ORIGINAL ARTICLE

POST-TRAUMATIC STRESS DISORDER AND ITS ASSOCIATED FACTORS AMONG SCHOOL-GOING CHILDREN EXPOSED TO A TSUNAMI DISASTER IN MALAYSIA

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ABSTRACT

Posttraumatic stress disorder (PTSD) is a psychiatric diagnosis made when someone including children who experiences traumatic stressor. Those who are exposed to a more severe trauma have highest level of PTSD. The aim of this study was to measure the prevalence of PTSD and its associated factors among 219 children who were affected by a form of natural disaster which is the tsunami waves in a rural area in Malaysia. A cross sectional study was carried out among children aged 10-12 years 6 months after the traumatic event. Child Posttraumatic Stress Disorder -Reaction Index (CPTSD-RI) was used as a screening instrument which was answered by the affected children through a self-administered questionnaire. Forty six percent of these children had PTSD symptoms; 31.1% of these children had mild, 11.4% had moderate, 3.7% had severe PTSD and none had very severe PTSD. Result also showed that 91.8% had re-experiencing symptoms, 28.3% had numbing/avoidance symptoms and 49.3% had hyperarousal symptoms. Children with low social support (Adj OR = 2.3 (95% CI: = 1.3- 4.2)), and children who experienced deaths among someone close to them (Adj OR = 3.7 (95% CI =1.2 - 11.5)) were more likely to have symptoms of PTSD. This showed that children are at higher risk of developing PTSD as early as 6 months after the event and thus early intervention should be offered to them. Future longitudinal study can be carried out among affected children to assess whether these PTSD symptoms persist over time.

***Keywords**: Posttraumatic Stress Disorder, Children, Risk Factors, Tsunami, Natural Disaster*

INTRODUCTION

Posttraumatic stress disorder (PTSD) is a psychological phenomenon suffered by those exposed to various forms of traumas or disasters. These traumas or stressful events include exposure to wars, physical or sexual abuses and natural disasters. Children are particularly vulnerable to such exposures and their long term consequences may impact their mental and psychological development [1, 2, 3]. Not many studies touch on the consequences of natural disaster particularly PTSD among Malaysian children.

Previous studies have reported on PTSD among children, particularly after the 2004 Tsunami event. Two out of 133 Norwegian children reported of having PTSD at 10 months in the similar disaster [4]. Another study was carried out among 216 adolescents living in affected villagers in Malaysia, 4 years after the tsunami event [5]. In this study it was found that 8.3% of the participant had severe PTSD. It was also found that 8.3% of the participant had severe PTSD, 39.8% had moderate symptoms, 42.1% had mild symptoms and 9.7% had no significant symptoms. This study showed that PTSD among children persists even after 4 years. Another study by Neuner (2006) [6] concluded that PTSD ranged between 14 and 39% among tsunami affected children at 3 to 4 weeks in Sri Lanka.

The objective of this study was to assess the prevalence of PTSD in terms of its severity, among children exposed to the tsunami disaster, at an early stage i.e. 6 months post trauma, as well as the prevalence of PTSD symptoms i.e. the 'reexperiencing', 'numbing/avoidance' and 'hyperarousal' symptoms experienced by these children. We also explored the association between PTSD and selected factors such as socio-demographic characteristics, family structure, academic performance, social support, behavioral problems and parental life stresses. This study is useful for identifying children at higher risk of developing PTSD. Such information would be useful for designing strategic plan of action to deal with children who developed symptoms of PTSD after facing massive trauma that affect not only their families but their communities.

METHODOLOGY

This is a cross sectional study conducted on a group of school children from areas affected by the 26th December 2004 Indian Ocean tsunami disaster. The study was carried out immediately 6 months after the disaster and it focused on

school children aged 10 to 12 years from three schools in Kota Kuala Muda Kedah. These schools were purposely chosen since they were situated in one of the hardest hit areas of the country. Parents of primary school children in standard four to six were informed of the study and consent from these parents was obtained. Children whose parents consented to participate by signing the consent forms were included in the study. Both children and parents provided data used in this study. For children, data was collected through guided self-administered questionnaires, where questions were read to them in class by the researcher. Questionnaires for parents were given to the children to be taken home for self-administered completion. Children provided information on academic performance, social support, specific exposure to tsunami and symptoms of PTSD, while parents reported on questions on demographic profile and their children's behavioral problems as well as family life stressors.

For assessing social support, the questions were adapted and modified from the Social Support Behavior Scale which consists of 32 items [7]. Children who had scores lesser than 160- were classified as having low social support while children with scores equal or more than 160 were classified as having high social support. For behavioral problems, questions were adapted from the Eyeberg Child Behavior Inventory which consists of 36 items [8]. Parents who answered yes to 11 or more items would be classified as having a child who had behavioral problems. Both questionnaires had been translated in the Malay language.

The parental life stressors were assessed through a 17-item questionnaire focusing on life events including the consequences related to the tsunami experience. Parents who answered yes to 2 or more items were classified as having higher stress.

In assessing exposure to tsunami, children were divided into exposed and non- exposed groups. Tsunami-exposed children were those who experienced at least 1 of the 10 experiences listed in the questionnaire. These could be human or property-related experiences. The questions include seeing the tsunami waves; being hit by the waves but was not injured; being hit by the waves and sustained injuries; having family or friends who suffered injuries; having family or friends who died in the tragedy; having house, boat or belongings damaged, having house, boats or belongings destroyed, having home destroyed and having to move out or relocate; and having father who lost his job due to the tsunami. Exposure was categorized as being mild if the children had between 1 to 4 experiences, and as severe if they had 5 or more experiences (excluding having death of family members or friends, or having to relocate), or having to relocate, or experiencing death of family members and friends. Those who did not experience any of the above were considered as non-exposed.

For measuring PTSD, questions were adapted and modified from a study by Ronan (1997) [9]. The questionnaire comprised of 20 items. This questionnaire was translated in Malay and the Chronbach's alpha was shown to be satisfactory, i.e 7.3. Each item was scored using Likert scale of zero to four and the total scores could range from 0 to 80. Children who had total scores less than 12 were classified as not having PTSD, those with scores of 12-24 were classified as having mild PTSD, scores of 25-39 as having moderate PTSD, scores of 40-59 as having severe PTSD, and scores more than 60 as having very severe PTSD. Children were also categorized as having re-experiencing symptoms if they answered yes to at least 1 item pertaining to re-experiencing symptoms; as having numbing/avoidance symptoms if they answered yes to at least 3 out of 5 items pertaining to numbing/avoidance symptoms; and as having hyperarousal symptoms if they answered yes to at least 2 out of 5 items pertaining to hyperarousal symptoms.

The data was analyzed using SPSS software version 19. Mann-Whitney test was used to analyze continuous variables, while the Chi-Square and Fisher Exact tests were used to analyze the categorical variables. Logistic regression analyses were used to assess the prevalence odds ratio and their 95% confidence intervals.

RESULTS

A total of 713 questionnaires and consent forms were distributed to the standard 4, 5 and 6 children and 404 agreed to participate in the study. However only 219 children and parents provided complete information required in the data analysis.

Socio-demographic characteristics

Table 1 shows that all the children were Malays, 96 (43.8%) were boys and 123 (56.2%) were girls. Their mean age was 10.9 ± 0.8 years and the majority (91.3%) came from intact families. With regards to parental education, 63.0% of the fathers had at least secondary school education. Most, 90.4% of fathers were employed compared to mothers (28.8%). The mean household income was RM 629.3 ± 529.4. The children's academic performances were average to poor (based on their mathematics and science subjects' achievement). The majority of the respondents had good social support (67.1%). Approximately 83% of the parents reported that the children had behavioral problems and more than two thirds (68.0%) of the parents had high life stressors.

Table 1 Distribution of sociodemographic factors, family structure, academic performance, social support and behavioral problem among children, and reported parental life stresses (n=219)

Characteristics	f	%
A. Sociodemographic factors		
Sex		
Male	96	43.8
Female	123	56.2
Family structure		
Intact marriage	200	91.3
Single parent due to divorce/ death	19	8.7
Father's education		
No or Primary School	81	37.0
Secondary school/ University	138	63.0
Mother's education		
No or Primary School	86	39.3
Secondary school/ University	133	60.7
Father's occupation		
Unemployed	21	9.6
Employed with non government	172	78.5
Employed with government	26	11.9
Mother's occupation		
Unemployed	156	71.2
Employed	63	28.8
Monthly household income		
Less than RM 500	75	34.2
RM 500-1000	125	57.1
More than RM 1000	19	8.7
Number of siblings		
Less than 4	50	22.8
4 or more	169	77.2
B. Academic performance		
Science/mathematics test results		
A or B	67	30.6
C or less	152	69.4
C. Social support		
Score < 160 (low)	72	32.9
Score ≥ 160 (high)	147	67.1
D. Behavioral problems		
0-5	14	6.4
6-10	24	11.0
≥ 11	181	82.6
E. No. of life stresses		
Low (0 -5)	70	32.0
High (6 -17)	149	68.0

Exposure to tsunami

Table 2 shows 140 (63.9%) of the children were exposed to the tsunami. Seventy four (33.8%) had mild experience, while the remaining 29 (13.2%) had 5 or more experiences, 19 (8.7%) experienced death of family members or friends and 23 (10.5%) had to relocate; all of which were considered as severe experiences. Seventy four (33.8%) had mild experience while the remaining, 66.2%, had severe experiences. Their experiences were also divided into human and property-related experiences. The most frequent human-related experiences were seeing the tsunami waves (39.3%), followed by being hit by the wave and sustaining injuries (23.3%), and having family or friends injured by the disaster (20.5%). With regards to property- related experiences, 47.0% had their house flooded by the tsunami, 39.3%, had houses, boats or other belongings damaged, and 28.3% had their belongings totally destroyed.

Table 2 Distribution of tsunami exposure experienced by children in the study (n =219)

Exposure	f	%
A. Exposure		
Non exposed	79	36.1
Exposed	140	63.9
B. Specific experience		
Human-related experience		
Saw tsunami waves	86	39.3
Hit by waves but was not injured	30	13.7
Hit by waves and sustained injuries	51	23.3
Family or friends injured in disaster	45	20.5
Family or friends died in disaster	19	8.7
Father lost job	21	9.6
Property- related experience		
House flooded by tsunami	103	47.0
House, boats and other belongings damaged	86	39.3
House, boats and other belongings destroyed	62	28.3
House destroyed or damaged, had to relocate	23	10.5
C. Severity of experience		
Not exposed	79	36.1
Mild (1- 4 experiences)	74	33.8
Severe		
5 or more experiences excl. death and relocation	29	13.2
having death of family or friend	19	8.7
having to relocate	23	10.5

Prevalence of PTSD

Base on the questionnaires, Table 3 shows that 101 (46.1%) of these children had PTSD symptoms with total scores of 12 and above; 31.1% of these children had mild, 11.4% had moderate, 3.7% had severe PTSD and none had very severe PTSD. This study also shows 201(91.8%) children had re-experiencing symptoms, 62 (28.3%) had numbing/avoidance symptoms, and 108 (49.3%) had hyperarousal symptoms.

Factors associated with PTSD

Table 4 shows the prevalence of PTSD by specific socio-demographic characteristics, academic performance, social support, reported behavioral problems and parental life stresses, and the crude and adjusted prevalence odds ratios for PTSD by these risk factors. The prevalence of PTSD were higher among boys (47.9%) compared to girls (44.7%). The adjusted prevalence odds ratio for PTSD was 0.9 (95% CI 0.5-1.7) in girls compared to boys.

The prevalence of PTSD was found higher in boys, those coming from intact families (parents currently married), those having unemployed fathers, those having employed mothers, those having low household income, those who were not the first child, having 4 or more siblings and those performing poorly in science and mathematics. However all these differences in prevalence were not statistically significant. The prevalence of PTSD was also higher among children reported to have behavioral problems and among children whose parents reported to having more life stresses. However both crude and adjusted analyses of both these factors were also not statistically significant.

Table 3 Distribution of specific symptoms in the diagnosis of PTSD among the children in the study (n=219)

Items/symptoms	Yes f (%)	No f (%)
A. Presence of PTSD	101 (46.1)	118 (53.9)
B. Specific Items		
Regular fear	175 (79.9)	44 (20.1)
Sense of foreshadowing future	173 (79.0)	173 (79.0)
Somatic complaints	169 (77.2%)	169 (77.2%)
Identified as trauma	119 (54.3)	100 (45.7)
Guilt	61 (27.9)	158 (72.1)
Reexperiencing		
Repetitive images	157 (71.7)	62(28.3)
Repetitive thoughts	110 (50.2)	109 (49.8)
Nightmares	118 (53.9)	101 (46.1)
Fear of recurrence	54 (24.7)	165 (75.3)
Upset by reminders	158 (72.1)	61 (27.9)
Reexperiencing symptomsa	201 (91.8)	18 (18.2)
Numbing/Avoidance		
Emotional avoidance	133 (60.7)	86 (39.3)
Social avoidance	98 (44.7)	121 (55.3)
Anhedonia	118 (53.9)	101 (46.1)
Emotional detachment	78 (35.6)	141 (64.4)
Emotional numbing	85 (38.8)	134 (61.2)
Numbing symptomsb	62 (28.3)	157 (71.7)
Hyperarousal		
Sleep disturbances	82 (37.4)	137 (62.6)
Behavior outburst	57 (26.0)	162 (74.0)
Concentration difficulties	64 (29.2)	155 (70.8)
Memory difficulties	91 (41.6)	128 (58.4)
Easily startled	95 (43.4)	124 (56.6)
Hyperarousal symptomsc	108 (49.3)	111(50.7)

a. Having at least 1 symptom of the 5 listed under reexperiencing
b. Having at least 3 symptoms of the 5 listed under numbing/avoidance
c. Having at least 2 symptoms of the 5 listed under hyperarousal

Table 4 also shows that children who reported having low social support had higher prevalence of PTSD compared to children with high social support (59.7% versus 39.5%). The adjusted prevalence odds ratio for PTSD was 2.3 (95% CI= 1.3-4.2) in children with low social support compared to children with high social support.

Table 5 shows that prevalence of PTSD is higher among children who were directly exposed to the tsunami compared to children who were not (47.9% versus 43.0%). The crude odds ratio for PTSD among exposed to non-exposed children was 1.2 (95% CI = 0.7-2.1). For specific experiences, Table 5 also shows higher prevalence of PTSD among children who saw the tsunami (51.2%), those who were hit by the waves and sustained injuries (51.0%), those who had family and friends who were injured in the tragedy (52.1%), those with family and friends who died in the tragedy (73.7%), those who had houses, boats and other belongings damaged during the tragedy (56.4%) and those who had to relocate due to damaged house (60.9%) compared to children who did not have similar experiences. However, there were no statistically significant differences in PTSD among children who experienced these symptoms compared to those who did not. In this study, only children who experienced death of family or friends had a significant crude odds ratio of 3.6 (95% CI=1.3-10.5) for PTSD compared to children without such experiences.

When adjusted for the factors explored in this study namely, sex, family structure, parental education and occupation, household income, position in family, number of siblings, school performances, social support, parental stresses as well as exposure to tsunami experiences, the prevalence odds ratio for PTSD showed similar results to that of crude analysis. For social support, the prevalence odds ratio remains significant, the odds ratio was 2.3 (95% CI = 1.3-4.2), after adjusting for all the other factors explored in this study. This is also true for children who experienced death of family member and friends where the adjusted prevalence odds ratio for PTSD was 3.7 (95% CI =1.2- 11.5).

Table 4 Prevalence, crude and adjusted prevalence odds ratio and 95% CI of PTSD by socio-demographic characteristics, family characteristics, academic performance, social support, behavior problems and parental life stresses

Factors	n	Presence of PTSD		Adjusted OR
		Yes f (%)	No f (%)	(95%CI)
Sex				
Girls	123	55 (44.7)	68 (55.3)	0.9
[Boys]	96	46 (47.9)	50 (52.1)	(0.5-1.7)
Family structure				
Not married	19	8 (42.1)	11 (57.9)	0.6
[Married]	200	93 (46.5)	107 (53.5)	(0.2-1.8)
Father's education				
No or primary school	81	37 (45.7)	44 (54.3)	1.1
[Secondary school/university)	138	64 (46.4)	74 (53.6)	(0.5-2.1)
Mother's education				
No or primary school	86	39 (45.3)	47 (54.7)	1.0
[Secondary school/university]	133	62 (46.6)	71 (53.4)	(0.5-2.0)
Father's occupation				
Unemployed	21	11 (52.4)	10 (47.6)	1.1
[Employed]	198	90 (45.5)	108 (54.5)	(0.4-3.3)
Mother's occupation				
Unemployed	156	70 (44.9)	86 (55.1)	0.9
[Employed]	63	31 (49.2)	32 (50.8)	(0.5-1.7)
Household income				
Less than RM 500	75	40 (53.3)	35 (46.7%)	1.5
[More than RM 500]	144	61 (42.4)	83 (57.6%)	(0.8-2.9)
First child				
No	153	75 (49.0)	78 (51.0)	1.6
Yes	66	26 (39.4)	40 (60.6)	(0.8-3.2)
No of siblings				1.0
4 or more	169	80 (47.3)	89 (52.7)	(0.5-2.1)
[Less than 4]	50	21 (42.0)	29 (58.0)	
Science results				
C and below	152	76 (50.0)	76 (50.0)	1.8
[A or B]	67	25 (37.3)	42 (62.7)	(0.9-3.6)
Mathematics results				
C and below	149	70 (47.0)	79 (53.0)	0.8
[A or B]	70	31 (44.3)	39 (55.7)	(0.3-1.5)
Social support				
Low score	72	43 (59.7)	29 (40.3)	**2.3**
[High score]	147	58 (39.5)	89 (60.5)	**(1.3-4.2)**
Behavioral problems				
Yes	181	85 (47.0)	96 (53.0)	1.2
[No]	38	16 (42.1)	22 (57.9)	(0.6-2.6)
Life stresses				
High score	149	71 (47.7)	78 (52.3)	1.0
[Low score]	142	30 (42.9)	112 (57.1)	(0.5-1.8)

DISCUSSION

The effect of disaster on the mental health of children and adults is well established, and usually presents as posttraumatic stress disorder. This study revealed the prevalence of PTSD among children in Kota Kuala Muda Kedah who were affected by the tsunami six months after the disaster. From this cross sectional study, we found 46.1% of children had PTSD symptoms; 31.1% had mild, 11.4% had moderate and 3.7% had severe PTSD. None of the children reported having very severe symptoms of PTSD. In a study involving children affected by Hurricane Floyd, it was found that 95% of them had PTSD and 71% had mild to moderate symptoms six months after the tragedy [10]. The difference in the prevalence could be attributed to the difference in level of exposure of the traumatic events. In fact the tsunami in Kota Kuala Muda Kedah was far less severe compared to other places such as Acheh, Sri Lanka, India or Thailand which took a heavy toll in loss of human lives and property damages. Posttraumatic Stress disorder were shown to be much higher (70.7%) among children in Tamil Nadu [11] in which 6065 live were lost.

Table 5 Prevalence, crude and adjusted prevalence odds ratio and 95% CI of PTSD by general and specific tsunami exposure experiences among children in the study

Exposure experience	n	Presence of PTSD		Adjusted OR
		Yes f (%)	No f (%)	(95% CI)
Exposure to tsunami				
Exposed	140	67 (47.9)	73 (52.1)	0.9
Non-exposed	79	34 (43.0)	45 (57.0)	(0.5-1.7)
Specific human-related experiences				
Saw tsunami waves				
Yes	86	44 (51.2)	42 (48.8)	1.2
[No]	133	57 (42.9)	76 (57.1)	(0.7-2.4)
Hit by waves but was not injured				
Yes	30	12 (40.0)	18 (60.0)	0.7
[No]	189	89 (47.1)	100 (52.9)	(0.3-1.7)
Hit by waves and sustained injuries				
Yes	51	26 (51.0)	25 (49.0)	1.3
[No]	168	75 (44.6)	93 (55.4)	(0.6-2.5)
Family or friends injured				
Yes	46	24 (52.1)	22 (47.8)	1.3
[No]	173	77 (44.5)	96 (55.5)	(0.7-2.6)
Family or friends died				
Yes	19	14 (73.7)	5 (26.3)	**3.7**
[No]	200	87 (43.5)	113 (56.5)	**(1.2-11.5)**
Specific property-related experiences				
House flooded by tsunami				
Yes	103	46 (44.7)	57 (55.3)	0.7
[No]	116	55 (47.4)	61 (52.6)	(0.2-1.8)
House, boats and other belongings damaged				
Yes	117	66 (56.4)	51 (43.6)	0.9
[No]	102	35 (34.3)	67 (65.7)	(0.5-1.9)
House, boats and other belongings destroyed				
Yes	62	27 (43.5)	35 (56.5)	1.7
[No]	157	74 (47.1)	83 (52.9)	(0.6-4.5)
House destroyed/damaged, had to relocate				0.6
Yes	23	14 (60.9)	9 (39.1)	(0.3-1.1)
[No]	196	87 (44.4)	109 (55.6)	
Father lost his job				
Yes	21	9 (42.9)	12 (57.1)	0.9
[No]	198	92 (46.5)	106 (53.5)	(0.5-1.6)

The most common symptoms reported by children in this study were regular fear, sense of foreshadowing future, somatic complaints, being upset by reminders and having repetitive images of the events. As for the classifications of items in the diagnosis, 91.8% of the children had re-experiencing symptoms, 28.3% had numbing/avoidance symptoms while 49.3% had hyperarousal symptoms. Study on 118 children following a series of volcanic eruptions in New Zealand revealed that 65% had re-experiencing symptoms, 24% had hyperarousal symptoms while 14% had numbing/avoidance symptoms [9]. In a study on 442 children who experienced the Hurricane Andrew in Florida found that 89.8% of the children had reexperiencing symptoms, 49.3% had numbing and avoidance symptoms and 67% had hyperarousal symptoms [12]. However the result of this study may be slightly different from other studies on symptoms of PTSD since the nature of disasters differed, there are differences in culture settings and the studies were conducted at different follow-up period after the disaster.

This study identified trends that are important for identifying children who are most likely to suffer negative sequel due to trauma such as the tsunami. With regards to age, it was found that children who were younger (10 to 11 years old) showed higher prevalence of PTSD compared to older children. This is similar to findings of a previous study by Shannon et al [13] which reported that the prevalence of PTSD is higher among children of younger age group.

We also found that the prevalence of PTSD was higher among children with lower social support compared to those with higher social support. Previous studies have shown that children with higher social support tend to be more resilient and they were also found to have better cognitive functioning, good disposition, self confidence, talents and faith [14].

Children who experienced death of family or friends were significantly associated with PTSD. This is similar to the Ursano et al. study [15] who found death of a family member or friend is a powerful stressor that gives rise to bereavement issues. Although deaths are a normal part of life, unexpected, violent death is especially difficult to confront and may lead to PTSD. Other study had shown that the development of PTSD among children and adults were related to the effect of a dose-response relationship [16.]

With regards to exposure towards tsunami, 47.9% of children who were directly exposed to the tsunami had PTSD, compared to 43.0% among the non-exposed but there was no significant association between PTSD and exposure to the tsunami. This could be due to sampling bias in which children who were not exposed lived in the same neighborhood and were affected indirectly to the consequences of the tsunami in their community. They too had the opportunity to visit the surroundings that were affected by the waves, including seeing the destroyed houses and belongings. The incidence had been much talked about by everyone in the neighborhood and these children had seen repeated replays of events concerning the tsunami on their television. It has been shown that PTSD could result from not only direct but also visual or verbal exposure to trauma [16, 17]. The difference between the two groups would probably differ significantly if the non-exposed or control group were chosen among children from a different neighborhood, far from the disaster zone. We may also miss some of the hardest hit children who may have moved out of the disaster area.

In this study, there were no significant difference between prevalence of PTSD and sex, family structure, parental socioeconomic status and academic performance. In a study done in North Carolina, it was found that females were more inclined to experience PTSD [18]. Previous studies have reported that low socio-economic status and poor academic achievement were significantly associated with PTSD [19, 20]. In this study, the response rate was noted to be low (only 30.7%) as not all questionnaires distributed to the parents were returned and answered completely. This could explain the non-significant finding in this study.

The prevalence of PTSD among children with behavioral problems was higher compared to children who were not reported to having behavioral problems. The adjusted odds ratio of PTSD among children with behavior problem was 1.2 (95% CI = 0.6-2.6) compared to children with no such problems, but the difference was not significant. Similar finding was also found in a study done on adolescents with a primary diagnosis of PTSD and Conduct Disorder [21]. In this study, the difference was not noted to be significant probably because parents were not forthright in revealing their children's negative conduct or behaviors. With regards to parental life stressors, this study also did not show any significant difference between PTSD and parental life stressors.

In this study, not all possible confounding factors were taken into consideration. These include the child's personality, past psychiatric family history and any types of aids, counseling and support that were offered to these children from the time of event to time of study.

CONCLUSION

In conclusion, schools provide the most convenient location and opportunity for screening children for the psychological effect of traumas especially 6 months after the event. Children who experienced death of family members or friends in the disaster had significantly higher PTSD than those without such experience[22]. The prevalence of PTSD was still high after 6 months not only among exposed but also unexposed children. Training could be given to teachers in schools on how to identify problems in children of affected communities. Children who had been identified should be referred to specialists for further management and follow up. A school-based intervention programme for children and their parents could be carried out in schools in order to alleviate the burden of these children. Further research, for example a longitudinal study, could be done to see whether PTSD experienced by these children would persist over time so that we will be better prepared when such disaster strikes again.

ACKNOWLEDGEMENT

This project is part of Dr Idayu Badilla Idris's Master's thesis and financial support for this study was provided by the Ministry of Health of Malaysia and Universiti Kebangsaan Malaysia. This study has also undergone Universiti Kebangsaan Malaysia ethics committee clearance (FF-164-2005).

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