

Post-traumatic Stress Disorder in Children after the Tsunami Disaster in Thailand: A 5-Year Follow-Up

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Background: Children may suffer from post-traumatic stress disorder after disaster. There was a severe tsunami following an undersea earthquake off the Sumatra coast of Indonesia. There were 20,000 children in 6 southwestern provinces of Thailand who were possibly affected.

Objective: To study the prevalence of post-traumatic stress disorder (PTSD) in Thai students in the area affected by the December 26th, 2004 tsunami disaster, Thailand.

Material and Method: One thousand six hundred and fifteen surviving students from two schools in Takua Pa district located in Phang-nga Province, Thailand participated in this longitudinal study. Screening was done by using Pediatric Symptom Checklists part II (PSC-II), Childhood Depressive Intervention (CDI) and the Revised Child Impact of Events Scales (CRIES 8). PTSD was diagnosed by child and adolescent psychiatrists by using criteria of DSM-IV. The intervention included psychological first aid, psycho-education, cognitive-behavioral therapy, medication in severe cases, group support for students, parents and teachers which was done, beginning at 10 days after the tsunami disaster. Data were analyzed by using SPSS version 12.0.

Results: The prevalence rates of PTSD in the students facing the tsunami disaster in the study group were 57.3, 46.1, 31.6, 7.6, 4.5, 3.9 and 2.7% at 6 weeks, 6 months, 1 year, 2 years, 3 years, 4 years and 5 years after the disaster, respectively. Female to male ratio was 1.7: 1. The peak age was 9-10 years old. The top five on the list of symptoms in PTSD were distress with cue, intrusive thought, functioning impairment, startled response, terrified and hyper vigilance. Seven cases (3.1%) were diagnosed partial PTSD, still exhibited a wide range of PTSD symptoms but did not fulfill the DSM-IV diagnostic criteria. The top five on the list of symptoms in partial PTSD were avoiding thought/feelings, terrified, avoiding place/activities, distress with cue and startled response.

Conclusion: The prevalence of PTSD among tsunami victims was 57.3% at 6 weeks after the disaster. It declined sharply at 2 years after the event. Despite receiving financial, rehabilitation and mental health support, 2.7% of the victims continued to suffer from PTSD 5 years after the disaster.

Keywords: Post-traumatic stress disorder (PTSD), Tsunami disaster, Thailand

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The tsunami that struck Thailand on 26th December 2004 was the greatest natural disaster in the country's history. A massive undersea earthquake northwest of Sumatra, Indonesia, with a Richter-scale magnitude of 9.3, caused a giant ocean shockwave, or tsunami, that devastated the shorelines of Indonesia, Sri Lanka, India, Thailand and several other countries⁽¹⁾. More than 200,000 people are estimated to have died from the tsunami, making it one of the deadliest natural disasters in history⁽¹⁾. It left in its wake unprecedented damage and destruction. Children suffered the loss of parents or guardians and survivors were left to cope with psychological trauma of the disaster.

In Thailand, Phang Nga province was the most severely affected, followed by Krabi and Phuket⁽²⁾. In Phang Nga alone, more than 4,200 people died and another estimated 4,250 people were displaced after their houses were destroyed. In Krabi, the death toll measured 721 and in Phuket, 279⁽²⁾. It is estimated that approximately 20,000 children in southern Thailand were displaced, lost 1 or more family members, were orphaned or injured or lost important belongings (material possessions with sentimental value to the child)^(1,2).

Schools were the best centers for the psychiatric team to support the victims⁽³⁾. Several studies have reported increased psychological trauma among children after natural disasters⁽⁴⁻⁸⁾. This included symptoms such as sadness, depression, worries, panic attacks, problems adapting with new living arrangement, physical complication due to elevated stress. The severity of children's symptoms depends on factors such as level of exposure to the event, personal injury, loss of loved ones, level of parental support and dislocation⁽⁹⁻¹⁷⁾. Post disaster psychiatric morbidity in children continued for years and presented different types of psychopathology which were characterized by specific psychological problems or disorder in DSM IV⁽¹¹⁾ diagnosis particularly post-traumatic stress disorder (PTSD), depressive disorder and anxiety disorder, non-specific distress such as elevation of PTSD symptoms (re-experience, avoidance or hyper-arousal symptoms), externalizing behaviors, cognitive impairment and school dropout. Most injured children with PTSD are not diagnosed or treated^(9,10).

Moreover, other factors significantly associated with PTSD symptoms included delayed evacuation, fearing that they or their family members' life was in danger, and extreme panic. The older children and the one who feared that they or their family members' life was in danger were more significantly associated with depressive symptoms⁽¹⁴⁾. The incidence

of PTSD in children was 6-25%^(3,7-9,15). An increase in drug usage and addiction has been observed among children, adolescents and adults⁽¹²⁻¹⁶⁾. Life-long medical symptoms are found at a rate of 10.3% among men and 18.3% among women⁽¹⁵⁾.

Objective

To study the prevalence of post-traumatic stress disorder (PTSD) in children and adolescents 5 years after tsunami disaster in Thailand.

Material and Method

After the Tsunami event in 2004, an emergency team was dispatched to tally and report the personal losses among children in each school. As a result, among the six most devastated districts, Phang-Nga was identified to suffer the most loss of lives. In Phang-Nga, 2 Schools at Takua Pa were selected as two of PTSD monitor sites. The mental health assessments were conducted among children aged 9 to 14 years at 6 weeks, 6 months, 1 year, 2, 3, 4 and 5 years after the disaster.

The first school survived the tsunami disaster in terms of the physical structure and buildings. But, it lost a total of 51 school children with 627 surviving. This school was suffered the highest number of school children deaths in Takua Pa district. One of 31 teachers died. Out of the 627 children, 211 individuals were identified through a preliminary evaluation by the teachers as having exhibited early signs and symptoms of mental health problems and 171 children who suffered from a loss of one or both parents and/or a complete destruction of their homes.

The second school was a private school located in Takua Pa district which did not suffer structural destruction. Out of a total of 998 students, 22 were reported as being dead or lost, 16 lost their parents and 95 lost their homes completely. Among 58 school staff, 3 were directly impacted. There were 131 students identified through the preliminary evaluation by their teachers to exhibit early symptoms of mental health problems, among them, 127 children suffered through the loss of one or both parents and/or a complete destruction of homes.

One thousand six hundred and twenty-five surviving students from two schools were enrolled. Screening tests were done, using pediatric symptom checklists, childhood depressive intervention (CDI) and Revised Child Impact of Events Scales (CRIES-8). Psychiatric evaluation was done by child and adolescent psychiatrists. Post-traumatic stress disorder

(PTSD) was diagnosed using criteria from Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM IV). Prevalence rates of symptoms of PTSD were calculated and analyzed using SPSS version 12.0. Regression analysis was done. The results were presented by percentage.

PTSD cases were monitored for 5 years from 2005-2010. As it was deemed necessary that the schools would need to be involved, school teacher orientation, education and training sessions were provided to the teachers who were made aware and understand PTSD and depression. Not only 57% of the school children faced a direct personal loss, the teachers and their family also suffered loss due to death, injuries and home destruction, etc. Support went to affected school teachers as well.

Parents also were invited to meet with the team in order to become more aware of PTSD and gain new knowledge about treatment and intervention. In cases where parents also suffered with PTSD themselves, treatment and intervention according to their mental conditions were also provided. Financial support was made available to families that were affected directly by the Tsunami disaster including scholarships to their children. Teams visited the schools 12 times to monitor, counsel and provide medical treatments during the 3 years after the disaster. School psychologists worked with teachers in schools and developed activities for supporting them.

The medical team developed the rehabilitation program starting 10 days after the tsunami and provided the initial psychological first aids for teachers and parents, group supports for children, identification of psychiatric disorders and intervention (supportive psychotherapy, cognitive behavioral therapy, group therapy, and medication in severe cases).

Results

Losses and the psychological impact of the tsunami catastrophe on the students from these two schools accounted for 25.2 % of all losses among all students in the Takua Pa region (Table 1).

The evaluation was performed on 1,615 students from the schools at 6 weeks after the disaster. There were 181 cases or 57.3% of number of students who were affected and suffered from PTSD (Table 1). PTSD was identified at a higher rate at age of 9-10 years. PTSD was found to be highest among Grade 4-5 students, second highest among Grade 6 students and lowest among young children attending kindergarten level 2. The female to male ratio was 1.7: 1.

At 5 years following the tsunami, 8 cases (3.3% of victims) reported symptoms with full criteria for diagnose of PTSD. Forty-seven percent of PTSD cases were diagnosed with depression. Symptoms of PTSD in the most part improved over time after the Tsunami disaster. Fig. 1 depicts the PTSD prevalence among children monitored over a 5-year monitoring period. The prevalence of PTSD during the first year (57.3%) and gradually declined to 46.1, 31.6, 7.6, 4.5, 3.9 and

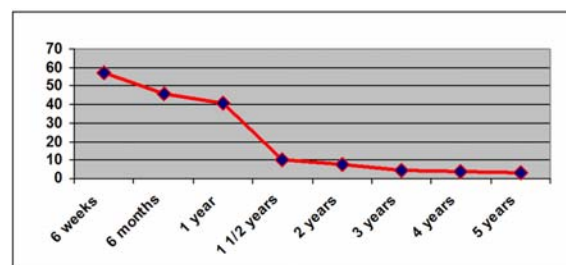


Fig. 1 Percent of children diagnosed with post traumatic stress disorder at different time periods after the 2004 Tsunami disaster in Thailand

Table 1. Number and magnitude of Tsunami impact on children and adolescents from the two school investigated as compared to the entire Region of Takua Pa, Phang-Nga Province, Thailand

	Total Number of Students from 18 Schools in Takua Pa Region who suffered Losses from the Tsunami Disaster	Students from two schools who suffered from the Tsunami Disaster	
		Number of Students	Percent of Total Takua Pa Region
Total students	6,454	1,625	25.2
Students who died or lost	184	69	37.5
Students who lost one or both parents	227	49	21.6
Students whose homes were destroyed	1,018	219	21.5

Table 2. Number of Students Receiving PTSD Diagnosis at Different Periods after the Tsunami Disaster

Time Period Post-Tsunami Disaster	6 wks	6 mo	1 yr	2 yrs	3 yrs	4 yrs	5 yrs
Total No. students in 2 schools (n)	1,625	1,528	1,364	1,360	1,307	1,345	1,615
Students with PTSD	181	118	86	16	11	9	6
% PTSD out of total students	11.1	7.7	6.3	1.2	0.8	0.7	0.4
Total No. of Students who were affected	316	256	212	212	246	223	223
% PTSD out of total affected students	57.3	46.1	31.6	7.6	4.5	3.9	2.7

2.7% at 6 weeks, 6 months, 1, 2, 3, 4 and 5 years, respectively (Table 2).

Partial remission in the PTSD group was found in 19 cases (7.7% of victims) who still exhibited a wide range of symptoms (re-experiencing of the incident, avoidance of reminders and hyper-arousal response) but not severe enough to fulfill the DSM IV criteria.

The most common symptoms of PTSD among these students were: distress with cue, intrusive thought, functioning impairment, startled response, terrified and hyper-vigilance (Table 3). And the most common symptoms of partial PTSD were terrified, distressed with cue, avoiding thought/feelings, avoiding places/activities and startled response (Table 4). In partial PTSD, most of the children reported symptoms of re-experience, avoidance and hyper-arousal. But most of them reported having 1-2 symptoms in avoidance criteria.

Discussion

Victims of severe natural disasters such as tsunami almost always have horrific and traumatic experiences. Their reactions vary according to age and adaptation ability. The first survival response to trauma and threats was body biochemical change. It gradually changed overtime. Immediate mental shock which resulted in reactions such as denial, blurring cognition, easily startled usually lasted not more than 4 weeks. The symptoms beyond 4 weeks were diagnosed as Post traumatic stress disorder (PTSD)^(3-7,14-18).

The incidence of PTSD, in other parts of the world, has been reported to be 6-25% after a disaster or a crisis^(3,7-9,15). It is believed that the PTSD rate is highly dependent on severity of the disaster encountered, level of family and community devastation and rescue effectiveness and quality⁽³⁾.

The prevalence of PTSD among children has been reported at a rate of 6-51%^(5-9,15). Reports of PTSD among children younger than 10 years of age are very rare. However, there was a report of a group of 200

Table 3. Symptoms of PTSD

Symptoms of Post traumatic Stress Disorder	Percent in PTSD (n = 8 cases)
Distress with cue	8 (100)
Intrusive thought	8 (100)
Functioning impairment	8 (100)
Startle response	7 (87.5)
Terrified	7 (87.5)
Hyper vigilance	7 (87.5)
Avoiding thought/feeling	6 (75)
Avoiding places/activities	6 (75)
Insomnia	6 (75)
Feeling tsunami was recurring	6 (75)
Irritabilities	6 (75)
Restricted affect	6 (75)

Table 4. Symptoms of partial PTSD

Symptoms of Post traumatic Stress Disorder	Percent in partial PTSD (n = 19 cases) Cases (%)
Terrified	18 (94.7)
Distress with cue	14 (73.7)
Avoiding thought/feeling	13 (68.4)
Avoiding place/activity	10 (52.6)
Startle response	9 (47.4)
Intrusive thought	8 (36.8)
Functioning impairment	7 (36.8)
Insomnia	7 (36.8)
Difficult concentration	7 (36.8)

children who survived the Jupiter ship wreck, with 51% of them being diagnosed with PTSD⁽¹⁸⁾. Most cases were more noticeable during the few weeks post ship wreck and a far fewer number of cases were reported after a long period. However, long-term follow-up 5-7

years found that 15 percents of the children continued to suffer from PTSD. The data indicates that PTSD cases although having declined over an extended period of time still remain at a significant rate among the children as they grow up⁽⁹⁻¹⁹⁾.

The severity of children's symptoms depends on factors such as level of exposure to the event, personal injury, loss of loved ones, level of parental support, and dislocation^(9,14). Moreover, other factors significantly associated with PTSD symptoms included delayed evacuation, fearing that they or their family members' life was in danger and extreme panic. The older children and those who feared that they or their family members' life was in danger were more significantly associated with depressive symptoms⁽¹⁴⁾.

The most common symptoms of PTSD among these students were distress with cue, intrusive thought, functioning impairment, startled response, terrified and hyper-vigilance (Table 3). And the most common symptoms of partial PTSD were terrified, distress with cue, avoiding thought/feelings, avoiding places/activities and startled response (Table 4). In partial PTSD, most of the children reported symptoms of re-experiences, avoidance and hyper-arousal. But most of them reported as having 1-2 symptoms in avoidance criteria.

Post disaster psychiatric morbidity in children continued for years and presented different types of behavior such as sadness, depression, worries, panic attacks, problems adapting with new living arrangement, physical complication due to elevated stress, avoidance or hyper-arousal symptoms, aggressive conduct behavior, cognitive impairment and school dropout.

Helping children understand and manage their feelings of fear so that possible negative impacts on their development are minimized. Family counseling may be necessary to make sure that parents are able to recognize and address mental health problems. Findings in the authors' assessment provided caretakers to better understand children. Teachers, in particular, may play a crucial role in the support and referral of affected children; hence, appropriate sensitivity training for mental health-related problems is recommended for school-based staff.

Symptoms of depression were almost 3 times higher among adults than among children^(7,9,15). It is important to note that while the assessment took place in similar settings and during the same time frame, the instruments to assess PTSD and depression in children and adults were not the same. Overall, the prevalence of depression symptoms in children was lower than in

adults, but the risk increased significantly with age. This finding suggests that older children may have been better able to evaluate and understand the possible negative consequences of the tsunami, such as the loss of loved ones, friends and possessions. Among adults, the main risk factors for symptoms of PTSD and depression were the loss of livelihood as a result of the tsunami. Thus, the focus of intervention approaches may be different for adults versus children. For example, children may have benefited from therapeutic interventions, while for adults, contextual interventions aimed at the restoration of livelihood may be more appropriate^(8,9,15).

As existing literature has pointed out there is increasing drug usage and addiction among adolescents and adults⁽¹¹⁻²⁰⁾. Life-long medical symptoms are found at a rate of 10.3% among men and 18.3% among women⁽¹²⁾. Therefore, long-term follow-up for this high risk group should be focused on the identification and possible intervention for learning problems, drug use, behavioral problems and school dropout⁽¹⁶⁻²⁰⁾.

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Potential conflicts of interest

None.

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ความผิดปกติทางจิตใจภายหลังภัยอันตรายในเด็กที่ประสบภัยพิบัติสึนามิ : ติดตาม 5 ปี

วินัดดา ปิยะศิลป์, พนม เกตุมาน, รัตโนทัย พลบูรณ์การ, ศิริรัตน์ อุฬารตินนท์, นันทวัช สิริธรรักษ์, ณัฏฐพร พิทยรัตน์เสถียร, พรจิรา ปรีวัชรากุล, ติรยา เลิศหัตถศิลป์, ณัฏฐิณี ชินะจิตพันธ์ุ, เกษศิริ เหลี่ยมวานิช, นิศารัตน์ วัชรอุดมกาล, จันทร์อาภา สุขทัพพ์, ธัญลักษณ์ วันเลี้ยง, ชูเกียรติ ยงพิทยาพงศ์, ปราณี ปวีณชนา, ลักษณา ทาสี, พีระยุทธ ไชยคุณ, นราทิพย์ สงวนพานิช

ภูมิหลัง: ภัยพิบัติสึนามิในวันที่ 26 ธันวาคม พ.ศ. 2547 เป็นภัยพิบัติรุนแรงที่สุดของประเทศไทยเกิดขึ้นใน 6 จังหวัด ได้ทำลายครอบครัว ชุมชน ที่อยู่อาศัยของคนจำนวนมากและส่งผลกระทบต่อเด็กโดยตรงมากกว่า 20,000 คน

จุดประสงค์: เพื่อประเมินความชุกของความผิดปกติทางจิตใจภายหลังภัยอันตรายหลังภัยพิบัติสึนามิ (Post-traumatic stress disorder: PTSD)

วัสดุและวิธีการ: ศึกษาติดตามนักเรียนระยะยาว 5 ปี จำนวน 1,615 คน จาก 2 โรงเรียนใน อ. ตะกั่วป่า จ. พังงา ใช้เครื่องมือคัดกรอง Pediatric Symptom Checklists part II (PSC-II), Childhood Depressive Intervention (CDI) and the Revised Child Impact of Events Scales (CRIES 8). ประเมินสภาพจิตใจและให้การวินิจฉัยตาม Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM IV) โดยจิตแพทย์เด็กและวัยรุ่น. วิเคราะห์ข้อมูลโดยใช้ SPSS version 12.0

ผลการศึกษา: พบอัตราการเกิดโรค PTSD ในนักเรียนกลุ่มที่ศึกษา ร้อยละ 57.3, 46.1, 31.6, 7.6, 4.5, 3.9 และ 2.7 ที่เวลา 6 สัปดาห์ 6 เดือน 1 ปี 2 ปี 3 ปี 4 ปี และ 5 ปี ตามลำดับ อัตราเกิดโรคในเด็กผู้หญิงต่อเด็กผู้ชาย 1.7 ต่อ 1 ช่วงอายุ 9-10 ปี พบได้สูงสุด อาการ 5 อันดับแรกที่พบ คือ อึดอัด กระวนกระวาย คิดถึงเรื่องเหตุการณ์ซ้ำๆ ผลการเรียนตกลง ตื่นตกใจง่ายและระแวงระวังภัย ร้อยละ 3.1 (7 ราย) ที่คงมีอาการแต่ไม่รุนแรงโดยเฉพาะอาการเดียวที่จะไม่คิดหรือรู้สึกถึงเหตุการณ์ หวาดกลัว เลี่ยงสถานที่หรือกิจกรรมที่ทำให้นึกถึงเหตุการณ์ อึดอัด กระวนกระวายและตื่นตกใจง่าย

สรุป: อัตราการเกิดโรค PTSD ในนักเรียนร้อยละ 57.3 ที่เวลา 6 สัปดาห์ หลังภัยพิบัติสึนามิ ลดลงมากที่ช่วงเวลา 1-2 ปี ถึงแม้ว่ากลุ่มนี้จะได้รับความช่วยเหลือทางกายภาพ ทรัพย์สินและการช่วยเหลือด้านจิตใจเต็มรูปแบบแล้วก็ตาม ยังพบนักเรียนที่มีอาการรุนแรงถึงร้อยละ 2.7 ที่เวลา 5 ปีหลังภัยพิบัติสึนามิ
