, it is possible that many disaster victims have subsyndromal PTSD and would require help.

The newer concept of PTSD in IC-11 is more focused, aiming at specific salient features of the diagnosis and simplifying the assessment. It will probably lead to a reduction of overdiagnosis and false-positives. It can be expected that considering fewer core symptoms, the diagnosis of PTSD in new systems will become more homogenous in adolescents. This may help in more focused intervention measures and outcome studies. In addition, IC-11 introduced the functional impairment criterion similar to DSM-5, which adds another clinically relevant and meaningful component to the diagnosis. Clinical implication of our study finding is that the use of IC-11 criteria of PTSD in adolescents will lead to fewer diagnoses compared to ICD-10; and the figures will be comparable to DSM-5.

Strength and Limitations

The study was conducted with a validated instrument in the local Nepali language. It could evidence the effect of the change of concept in PTSD in newer diagnostic systems, namely ICD-11 and DSM-5.

However, there were a few limitations. There was no scope for a clinical correlation of the findings, which would have been ideal. There is no specific description of how to quantify functional impairment as ‘significant’ in the diagnostic systems, so we have taken significant functional impairment as having more than 50% score of seven functional items to arrive at a diagnostic threshold. However, impairments in the individual areas could be clinically significant. For this purpose, diagnostic probabilities with the presence or absence of functional impairments are also given. It will be better to develop an instrument to measure and quantify the functional impairment associated with PTSD, appropriate for different age-groups. The response to the stressor criterion of DSM-IV was not specifically studied, although the fear of death as a response to the earthquake was ascertained. As PTSD was developed based on DSM-IV, it may not capture all the symptom criteria for DSM-5. There was no information on a couple of items of the PTSD checklist for DSM-5 (PCL-5) diagnosis, (e.g., blaming self or other for what happened, and taking too many risks or doing things that could cause harm). The estimated diagnostic prevalence may be lower than the actual value. An updated Child PTSD Symptom Scale for DSM-5 (CPSS-5), is now available.

Future epidemiologic studies should use updated screening based on the newer criteria for PTSD. It would be preferable to use a measure of functioning to identify significant impairment in a useful way. Similar studies are also required in different cultures, trauma types, and other age groups.

Conclusion

The possible prevalence of PTSD based on the ICD-11 criteria is comparable to that based on DSM-5 criteria, which is lower than figures based on their predecessors. Being focused on the core symptoms of PTSD and due to the inclusion of an impairment criterion, ICD-11 diagnosis of PTSD is expected to be more homogenous.
(Paediatric Nursing) thesis of Asmita Sharma submitted to Institute of Medicine, Tribhuvan University, Kathmandu, Nepal. Thesis advisor was Professor Tara Pokhrel and coadvisor was Tuml Shrestha at Maharajgunj Nursing Campus.

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References
1. American Psychiatric Association. The diagnostic and statistical manual of mental disorders (DSM-5). 5th ed. Washington, DC: American Psychiatric Association, 2013.

2. Maercker A, Brewin CR, Bryant RA, et al. Diagnosis and classification of disorders specifically associated with stress: Proposals for ICD-11. World Psychiatry 2013 Oct 1; 12(4): 198–206.

3. Cloitre M, Garvert DW, Brewin CR, Bryant RA, and Maercker A. Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. Eur J Psychotraumatol 2013; 4.

4. Kar N, Mohapatra PK, Nayak KC, Pattenak P, Swain SP, and Kar HC. Post-traumatic stress disorder in children and adolescents one year after a super-cyclone in Orissa, India: Exploring cross-cultural validity and vulnerability factors. BMC Psychiatry 2007; 7: 8.

5. Ho GWK, Hyland P, Shevlin M, et al. The validity of ICD-11 PTSD and Complex PTSD in East Asian cultures: Findings with young adults from China, Hong Kong, Japan, and Taiwan. Eur J Psychotraumatol 2020 Jan 30; 11(1): 1717826.

6. National Center for PTSD. PTSD in Children and Adolescents - PTSD: Available from: https://www ptsd va gov/professional/treatment/children/ptsd_in_children_and_adolescents_overview_for_professionals asp (accessed January 5, 2017).

7. Perry BD and Azad I. Post-traumatic stress disorders in children and adolescents. Curr Opin Pediatr 1999; 11: 310–316.

8. Kar N. Depression in youth exposed to disasters, terrorism and political violence. Curr Psychiatry Rep 2013; 15(4): 73.

9. Kar N and Bastia BK. Post-traumatic stress disorder, depression and generalised anxiety disorder in adolescents after a natural disaster: A study of comorbidity. Clin Pract Epidemiol Ment Health 2006; 2: 17.

10. Kolko DJ, Hurlburt MS, Jinjin Zhang, Barth RF, Leslie TK, and Burns BJ. Post-traumatic stress symptoms in children and adolescents referred for child welfare investigation: A national sample of in-home and out-of-home care. Child Maltreat 2010 Feb 1; 15(1): 48–63.

11. Familiar I, Murray L, Gross A, Skavenksi S, Jere E, and Bass J. Post-traumatic stress symptoms and structure among orphan and vulnerable children and adolescents in Zambia. Child Adolesc Ment Health 2014 Nov; 19(4): 235–242.

12. Saul AL, Grant KE, and Carter JS. Post-traumatic reactions in adolescents: How well do the DSM-IV PTSD criteria fit the real life experience of trauma exposed youth? J Abnorm Child Psychol 2008 Aug; 36(6): 915–925.

13. World Health Organization. ICD-11: Mortality and morbidity statistics. Cited February 1, 2020. Available from: https://icd who int/browsers/1-m en/ http%3a%2f%2fici d%2fsfidi ty%2f%2f0769808

14. Sharma A. Psychosocial status of adolescents after earthquake in highly affected and less affected districts of Nepal (Master of Nursing Program (Paediatric Nursing)). Kathmandu: Tribhuvan University, 2016.

15. Sharma A and Kar N. Posttraumatic stress, depression, and coping following the 2015 Nepal earthquake: A study on adolescents. Disaster Med Public Health Prep 2019; 13(2): 236–242.

16. National Planning Commission. Post disaster needs assessment. Kathmandu: Government of Nepal, 2015.

17. Foa EB, Johnson KM, Feeny NC, and Treadwell KRH. The child PTSD symptom scale: A preliminary examination of its psychometric properties. J Clin Child Psychol 2001; 30(3): 376–384.

18. Meyer RML, Gold JI, Young CM, and Kassam-Adams N. Psychometric evaluation of the child PTSD symptom scale in Spanish and English. Child Psychiatry Hum Dev 2015 Jun; 46(3): 438–444.

19. Kohrt BA, Jordans MJD, Tol WA, Luitel NP, Maharjan SM, Upadhaya N. Validation of cross-cultural child mental health and psychosocial research instruments: Adapting the depression self-rating scale and child PTSD symptom scale in Nepal. BMC psychiatry 2011; 11(1): 127.

20. Ditlevsen DN and Eikli A. Gender, trauma type, and PTSD prevalence: A re-analysis of 18 Nordic convenience samples. Ann Gen Psychiatry 2012 Oct 29; 11: 26.

21. Axinn WG, Ghimire D, Williams NE, and Jovanovic T. Impact of gender and PTSD prevalence in Nepal adults: Exploring cross-cultural mental health. J Health Soc Behav 2013; 54(4): 444–461.

22. Garza K and Jovanovic T. Impact of gender on child and adolescent PTSD. Curr Psychiatry Rep 2017 Sep 30; 19(11): 87.

23. Olff M. Sex and gender differences in post-traumatic stress disorder: An update. Eur J Psychotraumatol 2017 Sep 29; 8(Suppl 4). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5631782/

24. Irish LA, Fischer B, Fallon W, Spoonster E, Slenderski EM, Delahanty DL. Gender differences in PTSD symptoms: An exploration of peritraumatic mechanisms. J Anxiety Disord 2011 Mar; 25(2): 209–216.

25. Christiansen DM and Eikli A. Risk factors predict post-traumatic stress disorder differently in men and women. Ann Gen Psychiatry 2008 Nov 18; 7: 24.

26. Haravouhi H, Kivimäki O, Suomalainen L, and Marttunen M. An evaluation of ICD-11 posttraumatic stress disorder criteria in two samples of adolescents and young adults exposed to mass shootings: Factor analysis and comparisons to ICD-10 and DSM-IV. BMC Psychiatry 2016; 16: 140.

27. World Health Organization. The ICD-11 classification of mental& behavioral disorders: clinical descriptions and diagnostic guidelines. 10th ed. Geneva: World Health Organization, 1992.

28. American Psychiatric Association. The diagnostic and statistical manual of mental disorders (DSM-IV). Washington DC: American Psychiatric Association, 1994.

29. Barbano AC, van der Mei WE, Bryant RA, et al. Clinical implications of the proposed ICD-11 PTSD diagnostic criteria. Psychol Med 2019; 49(3): 483–490.

30. Dai W, Chen L, Lai Z, Li Y, Wang J, and Liu A. The incidence of post-traumatic stress disorder among survivors after earthquakes: A systematic review and meta-analysis. BMC Psychiatry 2016 Jun 7; 16. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4859949/

31. Kar N. Indian research on disaster and mental health. Indian J Psychiatry 2010 Jan; 52(Suppl 1): S286–S290.

32. Arnberg FK, Hultman CM, Michel P-O, and Lundin T. Fifteen years after a ferry disaster: Clinical interviews and survivors’ self-assessment of their experience. Eur J Psychotraumatol 2013 Oct 3; 4. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3790912/

33. Kuester A, Köhler K, Ehring T, et al. Comparison of DSM-5 and proposed ICD-11 criteria for PTSD with DSM-IV and ICD-10: Changes in PTSD prevalence in military personnel. Eur J Psychotraumatol. 2017 Oct 17; 8(1). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5687795/

34. Weathers F, Litz B, Keane T, Palmieri P, Marx B, and Schnurr P. The PTSD checklist for DSM-5 (PCL-5). 2013. Available from: http://www ptsd va gov/professional/assessment/adult sr/ptsd-checklist asp.

35. Foa EB, Asnaani A, Zang Y, Capalidi S, and Yeh R. Psychometrics of the child PTSD symptom scale for DSM-5 for trauma-exposed children and adolescents. J Clin Child Adolesc Psychol 2018 Jan 2; 47(1): 38–46.