

Post Traumatic Stress Disorder in Children after Tsunami Disaster in Thailand: 2 Years Follow-up

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Background: On December 26, 2004, the tsunami destroyed many families, communities, and residential areas. Adverse psychological impact on children and adolescents due to a natural disaster of this magnitude has never been reported in Thailand's history particularly as Post-Traumatic Stress Disorder (PTSD).

Objective: Investigate clinical symptoms and develop a 2-year monitoring and intervention program for PTSD in children affected by the December 26, 2004 tsunami natural disaster. The study period started six weeks after the event and was completed after two years.

Material and Method: One thousand six hundred and twenty five surviving students from two schools in Takuapa district, Phang-nga Province, were enrolled. Screening tests using Pediatric symptom checklists, Childhood depressive intervention (CDI), and Revised child impact of events scales (CRIES) were done. Psychiatric evaluations were 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.

Results: The prevalence of PTSD in the affected students were 57.3, 46.1, 31.6, 10.4, and 7.6% at 6 weeks, 6 months, 1 year, 1½ years, and 2 years, respectively. The female: male ratio was 1.7:1. The peak age was 9-10 years old. Threatened situations were studied. Of the 176 students who risked their lives in the waves, 48 (27.3%) suffered from PTSD. Meanwhile, of the 1,314 students who were not hit by the waves but were among affected friends and relatives, 42 students (3.1%) suffered from PTSD. The prevalence of PTSD in those hit by the waves were significantly higher than those who were not [p -value < 0.01, RR = 5.16 (4.04-6.6)].

Conclusion: The prevalence of PTSD in children who suffered from the tsunami disaster was as high as 57.3% at six weeks after the incident. It declined sharply at two years (7.6%) with the help of integrated welfare. The children continue to get financial, rehabilitation, and mental health support to prevent long-term adverse outcomes.

Keywords: Tsunami in Thailand, Post-Traumatic Stress Disorder (PTSD)

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Catastrophic events that occur throughout the world either caused by nature or by humans can bring substantial losses in property, lives, community, family, economic and social systems, and unaccountable personal or emotional loss. The tsunami disaster in South and South-East Asia on December 26, 2004 was the most catastrophic in Thailand's history.

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Enormous destruction to physical structures, social structure (family and community), as well as economic structure, transcends to both short-termed and long-termed devastation. In this case, the affected regions, including those lives, have been changed forever.

Psychiatric impact after the catastrophic tsunami event was found among the affected populations at a rate ranging from 40 to 84%. This includes symptoms such as sadness, depression, worries, panic

attacks, problems adapting with new living arrangement, physical complications due to elevated stress, and Post Traumatic Stress Disorder (PTSD). An increase in drug addiction and usage has been observed among children, adolescents, and adults⁽¹⁻⁷⁾.

PTSD ranks fourth in the number of incidents among all mental disorders that have ever been reported. Life-long medical symptoms are found at a rate of 10.3% among men and 18.3% among women. There has not been any diagnosis or report on PTSD among children in Thailand.

Objective

The objective of the present study was to investigate clinical symptoms and develop a 2-year monitoring program for PTSD in children affected by the December 26, 2004 tsunami natural disaster.

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 province, Takuapa district, Bang Muang and Suthin Anusorn Schools were selected as two of the PTSD monitor sites. In those schools, 1,625 students were pre-screened and identified according to the level of mental impact from the incident. They were divided into two groups, those who suffered from the waves directly and those who suffered indirectly through other children (e.g., schoolmates) who suffered through a personal loss.

Psychiatric screening tests were done, using Pediatric symptom checklists, Childhood depressive inventory (CDI), and Revised child impact of events scales (CRIES). Psychiatric evaluations were done by child and adolescent psychiatrists. Post-traumatic stress disorder was diagnosed using criteria from Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM IV)⁽¹⁾. The results were presented as percentage (%) and relative risk (RR) of survivals from the two groups, with 95% confidence interval (95% CI)

Results

Background

Bang Muang School survived the tsunami waves in terms of the physical structure and buildings. However, it lost 51 schoolchildren from their pre-tsunami enrolment of 678 students. This school suffered the highest number of schoolchildren deaths in Takua

Pa district. One of 31 teachers died. Out of the 627 surviving children, 211 were identified through preliminary evaluation by the teachers to exhibit symptoms for mental health risk, and 171 children suffered a loss of one or both parents and/or a complete destruction of homes.

Suthin Anusorn School is a private school located in Takua Pa district and was not structurally destroyed. Out of 998 students, 22 students from this school were reported dead or lost, 16 lost their parent(s), and 95 lost their homes completely. Among the school staff, out of 46 teachers and 12 assistants, three members were directly impacted. There were 131 students who were identified through preliminary evaluation by the teachers to exhibit symptoms for mental health risk and 127 children suffered a loss of one or both parents and/or a complete destruction of homes.

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

Detailed evaluation

Further evaluation was performed on 1,625 students from the schools six weeks after the disaster. There were 181 cases or 57.3% from a number of students who were affected and who suffered from PTSD (Table 2).

Gender: Female/Male ratio 1.7/1

Age: PTSD found at a higher rate at age of 9-10 years

Grade Level: PTSD was found to be the highest at Grade 4-5, second highest at Grade 6, and lowest in Kindergarten level 2 (2 cases) (Fig. 1)

Coping with Life-Threatening Environment: Natural survival instinct involves some responses to environmental stress. In an abrupt life-threatening situation, several impulses lead to extreme fear and shocking experiences. In this case, among the children who were hit directly by the waves and who survived and were rescued from the flood, 48 of them or 27.3% showed symptoms of PTSD. At the same time, there were 42 children who were not directly in the water but lived in the affected community and knew the survivors; 3.1% of these children showed PTSD symptoms. The difference in the PTSD rate between the two populations is markedly noticeable (Table 3).

Comorbidity: Depression is a common symptom or problem found concurrently in children suffering with PTSD. By using the Childhood Depressive

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 issues from the tsunami disaster	
		Number of students	Percent of total Takua Pa region
Total students	6,454	1,625	25.2
Students who died	184	69	37.5
Students who lost	227	49	21.6
Students who suffered	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 weeks n = 316	6 months n = 256	1 year n = 272	1 ½ year n = 212	2 years n = 212
% PTSD out of total affected students	57.3	46.1	31.6	10.4	7.6

Table 3. Number and percentage of students who exhibited PTSD symptoms in two populations (those directly hit by the tsunami waves and survived the flood vs those who were not in the waves but exposed to the survivors after the tsunami disaster)

	Directly hit by the tsunami waves and survived after the flood n = 176 (%)	Not in the waves but exposed to the survivors n = 1,314 (%)	Relative risk (95% CI) p-value < 0.01
Total students with PTSD	48 (27.3)	42 (3.1)	RR = 5.16 (4.04-6.6)

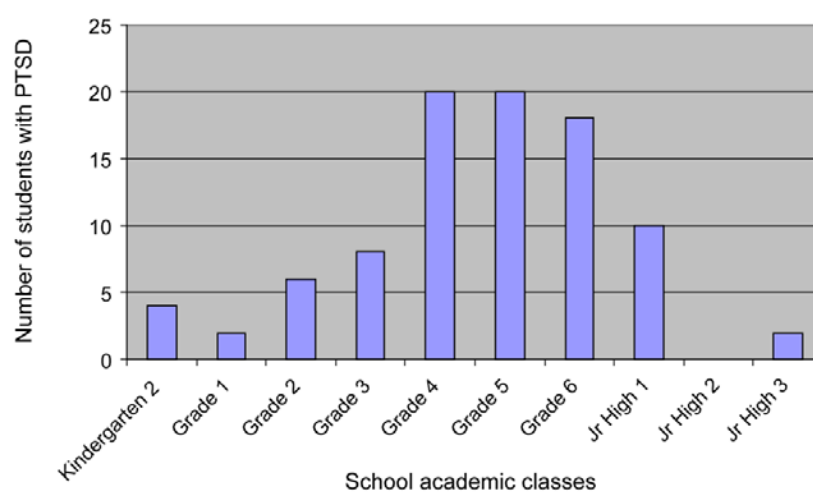


Fig. 1 Number of children and adolescents diagnosed with post traumatic stress disorder according to school classes after the 2004 tsunami disaster in Thailand

PTSD cases in children and adolescents

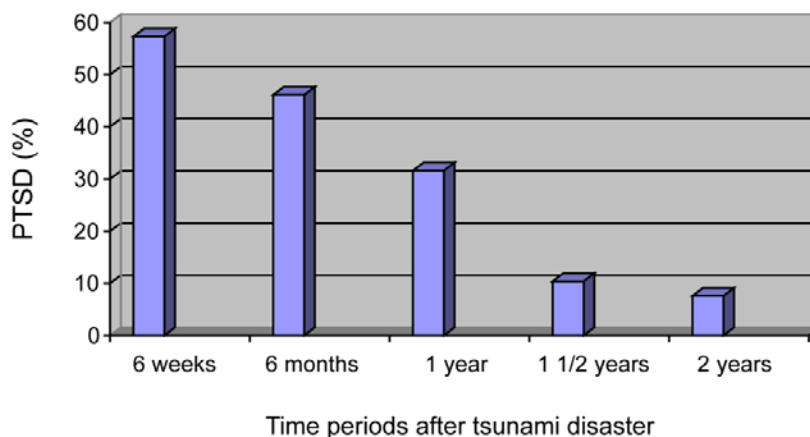


Fig. 2 Percent of children and adolescents diagnosed with PTSD at different time periods after the 2004 tsunami disaster in Thailand

Inventory (CDI) method, 35.5% of PTSD children scored > 20 points and 18 of them (or 20% of these children) were diagnosed to have both PTSD and Major Depressive Disorder. Nine patients (out of 20 or 45%) continued to suffer with both diseases through an extended period (2 yrs). They were administered with necessary prescription in combination with cognitive behavior therapy.

Progression: Symptoms of PTSD in the most part improved over time after the tsunami. Fig. 2 depicts the PTSD rate among children monitored over a 2-year monitoring period. PTSD started at 57.3% and gradually decreased to 46.1% and 31.6% at 6 months and 1 year, respectively. The greatest improvement was found in the period between 1 and 1½ years resulting in a three folds reduction to 10.4% and eventually to 7.6% at 2 years. This result indicates that the PTSD reduction curve followed a sigmoid or non-linear pattern. It would be interesting to further understand the significant improvement during one and a half year post-tsunami.

Discussion

Confrontation with a severe natural disaster such as the tsunami event is life threatening and shocking due to the catastrophic and horrific experience. Reaction to the physical and emotional trauma varied according to age and ability to accept the new life-changing situations. The biochemical changed in the body was at first a survival response to the trauma or threats, and over the time period, it gradually changed

in most cases, depending on one sense of personal stress and how to cope with the mental shock that had occurred. In some cases, when the most immediate mental shock resulted in some reaction (e.g., denial, blurring cognition, easily startled, etc.) lasting beyond 4 weeks, it would then be categorized as PTSD^(1,2,10,11).

There are extremely rare reports on epidemiology of PTSD in Thailand. In the UK, point prevalence of PTSD among children aged 11-15 years has been reported to be at a rate of 0.4% with twice the number of cases for girls compared to boys⁽⁴⁾. Reports on children with PTSD of < 10 years of age is very scarce but one that was reported found that in a group of 200 children who survived the Jupiter shipwreck, 51% of them were diagnosed as PTSD positive⁽⁸⁾. Most cases were more noticeable during the few weeks post shipwreck and far fewer cases were reported after a long period. A 5-7 years follow-up reported that 15% of the children remained PTSD positive⁽⁸⁾. In another disaster event involving a landslide at Aberfan, it was found that as many as 29% of the survivor still suffered of PTSD even though 33 years had past^(8,12). This evidence demonstrates that PTSD was found frequently among children who experienced a natural disaster or a catastrophic event. It also showed that PTSD cases although declined over an extended period of time remained in a significant rate among the children as they grew up in to adults^(2,4,6,7).

In the present study, the medical team initiated the assistant program started 10 days post tsunami.

It provided the initial psychological first-aid and conducted several group supports for children and their parents in the schools. As it was deemed necessary, the schools would need to be involved. Schoolteacher orientation, education and training sessions were provided to the teachers who were made aware and understood PTSD and depression. The team also provided medical and psychotherapy supports throughout the period where the schools served as the central administration of care and monitoring of the children. Not only 57% of the schoolchildren faced a direct personal loss, the teachers and their families also suffered loss due to death, injuries, and home destruction. Support went to affected schoolteachers as well. Parents also were invited to meet with the team to become more aware of PTSD and gain new knowledge about treatment and intervention. In cases where parents also suffered with PTSD, treatment and intervention according to their mental conditions was also provided. Financial support was made available to families that were affected directly by the tsunami including scholarships for their children. The team visited the schools eight times to monitor, counsel and provide medical treatment during the two years after the disaster.

The rate of PTSD in children gradually decreased over time but the most significant drop was after 1-1½ years post tsunami down to 10.4% of affected children (from initial 57%). After two years, 7.6% of affected children remained PTSD positive, which is lower than reports in other countries. PTSD in other parts of the world has been reported to reach a 25% level after a disaster or a crisis⁽¹³⁾. It is believed that the PTSD rate is highly dependent on the severity of the disaster encountered, level of family and community devastation, and rescue effectiveness and quality. Among children and adolescents, there can be several hidden symptoms that may not be apparent to others. Superficially, these individuals may appear normal and able to perform activities normally, such as playing games and catching up with classroom lessons. However, a decline in academic performance was noticeable. Some subtle signs included a personality change such as a tendency to isolate oneself away from friends and family, gazing or day dreaming, poorer concentration, lack of sound sleep pattern with nightmares, some of which relived the disaster experiences. It was found in the present study that a number of students had PTSD symptoms but were not severe enough to meet the full criteria according to the DSM IV.

In small children, even more subtle symptoms were found, possibly due to the inability to comprehend the full devastation or personal impact. However, children who received close supervision from adults were able to cope better and only two cases of PTSD were found. Those who only witnessed a disaster are also affected^(4,7,9).

Detailed evaluation of the data in this investigation shows that life-threatening factors by Tsunami induced a series of panic emotion and extreme fear at a rate of 27.3% (48 cases) of all PTSD positive children who experienced being in the waves directly. Another group of 150 children who similarly faced the waves directly, developed signs of PTSD initially within the first month and then improved to some degree, with only some minor sign of PTSD remaining. On the other hand, 42 children (or 3.1%) were diagnosed as PTSD positive but they had never been in the water or directly affected by the waves.

Factors or causes of PTSD and its pathological development are believed to develop when one is faced with extreme danger and fear leading to elevated psychological stress that becomes the driving force for other psychological impact including fear, worries, and in the worse case, extremely uncontrollable panic, helpless feeling, and an acute form of despair. These are key mechanistic factors or causes of the development of PTSD according to the Cognitive Model and Behavioral Model theories. However, in the PTSD positive individuals who never faced the tsunami waves personally, PTSD could also develop upon receiving the horrifying news second-hand and co-existing or living in the physical devastation of the community. After two years of treatment and intervention, it was found that 7.6% of the children still suffered from PTSD and continued medical support and monitoring. This is necessary for the long-term assistance program.

Conclusion

PTSD was found in children and adolescents six weeks after the 2004 tsunami disaster in Thailand at a rate of 57.3% among affected students. PTSD continued to be found in these students even after a period of two years and with financial and social support to the family of the children. Medical and monitoring programs continued throughout this period with regularity. After this two-year study period, PTSD was reduced to 7.6% among the students. Continued monitoring and support is needed to prevent any potential problems that may occur over an extended period.

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Post Traumatic Stress Disorder ในเด็ก หลังภัยพิบัติสึนามิในประเทศไทย

วินัดดา ปิยะศิลป์, พนม เกตุมาน, รัตโนทัย พลับรู่การ, วชิรพร โชติพัทธ์, สมทรง ต้นประเสริฐ,
สุมิตรา อ่าวจินดา, สมจิตต์ ธีรมโนภาพ

ภูมิหลัง: จากคลื่นสึนามิในวันที่ 26 ธันวาคม พ.ศ. 2547 ทำลายครอบครัวชุมชน ที่อยู่อาศัยของคนจำนวนมากและส่งผลกระทบต่อจิตใจโดยเฉพาะในเด็กและวัยรุ่นได้สูงและยาวนาน และสามารถทำให้เกิดโรค PTSD ซึ่งไม่เคยมีรายงานมาก่อนในประเทศไทย

วัตถุประสงค์: ผู้รายงานและคณะได้ศึกษาปัญหาจิตใจที่เกิดตามหลังภัยอันตรายจากคลื่นสึนามิ ในนักเรียนจำนวน 1,364 คน จาก 2 โรงเรียนใน อ.ตะกั่วป่า จ.พังงา ซึ่งอยู่ในพื้นที่ประสบภัยอันตรายจากคลื่นสึนามิ ตั้งแต่เวลา 6 สัปดาห์ถึงเวลา 2 ปีหลังเหตุการณ์ โดยค้นหาปัญหาอย่างเป็นระบบและติดตามดูแลรักษาเป็นระยะสม่ำเสมอ

วัสดุและวิธีการ: ทำการคัดกรองแยกเด็กโดยใช้เครื่องมือทดสอบ pediatric symptom checklists แบบสอบถามอารมณ์ ซีมเศร้า ตรวจสอบสภาพจิตโดยจิตแพทย์เด็กและวัยรุ่น วินิจฉัยโรค PTSD ใช้ criteria ของ diagnostic and statistical manual of mental disorders, 4th edition

ผลการศึกษา: พบอัตราการเกิดโรค PTSD ในนักเรียนที่ประสบภัยอันตราย ใ้ร้อยละ 57.3, 46.1, 31.6, 10.4 และ 7.6 ที่เวลา 6 สัปดาห์ 6 เดือน 1 ปี 1□ ปี และ 2 ปี ตามลำดับ พบในเพศหญิง: เพศชาย = 1.7:1 ช่วงอายุสูงสุดที่ 9-10 ปี เมื่อศึกษาสภาพแวดล้อมที่คุกคามชีวิตและกระตุ้นให้เกิดความหวาดกลัวสุดขีด พบว่านักเรียน 48 ราย (ร้อยละ 27.3) ของที่เสี่ยงชีวิตอยู่ในคลื่นมีอาการของโรค PTSD ขณะที่นักเรียน 42 ราย (ร้อยละ 3.1) มีอาการของโรค PTSD โดยที่ไม่ได้อยู่ในเหตุการณ์ แต่อยู่ท่ามกลางเพื่อนและผู้ใหญ่ที่อยู่ในเหตุการณ์ซึ่งมีความแตกต่างกันอย่างมีนัยสำคัญ $p\text{-value} < 0.01$, $RR = 5.16$ (4.04-6.6)

สรุป: โรค PTSD พบในนักเรียนที่ประสบภัยสึนามิในอัตราสูงถึงร้อยละ 57.3 มีการดำเนินโรคที่ยาวนานถึง 1 ปี และลดลงมากในช่วง 1□-2 ปี โดยยังพบโรค PTSD ใ้ร้อยละ 7.6 หลังเหตุการณ์สึนามิ ถึงแม้ว่านักเรียนได้รับความช่วยเหลือทั้งด้านสวัสดิการ การเงิน การศึกษาและการแพทย์ไปพร้อมกันตั้งแต่หลังเกิดเหตุเป็นระยะสม่ำเสมอ การติดตามและให้ความช่วยเหลือจำเป็นต้องใช้เวลานานเพื่อป้องกันผลกระทบระยะยาว