

Post-traumatic stress disorder in children witnessing a public hanging in the Islamic Republic of Iran

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الاضطراب الكربي التالي للصدمة النفسية لدى الأطفال الذين يشهدون عملية شنق علني في جمهورية إيران الإسلامية
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الخلاصة: درس الباحثون متلازمة الكرب التالي للصدمة النفسية لدى 200 طفل في عمر 7-11 عاماً، ممن شهدوا عملية شنق علني بالقرب من مدرستهم في مدينة أصفهان، بجمهورية إيران الإسلامية. وفي إطار الدراسة، تم استكمال قائمة تفقدية من خلال مقابلات مع والدي الأطفال بعد 3 أشهر من الحادث. وبيّنت الدراسة وجود أعراض الاضطراب الكربي التالي للصدمة النفسية لدى 104 أطفال منهم (52%)، مع معاناة 88 طفلاً من استرجاع مشاهد الحادث، و24 طفلاً من حالة اجتناب، و62 طفلاً من فرط التيقظ. وكان متوسط شدة الكرب، بحسب مَنسَب رد فعل الأطفال للكرب التالي للصدمة النفسية، هو 39.1، مما يشير إلى أن الكرب يتراوح بين المتوسط والوخيم. وتلقي هذه الدراسة الضوء على الآثار الانفعالية الشديدة على الأطفال الذين يشهدون أحداثاً تسبب الصدمة النفسية.

ABSTRACT A study was made of post-traumatic stress disorder in 200 children aged 7–11 years who had witnessed a public hanging next to their school in Isfahan, Islamic Republic of Iran. A standard checklist was completed through interviews with the children's parents 3 months after the event. Post-traumatic stress disorder symptoms were identified in 104 children (52%), with 88 suffering re-experiences, 24 avoidance and 62 hyperarousal. The mean stress severity according to the Child Post-Traumatic Stress Reaction Index was 39.1, indicating a moderate to severe severity of stress. The study highlights the serious emotional effects on children who witness traumatic events.

État de stress post-traumatique chez des enfants ayant assisté à une pendaison publique en République islamique d'Iran

RÉSUMÉ Une étude a été réalisée sur le syndrome de stress post-traumatique chez 200 enfants âgés de 7-11 ans qui ont assisté à une pendaison publique à proximité de leur école à Ispahan (République islamique d'Iran). Une liste de référence a été remplie lors d'entrevues avec les parents des enfants trois mois après l'événement. Des symptômes liés à un état de stress post-traumatique ont été identifiés chez 104 enfants (52 %), dont 88 souffraient de reviviscence, 24 d'évitement et 62 d'hyperexcitation. La sévérité moyenne du stress selon l'échelle d'hétéroévaluation *Child Post-Traumatic Stress Reaction Index* était de 39,1, ce qui indique une sévérité modérée à grave du stress. L'étude met en évidence les effets psychologiques considérables sur les enfants qui sont témoins d'événements traumatiques.

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Introduction

By definition, post-traumatic stress disorder (PTSD) can emerge following exposure to a traumatic event. Exposure takes many forms including direct victimization or indirect exposure through witnessing traumatic events such as accidents, domestic violence, murder, terrorism and war [1]. The defining characteristic of a traumatic event is its capacity to provoke fear, helplessness or horror in response to the threat of injury or death. Events that give rise to PTSD typically involve interpersonal violence (e.g. rape, assault and torture) or exposure to life-threatening accidents (e.g. motor vehicle accidents) or disasters (e.g. fires and earthquake) [2].

For the diagnosis of PTSD, a person must have been exposed to an extreme traumatic stressor to which he or she responded with fear, helplessness or horror and to have 3 distinct types of symptoms consisting of re-experiencing of the event, avoidance of reminders of the event and hyperarousal, for at least 1 month [3].

People who are exposed to traumatic events are at risk for PTSD as well as for major depression, panic disorder, generalized anxiety disorder and substance abuse, as compared with those who have not experienced traumatic events [4]. A number of factors contribute to the outcome following trauma, including aspects of the event and the exposure; the characteristics of the victim and family; and sociocultural factors.

Studies of PTSD around the world have been made on children experiencing a variety of traumatic events. Among child survivors of road traffic accidents in the United Kingdom, 33% met the criteria for PTSD, with even more showing sub-threshold clusters of distressing symptoms. After 6 months, 1 in 6 still presented with full-blown PTSD [5]. A study of adolescent

victims of a severe earthquake in Taiwan showed the incidence of PTSD symptoms was 7.0% in girls and 5.2% in boys [6]. Exposure to violence in the United States had a significant positive association with depression, anger, anxiety, dissociation and PTSD in 3735 students in grades 9 to 12 [7]. A study of 121 Palestinian children living in an area of bombardment showed that 54% suffered severe, 34% moderate and 11% mild and doubtful levels of PTSD, with girls more vulnerable [8]. Many studies have been made of children who have witnessed domestic violence [9–19], showing they can exhibit an increase in externalizing behaviours such as aggression, conduct disorders and impulsivity [16,17] and may have symptoms of PTSD [18,19].

In the Islamic Republic of Iran, a person who is sentenced to execution may be hanged in a public place. This study was conducted to measure the frequency of PTSD signs and symptoms among the primary school pupils who watched a public hanging of a criminal in Isfahan city, Islamic Republic of Iran.

Methods

This is a simple descriptive study carried out on children aged 7 to 11 years in a primary school located in the centre of Isfahan. On 26 March 2002, a male criminal, sentenced to death by the courts, was hanged next to a school. About 250 pupils were reported to have watched the scene.

Study tools

The study focussed on defining the relative frequency of PTSD signs among the children who had watched the execution, the number and percentage of traumatized children with chronic PTSD according to the American Psychiatric Association's *Di-*

agnostic and Statistical Manual of Mental Disorders (DSM-IV) scale [1] and the severity of PTSD symptoms according to the Child Post-Traumatic Stress Reaction Index (CPTSD-RI) [20].

A PTSD symptoms checklist was compiled, based on DSM-IV criteria [3]. The main symptoms of PTSD in DSM-IV are:

- Re-experiencing: recurrent and intrusive distressing recollections of the event; recurrent distressing dreams of the event; sudden acts; intense psychological distress on exposure to events that symbolize the event.
- Avoidance: avoiding thoughts associated with the event; avoiding activities that arouse recollections of the event; inability to recall the event; diminished interest in activities; feeling of detachment from others; restricted range of affect; sense of foreshortened future.
- Arousal: difficulty falling asleep; irritability; difficulty concentrating; hypervigilance; exaggerated startle response; physiological reactivity on exposure to events that symbolize the event.

The severity of PTSD symptoms was evaluated by using the self-reported CPTSD-RI [20], a 20-item scale assessing post-traumatic stress reaction in children and adolescents. The CPTSD-RI has been used to assess children's reaction to suffering a natural disaster (e.g. earthquake). Prior research has suggested criteria for defining levels of PTSD symptoms based on total CPTSD-RI scores [21,22]. The frequency of occurrence of symptoms was rated by parents on a 5-point Likert scale, ranging from 0 (none) to 4 (most of the time). Prior comparisons of CPTSD-RI scores with a diagnosis of PTSD in clinical populations have suggested the following criteria: 0–11 doubtful; 12–24 mild; 25–36 moderate; 40–59 severe; 60–80 very severe

[23]. Previous findings have indicated that a score of 40 or above is highly associated with a diagnosis of PTSD [24]. Test–retest reliability for the CPTSD-RI was assessed by the authors [25].

Study methods

The children who had witnessed the execution were identified and invitations were sent to all their parents informing them about the goals of study. Consent was obtained and the research was carried out with a total of 200 subjects who agreed to cooperate with the study. Pupils experiencing any other acute traumas during past year or those who had been referred to a psychiatric clinic or those not watching the execution scene were all excluded from the study.

A psychiatrist completed the PTSD symptoms checklist in a clinical psychiatric interview with each child and his/her parents to diagnose the frequency of symptoms of PTSD. The CPTSD-RI test was done by a psychologist to evaluate the severity of PTSD symptoms. Both checklists were completed 3 months after the trauma.

Data about the demographic characteristics of the children (family size and parent's educational level) were also gathered.

The data were analysed by descriptive statistics.

Results

Overall, 104 out of 200 children (52%) who had witnessed the hanging showed at least one of the symptoms of PTSD 3 months after the event. Of the total children, 44 (22%) showed re-experiencing, 18 (9%) hyperarousal, 20 (10%) re-experiencing plus hyperarousal and 24 (12%) re-experiencing plus hyperarousal plus avoidance (Table 1). There were 24 (12%) pupils diagnosed as

having chronic PTSD according to DSM-IV scales.

The most common of the re-experiencing symptoms, suffered by 29% of the total children, was recurrent and intrusive distressing recollections of the event, followed by severe physical reactions, for 20% of children (Table 2). A total of 14% experienced intense psychological distress at exposure to events that symbolized or resembled an aspect of the traumatic event and 12% had recurrent distressing dreams of the event. The most common avoidance symptom was diminished interest in significant activities (16% of all children) followed by feelings of detachment/estrangement from others (12%). The most common hyperarousal symptoms were irritability or outbursts of anger (28%), exaggerated startle response (22%) and hypervigilance (22%).

Of the 88 children with re-experiencing, the lowest prevalence of PTSD symptoms (5%) was for children whose parents had education higher than a bachelor's degree. Among the 62 pupils with arousal, the lowest prevalence (2%) was for children whose parents had education higher than

bachelor's degree, while the highest (25%) was for parents with education below high school ($P < 0.05$). Among the children with re-experiencing, the prevalence was higher among those in families with 4 members. Among the children with avoidance or hyperarousal the highest prevalence was for those with 3 to 4 family members.

The mean stress severity was 39.1 (standard deviation 3.7) according to CPTSD-RI. The majority of pupils had stress from moderate to severe levels (Table 3): 35% moderate (score 25–39) and 40 very severe (score 40–59).

Discussion

This study was undertaken to estimate the prevalence of PTSD in children after witnessing a public hanging. Over half of the children witnessing the traumatic event manifested at least 1 symptom of PTSD 3 months later. The highest prevalence of symptoms was for re-experiencing, in the form of recurrent and intrusive distressing recollections of the event, and for hyperarousal, in the form of irritability and anger. Furthermore, 12% of the children showed chronic PTSD according to DSM-IV criteria, coinciding with statistics already reported in psychiatric reference textbooks [26]. This result is comparable to the study of Fein et al. who reported that in an emergency department on follow-up assessment, 15% of patients reported significant post-traumatic stress symptoms [27]. The American Psychiatric Association and other authors have estimated that the lifetime prevalence of PTSD in the general population ranges from 1% to 14% [1].

The findings of our study suggest that the children had really experienced a traumatic event. Witnessed violence is verbal or physical violence that is heard or seen by

Table 1 Frequency distribution of chronic post-traumatic stress disorder symptoms among Iranian children witnessing a traumatic event

Symptom	No.	%
Re-experiencing	44	22
Avoidance	0	0
Hyperarousal	18	9
Re-experiencing + hyperarousal	20	10
Re-experiencing + hyperarousal + avoidance	24	12
No symptoms	96	48
Total	200	100

Table 2 Frequency distribution of chronic post-traumatic stress disorder symptoms by category of symptom

Symptom	No. ^a	% (n = 200)
<i>Re-experiencing symptoms</i>		
Recurrent and intrusive distressing recollections of the event	58	29
Severe physical reactions	40	20
Suddenly acts or feels as if the traumatic event was recurring	32	16
Intense psychological distress at exposure to events that symbolized or resembled an aspect of the traumatic event	28	14
Recurrent distressing dreams of the event	42	12
<i>Avoidance symptoms</i>		
Markedly diminished interest in significant activities	32	16
Feelings of detachment/estrangement from others	24	12
Efforts to avoid activities or situations that arouse recollections of the trauma	20	10
Sense of foreshortened future	20	10
Inability to recall an important aspect of the trauma	16	8
Restricted range of affect	14	7
Efforts to avoid thoughts or feelings associated with the trauma	24	2
<i>Hyperarousal symptoms</i>		
Irritability or outbursts of anger	56	28
Hypervigilance	44	22
Exaggerated startle response	44	22
Difficulty concentrating	38	19
Difficulty falling or staying asleep	34	17

^aSome cases had more than 1 symptom.
n = total number of respondents.

a child [12]. Exposure to domestic violence has short- and long-term effects on a child's emotional, social and cognitive development [15]. Children who witness parental homicides are emotionally traumatized, stigmatized and deeply scarred by a terrifying event. They often exhibit debilitating

symptoms comparable to those of PTSD [19]. As attention is focused on the deceased and on the perpetrator of the crime, the children who are witnesses inadvertently become the neglected victims [19].

Kilpatrick et al. examined variables that might mediate PTSD in child witnesses to

Table 3 Stress severity of post-traumatic stress disorder symptoms among Iranian children witnessing a traumatic event, according to Child Post-Traumatic Stress Reaction Index (CPTSD-RI) scores

CPTSD-RI score	Severity	No.	% (n = 200)
0-11	None	36	18
12-24	Mild	12	6
25-39	Moderate	70	35
40-59	Severe	80	40
> 60	Very severe	2	1

n = total number of respondents.

domestic violence [28]. The findings indicated that the impact of witnessing domestic violence in terms of PTSD is not mediated by factors such as maternal emotional well-being, age or sex of the child, or the child's style of coping with parental conflict. They suggested that all domestic violence may have severe and long-term impact on child witnesses [28]. A sample of children aged 6-12 years, of whom 20 had witnessed domestic violence and 15 had not, was examined for symptoms of PTSD, and witness status was found to be a significant predictor of PTSD [29].

Children exposed to violence through wars and other conflicts are also at risk. A study of PTSD in children who had witnessed violence interviewed 50 preschool children from 47 Iranian families living as refugees in Sweden. The prevalence of a PTSD diagnosis (according to DSM-III-R) increased from 2% to 21% in the 42 children with traumatic exposure through war and political persecution, and the amount of traumatic exposure was strongly related to the prevalence of PTSD. At follow-up 2.5 years later 23% of the children with traumatic exposure still met the full criteria of PTSD [30]. In another study of 311 refugee children from the Middle East in Denmark

who had been exposed to conditions of war and had witnessed violence, about two-thirds of the children were reported to suffer from anxiety and about 30% from sleep problems [31].

Carson et al. examined whether witnessing death and injury could produce psychophysiological responsive PTSD. Comparisons were made between 17 medication-free female Vietnam nurse veterans with a diagnosis of current PTSD related to their military service and 21 who never had PTSD. Nurses with PTSD showed significantly larger physiological responses than non-PTSD nurses only during imagery of military-related nursing events. The groups' self-reported emotional responses did not differ during imagery. Psychophysiological results support the proposition that witnessing death and serious injury to others is sufficiently stressful to cause PTSD [32]. Events that involve interpersonal violence give rise to PTSD more often than events such as motor vehicle accidents and natural disasters [26]. For example, PTSD developed in 55% of persons who reported being raped, as compared with 7.5% of those involved in accidents and 2% of those who learned of traumatic events [26]. One study reported that PTSD developed in approximately 14% of those who experienced the sudden, unexpected death of a loved one, making this event the single most frequent traumatic event to occur in both men and women, accounting for 39% of cases of PTSD in men and 27% of cases in women [26].

In our study, a lower prevalence of re-experiencing the trauma was associated with higher parents' educational level. This result is opposite to the results of Qouta who studied Palestinian children exposure to military violence and concluded that those most vulnerable to avoidance symptoms were children whose mothers were better

educated [8]. There was also a relation between larger family size and the prevalence of symptoms of PTSD. Thus, risk factors for developing of PTSD in children may be a low level of parents' education and a higher number of family members. Low socioeconomic level is one of the risk factors for PTSD [26].

North et al. describe a 1-year follow-up study of survivors of a mass shooting incident [33]. In the acute post-disaster period, 28% of subjects met the criteria for PTSD and 18% of subjects qualified for another active psychiatric diagnosis. At follow-up, 24% of patients reported a history of PTSD (17% were currently symptomatic), and 12% another current psychiatric disorder. Their study suggests that disaster research that conducts single interviews at the time of the incident or a year later may overlook a significant portion of PTSD. The considerable diagnostic co-morbidity found in this study was a robust predictor of PTSD at any time after the disaster. Disaster survivors with a psychiatric history, especially depression, may be most vulnerable to developing PTSD and therefore may deserve special attention from disaster mental health workers [33].

Most of the children in the present study had moderate or severe severity of stress

using the CPTSD-RI. The range of severity of the symptoms is very wide in different studies. A study found 54% of Palestinian children exposed to military violence suffered severe levels of PTSD [8]. Shannon et al. using the CPTSD-RI reported mild reaction scores (mean 21.7) among children and adolescents 3 months after hurricane Hugo (a severe hurricane in 1989, causing extensive damage throughout the state of South Carolina) and estimated that 5% had PTSD. Belter et al. reported moderate CPTSD-RI scores (range 26.9–35.1) among children 5 months after the hurricane. Garrison et al. also reported moderate scores (range 26–35) on the CPTSD-RI 1 year after the hurricane and estimated that 5% of the adolescents met DSM-III-R criteria for PTSD [25]. The CPTSD-RI score in the current study (mean 39.1) was lower than 6 months after hurricane Hugo (mean 58.6) and also the 1.5 year post-earthquake CPTSD-RI score of adolescents (mean 54.2).

In summary, parents, teachers and social managers in the Islamic Republic of Iran need to pay more attention to potentially stressful events that may be experienced by children such as witnessing violent acts or being involved in traumatic events.

References

1. Pfefferbaum B. Posttraumatic stress disorder. In: Lewis M, ed. *Child and adolescent psychiatry: a comprehensive textbook*, 3rd ed. Philadelphia, Lippincott Williams & Wilkins, 2002:912–24.
2. North CS et al. Psychiatric disorder among survivors of the Oklahoma city bombing. *Journal of the American Medical Association*, 1999, 282:755–62.
3. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders, DSM-IV*, 4th ed. Washington DC, American Psychiatric Association, 1994:427–9.
4. Yahuda R. Post-traumatic stress disorder. *New England journal of medicine*, 2002, 346:108–14.
5. Yule W. Post-traumatic stress disorder. *Archives of diseases in childhood*, 1999, 80:107–9.

6. Hsu CC et al. Posttraumatic stress disorder among adolescent earthquake victims in Taiwan. *Journal of the American Academy of Child and Adolescent Psychiatry*, 2002, 41(7):875–81.
7. Singer MI et al. Adolescents' exposure to violence and associated symptoms of psychological trauma. *Journal of the American Medical Association*, 1995, 273(6):477–82.
8. Qouta S, Punamaki RL, El Sarraj E. Prevalence and determinants of PTSD among Palestinian children exposed to military violence. *European child and adolescent psychiatry*, 2003, 12(6):265–72.
9. Kitzmann KM et al. Child witnesses to domestic violence: a meta-analytic review. *Journal of consulting and clinical psychology*, 2003, 71(2):339–52.
10. Bachman R, Saltzman LE. *Violence against women: estimates from the redesigned survey*. Washington DC, US Department of Justice, 1995 (Publication no. NCJ–154348).
11. Attala JM et al. Integrative review of effects on children of witnessing domestic violence. *Issues in comprehensive pediatric nursing*, 1995, 18:163–73.
12. Smith J, Berthelsen D, O'Connor I. Child adjustment in high conflict families. *Child: care, health and development*, 1997, 23:113–33.
13. Wissow LS et al. Family violence and the evaluation of behavioral concerns in a pediatric primary care clinic. *Medical care*, 1992, 30(5 suppl.):MS150–5.
14. Wolfe DA, Korsch B. Witnessing domestic violence during childhood and adolescence: implications for pediatric practice. *Pediatrics*, 1994, 94:594–9.
15. Jaffe P et al. Similarities in behavioral and social maladjustment among child victims and witnesses to family violence. *American journal of orthopsychiatry*, 1986, 56:142–6.
16. Jaffe P et al. Family violence and child adjustment: a comparative analysis of girls' and boys' behavioral symptoms. *American journal of psychiatry*, 1986, 143:74–7.
17. Hurt H et al. Exposure to violence: psychological and academic correlates in child witnesses. *Archives of pediatrics & adolescent medicine*, 2001, 155:1351–6.
18. Kilpatrick KL, Williams LM. Post-traumatic stress disorder in child witnesses to domestic violence. *American journal of orthopsychiatry*, 1997, 67, 639–44.
19. Burman S, Allen-Meares P. Neglected victims of murder: children's witness to parental homicide. *Social work*, 1994, 39:28–34.
20. Nader K et al. Children's PTSD reactions one year after a sniper attack at their school. *American journal of psychiatry*, 1990, 147:1526–30.
21. Foa EB et al. The child PTSD Symptom Scale: a preliminary examination of its psychometric properties. *Journal of clinical child psychology*, 2001, 30(3):376–84.
22. Pynoos RS et al. Life threat and post-traumatic stress in school-age children. *Archives of general psychiatry*, 1987, 44:1057–63.
23. Frederick CJ. Children traumatized by catastrophic situations. In: Eth C, Pynoos RS, eds. *Post-traumatic stress disorder in children*. Washington DC, American Psychiatric Press, 1985:71–99.
24. Pynoos R et al. Posttraumatic stress reactions in children after the 1988 Armenian earthquake. *British journal of psychiatry*, 1993, 163:239–47.
25. Goenjian AK et al. Posttraumatic stress and depressive reactions among Nicaraguan adolescents after hurricane Mitch. *American journal of psychiatry*, 2001, 158:788–94.

26. Posttraumatic stress disorder. In: Sadock BJ, Sadock VA, eds. *Kaplan and Sadock's Synopsis of psychiatry*, 9th ed. Philadelphia, Lippincott Williams & Wilkins, 2003.
27. Fein JA et al. Persistence of posttraumatic stress in violently injured youth seen in the emergency department. *Archives of pediatrics & adolescent medicine*, 2002, 156(8):836–40.
28. Kilpatrick KL, Williams LM. Potential mediators of post-traumatic stress disorder in child witnesses to domestic violence. *Child abuse and neglect*, 1998, 22(4):319–30.
29. Kilpatrick KL, Williams LM. Post-traumatic stress disorder in child witnesses to domestic violence. *American journal of orthopsychiatry*, 1997, 67(4):639–44.
30. Almqvist K, Brandell-Forsberg M. Refugee children in Sweden: post-traumatic stress disorder in Iranian preschool children exposed to organized violence. *Child abuse and neglect*, 1997, 21(4):351–66.
31. Montgomery E, Foldspang A. Seeking asylum in Denmark: refugee children's mental health and exposure to violence. *European journal of public health*, 2005, 15(3):233.
32. Carson MA et al. Psychophysiologic assessment of posttraumatic stress disorder in vietnam nurse veterans who witnessed injury or death. *Journal of consulting and clinical psychology*, 2000, 68(5):890–7.
33. North CS, Smith EM, Spitznagel EL. One-year follow-up of survivors of a mass shooting. *American journal of psychiatry*, 1997, 154:1696–702.

Correction

Coronary heart disease risk-factor profile in a lower middle class urban community in Pakistan. K. Aziz, S. Aziz, Najma Patel, A.M.A. Faruqui and H. Chagani. *Eastern Mediterranean Health Journal*, 2005, Vol. 11, No. 3, pages 258–272.

There were 2 errors in the abstract. The corrected abstract is shown below.

ABSTRACT We determined the risk-factor profile and prevalence of coronary heart disease in Metroville, a lower middle class urban community in Karachi, and compared them to the Pakistan health survey PNHS 1990–94, and the US health and nutrition survey 1988–94 NHANES111. Subjects < 18 years and pregnant women were excluded as were people with extreme ranges BMI, heart rate, height and waist. The prevalence of hypertension was 23% in men and women, hypercholesterolaemia was 17% in men and 22% in women ($P < 0.001$). Hyperglycaemia was present in 5% of men and women and obesity in 33% of men and 47% of women ($P < 0.001$). Compared to PNHS, the prevalences of obesity, hypertension, hypercholesterolaemia and WHR were higher in our population. Mean values of BMI, cholesterol, WHR were higher in the US population while mean values were lower for diastolic blood pressure and blood glucose.