

Factors Associated with Psychological Impact of Junior High School Students after Earthquake in Padang, West Sumatera, Indonesia

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Abstract— Objectives: To examine factors associated with psychological impact of junior high school students after earthquake in Padang, West Sumatera, Indonesia.

Method: This was a cross-sectional study, purposive random sampling was composed of 270 students were recruited from three Junior High Schools consist of SLTP 7, SLTP 13 and SLTP 25 in Padang West Sumatera from Mey - June 2013. The psychological impact were assessed using the Depression Anxiety and Stress Scales-21 (DASS-21) and Way of Coping questionnaire was used to measure the coping strategies.

Result: Using the DASS-21 with a score of 24.4% for symptom of depression, 58.1% and 22.6% was found to suffer anxiety and stress respectively. Factors found to be significantly associated with depression, anxiety and stress were younger age group, but gender not associated with anxiety, socio-economic status and living arrangement not associated with depression and anxiety, loss family member and coping strategies ($p < 0.05$).

Conclusion: Additional research is needed to investigate the long-term, earthquake-related psychopathology. Nurses should receive more education about disaster-related psychological health skills to provide adequate psychological counseling and intervene successfully to assist students who survived the tragedy to optimize their psychological health status after earthquake.

Keywords— Psychological Impact; coping strategies; adolescent; disasters; earthquake

I. INTRODUCTION

Disasters are becoming more frequent, especially in the Asia-Pacific region. In 2008, 40% of all reported natural disasters occurred in Asia and more than 80% of the reported victims lived in that area [1]. Base on previous studies, natural disaster bring physical and psychological stresses to the survivors [2]. Indonesia has recently struck by a series of major earthquakes and subsequent tsunamis that have largely affected cities. For example, in 2004 tsunami and earthquakes destroyed Banda Aceh and Meulaboh. In addition, in 2006, central Java was damaged by earthquake [3]. After two years, an earthquake occurred in the West Sumatera Island, especially in Padang, a magnitude force of 7.6 on the Richter scale has struck on September 2009. This earthquake caused significant damage to hundreds of buildings and the death of 1117 individuals [4]. Padang is the capital city of West

Sumatera Province in Indonesia. Geographically, Padang has potential hazards of earthquakes, it is important to note that the city is located on the Eurasian plate and quite near to the inter-plate boundary between the Eurasian Plates and Indo-Australian Plates. This inter-plate boundary is reported to be the most seismically active in the region [4]. Musa and his colleagues (2012) reported that people affected by natural disasters like tsunami in Aceh, earthquake and landslide in West Sumatera were at risk to develop psychological impact such as depression, anxiety and stress[5]. 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 ones losses. In post-disaster studies, researchers have found that coping is an important predictor of psychological symptoms. In addition to directly ameliorating or deteriorating psychological distress, coping has been found to moderate the relationship between stressors and mental health outcomes in a few of empirical researches [6]. Adolescence is a developmental period where teens are particularly vulnerable to traumatic events. This is a particularly challenging period for this population because they must simultaneously cope with significant changes in physical and psychosocial development [7]. Several studies suggest that teenagers also show depression, belligerence, and anxiety following a disaster. Incidence caused by the earthquake that occurred in West Sumatra Island had a psychological impact on mental health problem in adolescents. This study concentrated on junior high school students who as discussed above, are amongst the most vulnerable to psychological impact. Youth are the future generation of the nation. The condition of teenagers today can predict future development of the nation. Therefore, is very important to pay attention to these teenagers in all aspects of their lives. One of the most important aspects is mental health. The main objective of the present study was to examine factors associated with psychological impact of junior high school students after earthquake in Padang. Therefore identifying the risk factors would assist in the future management of survivors of natural disasters to help them cope up better with their mental health.

II. MATERIAL AND METHOD

This cross-sectional study was conducted on Junior high school students in West Sumatra, Indonesia. A total of 270 respondents were recruited by using purposive random sampling to choose the Junior high school. Further, to select the sample in each Junior high school will use simple random sampling, by inclusion criteria; adolescents in Junior high schools from first to third grade, students who ages of 11 to 16 years old and also have been permitted by the parents or guardian being participant. Participation of young students who had experienced by earthquake and also had resided in Padang at the time of the earthquake, can use effective verbal communication and willing to participate cooperatively and for students who have previous mental disorders, moving out from Padang city and reject to give consent and communication barriers was excluded in this study.

Ethical clearance was obtained from the Ethical Research Committee of Boromarajonani College of Nursing Nopparat Vajjira and legal study permits were obtained from relevant authorities in Padang city. The respondents' levels of stress, depression and anxiety were measured using the Indonesian version of Depression, Anxiety and Stress Scale 21 (DASS-21). The DASS has been shown to have high internal consistency and discriminations in a variety of settings [8]. The Ways of Coping Questionnaire (WOC) is a validated measure that identifies the thoughts and actions an individual has used to cope with specific stressful encounters [9]. For content reliability, the cronbach's alpha coefficients for ways of coping were $\alpha = 0.65-0.88$. Data was entered, cleaned and analysed using Statistical Package for the Social Sciences (SPSS Student Version 15.0) for Windows provided by Kasetsart University.

III. RESULTS

According to Table 1, showed most of the students ages ranged from 11 to 16 years old and female students slightly over than male. Family income of the participants were in the highest socio-economic status, with monthly income more than 1,000, 000 rupiah . With regard to living arrangement, it was found that most of the respondents live with both biological parents, and more than half 86.7 % of the participant no relative were loss. In addition, for coping strategies divides into two categories consist of Problem focused-coping and Emotion focused coping. Majority 63% of the participants had often used problem focused coping and then 62.2 % emotion focused coping. Table 2 showed 22%–58% of respondents being either stressed, depressed or anxious.

Table 3 showed that there was statistical association between age, gender, socio economic status, living arrangement, loss family members, coping strategies (Problem-focused coping and Emotion-focused coping) and psychological impact with p -value < 0.05 , but not significantly association between gender and anxiety. The other variables such as socio-economic status, living arrangement also were not significantly association with depression and anxiety. Cramer's V was used to determine the

strenght or the weakness of the association between independent variables and dependent variables. Majority the association was weak, only association between gender, coping strategies (Problem-focused coping and Emotion-focused coping) and stress with moderate association.

IV. DISCUSSION

The purpose of the study was to examine factors associated with psychological impact of junior high school students after earthquake. Among the demographic variables of interest, age had statistically significant association with depression, anxiety and stress, the result of this study suggest that victims of younger age group were more vulnerable to depression, anxiety and stress following a natural disaster. It implies that younger age group especially the school-going children, are a vulnerable group for adverse psychological implication in post-disaster areas. This result consistent with previous study which also used same questionnaire for psychological impact in Aceh aceh and West Sumatera, was found that young age significantly associated with depression, anxiety and stress [5]. Actually, the developmental psychopathology in relation to depression, anxiety and stress has been found to be associated with age [10]. Similar result with Sopacua (2007) was reported the younger age who experience with disaster higher psychological impact than older.

In regard to gender, both genders were well presented in the study, and consist of mostly equal between male and female. There was significant association between gender and psychological impact i.e. depression, and stress. This study similar with previous findings explained that the female gender is a more predictor of mental issues such as depression and traumatic stress responses than male [12]. Regarding to income, there was a higher income, but negatively significant associated between socio-economic status and psychological impact (i.e. depression and anxiety). This result contrast with Asgary and Willis (1997) stated that the socio economic status of individuals may also affect their psychological response to disaster. Lower income or wealth can place individuals or their households at greater risk of damage from disasters; because, for example, of poor housing quality, inferior residential location or inadequate safety features. Additionally, it was found that the lower the income amongst the sample, the higher the likelihood of severe mental illness [14].

In this study, mostly (80.4%) of the participants were live with both parents. Furthermore, statistical analysis showed that there was positively significant association between living arrangement and stress. Perceived support from parents, classmates and teachers seem to associate with a lower risk of stress. Studies including natural disasters, community violence, sexual and psychal abuse, parental homicide and serious illness have documented the importance of parental support and parent's capability to cope with the trauma regardless of their own emotional reaction in preventing post trauma stress disorder symptoms of children and adolescents [15]. Loss family members were statistically significant with depression, anxiety and stress. This result considering that factors related to the stressor it self may also increase vulnerability, such as

the loss of a loved one, home, or job, or the experience of injury as a consequence of the event [13,14,15,16,17] This recent findings is consistent with other research findings was found that people who lost family members reported significant severe psychological impact compared to those who did not [18].

According to Lazarus and Folkman (1984) define coping as “constantly changing cognitive and behavioural efforts to manage specific internal/external demands that appraised as exceeding the resources of the person. The type of coping strategies were divides by Lazarus and Folkman (1984) were problem focused coping strategy and emotional focused coping strategy. This study revealed that, there were two coping strategies were used in the study area, 63% of respondent confessed that they often used problem focused coping and about 62.2% of the respondents claimed often used emotional focused coping. In addition, the present study revealed that significantly association between coping strategies and psychological impacts. In this study revealed that coping strategies were one of the factors that associated with psychological impact i.e depression, anxiety and stress.

The similar finding with Chung and his colleagues (2004) studied community residents exposed to two technological disasters and found that often used of both emotion-focused and problem-focused coping strategies was associated with post-traumatic stress symptoms and general health problems. Similarly, Spurell & McFarlane (1993) examined the association between coping strategies and the presence of post traumatic stress. The results indicated that the used often coping strategies was associated with the presence of a diagnosed disorder such as post traumatic stress, major depression, affective disorder or anxiety disorder.

According to previous study problem-focused coping appears to be associated with reduced depressive symptoms as this style actively removes or resolves stressors [21]. As stressors are removed before they develop into functionally inhibiting stressors, this may reduce stress levels and prevent individuals from experiencing more severe psychological distress. Research has also shown that problem-focused coping is adaptive in uncontrollable situations as it provides individuals with a sense of mastery and gain [9]. Emotion focused coping strategies are employed to regulate emotional reactions or to make one feel better without actually solving the problem. According to previous study emotion focused coping can be adaptive in dealing with in capability feeling in an unclear situation [20].

Lazarus (1984) mentioned that distancing, as one of the emotional coping strategies have been reported to be significantly helpful in situations that are extremely stressfull, emotially distressing and appraised as unchangeable. They believe that our emotions are results of our receiving information. It is obvious that a person’s beliefs about stress and their ability can widely change the way person responds, that is, his/her behavioural component of their coping responses. Individuals only use emotion focused coping strategies if they were sure that there was chance to manage or alter the stress sources or demands from the situation.

Coping strategies of individuals have been found to be related to the symptoms and the course of the disorder. When a traumatic event happens, pre-event coping strategies of individuals may no longer be adequate and new skills need to be gained. That is why it is important to help individuals to cope with the disorder and environmental adversity. the factors affecting coping strategies also affect post trauma stress symptomatology [20]. Psychological stress that trauma survivors experience can be explained by the cognitive theory of stress and coping [9]. The model suggests that what determines the stress level that an individual experiences is the cognitive evaluation of the event and available coping resources. In other words, how the individual perceives the stressor and gives response to it is very important for his or her psychological well being [22]. Finally, the limitations of the study need to be acknowledgement. Firstly, this research was a cross-sectional descriptive study that could not convinces the real time of its episode so prospective study is recommended. Secondly, it could not explain continous sequences of depression, anxiety and stress through all stage of mental health problem. Psychological impact among earthquake survivors along side experience of other problems could be considered a serious issue for people’s health status living in such difficult conditions. Evidence suggests that severe earthquakes even can cause long standing morbidity [23]. However, past psychiatric illness also might contribute to this situation [2]. Unfortunately one of the shortcomings of the present study was did not measure previous psychiatric conditions among survivors and thus it was not possible to comment on this further. Thirdly, no information was obtained on important trauma-exposure variables such as extent of fear or perceived life-threat during the earthquake, rubble experience, dissability or injury, et cetera. Besides, the last point highlight a potential limitation to this study is did not measure PTSD symptom. Thus, since post traumatic stress disorder is also common in earthquake survivors, this study is limited in not including a validated diagnostic measure of PTSD.

TABLE I. DEMOGRAPHIC CHARACTERISTICS, COPING STRATEGIES AND PSYCHOLOGICAL IMPACT OF THE RESPONDENTS

Variables	Frequency	Percent
Age (years)		
11-13	117	43.3
14-16	153	56.7
Gender		
Male	144	53.3
Female	126	46.7
Socio Economic Status / Income Family (Rupiah)		
<=1,000,000 Rupiah (US\$)	37	13.7
>1,000,000 Rupiah (US\$)	233	86.3
Living Arrangement		
With Parent	217	80.4
Other Arrangement	53	19.6
Loss Family Member		
No relatives/family were lost	235	87
Loss relatives/family member	35	13
Problem-focused coping		
Often used	170	63
Rarely used	100	37

Emotion-focused coping		
Often used	168	62.2
Rarely used	102	37.8
Psychological Impacts		
Depression	66	24.4
Anxiety	157	58.1
Stress	61	22.1

TABLE III. ASSOCIATED RISK FACTORS TO DEPRESSION, ANXIETY AND STRESS

Variable	Depr ession	p-value (crame r'v)	Anxie ty	p-value (crame r'v)	Stress	p-value (crame r'v)
Age (years)						
11-13	36.8%	<.001	68.4%	.002	37.6%	<.001
14-16	15 %	(.250)	50.3%	(.181)	11.1%	(.314)
Gender						
Male	31.3%	.004	61.3%	.119	29.9%	.002
Female	16.7%	(.169)	54 %	(.079)	14.3%	(.186)
Family Income (Rupiah)						
<=1,000,000	24.3%	.584	56.8%	.495	8.1%	.014
>1,000,000	24.5%	(.001)	58.4%	(.011)	24.9%	(.138)
Living Arrangement						
With Parent	22.6%	.105	57.6%	.418	19.8%	.024
With others	32.1%	(.088)	60.4%	(.022)	34%	(.134)
Loss Family Member						
No loss family	20.9%	.001	54.5%	.001	18.7%	<.001
Loss family	48.6%	(.217)	82.9%	(.193)	48.6%	(.220)
Problem-focused coping						
Often used	15.9%	<.001	52.9%	.016	11.2%	<.001
Rarely used	39%	(.260)	67%	(.138)	42.2%	(.356)
Emotion-focused coping						
Often used	16.1%	<.001	51.2%	.002	10.7%	<.001
Rarely used	38.2%	(.250)	69.6%	(.181)	42.2%	(.365)

V. 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 result indicate that interventions focusing on the psychological impact of such traumatic events should give special attention to those who loss family member and living alone. Particularly, younger age may also be psychologically vulnerable in the aftermath of an earthquake and knowing the factors could be assisted healthcare provider to reduce negative health impacts of the earthquake adequate psychological counseling is needed for those who survived the tragedy.

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