

## **Prevalence of Post Traumatic Stress Disorder among School-age Adolescent**

**Khalid Astitene<sup>1\*</sup>, Hassan Aguenou<sup>2</sup>, Laila Lahlou<sup>3</sup> and Amina Barkat<sup>1,4</sup>**

<sup>1</sup>*Health and Nutrition Research Team of the Mother and Child Couple, Faculty of Medicine and Pharmacy of Rabat, Mohammed V University, Rabat, Morocco.*

<sup>2</sup>*Joint Research Unit in Nutrition and Food-CNESTEN, Université Ibn Tofail, Morocco.*

<sup>3</sup>*Laboratory of Epidemiology and Clinical Research, Faculty of Medicine and Pharmacy of Rabat, Mohammed V University, Rabat, Morocco.*

<sup>4</sup>*Department of Medicine and Neonatal Resuscitation, Ibn Sina Children's Hospital, Faculty of Medicine and Pharmacy of Rabat, Mohammed V University, Rabat, Morocco.*

### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author KA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors HA, LL and AB managed the analyses of the study. Author AB managed the literature searches. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/INDJ/2020/v14i130121

#### Editor(s):

(1) Manabu Makinodan, Nara Medical University, Japan.

#### Reviewers:

(1) P. Geetha, Vels Institute of Science, Technology and Advanced Studies, India.

(2) Gilbert Sterling Octavius, University of Pelita Harapan, Indonesia.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/58230>

**Original Research Article**

**Received 04 April 2020**

**Accepted 11 June 2020**

**Published 22 June 2020**

### **ABSTRACT**

**Aim:** After a traumatic event, the person can develop post-traumatic stress disorder (PTSD), the purpose of the study is to assess the prevalence of PTSD in adolescents in public middle schools of the prefecture of Salé in Morocco and study anxiety and depression which are the comorbid disorders of the PTSD. The survey was carried out from March to June 2017.

**Methods:** 523 students were selected by the cross-sectional method from fifteen schools that were randomly selected, the age of the students vary between 12 and 17 years. For the survey, standardized questionnaires (the socio-demographic data, the Life Events Checklist, the CPTS-RI (Children's Post Traumatic Stress Reaction Index), the STAIY (State Trait Inventory Anxiety Form Y) and the CDI (Children Depression Inventory) were used which were filled in by the students.

\*Corresponding author: E-mail: [ast\\_khalid@yahoo.fr](mailto:ast_khalid@yahoo.fr);

**Results:** The prevalence of PTSD was 70.4% in the students who have PTSD. We found that the prevalence in boys was 46.74%, while in girls it was 53.26%. In addition to that, 81% of students found to be anxious and 51.8% of students have depression.

**Conclusion:** There is a high prevalence of post traumatic stress disorder among adolescents, there are practical implications for the support and care of these adolescents.

*Keywords: Adolescent; student; traumatic event; post-traumatic stress disorder; comorbid disorders.*

## 1. INTRODUCTION

Post-Traumatic Stress Disorder (PTSD) is an anxiety disorder, it is characterized by the development of specific symptoms following exposure to an extreme traumatic event that has involved death, threat of death, serious injury and/or threat to the physical integrity of the person and/or others.

Among the traumatic events we found the social violence, assaults, natural or industrial disasters, road accidents, war situations and others.

Generally, the symptoms of PTSD in adolescents are similar to the symptoms of PTSD in adults [1].

According to an international consensus, almost all children and adolescents exposed to a traumatic event are likely to have immediate stress reactions, a significant proportion of which will develop into PTSD.

The adolescents may show specificities with extreme reactions than in adults such as becoming more impulsive or consuming substances in an abusive way [2].

We can observe in adolescents nightmares are common, there is emotional insensitivity, a conscious avoidance of anything that might remind one of the traumatic event, but also frequent depression, antisocial behaviour, somatic complaints, again decreased academic performance, sleep problems, suicidal ideation, that's why some studies have shown features of PTSD symptomatology in children and adolescents [3].

The psychological impact of PTSD can persist for many years and usually worsens when left untreated.

PTSD is often associated with other disorders that have the co-morbid conditions anxiety and depression and in this study, these PTSD, anxiety and depression had a direct and negative effect on students' school lives.

The aim of this study is to assess the prevalence of Post-Traumatic Stress Disorder (PTSD) among adolescents attending public schools in the prefecture of Salé in Morocco. There are few studies that have investigated the impact of traumatic events experienced by school adolescents on their lives and especially on the appearance of PTSD and also the impact of PTSD on their social life and their school career. There are two co-morbid disorders, anxiety and depression, which are the most observed disorders after experiencing PTSD and these two co-morbid disorders will also be studied in this study.

## 2. MATERIALS AND METHODS

### 2.1 Population

The sample obtained was 750 students, the number of students who refused to participate in the study and did not provide informed consent was 158 adolescents and 69 adolescents who did not complete the questionnaires, that they had not experienced any traumatic events in their lives. Thus, the number of adolescents who participated in the study up to the end was 523 students enrolled in school with 272 female and 251 male students and the participation rate was 78.93% (592 adolescents who participated in the survey).

The inclusion criteria : Have lived or witnessed a potentially traumatic event, to be currently educated, being present at the school during the course of the study, do not go beyond the age of 17 years and have given informed consent.

The exclusion criteria: Do not be currently in school, exceed the age of 17 years, refuse to participate and do not have a mental disability.

### 2.2 Procedure

The research project began after receiving a research authorization from the Ministry of National Education, Morocco. A first meeting was held with the directors of the schools to explain

the objective of our study and also to prepare the students of each school.

Students were interviewed directly at their school to assess their symptoms of PTSD [4,5].

A second meeting was established with the students to explain the purpose and interest of the study and to answer their questions about how the study would be conducted, then I distributed an information letter for each student explaining the purpose of the study and I also distributed informed consents to be signed by their parents or guardians. In the third meeting and after receiving signed informed consents, the data was collected using two questionnaires (a socio-demographic questionnaire and a checklist of life events) and in the fourth meeting, the rest of the data were collected using three questionnaires (CPTS-RI, STAIY and CDI successively) and the adolescents who had not experienced any traumatic event, they did not complete the questionnaires CPTS-RI, STAIY and CDI. All the questionnaires were completed by the adolescents themselves.

### 2.3 Materials

The different questionnaires used to collect data are successively:

A questionnaire of socio-demographic data and the Life Events Checklist which presents stressful life events with 17 questions according to DSM-IV [6].

The CPTS-RI (Children's Post Traumatic Stress Reaction Index) to assess symptoms of PTSD after exposure to a traumatic event [7], it is a scale of 20 items intended for children from 6 to 16 years old, each item of the scale is rated in 5 levels. The gradation into 4 categories according to the score is as follows: a score between 12 and 24 indicates a low level of PTSD, between 25 and 39 a moderate level, between 40 and 59 a severe level and a score of over 60 a very severe level.

The STAIY (State Trait Inventory Anxiety Form Y, French version of Brochon-Schweitzer and Paulhan, 1993) [8], to evaluate the intensity of anxiety of adolescents, this scale includes 20 items, each answer to a questionnaire item corresponds to a score from 1 to 4 and the grades can be divided into five levels: higher than 65 (very high), 56 to 65 (high), 46 to 55 (medium), 36 to 45 (low), lower at 35 (very low). The last questionnaire is to assess the level of CDI depression (Children Depression Inventory

[7], this scale evaluates the intensity of the symptomatology depressed and the CDI includes 27 items, each item corresponds to three sentences and the student must choose the sentence that best corresponds to his condition in the last fifteen days, each item is scored from 0 (normal) to 2 (severe) and a total score is calculated by the sum of all items, it ranges from 0 to 54. All questionnaires were anonymous.

The analyses were carried out using SPSS statistical software version 20. Based on descriptive statistical analysis, data were presented by number of effective and percentage of effective, continuous or quantitative variables were expressed as mean and standard deviation. The comparison of the quantitative variables was performed using the Student t test and the comparison of qualitative or categorical variables was performed by a chi-square test ( $\chi^2$ ). A correlation was made for a comparison between the continuous variables using the Pearson correlation. p values < 0.05 were considered significant.

## 3. RESULTS

### 3.1 Socio-demographic Data and Exposure to Traumatic Events

The average salary parental was  $2.49 \pm 1.40$  dh (Moroccan dirham), which implies that it is around 2000 dh and 4000 dh per month.

The 523 students responded that they experienced one or more traumatic events during their lifetime and the percentage of students who were at least exposed to a traumatic event in their lifetime is 88.34%.

Of the 17 traumatic events all students did not experience the traumatic event the participation in a fight or presence in a war zone and the most traumatic event experienced is the sudden and unexpected death of a loved one with 33.1% of students.

The average date of traumatic event was  $4.44 \pm 1.73$  months, which implies that this date was between 3 months and 6 months (Table 1).

### 3.2 Prevalence of Post-traumatic Stress Disorder (PTSD) and Comorbid Disorders

According to the CPTS-RI scores we'd found 368 (70.4%) adolescents with PTSD (24.9% PTSD

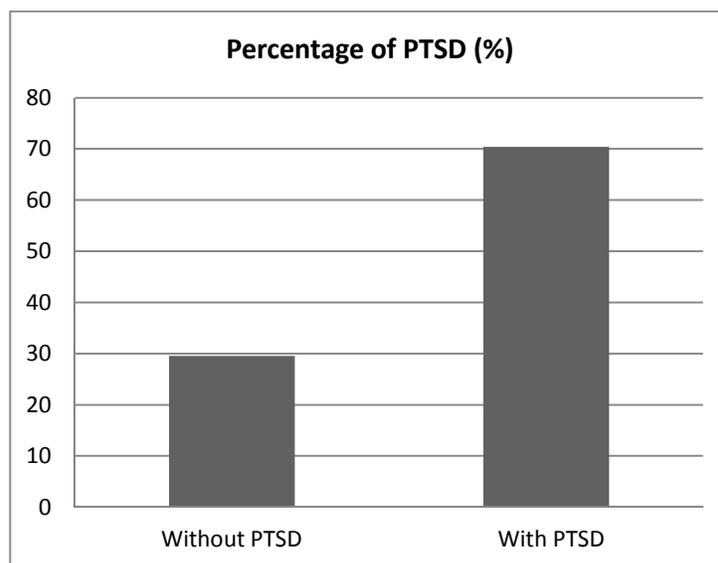
low, 30.6% PTSD moderate, 13.2% PTSD severe and only 1.7% PTSD very severe) and 155 adolescents (29.6%) without PTSD and we'd found 46.7% in boys with PTSD, while in girls 53.3% with PTSD (Fig. 1).

For the group with PTSD, we'd found 168 girls (45.6%) with anxiety, while in boys 134 (36.4%) with anxiety and also we'd found 118 girls (32.1%) with depression, while in boys 79 (21.5%) with depression.

**Table 1. The distribution of the number and percentage of boys and girls according to the variables**

<b>The variable</b>	<b>Boys (%)</b>	<b>Girls (%)</b>	<b>Total (%)</b>
<b>Family situation of parents</b>			
Married	212 (40.55)	212 (40.55)	424 (81.1)
Divorced	46 (46.46)	53 (53.54)	99 (18.9)
<b>Father's job</b>			
Employed	230 (44.0)	234 (44.7)	464 (88.7)
Unemployed	6 (1.2)	11 (2.1)	17 (3.3)
Retired	14 (2.7)	12 (2.3)	26 (5.0)
Death	6 (1.1)	10 (1.9)	16 (3.0)
<b>Mother's job</b>			
Employed	21 (4)	49 (9.5)	70 (13.4)
Unemployed	227 (43.4)	220 (42.1)	447 (85.5)
Retired	1 (0.2)	0 (0.0)	1 (0.2)
Death	2 (0.4)	3 (0.5)	5 (0.9)
<b>Salary</b>			
Under 2000dh	79 (15.1)	84 (16.1)	163 (31.2)
Between 2000-4000dh	72 (13.8)	70 (13.4)	142 (27.2)
Between 4000-6000dh	40 (7.6)	44 (8.5)	84 (16.1)
Between 6000-8000dh	37 (7.1)	49 (9.4)	86 (16.5)
More than 8000dh	23 (4.4)	25 (4.8)	48 (9.2)
<b>Traumatic events</b>			
Natural disaster	2 (0.4)	1 (0.2)	3 (0.6)
Fire or explosion	8 (1.5)	11 (2.1)	19 (3.6)
Accident of the public way	36 (6.9)	14 (2.7)	50 (9.6)
Serious accident at school, home or during leisure activities	13 (2.5)	7 (1.3)	20 (3.8)
Exposure to a toxic substance	2 (0.4)	3 (0.6)	5 (1.0)
Physical aggression	15 (2.9)	18 (3.4)	33 (6.3)
Hold-up	15 (2.9)	9 (1.7)	24 (4.6)
Sexual assault	3 (0.6)	11 (2.1)	14 (2.7)
Another unwanted and unpleasant sexual experience	4 (0.8)	6 (1.1)	10 (1.9)
Captivity	7 (1.3)	0 (0.0)	7 (1.3)
Illness or life-threatening injury	12 (2.3)	10 (1.9)	22 (4.2)
Intense human suffering	9 (1.7)	15 (2.9)	24 (4.6)
Violent death (homicide, suicide, ...)	18 (3.4)	12 (2.3)	30 (5.7)
Sudden and unexpected death of a loved one	75 (14.4)	98 (18.7)	173 (33.1)
Serious injury, damage or death caused by you to someone	5 (1.0)	0 (0.0)	5 (1.0)
Another very stressful experience	27 (5.2)	57 (10.9)	84 (16.1)
<b>Date of event</b>			
Between 1 month and 3 months	44 (8.4)	54 (10.3)	98 (18.7)
Between 3 months and 6 months	40 (7.6)	41 (7.9)	81 (15.5)
Between 6 months and one year	39 (7.4)	47 (9)	86 (16.4)
Between 1 year and 3 years	53 (10.1)	48 (9.2)	101 (19.3)
Between 3 year and 5 years	34 (6.5)	32 (6.1)	66 (12.6)
More than 5 years	41 (7.8)	50 (9.6)	91 (17.4)

*Dh : Moroccan dirham.*



**Fig. 1. The percentage of post traumatic stress disorder (PTSD) among school-aged adolescents**

Whereas for comorbid disorders we'd found 81.07% with anxiety (31.74% low anxiety, 24.66% moderate anxiety, 15.87% high anxiety, 8.80% very high anxiety) and 51.82% with depression.

The score of CPTS-RI at the adolescents with PTSD is raised more than the adolescents without PTSD ( $p < 0.001$ ).

Students with PTSD were more depressed than students without PTSD ( $p = 0.019$ ) and these students with PTSD were more anxious than students without PTSD ( $p = 0.028$ ).

Unfortunately, a high rate of students (71%) reported that they had done poorly in school.

The difference between the group with PTSD and the group without PTSD was significant in terms of living environment ( $p < 0.001$ ).

There is a significant relationship between father's job and PTSD status of the adolescent ( $p = 0.012$ ).

There is no significant relationship between salary and PTSD status of the adolescent ( $p = 0.32$ ) and there is no significant relationship between mother's job and PTSD status of the adolescent ( $p = 0.78$ ) (Table 2).

Girls were more CPTS-RI score than boys with a significant relationship ( $p < 0.001$ ), so the girls present more PTSD than boys.

**Table 2. Difference of salary, scores of the scales and parent's job between adolescents without PTSD and adolescents with PTSD**

	Without PTSD (mean $\pm$ SD)	With PTSD (mean $\pm$ SD)	t	p	$\chi^2$	p
Salary	2.58 $\pm$ 1.46	2.45 $\pm$ 1.38	0.99	0.32		
CPTS-RI score	9.85 $\pm$ 1.13	31.76 $\pm$ 12.12	22.44	<0.001		
STAIY score	44.50 $\pm$ 12.13	47.17 $\pm$ 12.85	2.20	0.028		
CDI score	14.78 $\pm$ 6.93	16.40 $\pm$ 7.29	2.36	0.019		
Father's job					22.65	0.012
Mother's job					5.63	0.78
Living environment					58.05	<0.001

SD = standard deviation.

t = Student t test.

$\chi^2$  = chi-square test.

p = significance.

Girls were more anxious and depressive than boys with a significant relationship respectively ( $p < 0.001$ ) and ( $p < 0.001$ ).

Girls were more traumatic events than boys with a significant relationship ( $p < 0.001$ ) (Table 3).

As the age increased, so did the level of PTSD ( $p = 0.003$ ), the level of anxiety ( $p < 0.001$ ) and the level of depression ( $p < 0.001$ ) increased.

The more the level of PTSD has increased, the poor academic performance ( $p = 0.036$ ) increased.

The more the level of PTSD has increased, the more the student's desire to commit suicide has increased ( $p < 0.001$ ).

As the level of PTSD increased, so did the level of anxiety ( $p < 0.001$ ) and depression ( $p < 0.001$ ) increased.

As the higher the level of PTSD ( $r = 0.48$  and  $p < 0.001$ ), the more the student had difficulty remembering things they learned at school or at home increased.

The more the level of PTSD has increased, the more the student does not do his homework ( $r = 0.12$  and  $p = 0.005$ ), the concentration ( $r = 0.34$  and  $p < 0.001$ ).

The more the concentration decreases, the more the poor academic results have increased ( $r = -0.09$  and  $p = 0.050$ ) (Table 4).

#### 4. DISCUSSION

Among the most serious disorders after a traumatic event is post-traumatic stress disorder [9] PTSD, this disorder will be the objective of our study by calculating its prevalence in the

prefecture of Salé in Morocco in government college schools.

The CPTS-RI scale was used in this study, which is why the age of adolescents should not exceed 17 years according to several studies in the scientific literature [10,11].

There are reasons why adolescents do not tell their parents everything about the traumatic event [12,13] and why parents may overlook their child's PTSD symptoms [14,15], so it is important to ask these adolescents directly about these symptoms.

There are peculiarities in the symptoms of PTSD for adolescents compared to adults, but in general there is a great similarity in these symptoms [16,17]. Adolescents experience trauma more often than adults [18]. The prevalence of exposure to at least one traumatic event in a lifetime would approach 100% [19,20]. The event most reported by adolescents is the death of a family member and others [20].

For our study, the sudden and unexpected death of a loved one was found to be the most common traumatic event among adolescents with 33.1% of adolescents and the percentage of adolescents who were at least exposed to a traumatic event during their lifetime is 88.34%.

According to some studies, boys experience more traumatic events than girls, but girls may develop more PTSD than boys [21,22].

Socially and psychologically, adolescents are less prepared than adults to cope with trauma [23], which is why they are more likely to develop PTSD [24] and what also increases the risk of developing PTSD after a traumatic event is that adolescents experience problems in emotional regulation and behavior [25]. Depending on age and type of trauma and studies show that the

**Table 3. Difference of age, scores of the scales and traumatic event between boys and girls**

	Boys (mean ± SD)	Girls (mean ± SD)	t	p	$\chi^2$	p
Age (years)	14.34 ± 1.39	14.11 ± 1.32	1.96	0.05		
CPTS-RI score	22.41 ± 11.86	27.89 ± 15.76	4.46	<0.001		
STAIY score	43.57± 11.61	48.97 ± 13.10	4.98	<0.001		
CDI score	14.57 ± 6.56	17.17 ± 7.58	4.17	<0.001		
Traumatic event					47.12	<0.001

*SD = standard deviation.  
t = Student t test.  
 $\chi^2$  = chi-square test.  
p = significance.*

**Table 4. The correlation between PTSD and the variables**

variables	r	p
Age	0.13	0.003
Academic performance	0.09	0.036
Suicide	0.21	<0.001
Level of anxiety	0.41	<0.001
Level of depression	0.36	<0.001

*r* = Pearson correlation

*p* = significance

prevalence of PTSD is high with 25% to 50% [26,27] and according to other studies, the prevalence of PTSD can be as high as 80% [28] and in other studies, this prevalence can reach up to 90% [29,30] and according to the results of some studies, the prevalence of PTSD remains high among people with traumatic events such as the loss of a close family member, friend or other close relative [31,32].

Adolescents in low-income countries have a higher prevalence of PTSD than those living in high-income countries, which is why these adolescents in low-economy countries are more likely to present PTSD after an event and the same for adolescents who belong to a minority ethnic community [31,33].

Several studies show that prevalence of PTSD varies depending on the differences between the populations studied (sex, age, living environment, ethnic origin, etc.), the instruments used, the type of trauma and the severity of the symptoms [34].

For our study, we found a high prevalence of PTSD with 70.4% with different levels of severity and this is because of the different problems of the students' adolescence, the age of these adolescents and the conditions of the country where the study was conducted which is a developing country.

According to the results of our study, students who have PTSD, we found 46.74% in boys, while in girls 53.26%, therefore girls have a higher PTSD rate than boys, Girls have more PTSD than boys [17], adolescents enrolled in school with PTSD may experience severe academic performance problems and low academic achievement, increasing the risk of repeating the school year

In processing the results of our study for students with PTSD, we found that 18.75% have difficulty

remembering things that the student has learned at school, 33.42% have difficulty concentrating and therefore we can explain the high rate of 71% of students with declining school results and we also found 6.52% of the students with suicidal ideas [18,28].

PTSD is often associated with other co-morbid medical conditions, in our study we limited ourselves to the two co-morbid conditions most often associated with PTSD, which are anxiety and depression [35]. Thus, we found in the scientific literature that nearly 75% of adolescents with a comorbid disorder have PTSD [36]. With respect to the prevalence of anxiety and depression among adolescents with PTSD, in our study, 82% of the students were found to have anxiety and 53.5% were found to have depression and namely, adolescents are more vulnerable to anxiety and depression [37].

If a disorder associated with PTSD, especially comorbid disorders of anxiety and depression, is present, these disorders influence the intensity of the maintenance of PTSD and the symptomatology of PTSD [38,39].

In comparison with the sexes, several studies confirm that girls may have more symptoms of PTSD and more associated anxiety and depression disorders than boys [40] and in our study, girls were found to have more comorbid disorders than boys: adolescent girls with PTSD had more comorbid disorders (anxiety and depression) with 88.3% than adolescents with 79% who present this PTSD disorder.

## 5. CONCLUSION

Negative impacts of PTSD on the lives of school-aged adolescents can be problems in interpersonal relationships and poor academic performance that can lead to academic failure and there may be other consequences of PTSD

including comorbid disorders which are anxiety and depression.

For practical implications, there are several effective treatments for PTSD, the Cognitive Behavioural Therapy, the Eye Movement Desensitization and Reprocessing Alternatively and the pharmacotherapy to control the various symptoms of PTSD. After the various therapeutic treatments, partial or total remission of PTSD can be as high as 90%.

## CONSENT

Informed consent from study participants was obtained for those who agreed to participate in the survey.

## ETHICAL APPROVAL

An authorization to carry out the study was obtained by the Ministry of National Education and by the Faculty of Medicine and Pharmacy of Rabat.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Dyregrov A, Yule WA. Review of PTSD in children. *Child Adolesc Ment Health*. 2006;11:176-184.
2. Pelcovitz D, Kaplan S. Post-traumatic stress disorder in children and adolescents. *Child Adolesc Psychiatr Clin N Am*. 1996;5:449-469.
3. Bui E, Ohye B, Palitz S, et al. Acute and chronic reactions to trauma in children and adolescents. In Rey JM (ed), *IACAPAP e-Textbook of Child and Adolescent Mental Health*. 2014;4:1-29.
4. Kassam-Adams N, Garcia-Espana JF, Miller VA, et al. Parent child agreement regarding children's acute stress: the role of parent acute stress reactions. *J Am Acad Child Adolesc Psychiatry*. 2006; 45(12):1485-1493.
5. Meiser-Stedman R, Smith P, Glucksman E, et al. Parent and child agreement for acute stress disorder, post-traumatic stress disorder and other psychopathology in a prospective study of children and adolescents exposed to single-event trauma. *J Abnorm Child Psychol*. 2007; 35(2):191-201.
6. American Psychiatric Association (APA), DSM-IV. Manuel diagnostique et statistique des troubles mentaux. Traduction française, Paris, Masson; 1996.
7. Fernandez L, Marielle A, Bonnet A, et al. Démarches épidémiologiques après une catastrophe, Module VI, Outils psychométriques; 2005.
8. Spielberger CD, Gorsuch RL, Lushene R, et al. Manual for the state-trait anxiety inventory. Palo Alto, CA: Consulting Psychologists Press; 1983.
9. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders - 4th ed. Washington DC Critères diagnostiques. Traduction française par Guelfi JD et al. Paris: Masson. 1996;1056.
10. Dogan A. Adolescents' posttraumatic stress reactions and behavior problems following Marmara earthquake, *Eur J Psychotraumatol*. 2011;2:1.
11. GINDT M. Developmental perspectives of cognitive markers of the time course of PTSD symptoms. Doctoral thesis, University of Nice Sophia Antipolis; 2014.
12. Vila G, Bertrand C. Exposition de l'enfant au facteur traumatique et réactions parentales. Analyse des interactions et modélisation. *Stress et Trauma*. 2003; 3(2):89-91.
13. Yule W, Williams RM. Post-traumatic stress reactions in children. *J Trauma Stress*. 1990;3(2):279-295.
14. Earls F, Smith E, Reich W, et al. Investigating psychopathological consequences of a disaster in children: A pilot study incorporating a structured diagnostic interview. *J Am Acad Child Adolesc Psychiatry*. 1988;27(1):90-95.
15. Stuber J, Galea S, Pfefferbaum B, et al. Behavior problems in New York City's children after the September 11, 2001, terrorist attacks. *Am J Orthopsychiatry*. 2005;75(2):190-200.
16. Keppel-Benson JM, Ollendick TH. Posttraumatic stress disorder in children and adolescents. In: Children and disasters. Saylor CF ed, Plenum Press, New York. 1993;29-43.
17. Vila G, Porche LM, Mouren- Simeoni MC. L'enfant victime d'agression, État de stress

- post-traumatique chez l'enfant et l'adolescent. Masson, Paris; 1999.
18. Giaconia RM, Reinherz HZ, Silverman AB, et al. Traumas and posttraumatic stress disorder in a community population of older adolescents. *J Am Acad Child Adolesc Psychiatry*. 1995;34(10):1369-1380.
  19. Costello E, Erkanli A, Fairbank JA, et al. The prevalence of potentially traumatic events in childhood and adolescence. *J Trauma Stress*. 2002; 15(2):99-112.
  20. Elklit A, Petersen T. Exposure to traumatic events among adolescents in four nations. *Torture*. 2008;18(1):2-11.
  21. Breslau N, Davis GC, Andreski P, et al. Traumatic Events and Posttraumatic Stress Disorder in an Urban Population of Young Adults. *Arch Gen Psychiatry*. 1991;48:216-222.
  22. Noms FH. Epidemiology of Trauma: Frequency and Impact of Different Potentially Traumatic Events on Different Demographic Groups. *J Consult Clin Psychol*. 1992;60:409-418.
  23. Pynoss RS, Sorenson SB, Steinberg AM. Interpersonal violence and traumatic stress reactions, Dans L. Goldberger, & S. Breznitz (Éds.), *Handbook of Stress: Theoretical and Clinical Aspects*, New York: The Free Press. 1993;2:573-590.
  24. Koltek M, Wilkes TRC, Mphil MB, et al. The prevalence of posttraumatic stress disorder in an adolescent inpatient unit. *Can J Psychiatry*. 1998;43: 64-68.
  25. Friedman MJ, Keane TM, Resick PA. *Handbook of PTSD: Science and Practice*, Guilford Press, New York; 2007.
  26. Berkowitz S, Stover C, Marans S. The child and family traumatic stress intervention: Secondary prevention for youth at risk of developing PTSD. *J Child Psychol Psychiatry*. 2010;52(6):676-685.
  27. Kearney C, Wechsler A, Kaur H, et al. Posttraumatic stress disorder in maltreated youth: A review of contemporary research and thought. *Clin Child Fam Psychol Rev*. 2010;13:46-76.
  28. Taieb O, Baubet T, Pradère J, et al. Traumatismes psychiques chez l'enfant et l'adolescent. *EMC-Psychiatrie*. 2004;1:23-32.
  29. American Psychiatric Association (APA). *Diagnostic and Statistical Manual of Mental Disorders (Text-Revised)*, Washington DC; 2000.
  30. Suliman S, Mkabile SG, Fincham DS, et al. Cumulative effect of multiple trauma on symptoms of posttraumatic stress disorder, anxiety and depression in adolescents. *Compr Psychiatry*. 2009;50:121-127.
  31. Ma X, Liu X, Hu X, et al. Risk indicators for posttraumatic stress disorder in adolescents exposed to the 5.12 Wenchuan earthquake in China. *Psychiatry Res*. 2001;189(3):385-391.
  32. Yang P, Yen CF, Tang TC, et al. Posttraumatic stress disorder in adolescents after typhoon Morakot-Associated Mudslides. *J Anxiety Disord*. 2011;25:362-368.
  33. Chossegros L, Hours M, Charnay P, et al. Predictive factors of chronic post-traumatic stress disorder 6 months after a road traffic accident. *Accid Anal Prev*. 2011;43(1): 471-477.
  34. Berthiaume C. Post-traumatic stress disorder in children: state of knowledge and examination of the effectiveness of cognitive-behavioral treatment following a unique traumatic event, These presentee du doctorat en psychologie, Université du Québec, Montreal; 2007.
  35. Davis L, Siegel L. Posttraumatic stress disorder in children and adolescents: A review and analysis. *Clin Child Fam Psychol Rev*. 2000;3:135-154.
  36. Bouvard M. Echelles et questionnaires d'évaluation chez l'enfant et l'adolescent, Elsevier Masson; 2008.
  37. Kerig PK, Becker SP. From internalizing to externalizing: Theoretical models of the processes linking PTSD to juvenile delinquency. In: Egan, S.J., Ed., *Posttraumatic Stress Disorder (PTSD): Causes, symptoms and treatment*, Nova Science Publishers, Hauppauge, NY. 2010;2:33-78.
  38. La Greca A, Silverman W, Wasserstein S. Children's predisaster functioning as a predictor of posttraumatic stress following Hurricane Andrew. *J Consult Clin Psychol*. 1998;66:883-892.

39. Lai B, La Greca A, Auslander B, et al. Children's symptoms of posttraumatic stress and depression after a natural disaster: Comorbidity and risk factors. *J Affect Disord.* 2012;146:71-78.
40. Fletcher KE. Childhood posttraumatic stress disorder. In: Mash, E.J. and Barkley, R.A., Eds., *Child Psycho-pathology*, Guilford Press, New York. 2003;2:330-371.

---

© 2020 Astitene et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<http://www.sdiarticle4.com/review-history/58230>