

## Effect of Trauma Distress, Trauma Dissociative Experience and Life Satisfaction among Earthquake Victims in Sabah, Malaysia

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**Abstract:** For years, many researchers have been working on ways of examining the psychological effect of earthquakes among victims who have experienced trauma. The goal of this study is to examine the relationship between trauma distress, associative trauma and life satisfaction among earthquake victims in Ranau, Sabah. A survey was conducted in a sample of 136 students from the Ranau area, 1 month after the earthquake. Demographics were obtained from participants using a self-administered questionnaire, fear and sense of helplessness were assessed with the Peritraumatic Distress Inventory (PDI), peritraumatic dissociative experiences were assessed with the Peritraumatic Dissociative Experiences Questionnaire (PDEQ) and life satisfaction was assessed with the cantrill's vertical visual-analogue scale ladder of life satisfaction. The results showed that was a significant negative effect of traumatic distress towards life satisfaction whereas dissociative traumatic experience did not have significant effect on life satisfaction. In addition, there was a significant and positive relationship between trauma distress and dissociative trauma among earthquake victims in Ranau. The findings suggest that concern over earthquake disaster was strongly associated with psychological distress. Reliable, accurate information on earthquake disaster might reduce psychological effects among victims.

**Key words:** Trauma distress, dissociative trauma experience, life satisfaction, earthquake victims, demographics

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### INTRODUCTION

A moderate earthquake with a Richter-scale magnitude of 6.0, hit Sabah State in Ranau District at 7:15am on June 5, 2015. This was one of the biggest natural disasters in Sabah's history, surpassed by the previous quakes. Earthquakes of this magnitude occur at an approximate rate of once every 25 years with the first being recorded in 1966 at a magnitude of 5.3 and another in 1991 at a magnitude of 5.2. According to the National Earthquake and Tsunami Centre, the earthquake was felt in most places on the west coast of Sabah including Tambunan, Tuaran, Kota Kinabalu and Kota Belud, since the earthquake was located at 6.1 North 116.6 East.

The US Geological experts confirmed that no tsunami was caused by the earthquake because of the fact that Malaysia is not located in the Pacific Ring of Fire. This circle includes the Pacific Ocean and the neighbouring countries like the Philippines and Indonesia. Mount Kinabalu is a young fold mountain that is in a region with active volcanoes and earthquakes. The Sabah Education

Department reported that a total of 23 schools has been affected by the earthquake in Ranau, Tuaran, Kota Belud, Penampang, Nabawan and Keningau. The Search and Rescue Officials (SAR officials) confirmed that the death toll from the earthquake at Mount Kinabalu was 19 and there was significant destruction of property among the affected population.

A number of studies have examined the association between natural disasters and Post-Traumatic Stress Disorder (PTSD). Norris *et al.* (2008) stated that the age, gender, ethnicity, socioeconomic status, level of exposure to disasters, family factors and level of social support affects the psychological status of victims. Shultz *et al.* (2012) also found that the Haiti earthquake in 2010 has led to a very high level of trauma among the victims of the disaster. Giannopoulou *et al.* (2006) found that the prevalence of PTSD for 6-7 months after the earthquake in Athens in 1999 was 35.7% among adolescents aged 9-17 years old. After the Taiwan earthquake in 1991, PTSD was reported to exist among 9.4% of teenagers 17 months after the earthquake

(Chengzhi *et al.*, 2001). The overall rate of PTSD variability across studies may be due to differences in the nature and severity of the earthquake suffered by the victim.

Yang *et al.* (2003) studied the rate of psychiatric morbidity and symptoms of PTSD among earthquake victims in Pu-Li, Taiwan. The results showed that levels of PTSD among female victims are higher than the level of PTSD among male victims. The findings also suggest that the most significant effects of PTSD in this study are insomnia, poor memory, nervousness, autonomic hyperarousal and anxiety function overload.

Cenat and Derivois (2015) state that with regard to gender among adolescent victims of the Haitian earthquake, girls often reported a higher level of severity of PTSD and peritraumatic distress than boys. The findings show that there are differences in the level of severity of PTSD with regard to gender. Next, a study conducted by Shultz *et al.* (2013) found that the earthquake victims in Haiti are experiencing psychological distress and declining health status. The level of psychological distress and diminished health status among the earthquake victims in Haiti led to low levels of life satisfaction (Shultz *et al.*, 2012).

Fukuda *et al.* (1999) in their study found that the largest earthquake that occurred in Japan in 1993 has had an impact on the physical and mental health of the earthquake victims. The earthquake victims have been found to have an increased incidence and severity of PTSD symptoms from 5-60%, in the next 1-2 years after the disaster (Canino *et al.* (1990). The study was supported by the findings of Fujimori (1998) which found that more than 60% of the earthquake survivors at high risk of PTSD. Fujimori (1998) reported that the earthquake victims who survived the disaster are likely to suffer from a psychological state which is critical during the 6 months after the disaster. Therefore, mental health problems such as trauma distress and dissociative trauma among earthquake victims should be considered (Tyhurst, 1957).

**Objectives:** The specific aims of this study are as follows:

- To determine the effect of dissociative traumatic experiences on life satisfaction
- To determine the effect of traumatic distress on life satisfaction
- To determine the relationship between traumatic distress and dissociative traumatic experience among earthquake victims

**Justification of the study:** A number of studies have examined the association between natural disasters, specifically earthquakes and Post-Traumatic Stress Disorder (PTSD). However, in Malaysia, especially in Sabah, no such scientific studies have yet been conducted to explore; the experience of trauma, the level of trauma and the life satisfaction among earthquake victims. Earthquakes have occurred in Sabah in 1966 with a magnitude of 5.3 and in 1991 with a magnitude of 5.2. Although, these earthquakes happened, no studies on psychological trauma and life satisfaction have been conducted on the earthquake victims. However, when psychology started to grow in Malaysia it began to be seen as essential and significant, especially in measuring the levels of psychological trauma in the victims of earthquakes and in developing psychological methods that can be used to reduce the level of psychological trauma among victims. Thus, it has allowed psychologists from the Malaysian University of Sabah to conduct a scientific study that will identify, explore and assess psychological trauma and life satisfaction among the earthquake victims.

## MATERIALS AND METHODS

This study was conducted using a survey design using a set of questionnaire. Purposive sampling was used in this study. The participants consisted of 136 students from schools that were scattered throughout several municipalities in the capital seriously affected by the quake which are Ranau, Kundasang and Kota Belud. The inclusion criteria were aged 13 years or older and physically and psychologically capable of understanding and providing consent for study participation.

Demographic items included age, gender, religion, ethnics and earthquake exposure. Peritraumatic distress was evaluated by the Peritraumatic Distress Inventory (PDI). This instrument was built by Brunet *et al.* (2001) and went through a back translation process by a group of researchers. It consists of 13 items and rated on a 5-point Likert scale.

Peritraumatic dissociative experiences evaluated by the Peritraumatic Dissociative Experiences Questionnaire (PDEQ). This instrument was built by Marmar *et al.* (1997) and went through a back translation process by a group of researchers. It contains 10 items and rated on a 5-point Likert scale. The Cantrill's Vertical Visual-Analogue Scale Ladder of Life Satisfaction Measuring tool Visual Analogue Scale (VAS) by De *et al.* (2004) was used to measure life satisfaction disaster victims. It contains 10 options or responses rated from 1 = worst life to 10 = best life. All statistical analysis was carried out using Smart PLS 2.0 Software.

Table 1: Convergent validity

Construct/Items	Factor loadings	Convergent validity			
		AVE	Composite reliability		
<b>Dissociative traumatic experience</b>					
PDEQ10	0.678	0.512	0.880		
PDEQ2	0.686				
PDEQ4	0.661				
PDEQ5	0.721				
PDEQ7	0.771				
PDEQ8	0.792				
PDEQ9	0.689				
<b>Traumatic distress</b>					
PDI1	0.597			0.501	0.888
PDI10	0.820				
PDI11	0.778				
PDI12	0.680				
PDI13	0.642				
PDI2	0.619				
PDI4	0.757				
PDI8	0.739				

PDI3, PDI5, PDI6, PDI7, PDI9, PDEQ1, PDEQ3 and PDEQ6 were deleted due to low factor loadings

The analytical procedure involves two stages, the measurement model is first being tested to determine the validity and reliability of the instruments followed by the structural model to examine the hypothesized relationships. In order to determine the significant path coefficients and loadings, 500 resamples was used as suggested by Chin (1998) (Table 1).

## RESULTS AND DISCUSSION

**Measurement model:** In determining the validity of the measurement model, convergent validity and discriminant validity were examined. According to Hair *et al.* (2014), convergent validity is achieved when the loadings are all >0.7, the Composite Reliability (CR) are all >0.7 and the Average Variance Extracted (AVE) are all >0.5 based on Table 1, all loadings, AVEs and CRs are higher than the threshold value thus indicates that convergent validity is sufficiently met.

Meanwhile, to examine the discriminant validity, the Fornell and Larcker (1981) criterion was followed by comparing the correlations between constructs and the square root of the AVE for that particular construct. Based on Table 2, the values on the diagonals were higher than values of the corresponding row and column, thus it can be concluded that discriminant validity has been achieved.

**Structural model:** The assessment of structural model involves  $R^2$ ,  $\beta$ , t-values, predictive relevance ( $Q^2$ ) and effect sizes ( $f^2$ ) (Hair *et al.*, 2014). To determine the significant hypothesis relationship, bootstrapping procedure with a resample of 500 was used (Chin, 1998). Firstly, dissociative traumatic experience ( $\beta = -0.013$ ,

Table 2: Discriminant validity

Scales	1	2	3
Life satisfaction	1.000	-	-
Dissociative traumatic experience	-0.265	0.716	-
Traumatic distress	-0.375	0.688	0.708

Diagonals (bolded) represent the square root of the average variance extracted while the off-diagonals are correlations among constructs

Table 3: Hypothesis testing

Hypothesis relationship	Std. $\beta$	SE	t-value	Decision	$R^2$	$f^2$
H <sub>1</sub> : Dissociative traumatic experience- Life satisfaction	-0.013	0.090	0.146	Not supported	0.140	
H <sub>2</sub> : Traumatic distress- Life satisfaction	-0.366	0.094	3.910	Supported		0.06
H <sub>3</sub> : Trauma distress- Dissociative traumatic experience	0.688	0.054	12.860	Supported	0.474	

$p > 0.01$ ) was negatively not significantly related to life satisfaction. Thus, H<sub>1</sub> is rejected. Next, traumatic distress ( $\beta = -0.366$ ,  $p < 0.01$ ) was negatively and significantly related to life satisfaction, explaining 14.0% of the variance in life satisfaction. Thus, H<sub>2</sub> is accepted. Lastly, traumatic distress ( $\beta = 0.688$ ,  $p < 0.01$ ) was positively related with dissociative traumatic experience explaining 47.4% of variance in dissociative trauma experience. The  $R^2$  value of 0.140 was  $> 0.13$ , thus indicated a moderate model whereas  $R^2$  values of 0.474 was  $> 0.26$  indicated a substantial model (Cohen, 1988).

According to Sullivan and Sullivan (1980), “while a p-value can inform the reader whether an effect exists, the p-value will not reveal the size of the effect. In reporting and interpreting studies, both the substantive significance (effect size) and statistical significance (p-value) are essential results to be reported”. Based on Table 3, the effect size of 0.06 represents a small effect (Cohen, 1988). In addition, the assessment of the predictive relevance ( $Q^2$ ) of the model was also conducted by using blindfolding procedure. All  $Q^2$  values for life satisfaction (0.123) and Dissociative Trauma Experience (0.223) are  $> 0$ , thus proven that the model has a sufficient predictive relevance.

## CONCLUSION

This study aimed to determine the effect of dissociative traumatic experience on life satisfaction. Secondly, to determine the effect of traumatic distress on life satisfaction. Thirdly, to identify the relationship between traumatic distress and dissociative traumatic experience. The findings of this study confirm that there was a significant negative effect of traumatic distress towards life satisfaction among earthquake victims. This finding is consistent with other studies (Chou *et al.*, 2004;

Wang *et al.*, 2000). Earthquake victims are commonly forced to live in makeshift circumstances with associated traumatic distress but appear to have poorer psychological well being and life satisfaction than before the earthquake (Chou *et al.*, 2004).

Lowlife satisfaction is believed to be associated with traumatic distress and behavioral change in the aftermath of an earthquake. Wang *et al.* (2000) has been found negative correlation between traumatic distress and life satisfaction among victims aftermath of the earthquake. The greater the severity of the traumatic distress, the lower the scores are for life satisfaction (Tsai *et al.*, 2007). A longitudinal study of earthquake victims related traumatic distress in a purposively selected sample in Ranau, Sabah found that the victims who suffered from traumatic distress had lowlife satisfaction than those without traumatic distress (Wang, 1999).

Contrastly, it was found that there was no significant effect of dissociative traumatic experience on life satisfaction among earthquake victims. The results did not confirm previous findings (Carlson and Rosser, 1991) which found that dissociative traumatic experience gives effect on life satisfaction among earthquake victims. Lowlife satisfaction and low quality of life might have been more prominent for a victims with dissociative traumatic experience shortly after the earthquake. This finding has yet to be confirmed by further studies with longer follow-up periods.

In addition, that there was a significant positive relationship between traumatic distress and dissociative traumatic experience. In other words, the higher the traumatic distress felt by the victims, the higher the dissociative traumatic experience they suffered. This finding is consistent with the previous studies (Carlson and Rosser, 1991). Symptoms of traumatic distress have been observed among earthquake victims has been identified that makes up the syndrome of dissociative traumatic experience.

### **SUGGESTIONS**

The study of the effect of traumatic distress and trauma dissociative experience towards life satisfaction among the victims of the earthquake is the first study of its kind to be conducted in Sabah and perhaps in Malaysia, since the earthquakes in 1966 and 1991. The Sabah earthquake that occurred on June 5, 2015, provided an opportunity for empirical evidence based studies, particularly in the field of psychology. Therefore, the researchers suggest that the results of this study be used by future researchers to develop methods of coping and resilience that can be used by earthquake victims so that

they can live prosperous lives in the event of a major earthquake occurring again in the future. While organizing disaster relief programs and planning post-disaster psychological interventions, many variables other than initial exposure should seriously be taken into account.

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