

Post tsunami psychological impact among survivors in Aceh and West Sumatra, Indonesia

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Abstract

Objective: In 2004, the province of Aceh, Indonesia was rocked by tsunami and in September 2009, West Sumatra, Indonesia was hit by an earthquake. The aim of this study was to determine the long-term psychological impact on the residents inhabiting these regions and to identify factors associated with it.

Methods: A cross-sectional study was conducted among the residents. The Depression, Anxiety and Stress Scale (DASS) was used to measure their psychological well-being.

Results: Out of 200 respondents, 1 in 5 (19%) was found to suffer from a high level of depression, 1 in 2 (51%) had anxiety and 1 in 5 (22%) experienced stress. Factors found to be significantly associated with depression, anxiety and stress were female, young age, unemployed, and single ($p < 0.05$).

Conclusion: The psychological impact following the tsunami persisted in the population after many years post-disaster. It is recommended that the psychological profile of the population be evaluated for the vulnerable group following any natural disaster.

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1. Introduction

Indonesia is a country which lies in the earthquake belt and is frequently struck by natural disasters causing loss of human lives. On December 26, 2004, the province of Aceh was rocked by a powerful earthquake measuring 9.2 degrees on the Richter's scale, which was followed by tsunami that hit the north and west regions of Aceh. Indonesian government estimated the loss to be as follows: 129,775 deaths, 38,786 missing, and another 504,518 displaced from their homes [1]. The tsunami disaster was the most catastrophic incidence in

the history of Aceh, to date. Again, on 30 September 2009, several areas in west Sumatra, Indonesia were hit by an earthquake with the magnitude of 7.6 on Richter's scale. This earthquake caused significant damage to hundreds of buildings and the death of 1117 individuals [2].

Disasters are events that challenge the individual's ability to adapt, which carry the risk of adverse mental health outcomes including serious posttraumatic psychopathologies [3]. Natural disasters also have catastrophic consequences in terms of human health, social and economic condition. Disasters also challenge the individual's ability for adaptation, which can promote the onset of undesirable mental health outcomes [3]. While risk of adverse mental health outcomes is related to the degree of exposure to psychological toxins, the unique vulnerabilities of special populations within the affected community as well as secondary stressors play an important role in determining the nature and amount of morbidity [3]. People affected by natural disasters like tsunami in Aceh, earthquake and landslide in West Sumatra were at risk to develop psychological problems such as depression, anxiety

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and stress. It is stated by the World Health Organisation (2009) [4] that up to 50% of the affected population in Indonesia are expected to experience significant psychological distress and about 5% to 10% of them would develop diagnosable stress-related psychiatric disorders. The psychological impact often persists for a very long time after the disaster and represents a further burden to individuals whose physical and emotional resources have already been depleted by their own and their beloved's losses. The risk and level of psychological morbidity are influenced by the nature of losses, individual stressors, biological, social and economic factors [3]. Disasters in developing countries and those associated with substantial community destruction are associated with negative outcome. This is partly due to shortage of human resources in psychiatry in developing countries, which places a significant burden on psychiatric services even without the additional constraints imposed by disaster [3].

Disasters are best managed using a public health approach to mental health that better serves the needs of the individual and the affected community. Such an approach considers all available human resources and is intended to mitigate the effects of disaster before serious psychopathologic sequelae arise.

The main objective of the present study was to determine the long-term psychological effects of natural disasters of severe earthquake and tsunami among residents in Aceh and West Sumatra. We also compared these psychological impacts between the two locations. The other objective was to determine the associated risk factors such as demographic profiles, time interval between the events of disasters and the onset of psychological problems. Identifying the risk factors would help in the future management of survivors of natural disasters to help them cope up better with their mental health problems.

2. Methodology

This cross-sectional study was conducted on 12–75 years old victims of tsunami in Aceh and victims of earthquake in West Sumatra, Indonesia. The study was carried out in 15 different locations in Aceh and West Sumatra i.e. Al-Fityan School, Beuraweh, Pos Keadilan Peduli, Umat Orphanage, Lampisang, Lampuuk, Lampeuneuerut, Syiah Kuala University, Jeulingke, Rukoh, Pariaman, Maninjau Shelter, Sungai Tampang, Universiti Andalas and Pondok Pesantren Prof. Dr. Hamka. A total of 200 respondents were recruited by using stratified cluster sampling of which 100 were from Aceh, and another 100 were from West Sumatra.

The proposal was approved by the International Islamic University Malaysia Ethics Committee. In every place where the study was conducted, the highest authority was approached for approval and ethical clearance was obtained. The inclusion criteria were: individuals aged between 12 and 75 years, and those directly affected by the natural disasters. Those with previous mental disorders, inability to give

consent and communication barriers, were excluded from this study. The respondents' levels of stress, depression and anxiety were measured using the Indonesian version of Depression, Anxiety and Stress Scale 21 (DASS-21). This scale contains 21 items divided into three subscales (Depression, Anxiety and Stress) each comprising 7 items. The DASS has been shown to have high internal consistency and discriminations in a variety of settings [5].

3. Results

According to Table 1, the respondents in Aceh and West Sumatra were comparable ($P > 0.05$) with regard to gender, age, occupation and marital status. Majority of the respondents in both groups were females, unemployed and in the age range between 12 and 17 years.

Table 2 showed 32%–57% of respondents being either stressed, depressed or anxious.

Table 3 showed that there was no statistical difference in the levels of depression, anxiety and stress between respondents in Aceh and West Sumatra ($p > 0.05$). Females were more depressed, anxious and stressed ($p = 0.02$, 0.01 and 0.01 , respectively). Respondents aged between 12 and 17 years were more anxious and stressed compared to other age groups. Being unemployed was also a risk factor for depression and anxiety ($p = 0.01$) but not to stress. Among the respondents, those who were single, were statistically more depressed and stressed ($p = 0.01$).

4. Discussion

The prevalence of psychological disorders obtained from this survey was high but comparable to other studies related to post natural disaster. Psychiatric impact following the

Table 1
Socio-demographic profile of the respondents.

Variables	Aceh (n=100)	West Sumatra (n=100)	Total (n=200)	P value
Gender				
Male	29	32	61 (30.5%)	0.65*
Female	71	68	139 (69.5%)	
Age (years)				
12–17	29	24	53 (26.5%)	0.05*
18–25	25	14	39 (19.5%)	
26–40	22	19	41 (20.5%)	
41–55	14	22	36 (18.0%)	
56–75	10	21	31 (15.5%)	
Occupation				
Unemployed	78	77	155 (77.5%)	0.14*
Non-Professional	15	21	36 (18.0%)	
Professional	7	2	9 (4.5%)	
Marital Status				
Married	42	53	95 (47.5%)	0.09*
Single/widow	58	47	105 (52.5%)	

Chi-square test*.

Table 2
Percentage of respondents with depression, anxiety and stress.

	Aceh	West Sumatra	P value	Total
Depression	20.0% (n=20)	18.0% (n=18)	0.7*	19.0% (n=38)
Anxiety	52.0% (n=52)	51.0% (n=51)	1.0*	51.5% (n=103)
Stress	19.0% (n=19)	25.0% (n=25)	0.8*	22.0% (n=44)

Chi-square test*. Cut-off points of 14, 10 & 19 were used respectively for cases of depression, anxiety & stress.

catastrophic tsunami event was found among the affected populations at a rate ranging between 40% and 84% [6–8].

The results of this study support the evidence that females are prone to any form of psychological adversity as a result of disaster. This finding is in agreement with a previous study by Raj and Subramony (2008) [9] which concluded that women had higher perceived stress than men, in tsunami affected areas in India. The gender difference was specific to events associated with emotion and was consistent across positive and negative emotions. Thus, it indicates that females particularly those in the younger age tend to accumulate more memories of emotional events, including events evoking negative emotions and these may contribute to the gender differences in depression and stress [10,11].

The present findings suggest that victims of younger age group were more vulnerable to depression, anxiety and stress following a natural disaster. It implies that youngsters especially the school-going children, are a vulnerable group for adverse psychological implication in post-disaster areas. This is supported by a past study which also used DASS-42 in Aceh, in which it was found that psychological impacts after disaster decreased with age [12]. The present findings were also in keeping with the outcome of another study by Maercker et al. [13] particularly on the manifestation of depressive psychopathology. In this particular study, conditional risks for stress and major depression in the childhood group were 17.0% and 23.3%, respectively, compared with

risks of 13.3% and 6.5%, respectively, in the adolescent group [13]. Evidently, the developmental psychopathology in relation to depression, anxiety and stress has been found to be associated with age [14,15]. Older affected individuals were reported to experience lesser psychological impact of disaster compared to the younger population [12].

In the present study, a significant association was observed between depression and employment status in Aceh but not in West Sumatra. This may be explained by the different coping modes between the two populations. According to Carmi and Leonard (1978), effective coping modes were not equally distributed in society, with different occupational backgrounds representing different results in dealing with post-traumatic mental problems [16]. The link between the social support and their coping behaviour may be influenced by several factors known to modulate adaptability of stress such as level of experience, intelligence and level of authority [17].

Marital status is commonly related to psychological aspects of natural disaster victims. Married people are generally considered as having better social support compared to those single or widowed. The results in this study showed that single individuals had higher scores of depression and stress than married individuals. This may be explained by the better social support enjoyed by married individuals which may include confiding relationship and ability to ventilate emotions to their partners. The overall score for depression, anxiety and stress was also higher in the unmarried group. This finding was similar to Cooper's study (2006) where marital status had a correlation with psychological wellness [18]. Our study also supports the findings of the study conducted in Sri Lanka by Banford (2009) which showed that married mothers experienced less depression compared to single mothers in tsunami affected areas [19].

Several longitudinal studies reported that the psychological impact of natural disasters tend to decline over time. In general, residents in Aceh province were expected to have

Table 3
Associated risk factors to stress, anxiety and depression.

Variables	Depression	p-value	Anxiety	p-value	Stress	p-value
Gender						
Male	11.5% (7)	0.02*	44.3% (27)	0.14	13.1% (8)	0.01*
Female	22.3% (31)		57.4% (76)		26.0% (38)	
Age (years)						
12–17	30.2% (16)	0.01*	64.2% (34)	0.15	32.1% (27)	0.03*
18–25	15.4% (6)		48.7% (19)		23.1% (15)	
26–40	14.6% (6)		48.9% (20)		19.5% (13)	
41–55	13.7% (5)		47.2% (17)		19.4% (12)	
56–75	16.1% (5)		41.9% (13)		10.0% (5)	
Occupation						
Unemployed	22.6% (60)	0.01*	51.6% (87)	0.03	25.8% (40)	0.01*
Non-Professional	8.3% (6)		36.1% (13)		11.1% (4)	
Professional	0% (0)		33.3% (3)		0% (0)	
Marital Status						
Married	12.6% (12)	0.01*	41.2% (43)	0.01	15.7% (15)	0.01*
Single	24.8% (26)		57.1% (60)		27.6% (29)	

Chi-square test*.

lower levels of depression, anxiety and stress as compared to West Sumatra. However, we found that the prevalence of depression, anxiety and stress did not differ between the provinces. A probable explanation for this dissonance is the exposure to recurrent earthquake in Aceh recently and that the significant impacts of tsunami caused long suffering to the residents as supported by studies in the past [20]. Beside the tsunami incidence, Aceh has been facing an ongoing internal conflict that occurred for years which is believed to be a contributing factor to the persistent negative psychological impact among Acehnese [21]. This was supported by several studies which mentioned that such disaster causes longer response and more severe mental health problems than natural disaster [21,22].

Being a cross-sectional study, which measured both exposure and outcome at a single point of time by using a self-rated questionnaire, the causality between the psychological effect and natural disasters cannot be determined. The respondents were also subjected to recall bias due to the self-report assessment tools used in the study. Besides, post-traumatic stress disorder was not specifically studied in this research and this poses another limitation of this research work.

5. Conclusion

In conclusion, negative psychological sequelae of natural disasters remain prevalent and substantial in up to 50% of the survivors, even after many years following the disaster. This study highlights the importance of strategic preventive measures on the disaster victims focusing particularly on the ‘at risk’ group i.e. younger age group, females and jobless victims.

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