



## Review Article

# Social Support for Exposed Children and Adolescents Who Experienced the 2004 Indian Ocean Tsunami - Associations with Psychological Health in Young Adulthood

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## Abstract

**Background:** Lack of social support is a risk factor for negative psychological outcomes post disaster. However, we do not know if this is the case after many years. **Aim:** The aim was to examine the association between remembered social support directly after the 2004 tsunami or social support eight years post disaster and psychological distress, posttraumatic stress symptoms, self-rated health, worry or anxiety and suicide ideation in 2012 for exposed children and adolescents. **Subjects and Methods:** A questionnaire was distributed to young adults who experienced the tsunami when they were 10-15 years of age. The questionnaire included Crises Support Scale, General Health Questionnaire, Impact of Events Scale Revised and questions of Worry and Anxiety, Self-rated Health, and Suicidal ideation and questions specially made. **Results:** Low levels of perceived social support given in 2004 or 2012 were associated with higher levels of psychological distress, additional posttraumatic stress symptoms, low self-rated health, more worry or anxiety and more suicidal ideation in 2012. **Conclusion:** The results show that providing social support for children and adolescents who have experienced a disaster create better psychological health many years later.

**Keywords:** Children, Adolescents, Natural disaster, Social support, Psychological outcomes

## Introduction

Many studies have shown that providing social support for children and adolescents who have experienced a natural disaster helps them to maintain or restore psychological health, while a lack of social support is a risk factor for negative psychological outcomes post disaster [1-9]. Social support has been thought to reduce the effects of stressful experiences by limiting threatening interpretations of the disaster and providing more effective coping strategies [10]. Social support has also been thought to calm fears and encourage positive behaviors [11]. Kronenberg et al. [12] emphasized the importance of building and maintaining supportive relationships following disasters.

Social support is a common construct in disaster research defined in different ways by different researchers [10,13,14]. Social support has been described as perceived and received social support in different studies [13,14]. It is often referred to as the instrumental or emotional resources provided by the social network for the individual after the disaster (Cohen, 2004). Instrumental support involves the provision of material aid, such as financial assistance and help with daily tasks. Emotional support involves the expression of empathy, caring, reassurance and trust and provides opportunities for emotional expression and venting [10].

Receiving support from significant others is of importance for children and adolescents [15]. High levels of

both family and peer social support have demonstrated associations with low levels of psychological distress after a natural disaster [6]. Parents are the primary support system for children after disasters [1,11] as children are dependent on their caregivers for meeting basic needs [8]. Chrisman and Dougherty [16] described the importance of children and adolescents having access to family protective factors such as good parent-child relationships and parental harmony after a traumatic event. Williams et al. [17] emphasized the importance of creating opportunities for children to express their feelings and concerns and of establishing a sound sense of normality as soon as possible after disasters. Children should also be encouraged to talk to their parents [18]. The level of social support for children and adolescents is therefore partly dependent on the openness of the family after a natural disaster. However, it can be difficult for adolescents to talk with parents or other adults, because the adolescents want to avoid expressing distressing and painful feelings [19]. Parents may themselves be affected adversely by the disaster, and they may change their behavior toward their children, which can impair their ability to provide support [8,17]. In one recent study, it was found that caregivers who reported that they themselves had traumatic reactions in the aftermath of the disaster had an impact on the development of posttraumatic syndromes in their children later in life [20]. The child or adolescent may hold back his or her own

thoughts and feelings in the early post-disaster period, especially if the parent is also distressed [21].

Social support and the existing level of personal attachment to parents can also affect the young disaster victim's capacity to receive support [12]. Securely attached persons have been found to have a higher likelihood of seeking social support and show less symptomatic response to stressful life events [22]. Bryant et al. [23] called attention to the finding that those who benefit most easily from social support in the aftermath of a disaster are often those who have a secure attachment style.

The associations between social support and psychological wellbeing have been examined in victims during the first year of the post-disaster period [5,24]. We believe that it can also be valuable to examine these associations several years after a disaster to obtain important information about how trauma in childhood and adolescence may have a long-lasting impact over a period of years [8,11,12,24] even if no longitudinal study can be made. Thordardottir and colleagues [20] studied children 16 years after two avalanches that occurred in Iceland, and they found that lack of social support and the occurrence of traumatic reactions among caregivers predicted the development of posttraumatic stress disorder symptoms in the children.

Prior studies have often restricted their examination of outcomes after natural disasters to studying general psychological distress and posttraumatic stress symptoms. Other outcomes such as Self-rated health and Suicide ideation have not been investigated as often. Self-rated health refers to a person's perception of his or her subjective general health status including psychological, social and medical factors [25]. Serious thoughts of suicide can also be considered an important factor to study in children and adolescents who have experienced a natural disaster as their subjective perceptions can adversely affect their development.

Many Swedish families with children and adolescents between 10 and 15 years of age, were vacationing in Southeast Asia, most of them in Thailand, during the Christmas season in 2004. A tsunami struck on December 26 [26]. The situation in areas struck by the tsunami changed very quickly from being that of a positive holiday experience to a chaotic and life-threatening situation for many. The tsunami hit the coast, and many children and adolescents underwent a life-threatening experience; many were separated from their parents. Totally 543 Swedish citizens died in this disaster. As tourists, survivors were able to leave the disaster struck areas and return to Sweden, far from the area where they had suddenly experienced a tsunami, a natural event that does not occur in Sweden.

## Aim

The aim of this study is to examine the social support provided for Swedish children and adolescents who survived the 2004 tsunami. Support that was provided directly after the tsunami in 2004 during a period of approximately up to six months, as our subjects remembered that support in 2012, and social support was offered again in 2012. It is also to determine the associations between the social support the young adults remembered being given directly after the

disaster and the social support being given today with psychological distress, posttraumatic stress symptoms, self-rated health, worry or anxiety and suicide ideation.

Our hypothesis was that the remembered level of perceived social support directly after the tsunami and perceived social support eight years post disaster would be associated with levels of psychological distress, posttraumatic stress symptoms, self-rated health, worry or anxiety and suicide ideation.

## Subjects and Methods

### Participants

A total of 627 children, age 10 to 15 years, who lived in Stockholm County, Sweden were registered by Swedish police upon their return to Sweden from countries in Southeast Asia, not all from a tsunami-struck area. In 2012, we obtained the addresses of 609 young adults, now between 18 and 23 years of age. Of the 609,255 (41.9%) returned the questionnaire between August 2013 and October 2013. To be included in the study, the questionnaire recipient had to have been in an affected area at the time of the tsunami. Based on this criterion, 45 persons were excluded. The remaining 210 young adults constituted the study group (34.5%). The mean age at the time of the tsunami was 12 years and at the time of the study, 20 years.

The study group consisted of 134 females and 76 males, evenly distributed within four exposure groups together with the ages of the respondents. The study group was divided into four exposure groups, based on their experience of one or more types of exposures. If respondent had been on the beach or in the water, having seen the wave during the tsunami they were included in exposure group 1. If they had also experienced a threat to their life they were included in exposure group 2. Separation from their parents or loss of a near person were the inclusion for exposure group three and four. Those in exposure group 2 have consequently experienced the same exposures as those in group 1, those in exposure group 3 have consequently experienced the same exposures as those in group 2 and finally those in exposure group 4 have consequently experienced the same exposures as those in exposure group 3. Further description of these groups can be found in a previous study [27].

### Procedure

A web-based questionnaire accompanied the information letter and together with a paper-based questionnaire, three reminders were sent out. The questionnaire included self-assessment scales, questions from the Stockholm health cohort and questions designed specifically for this questionnaire, a total of 175 items: Background factors, types of exposures, social support and psychological outcomes eight years post disaster. The background variables were age, gender, educational level, living arrangement and country where the respondents had grown up. For more detailed background factors see Table 1.

Questions about past time also included the alternative 'do not remember' to reduce recall bias.

	Total (n=210)	Exposure <sup>1</sup> group 1 (n=61)	Exposure <sup>2</sup> group 2 (n=83)	Exposure <sup>3</sup> group 3 (n=37)	Exposure <sup>4</sup> group 4 (n=29)
<b>Age at tsunami (2004)</b>					
<b>10-11</b>	30	34	33	16	35
<b>12-13</b>	38	29	39	46	42
<b>14-15</b>	32	36	27	38	24
<b>Gender</b>					
<b>Female</b>	64	62	65	70	55
<b>Male</b>	36	38	35	30	45
<b>Education</b>					
<b>Elementary school</b>	19	17	16	22	27
<b>High school</b>	72	75	71	70	66
<b>College/University</b>	9	8	10	5	7
<b>Cohabitation*</b>					
<b>Yes</b>	81	82	84	78	72
<b>No</b>	19	18	16	22	28

<sup>1</sup>Exposure group 1 = Present on the beach, in the water or had seen the wave

<sup>2</sup>Exposure group 2 = Present on the beach, in the water or had seen the wave and Life threat

<sup>3</sup>Exposure group 3 = Present on the beach, in the water or had seen the wave, Life threat and experienced Separation

<sup>4</sup>Exposure group 4 = Present on the beach, in the water or had seen the wave, Life threat and experienced Separation and Loss

Cohabitation\* = Living together with someone else

**Table 1:** Background factors totally and per exposure group (%).

## Measures

### Crises Support Scale:

The Crises Support Scale (CSS) was used to identify social support [28]. The scale was originally developed as a semi-structured interview to measure received social support [29]. Joseph and colleagues [28] converted the original version to a scale-based version, and the CSS has since then been used as a standardized scale that has been found to have robust psychometric properties [30]. The Swedish version of the CSS scale has been used in this study. The Swedish version of the CSS is a seven-item scale, and answers are rated from 1=never to 7=always. The CSS can be used according to the developers; Joseph et al. [28] and Dagleish et al. [31] in two-time frames. The respondent can answer questions about social support provided directly after the disaster and about social support experienced in present time. In this study the CSS was divided so that we could use these two time frames: 1) Social support remembered and reported up to six months post disaster, 2) social support in 2012.

We divided the CSS in this study into three parts, following earlier studies concerning adults [13]. In the former Swedish study, the scale was divided into two parts, one consisting of questions 1-5 and the other of the single question 7. Question number 6 was handled as a separate factor [13]. In this study, part one (questions 1-5) examined different aspects of social support, part two (question 6) examined disappointment experienced with another person and part three (question 7) examined satisfaction with the perceived overall social support.

The first part, including the five questions 1-5, was examined in both time frames 1 and 2. For example, the respondent was asked if there was/is someone willing to listen

to them, if they were/are able to speak about their thoughts and feelings, if they had/have personal contact with persons in the same situation or if others were/are supportive or helpful in a practical way. Question 6 asked if they felt/feel disappointed with anyone whom they thought should have supported them, examined both up to six months and eight years post disaster. Question 7 examined only experience eight years post disaster and the respondent was asked if he or she was satisfied overall with the support received after the tsunami.

### General Health Questionnaire:

The 12-item General Health Questionnaire (GHQ-12), was used in this study to examine psychological distress. GHQ-12 is often used in trauma research and the scale contains questions pertaining to psychological health rated over the preceding few weeks (Goldberg & Williams, 1988). The GHQ-12 has been translated into Swedish and has been used in several studies and has been found to have sound psychometrics [26,32]. Each item scored from zero to three and the higher the score, the more distressed the respondent. Responses were dichotomized in accordance with instructions [33] whereby ratings 0-1 were coded as 0 and ratings 2-3 as 1, within a range of 0-12.

### Impact of Event Scale Revised:

The Impact of Event Scale Revised (IES-R) consists of 22 items and is used to identify posttraumatic stress symptoms [34,35]. The scale has been translated into Swedish and been used in several studies [26,32]. The degree of distress during the preceding week in response to a specific stressor, here the

2004 tsunami, is rated for each item on a five-point scale, ranging from 0=not at all to 4=extremely. In this study, the stated stressor was the 2004 tsunami.

### Single questions:

Worry or anxiety was examined by using the same question as in "Stockholm health cohort" [36], 'Are you bothered by worry or anxiety?', with responses ranging from 1=no to 3=yes, severe difficulties.

Self-rated health (SRH), the rating of subjective, self-perceived, health status is included in many public health surveys, the subjective perception of the general health status influenced by both psychosocial and medical factors [25]. Often, as in this study, it is assessed with the question 'How would you rate your general state of health?' Responses were rated on a five-point scale, ranging from 1=very good to 5=very poor. The validity and reliability of this question are good [25].

Suicide ideation was examined by using the same question as in "Stockholm health cohort" [36], 'Have you considered to take your own life and maybe planned how to do it?', and respondents answered based on a four-point scale, ranging from 1=no to 4=yes, during the last week.

### Questions made for this questionnaire:

Five extra questions were made for this study, questions concerning social support that research has found [10,21] important but were not covered by the original CSS. For the period 'up to six months post disaster', respondents were first asked if they were satisfied with the support they got from family, relatives and friends and secondly from school, teachers and principal. These were to be answered using a four-point scale from 1=Yes, very satisfied to 4=No, not satisfied, the option 'Received no support' was also available. The third question was 'Did you avoid talking with somebody because of that person's worry or psychological wellbeing?', and the fourth question was 'Did you get the information you needed?'. The third question was to be answered by a 'yes' or 'no' response, and the fourth question answer was to be rated on a four-point scale from 1=Yes, everything I wanted to 4=No, not at all. The answer to the fifth question, 'How do you think it was for you up to six months after the tsunami?', was also to be rated on a four-point scale, 1=I got a lot of help and support from others, 2=I got help and support from others, 3=I got little help and support from others, 4=I managed by myself most of the time.

### Data analysis

The answers to the CSS were divided into low, medium and high with mean at 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentile for questions 1-5 and 7 [13]. For questions 1-5, scores 0-19 were rated as low, 20-29 were rated as medium and  $\geq 30$  were rated as high. For question 7, scores 0-3 were rated as low, 4-6 were rated as medium and  $\geq 7$  were rated as high. Question 6 was dichotomized to get two comparable groups and all respondents answering never (1) were given the code 0 and

answering yes in different degree (2-7) was given the code 1. The level of statistical significance was set to 0.05 for CSS.

The distributions of GHQ-12 and IES-R were skewed, which was the reason why scores were dichotomized. This was done in accordance with the scale instruction [33] and in line with other published studies [26,34,37]. For GHQ-12, scores 0-2 were coded as 0 and scores 3-12 coded as 1. The cut-off used, between responses two and three, corresponds to the 75<sup>th</sup> percentile. For IES-R the cutoff was set at 75<sup>th</sup> percentile, which meant coding scores 0-32 as 0, and scores 33-88 as 1 [13,35]. The level for statistical significance was set to 0.05 for GHQ-12 and IES-R.

All other outcome measures were also dichotomized, otherwise the groups were too small to allow statistical comparison. For self-rated health, scores 1-3 were coded as 0 and scores 4-5 coded as 1. For suicide ideation the score 1 was coded as 0 and the scores 2-4 was coded as 1. For worry or anxiety, the score 1 was coded as 0 and scores 2-3 were coded as 1.

The potential of age, gender, education and exposures to predict each of GHQ-12, IES-R, self-rated health, worry or anxiety and suicide ideation was examined by using a series of binary logistic regression analyses, employing age, gender, education and exposures groups as confounders. No other explanatory factors were examined as confounders in this study.

Logistic regression analysis was performed in the same way concerning satisfaction with support from family or school and the other three questions designed specifically for this questionnaire, with gender and exposures as predictors.

To compare social support up to six months post disaster with social support eight years post disaster, Wilcoxon's test for matched pairs and signed-rank test was performed.

### Ethical consideration

Participation was optional, and a returned completed questionnaire was considered as indicating informed consent. Information was given about anonymity, that all data presented would be in the form of only de-identified data and that all data is presented as group-data only. The study was approved by the Regional Ethical Review Board in Stockholm, Sweden (Dnr:2014/607-31).

## Results

### Social support remembered up to six months post disaster

Most of our subjects remembered the 2004 tsunami and the time up to six months post disaster. Most of them thought they remembered where they were when the wave hit and if they got help and support from others up to six months post disaster (95%).

### Social support according to the Crises Support Scale:

Those who answered in the low range to questions 1-5 in the Crisis Support Scale, according to the subjects' memory of social support up to six months after the tsunami, had significantly higher odds ratios for more psychological

distress, additional posttraumatic stress symptoms, lower self-rated health and worry or anxiety eight years post disaster compared with children and adolescents who responded in the high range. Those who answered in the medium range compared with those who answered in the high range to those questions had significantly higher odds ratios only for lower self-rated health (Table 2).

The results obtained based on answers to questions 1-5 in the Crisis Support Scale, questions dealing with social

support in 2012, showed that in this time interval those with low-range answers had significantly higher odds ratios than those with high-range answers for more psychological distress, additional posttraumatic stress symptoms and lower self-rated health. Those who gave medium-range answers for this time interval had significantly higher psychological distress than those who gave high-range answers (Table 2).

In summary, in both time intervals there were significant associations with different outcomes in young adulthood.

Outcome measures controlled for age, gender, education and exposure	Crisis Support Scale Questions 1-5 <6 months post disaster OR L-H <sup>1,3</sup>	OR M-H <sup>2,3</sup>	Crisis Support Scale Questions 1-5 8 years post disaster OR L-H <sup>1,3</sup>	OR M-H <sup>2,3</sup>
Psychological distress (GHQ-12)	4.8* (1.5-16.5)	1.2 (0.4-3.7)	3.4*(1.2-9.2)	2.5*(1.2-5.5)
Post traumatic stress symptoms (IES-R)	7.0*(1.4-43.7)	2.8 (0.7-14.4)	7.3*(2.0-29.6)	1.2 (0.4-3.3)
Self-rated health	14.0*(2.7-100.5)	5.7*(1.3-35.6)	5.8*(1.5-39.5)	3.6 (0.9-24.5)
Worry or Anxiety	4.7*(1.5-16.6)	2.2 (0.8-6.1)	2.0 (0.8-4.9)	0.9 (0.4-2.1)
Suicide Ideation	2.3 (0.6-9.0)	1.9 (0.6-6.7)	1.9 (0.6-6.6)	1.8 (0.6-6.2)

\*=statistically significant p<0.05, 1 L= low range, score 0-19, 2M= medium range, score 20-29, 3H= high range, score <30 OR= odds ratio  
 Questions 1-5: Whenever you wanted/want to talk how often was/is there someone willing to listen? Did/Do you have personal contact with persons in the same situation or with a similar experience? Were/are you able to speak about your thoughts and feelings? Were/are others sympathetic and supportive? Were/are people helpful in a practical sort of way?

**Table 2:** Low range or Medium range responses in comparison with High range responses to questions 1-5 in Crisis Support Scale in relation to outcome measures.

Respondents whose answers to question 6 in Crisis Support Scale indicated that they remembered that they were disappointed with someone during the time up to six months after the tsunami had significantly higher odds ratios for more psychological distress, additional posttraumatic stress symptoms, lower self-rated health and additional thoughts

about suicide eight years post disaster than those answering that they were not disappointed with any individual. For the time eight years post disaster the same result was found according to answers to question 6. The conclusion was that results in both time intervals had significant associations with all examined outcomes eight years post disaster (Table 3).

Outcome measures controlled for age, genus, education and exposure	Crisis Support Scale Question 6 < 6 months post disaster OR	Crisis Support Scale Question 6 8 years post disaster OR
Psychological distress (GHQ-12)	3.7*(1.7-8.3)	4.9*(2.4-10.3)
Posttraumatic Stress Symptoms (IES-R)	12.7*(4.6-4.5)	8.7*(3.0-31.6)
Self-rated health	5.1*(2.2-13.5)	4.0*(1.8-9.5)
Suicide Ideation	2.9*(1.6-5.5)	12.1*(4.7-36.3)

\*=statistically significant p< 0.05 OR=odds ratio  
 Question 6: Did/do you at any time feel disappointed by anyone whom you thought should support you?

**Table 3:** Responses to question 6 in the Crisis Support Scale in relation to outcome measures.

Those who responded in the low range to question 7 in Crisis Support Scale had significantly higher odds ratios for more psychological distress, additional posttraumatic stress symptoms, lower self-rated health, worry or anxiety and suicide ideation in young adulthood than children and

adolescents who responded in the high range. For those who responded in the medium range there were significantly higher odds ratios for more psychological distress and additional posttraumatic stress symptoms (Table 4).

Outcome measures controlled for age, gender, education and exposure	Crises Support Scale Question 7 8 years post disaster OR L-H <sup>1,3</sup>	Crises Support Scale Question 7 8 years post disaster OR M-H <sup>2,3</sup>
General Psychological distress (GHQ-12)	9.4*(3.6-27.2)	2.7*(1.1-7.1)
Posttraumatic stress symptoms (IES-R)	12.7*(2.8-93.6)	8.0*(1.9-55.8)
Self-rated health	7.4*(2.3-29.0)	2.6(0.7-8.7)
Worry or Anxiety	2.7*(1.1-6.9)	1.2(0.6-2.6)
Suicide Ideation	3.9*(1.4-11.2)	1.9(0.8-5.2)

\*=statistically significant p<0.05, 1 L= low range, score 0-19, 2M= medium range, score 20-29 3H= high range, score <30  
 Question 7: Overall, are you satisfied with the support you received after the tsunami?

**Table 4:** Low range or Medium range responses in comparison with High range responses to question 7 in Crises support Scale in relation to outcome measure.

**Comparison of social support directly after the event with social support eight years post disaster:**

The results indicated significantly, p<0.001 (n=187), according to Wilcoxon’s test for matched pairs and signed-rank test, that it was more common for individuals to perceive having received higher social support up to six months post disaster than they did in 2012 according to responses to questions 1-5 in the Crises Support Scale.

A significant p<0.001 (n=99) decline in the perception of disappointment with someone offering social support existed, according to answers to question 6.

**Social support according to questions made for this questionnaire:**

Ninety-six percent of the respondents (96%) answered that they remembered if they were satisfied with the support they got from family, relatives and friends up to six months post disaster. Respondents who were not satisfied had significantly higher odds ratios for additional posttraumatic stress symptoms, lower self-rated health, more worry or anxiety and additional suicide ideation than did satisfied respondents (Table 5).

Ninety-five percent of the respondents (95%) answered that they remembered if they were satisfied with the support from school up to six months post disaster. In contrast, no significant differences were found between these two groups,

dissatisfied and satisfied, concerning psychological outcomes in young adulthood (Table 5).

Ninety-five percent of respondents (95%) answered that they remembered if they got or did not get help and support from others up to six months post disaster. Nearly half of these (48 %) answered that they got little help or managed mostly by themselves up to six months post disaster. These individuals had significantly higher odds ratios for experiencing more general psychological distress than those who received help and support from others (Table 5).

Seventy-seven percent of respondents (77%) reported that they remembered that they avoided talking with someone because they were worried that the person would be disturbed by hearing about the disaster. Those who avoided talking to someone had significantly higher odds ratios for more psychological distress, additional posttraumatic stress symptoms, lower self-rated health, more worry or anxiety and additional suicide ideation thoughts than those who did not avoid talking to someone (Table 5).

Eighty-three percent (83%) reported that they remembered if they obtained needed information up to six months post disaster. Respondents who did not receive information had significantly higher odds ratios for more psychological distress, additional posttraumatic symptoms, lower self-rated health and more worry or anxiety than respondents who had received the information they needed (Table 5).

Outcome measures controlled for gender and type of exposure	General Psychological Distress (GHQ-12) OR	Posttraumatic Stress Symptoms (IES-R) OR	Self-Rated Health OR	Worry or Anxiety OR	Suicide Ideation OR
Were you satisfied with the support you got from family, relatives and friends?	2 (0.9-4.1)	3,7*(1.5-9.3)	3,6*(1.5-8.8)	2,5*(1.2-5.2)	4.2*(2.0-9.4)
Were you satisfied with the support you got from school, teachers and principal?	1.5(0.7-3.3)	1(0.4-2.7)	1.8(0.8-4.4)	1.6(0.8-3.1)	0.8(0.4-1.7)
How do you think it was for you	2.3*(1.2-4.7)	1.2(0.5-2.8)	1.9(0.8-4.4)	1.8(0.9-3.4)	1.4(0.7-3.0)

up to six months after the tsunami?					
Did you avoid talking with somebody because of that persons worry or psychological wellbeing?	3.1*(1.4-6.9)	9.1*(3.1-30.7)	3.0*(1.1-8.5)	3.7*(1.7-8.5)	2.7*(1.2-6.2)
Did you get the information you needed?	3.1*(1.4-7.1)	7.6*(3.0-20.7)	3.9*(1.5-10.6)	2.4*(1.1-5.6)	1.2(0.5-2.8)

\*=statistically significant p<0.05 OR=odds ratio

**Table 5:** Responses to questions especially made for this questionnaire, examining social support, remembered up to six months post disaster in relation to outcome measures.

## Discussion

The results showed that the level of social support, both as remembered and present-day, for children and adolescents who experienced the tsunami in Southeast Asia 2004, had associations with levels for outcomes as psychological distress, posttraumatic stress symptoms, self-rated health, worry or anxiety and suicide ideation in young adulthood, eight years post disaster. The participants were between 10-15 years old when they experienced the 2004 tsunami, and social support was reported both as they remembered it up to six months after the tsunami and again eight years post disaster.

The hypothesis that the level of perceived social support provided in the first months and again eight years later was associated with levels of psychological distress, posttraumatic stress symptoms, self-rated health, worry or anxiety and suicide ideation was confirmed. The results in this study are congruent with those from earlier studies that have shown the importance of social support for psychological health post disaster for children and adolescents as well as for adults [1-6,9,12]. In addition, the results from this study demonstrate that the social support they remembered receiving is significant for a long time after a natural disaster experienced in childhood or adolescence. The results are also in line with what had been found [38] showing that children had benefited from the social support they received soon after a disaster. However, it could be argued that being in good psychological health at the time the questionnaire was given increased the possibility that the respondent would report receiving a high level of social support during both time frames, an alternative to be considered when using the results from this study.

Secondly, the results also show the positive effects of being satisfied with the overall social support. Dissatisfaction with social support had negative associations with all examined outcomes.

A third result revealed how important it was for children and adolescents to have access to a well-functioning social network that allows them to deal with the psychological consequences of a natural disaster. This was shown both through the respondents' remembered experience as reported in answers to Crises Support Scale questions and by their answers to single questions made for this study. This result is in line with the results from other studies after the 2004 tsunami [3,4,14,39]. Conflicts in the family and the mothers' worsening mental health contributed to posttraumatic stress symptoms and depression in youngsters as indicated by a

study of Norwegians who experienced the 2004 tsunami [39]. In some studies it was found that these factors negatively influence children and adolescents. The taking of sick leave by parents because of the effects on them of the tsunami was found to be a negative factor in one study [3] and that parents' posttraumatic stress reactions influenced their children was found to be a factor in another Norwegian study [4]. Highly exposed children were more vulnerable to parents' distress according to this study. In a Swedish study subjects between 16-19 years of age, mentioned the loss of old friends in the post-disaster years. They had wanted to talk about their experience of the tsunami, but they felt that nobody was interested in hearing about that [14].

To avoid talking about one's own thoughts and feelings because of concern that another person might become distressed was found to have negative post-disaster effects in our study. This was congruent with the findings of a study made by Gil-Rivas et al. [40] that illustrated higher levels of posttraumatic stress among adolescents who viewed their parents as supportive but who did not discuss the disaster with their parents because they feared upsetting their parents.

Another finding was the importance of information. Children and adolescents who reported that they did not get the information they needed directly after the natural disaster experienced negative outcomes eight years post disaster. Information is important not only for adults but also for children and adolescents after a natural disaster [21], something also shown in our study. However, the results from our study do not show exactly which kinds of information were important since the question asked was unspecific. That question must be made more specific in any future study. Earlier studies after the tsunami 2004 had found that the absence of information made children very uncomfortable [41].

Self-rated health had a direct association with perceived social support in both time frames in this study. This indicates the importance of taking self-rated health into consideration in future research when examining children and adolescents after natural disasters. Wahlström et al. [42] found that after the 2004 tsunami, adults had somatic complaints even if they were not physically hurt during the disaster. Cohen et al. [43] found that negative interactions increase the risk for disease in children. Twenty-three percent (33%) of the children and adolescents in the Cohen's study have had serious thoughts about suicide during past time. These thoughts may have existed before the tsunami, but factors found in our study

must be considered when meeting children or adolescents after a natural disaster. Tang et al. [44] found that a high level of perceived family support decreased suicide risk in adolescents after they had experienced Typhoon Morakot in Taiwan, an outcome congruent with the results of our study. Bryant et al. [45] concluded that for adults the suicidal risk affects a significant proportion of patients who experience a traumatic somatic injury.

Young adults, respondents were asked to remember what took place during the time directly after the 2004 tsunami. Most of the respondents answered that they remembered what took place during the time directly after the tsunami even if they had the opportunity to choose the alternative 'do not remember'. Howe et al. [46] concluded that memories of stressful events generally are remembered accurately even if findings vary. In one study five years after the 2004 tsunami they found that two-thirds of the children reported direct memories of the disaster and one-third reported having memories based on reports from other people [47].

## Limitations and Strength of the Study

One limitation was the recall bias. This study examined social support retrospectively. Eight years had passed between the tsunami and the questionnaire. One reason children and adolescents between 10 and 15 years of age were included in this study was because of their cognitive ability to remember the disaster. A low level of perceived emotional support eight years post disaster could also increase the likelihood of remembering a low level of social support up to six months post disaster. Another limitation was the small size of the study group and it can only be speculated that several did not respond to the questionnaire because they had not been in an affected area, a phenomenon that was observed in a survey study in Norway [48]. Unfortunately, no drop-out analysis could be made in our study because of the terms of confidentiality. The study also included ethical challenges such as possible negative consequences of bringing up this subject years later or asking about suicide plans. Psychotherapists were prepared for this, and this was asked for by some of the subjects in 2012. A limitation of this study is also that we have not asked about possible experienced potential traumas during the eight years that had passed since the tsunami.

However, a major strength of this study was the opportunity of reaching all children or adolescents in this age range through the system of police registration upon their return from South East Asia in 2004. A second strength of this study is the self-report and the long-term perspective, and third strength is looking at social support years later since long-term studies are valued [5,24]. Lastly, being able to complete the questionnaire via internet or on paper was another strong point.

## Conclusion

In young adulthood, eight years after exposure to the 2004 tsunami in childhood or adolescence, levels of remembered social support up to six months after this natural disaster or social support eight years post disaster were related

to levels of psychological health. Low levels of social support had associations with more psychological distress, additional posttraumatic stress symptoms, low self-rated health, worry or anxiety and suicidal ideation in young adulthood. Dissatisfaction with overall social support, remembering disappointment with someone who was expected to offer support, remembering avoiding talking about one's own thoughts and feelings because of fear of causing someone else distress and remembering not having access to information were found to have associations with negative psychological outcomes eight years post disaster. The results of this study reveal how significant perceived social support after the 2004 tsunami has been for the exposed children and adolescents, social support remembered immediately following the disaster as well as after many years. These results contribute to our knowledge and they also show what aspects of social support must be kept in mind when meeting children and adolescents after a natural disaster.

## Acknowledgements

The authors would like to acknowledge 'Kempe Carlgrenska fonden' for economic support and Magnus Backheden for statistical analyses.

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**Received date:** November 12, 2019; **Accepted date:** December 05, 2019; **Published date:** December 07, 2019

**Citation:** Adebäck P, Nilsson D (2019) Social Support for Exposed Children and Adolescents Who Experienced the 2004 Indian Ocean Tsunami - Associations with Psychological Health in Young Adulthood. *J Health Sci Educ* 3(6): 174.

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