Original Article

Post-traumatic stress disorder in a school in Darfur, Western Sudan

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Abstract

Objective
To determine the prevalence and predictors of Post-traumatic stress disorder (PTSD) among children and adolescents in a war zone.

Methods
Two hundred displaced 10-18 years old school children and adolescents randomly selected from a resettlement camp in Al Geneina City, Western Sudan, were interviewed using a war-related trauma checklist, the Post-traumatic Stress Diagnostic scale (PDS) and the Short Mood and Feelings Questionnaire (SMFQ).

Results
The 200 students reported 255 and 586 war-related personally experienced and witnessed events respectively. The prevalence of PTSD was 55% with no significant gender difference. Multiple traumatic events were the rule. The strongest predictor of PTSD was exposure to gunfire followed by hearing about sexual assaults. PTSD followed a chronic course in all victims, the onset being within six months after the disaster. The most common PTSD symptom cluster was increased arousal followed by re-experiencing the traumatic events; the least common symptoms were in the domain of avoidance and numbing. Physical complaints dominated the picture in 23.6% and depressive symptoms were present in 87% of the victims. Contrary to media reports traumas of sexual nature were not reported to be personally experienced or witnessed but heard of by 8.5% of the sample in this conservative Muslim society.

Conclusion
PTSD is not culture-bound and it transcends age and cultural barriers. An intervention scheme to reduce war-related PTSD symptoms should be adopted to target at-risk groups of children and adolescents in parallel with the freely available nutritional and medical services, otherwise the future psychological wellbeing of this age-group will be bleak.

Keywords: PTSD, PDS, SMFQ, Darfur, Sudan

Introduction
Post-traumatic stress disorder (PTSD) is a severe anxiety disorder following exposure to an overwhelming traumatic event/s which must have involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others(1). It is characterized by symptom-clusters involving involuntary re-experiencing elements of the event, hyperarousal, avoidance and emotional numbing. The symptoms must last for more than a month...
and must significantly affect important areas of functioning. In recent years, there has been substantial research in the prevalence and phenomenology of PTSD in at-risk groups of children from different ethnic and cultural backgrounds lending further evidence that PTSD transcends age and cultural barriers\(^{2-8}\).

In the Middle East, a number of studies about PTSD in children exposed to calamitous events emerged as the region is riddled with war-related traumas. As a result of the on-going Israeli-Palestinian conflict most of the studies came from that region, but single reports of child-specific PTSD were also reported from Iraqi Kurdistan, Kuwait following the Gulf war and Lebanon\(^{9-16}\).

Regional conflicts and wars have been raging in Sudan since 1955, claiming thousands of lives and forced immigration to neighbouring countries in addition to internal displacement of millions\(^{17}\) but only two published studies were found about the psychological impact of war trauma on children. In an exploratory study, on the psychosocial effects of war situation on South Sudanese refugee children in Northern Uganda, Paardekooper et al reported significantly more traumatic events and PTSD-like complaints, behavioural problems and depressive symptoms compared to Ugandan children\(^{18}\). Twenty percent of Southern Sudanese refugee minors resettled in USA were reported to experience PTSD\(^{19}\).

Darfur is the largest region in Sudan bordering Libya, Chad and Central African Republic and is inhabited by people of different ethnic background. Darfur conflict started in early 2003 and the war rapidly climaxed to involve the whole region claiming thousands of lives, forced internal displacement and immigration to neighbouring countries of thousands of refugees. Geneina, capital of Western Darfur, received thousands of these people. Al-Riyad camp – one of eight camps established in Sept 2003 in Geneina – sheltered approximately 20,000 people, mainly women and children. The camp is over-crowded, the homes built from straw and covered by plastic sheets with no electric and water supplies. Modest health, educational services and food are provided by the UN, Sudanese government and more than thirty non-governmental humanitarian agencies. This study examined the prevalence of war-related traumatic events and its association with symptoms of PTSD in a school in Al-Riyad camp during the last week of August 2007.

**Methods**

From the eight resettlement camps in Al-Geneina city, Al-Riyad camp school was randomly selected. Approximately 2,000 students were enrolled in this school, each class holding up to 75 students. Two hundred students aged 10-18 years randomly selected from the students’ list of names constituted the study sample, the genders being equally represented. This age group was chosen because children of this age are cognitively able to provide direct information. Interviews were conducted by two trained final year medical students (2\(^{nd}\) and 3\(^{rd}\) authors) supervised by the first author. Each student was interviewed in privacy in the school with reassurance about the confidentiality of the information. Consent was obtained from the camp and school administrations.

The data was collected using a checklist covering personally experienced and witnessed war-related traumatic events (Table 1), the Post-traumatic Diagnostic Scale (PDS) (Appendix 1) and the Short
Mood and Feelings Questionnaire (SMFQ) (Appendix 2). PDS is a brief screening measure derived from the DSM-IV diagnostic criteria of PTSD and has a long track record of multicultural use\(^1,20\).

Table 1: The prevalence and prediction of PTSD by the type of traumatic event among the study sample in Al-Riyad camp.

<table>
<thead>
<tr>
<th>Type of trauma</th>
<th>No. of students exposed</th>
<th>No. developed PTSD (%)</th>
<th>Type of trauma</th>
<th>No. of students exposed</th>
<th>No. developed PTSD (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shot by bullet</td>
<td>18</td>
<td>16 (88.8)</td>
<td>Heard of sexual assault</td>
<td>17</td>
<td>15 (88.2)</td>
</tr>
<tr>
<td>Physical violence</td>
<td>57</td>
<td>33 (57.8)</td>
<td>Family member injured/killed</td>
<td>128</td>
<td>83 (65.8)</td>
</tr>
<tr>
<td>Armed robbery</td>
<td>180</td>
<td>101 (56)</td>
<td>Gunfire/explosion</td>
<td>173</td>
<td>100 (57.8)</td>
</tr>
<tr>
<td>Sexual assault</td>
<td>0</td>
<td>0 (0)</td>
<td>Own house burning</td>
<td>104</td>
<td>59 (65.7)</td>
</tr>
<tr>
<td>Total</td>
<td>255</td>
<td></td>
<td>Friend/neighbour injured/killed</td>
<td>90</td>
<td>51 (56.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stranger injured/killed</td>
<td>74</td>
<td>34 (45.9)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>586</td>
</tr>
</tbody>
</table>

Before use it was modified by double translation of the English to an Arabic version. The SMFQ provides a swift assessment of core depressive symptomatology as specified by DSM-IV criteria of depressive disorder\(^1,21\). It consists of thirteen descriptive phrases regarding how the subject has been feeling over the past two weeks, and it has been widely used as a screening measure for depression in children and adolescents epidemiological studies (Appendix 2). The SMFQ was likewise double translated before use in this study.

The data was analyzed using SPSS, version 10 software.

**Results**

All the students selected agreed to be interviewed. As shown in Table 1 the sample reported they had experienced multiple traumas, a total of 255 and 586 war-related personally experienced and witnessed events respectively were reported by the 200 male and female students, the average student had experienced four (4.2) traumatic events with no gender difference. Traumas of sexual nature were not reported to be personally experienced or witnessed, but 17 (8.5%) students admitted hearing about them. The most frequent personally experienced event was armed robbery (90%) followed by witnessing gunfire or explosion (86.5%).

In this study PTSD was found in 110 students (55%) with no significant gender difference; 51% of the girls and 59% of the boys had PTSD symptoms.

The prevalence of traumatic events among the study sample are shown in Table 1. The experience of personal exposure to gunfire and hearing about sexual assaults triggered PTSD symptoms in 88.8% and 88.2% of those who had experienced these events respectively. The students with and without PTSD had experienced a total of 492 and 349 events with an average of 4.4 and 3.8 events per student respectively. There was no gender difference for the number of traumatic events between the two groups.

The war-related traumatic events considered in this study were only those that the students had experienced in the period between the start of the war in early 2003.
and resettlement in the camp in September 2003. After this period the camp was considered as a safe haven, only one child developed acute PTSD while the remaining 109 children had chronic PTSD and in 6 children the onset was delayed according to DSM-IV specifiers.

The Short Mood and Feelings Questionnaire (SMFQ), child version revealed that 87% of the PTSD victims had significant depressive symptoms. Somatizing physical symptoms particularly headache and abdominal pain were present in 23.6% of the PTSD victims (Table 2).

| Table 2: The prevalence of PTSD and other variables among 200 students in Al-Riyad Camp. |
|---------------------------------|-----------------|
| N | % |
| Moderate/severe symptoms | 110 | 55 |
| Male students | 59 | 29.5 |
| Female students | 51 | 25.5 |
| Mild symptoms | 73 | 36.5 |
| No symptoms | 17 | 8.5 |
| Chronic PTSD | 109 | 54.5 |
| Delayed onset | 6 | 0.3 |
| Acute onset | 1 | 0.05 |
| Depressive symptoms | 95 | 87 |
| Somatizing symptoms | 26 | 23.6 |

Discussion
Our sample of students reported multiple traumatic events experienced during the war and in their flight till they were settled in the camp in September 2003. A number of studies have demonstrated that increasing severity and the number of traumatic events produce a dosage effect with high levels of trauma exposure resulting in more emotional symptoms. In this study significantly more witnessed events than personally experienced events were reported by both the whole sample of 200 students and the 110 PTSD victims. Apparently witnessing repeated traumatic events could be more anxiety-provoking than living through the events. Alternatively in this conservative Muslim society, respondents might have been unwilling to admit being victims of worst type of traumatic experiences like personally experienced or witnessed sexual violence. Traumas of sexual nature were not reported to be experienced or witnessed in this study; only 17 students (8.5%) reported them as being heard of, albeit triggered PTSD in 15 of them (88%). This sensitive issue has received a lot of media attention and scientifically researching it may be difficult in this culture.

The prevalence of PTSD was found to be 55% which support the view that PTSD is common in children and adolescents and lending more evidence that PTSD follows similar dynamics cross-culturally. The prevalence is generally consistent with regional and local literature reports of PTSD prevalence in at-risk groups of children and adolescents. Post-traumatic stress disorder was chronic in almost all victims and this is in agreement with literature reports that exposure to other stressors after living throughout traumatic experience can prolong the duration of PTSD. Sudanese refugee children in Paradekoooper's study reported experiencing more daily stressors after relocation in camps in Northern Uganda than did the Ugandan children. Stressors included, but were not confined to overcrowding, lack of security, poor sanitation, poverty and perhaps political harassment, all prevailing in Al-Riyadh camp.

The high prevalence of PTSD in our study is in sharp contrast to the 20% prevalence reported by Geltman et al among Southern Sudanese refugee minors resettled in the United States. The absence of the adversities of the 'camp effect', far better living conditions and implementing a resettlement program for the Sudanese minors explains the difference. These minors were reported to do quite well on a
variety of health outcome measures including PTSD, but they reported high rates of seeking medical care for physical symptoms that were often signs of psychological distress or 'somatisation'. In our study, somatizing physical symptoms particularly headaches and abdominal pain were present in 23.6% of PTSD victim and one of the most frequently prescribed medication in the camp dispensary was paracetamol. From this finding, in addition to literature reports a tentative proposal would be that similar population of at-risk children presenting to healthcare professionals with somatic symptoms should be screened for symptoms of PTSD. In fact, in our study somatic symptoms were more common than the symptoms of avoidance and numbing (Category C) and this can be explained by cultural differences as the PDS was validated in a western culture\(^{(20)}\).

Depressive symptoms were reported to be common in traumatized children\(^{(9,12,18)}\). The finding that depressive symptoms were present in 87% of the PTSD victims in our study is in agreement with literature reports lending further evidence that the symptoms of PTSD and depression may overlap. From Table 1 it can be extrapolated that students with PTSD received almost similar "doses" of traumatic events compared with students without PTSD (4.4 vs. 3.8 events per student) which suggest that trauma is not the sole factor triggering PTSD. Individual, family and community factors are reported to operate as mediating or moderating factors facilitating or protecting against the debilitating effects of political violence\(^{(9,16,23)}\). In Sudan, the cohesive extended family structure may play a protective role against traumatic experiences particularly in rural communities like Darfur. The results of this exploratory study demonstrate the need to further investigate, on a large scale, the psychological impact of war atrocities for the psychiatric complications of untreated PTSD are well documented\(^{(6,24,25)}\). In developing countries psychiatric disorders including PTSD may present with somatizing physical complaints. At-risk groups of children and adolescents exposed to traumatic experiences should be screened routinely for symptoms of PTSD.

**Limitations**

This study was conducted approximately five years after resettlement in the camp, so the respondents might have been subject to the effect of recall. The instruments used were not validated in this culture and social support networks and family factors were not explored in this study.

**Acknowledgement**

This study was sponsored by the University of Medical Sciences & Technology, Khartoum, Sudan. Gratitude is due to the Sudanese Islamic Association who hosted us during the period of the study.

**References**

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Appendix 1
Post-traumatic stress disorder diagnostic scale (PDS)

1. Have you experienced, heard or witnessed a life-threatening event that caused intense fear, helplessness, or horror?
2. Do you re-experience the event through repeated, distressing memories or dreams?
3. Do you re-experience the event through flashbacks (feeling as if the event were happening again) or a sense of reliving it?
4. Do you experience intense physical and/or emotional distress when you are exposed to things that remind you of the event?
5. Do you avoid thoughts, feelings, or conversation about the event?
6. Do you avoid activities, places, or people who remind you of the event?
7. Are you unable to remember important parts of the event?
8. Have you lost interest in significant activities in your life?
9. Do you feel detached from other people?
10. Do you feel your range of emotions is restricted?
11. Do you feel as if your future has shrunk (for example, you don't expect to have a career, marriage, children or a normal life span)?
12. Do you have trouble sleeping?
13. Are you irritable, or experiencing outbursts of anger?
14. Do you have problems concentrating?
15. Do you frequently feel "on guard"?
16. Do you experience an exaggerated startle response?
17. Do your symptoms interfere with your daily life?
18. Have your symptoms lasted at least one month?
19. Have your symptoms lasted for more than three months?
20. After how long from the event the symptoms start to appear?

Appendix 2
Short Mood and Feelings Questionnaire—Child Version

<table>
<thead>
<tr>
<th>0 Not true</th>
<th>1 Sometimes</th>
<th>2 True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I felt miserable or unhappy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I didn't enjoy anything at all.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I felt so tired I just sat around and did nothing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I was very restless.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I felt I was no good anymore.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I cried a lot.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I found it hard to think properly or concentrate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I hated myself.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I felt I was a bad person.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I felt lonely.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I thought nobody really loved me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I thought I could never be as good as other kids.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I felt I did everything wrong.</td>
<td></td>
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</tbody>
</table>
اضطراب ما بعد الکرب لدى عينة من الطلاب في مدرسة في دارفور في غرب السودان

فضل العلم عبد الرحيم
ابو بكر عيد المنعم
محمد انور

الهدف: تحديد مدى انتشار الإنذارات المسببة لاضطراب ما بعد الکرب في منطقة نزاع.

المجتمع: تم اختيار عينة عشوائية من الطلبة، اعمارهم ما بين 18-20 سنة من أعيد توزيعهم نتيجة للحرب في مدينة الجينية غرب السودان. تم تنفيذ مقابلة أفراد العينة باستخدام قائمة الفحص الخاصة بالصدامات الناتجة عن الحرب، ومقياس اضطراب ما بعد الکرب والاستبانة المختصرة لمقياس المزاج والمشاعر.

النتائج: أظهرت الدراسة أن انتشار اضطراب ما بعد الکرب بشكل 55% دون فروق بين الذكور والإناث.

كان لأقوى النماذج لانتشار ما بعد الکرب هو تعرض لطلقات الأسلحة النارية تبعي الشماع عن الاعتداءات الجنسية. في جميع الحالات كان الکرب مستمراً وكنما كانت بداية في غضون ستة أشهر بعد الاعتداء لسبب. أبرز الاعتداءات كانت كالتالي: ارتفاع مستوى البقاء والحذر والتنوير لمعاودة الذاتية التلقائية للحرب وذلك لاتخاذ الاختيار الدائم للنفاذ بالابتعاد عن ما يذكر بالحدث وأعراض تبلغ المشاعر.

وجدت الأعراض البدنية في 35% وأعراض الاكتئاب في 38% من الضحايا. بخلاف ما يذكر في وسائل الإعلام في تقديرها لم تعود الاعتداءات الجنسية (لا بالتعبير لها ولا بمشاهدتها) ولكن سمع عنها 60.5% من الضحايا في هذا المجتمع المسلح المحافظ.

الاستنتاج: اضطراب ما بعد الکرب ليس مقصوراً على مجتمع بعينه ولا عمر محدد. من المهم في حالات الحرب وضع برامج وقائية وعلاجية لحالات اضطراب ما بعد الکرب للاطفال والمراهقين لتكون صنواً لخدمات الطبية والعلاجية المقدمة لهم.

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