International Proceedings of Social and Behavioral Sciences, 2014
Vol. 2, No.1, 82-89
URL: http://www.pakinsight.com/?ic=projournal&journal=IPSBS

FACTORS AFFECTING RESILIENCE IN ELEMENTARY SCHOOL-AGED CHILDREN AFTER EXPOSING THE FLOODS

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ABSTRACT
Flooding is considered as a risk and brings out many challenges to children. The increasing of floods incidents is impact on the interference of academic performance of children. Resilience is an ability to maintain well-being of children despite difficult time when they face severe floods. The main purpose of this study was identifying factors affecting resilience in elementary school-aged children exposed to major floods. To accomplish this study, a cross-sectional correlation design was employed. The participants were 162 children from 9–12 years old who exposed to major floods in 2013. The instruments used were a self-report questionnaire. The Connor-Davidson Resilience Scale- 10, Multidimensional Scale of Perceived Social Support, The After-School Environment Scale, The Cultural Competence Self-Assessment Tool, The Daily Spiritual Experience Scale, The Strengths and Difficulties Questionnaire and The Physical Activity Questionnaire were utilized in this study based upon the validity and reliability test. Descriptive and Multiple Regression analyses were employed for analyzing data. The results showed that significant affecting factors for were family support (b = 0.276, P < 0.01), peer support (b = 0.264, P < 0.01) and culture (b = 0.221, P < 0.01) respectively with the overall R adjusted was 0.317. In conclusions, family support, peer support and culture could affect to resilience in elementary school-aged children. A comprehensive intervention program for children to promote the development of positive relationships with family is recommended. The cultural approaches in bringing out the positive relationship between children and family would be helpful to increase the resilience.

KEYWORDS: Resilience, Flooding, Children, Elementary School, Family, Peer, Culture.

INTRODUCTION

Resilience is defined as the "capacity of individuals, their families and their communities to negotiate culturally meaningful ways to share resources" (Ungar and Liebenberg, 2013). Over the past three decades, resilience studies in children have been developed due to the increasing of global catastrophe (Gizir and Aydin, 2002). Study by Taylor identified flooding as one of global catastrophes which influence the psychosocial and development of children, especially in early childhood (Taylor, 2011). Therefore, resilience is required to buffer such potential risk that might impact to the development of children.

According to Rashid cited in Taylor, the impact of floods to its victims are "scarcity of save-drinking water; increase food prices; poor sanitation facilities; illnesses such as diarrhoea, fever, colds; unemployment; and increase tension and incident of domestic violence in the household." Taylor mentioned children are considered to be vulnerable in time of floods incident because of their growth and physical, levels of emotional and behavioral, and either partial or complete dependence on adult (Taylor, 2011). The National Disaster Management Agency of Indonesia (BNPB) claimed the incidents of flooding are 38% larger than others disasters. During the last 10

years, there is increasing the number of floods incidents in Banten Province. Between January and August 2013, it has been reported that 15.700 houses were covered by floods, 10 people dead and more than 50,000 people were evacuated to the emergency camps and shelters. There are 107 school buildings, including 9 kindergartens, 80 elementary schools, 14 junior high schools, and 4 senior high schools were swamped by floods. In Serang alone, there are several areas extremely swamped by floods, but the most severe area is located in Undar Andir, Serang District, which major flood covered 669 houses with altitude up to 3 meters, and forced 3,954 people including children to be evacuated to the emergency camps for more than one week (National Disaster Management Agency of Indonesia (BNPB), 2013). As reports of the schools, children in Undar Andir showed the declining of Grade Point Average (GPA). The decreasing of academic performance indicated as a symptom of psychological problem (Masten *et al.*, 2008).

According to Masten, Herbers, Cutuli and Lafavor, children exposed significant threat respond in different ways to resilience. The first is being resistant or still well-functioning in spite of adversity. The second is children fall apart and stop functioning for a while, then recovery toward to the previous state (Masten *et al.*, 2008). School-age children aged 9 years or older also has characteristics to building trust within their environment, so it ease they achieve resilience (Carroll *et al.*, 2011). There are some protective factors that required for children to build their resilience (Grotberg, 1995). Resilience Model by Kumpfer showed important factors behind resilient children (Kumpfer, 1999). Existing study mentioned children who engage within the environmental factors such as family, peer, community and cultural activity showed a higher resilience than the contrasting. Furthermore, this previous study is seeing the sights of resilient children is play as a social actor within community by engaging Indonesian cultural activity known as *gotong royong* which means work together through community (Taylor, 2011). However, Grotberg mentioned that in order to become resilient, children 9 years old above use many resources not only external, but also internal factors such as spirituality, emotion, behavior and physical activity (Grotberg, 2001). Study resilience in children exposed disaster is still limited in Indonesia (Taylor, 2011) and internal resilience factors have not been explore in dept. Therefore, current study aimed to examine both external and internal resilience factors that influence the increasing of resilience within the challenging situations related to major floods incident.

METHOD

A. Design

A cross-sectional study design was employed.

B. Sample

The total participants in this study were 186 children who were selected from two elementary schools in Undar Andir, Serang district. The inclusion criteria of participants were children aged 9-12 years old, (1) who experienced flooding event and evacuation, (2) who had their schools and homes were drowned by floods, (3) who got permission from parents or guardian, (4) who were able to understand and fill out the questionnaire, and (5) who agreed to participate. Regarding the exclusion criteria, children who were experiencing illness within one week before data collection were not allowed to participate.

C. Data Collection

Assent formed written was obtained from children under the agreement of their parents or guardians. The information sheets were given for two days before the data collection, so they can read and make sure that they understand the details of data collection process. Data were collected at schools on July 10th, 2014 after getting the permission from the Head of Schools. Simple Random Sampling was used to select the participants. All questionnaires in this study were fit for children 9 years old and above. Children who were selected as participants and do not have the signature of informing consent from a parent or guardian were still given the questionnaires, but the questionnaires were destroyed and did not used. Participants were emphasized that the questionnaire was not an examination, so the answer must be based on their perception. In order to make children more comfortable, the total of participants was divided into 13 small group discussions. One group

was led by the researcher, and another 12 groups were led by assistant researchers who knowledgeable regarding the data collection process. The data collection was taken in the classes about 80 minutes. In the middle of a session, participants had 10 minutes break and refreshment. The researchers collected the questionnaires from the participants who were finished. The questionnaires were kept in the sealed envelopes. At the accomplishment of the questionnaire, participants were given a token of appreciation. A total of 186 questionnaires were obtained, and the final analysis was performed with 162 questionnaires as six questionnaires had missing items and another 18 were questionnaires of participants who did not have permission from parents or guardians.

D. Measurement Tools

1. Personal Characteristics and Illness

Personal characteristic variables of children include age, gender and experiences of illness related to flood incidents in 2013.

2. Resilience

Resilience was measured with Connor-Davidson Resilience Scale 10 (CD-RISC 10) that has been developed by Connor and Davidson (2003). CD-RISC is available in many languages, including Bahasa Indonesia and fit for children from 6 years old above. Genuinely, this questionnaire has two versions; (1) CD-RISC scale 25, and (2) CD-RISC scale 10. However, several resilience studies in Indonesia used CD-RISC scale 10 for population who exposed natural disaster (Im and Kim, 2012). Therefore, CD-RISC scale 10 was used to assess resilience in children who exposed major floods in 2013. This questionnaire consists of 10 items with the answer choice are; "not true at all" (score 0), "rarely true" (score 1), "sometimes true" (score 2), "often true" (score 3), and "true nearly all the time" (score 4). According to the manual guideline of the questionnaire, the total score of CD-RISC is 40. Reliability of CD-RISC scale 10 was satisfactory with the cronbach's alpha 0.87 (Connor and Davidson, 2003).

3. Family Support, Peer Support and Community

Family, Peer and Community support were measured with Multidimensional Scale of Perceived Social Support (MSPSS). This questionnaire has been developed by Dahlem, Zimet and Farley. The total number of question was 12 and divided into subscales of Family Support (no 3, 4, 8, and 11), Peer Support (no 6, 7, 9, and 12) and Community Support (no 1, 2, 5, and 10). The total score of MSPSS is 84. For the Family, Peer and Community support subscales, the cronbach alpha 0.90, 0.94, and 0.95, respectively (Dahlem *et al.*, 1991).

4. School Support

School support was measured with The After-School Environment Scale (ASES) that has been developed by Rosenthal & Vandell. This questionnaire is fit for elementary-school children grade third above. Three scales are identified by Rosenthal & Vandell: Emotional Support, Autonomy/Privacy, and Peer Affiliation. However, in this study, ASES will be used only Emotional Support scale which assesses the School support with the total item 19 questions. The total score is 76. This tool also has been found to have good reliability. Internal consistency is 0.95. Test-retest coefficients for an average 17-day interval (range = 6-29 days) are 0.91 (Rosenthal and Vandell, 1996).

5. Culture

Culture was measured with Cultural Competence Self-Assessment Tool 7 scale (CCSAT-7) that has been developed by Mason. This questionnaire is intended to identify cultural competence. The total item question is 18. The total score of all item question is 72. The reliability of CCSAT-7 was satisfactory with the cronbach's alpha 0.80. And for the validity all items were correlations $P < 0.001$ (Mason et al., 2010).

6. Spirituality

Spiritual was measured by Daily Spiritual Experience Scale (DSES) that has been developed by

Lynn G. Underwood. This questionnaire is available in many languages, including Bahasa Indonesia. This questionnaire was used to measure Spiritual variable. The total score of the questionnaire is 94. The reliability of DSES was satisfactory with the cronbach's alpha 0.85 (Underwood and Teresi, 2002).

7. Emotion and Behavior

The emotional and behavioral was measured by the Strengths and Difficulties Questionnaire (SDQ) that developed by Koskelainen. This questionnaire is fit for children 4 to 16 years old and can measure the children's emotion and behavior in term of difficulty time. In addition, this questionnaire has a Bahasa Indonesia version, and fit for Indonesian children 4 to 16 years old (Eun-Hee Chae *et al.*, 2005). Originally, the SDQ consists of 25 items and divided into 5 scales; emotional symptom, conduct problem, hyperactivity, peer relation problem, and pro-social behavior. Each sub-scale consists of 5 items. However, in this research, SDQ was used only sub-scale emotional and behavior with choices of answer "not true" (score 0), "somewhat true" (score 1), and "certainly true" (score 2). The reliability of SDQ was satisfactory in of the three informant groups with the cronbach's alpha 0.71 of the emotional and behavior sub-scale (Koskelainen, 2008).

8. Physical Activity

The physical activity was measured by Physical Activity Questionnaire for Children (PAQ-C) that has been developed by Kowalski (Mason *et al.*, 2010). This questionnaire is a self-administered, 7-day recall instrument which consists of 10 questions. It was developed to assess general levels of physical activity elementary school children in grades 4^{th} to 8^{th} and approximately 8 to 14 years old. However, this questionnaire has not been found in Indonesian version, so back-translate method was used to translate the original version in English to Bahasa Indonesia. According to the previous study, the reliability was acceptable for both samples, females ($\alpha = 0.83$) and males ($\alpha = 0.80$) (Crocker *et al.*, 1997).

E. Ethical Approval

This study was approved by Ethics Review Board Committee for Research Involving Human Research Subjects, Borommarajonani College of Nursing Nopparat Vajira (ERB of BCNNV). Participant information sheet (PIS) and inform consent have been provided for all participants in this study. This study considers the anonymity and confidentiality. All information was de-identified by assigning a unique code number for this study. The data security was maintained by using computer password protection. Besides, research files were kept in a locked file cabinet in a restricted area accessible only by authorized personnel. Files related to research were kept for up to three years after the data collection. The researchers gave freedom to the potential respondents to participate. Participants who met the inclusion criteria and were willing to take part in the study were asked to sign the consent form. The participants could withdraw from the study at any time without any consequences.

F. Data Analysis

The statistical analysis was conducted using SPSS software version 15.0 (Kasetsart University, Thailand). Percentage was used to describe the personal characteristic data. Means and standard deviations were calculated to describe resilience factors and resilience of children. Pearson Product-Moment correlation coefficient and Point-biserial were used in bivariate analysis, but the results were reported separately. Multiple regression with enter method was used to identify variables significantly affecting to resilience of children.

RESULT

The current study aimed to identify factors affecting resilience amongst children after their exposure to major flood. The variables included personal characteristic (age, gender and illness), external protective factors (family support, peer support, community support, school support and culture) and internal protective factors (emotion, behavior, spirit and physical). Data were collected from July 7 to July 10, 2014. The results are present in the following sections.

A. Personal Characteristics of Participants

Table-1. Personal characteristics (n = 162)

Variables	%
Age	
9	22.2
10	24.7
11	22.2
12	30.9
Gender	
Male	46.9
Female	53.1
Illness	
Experiencing illness	35.8
Not experiencing illness	64.2

According to table 1, female and male participants were almost equally distributed in the sample (F = 53.1%, M = 46.9%). The majority of children were aged 12 years old (30.9%) and children who experienced illness during and after the flood incident were about 35.8%.

B. Level of Resilience and other Variables

Table-2. Level of resilience (n = 162)

Variable	Level of resilience (%)		
Resilience	Low	Moderate	High
	16.7	65.4	17.9

According to table 2, resilience in children of this study was moderate level (65.4%).

Table-3. min-max, mean and SD of resilience and resilience's factors (n = 162)

Variables	Min-max	Mean	SD
Resilience	11-39	24.36	5.1
Family support	12-28	23.01	3.5
Peer Support	9-27	20.41	4.2
Community Support	10-28	22.15	3.5
Emotion	1-10	5.82	1.9
Behavior	2-10	8.10	1.5
School Support	40-72	60.97	7.6
Culture	22-64	37.93	10.2
Spirituality	33-89	61.02	11.2
Physical activity	14.4-37.3	25.25	4.3

According to table 3, resilience score were between 11-39 with mean of 24.36 (SD 5.14), family support (mean: 23.01, SD 3.53), peer support (mean: 20.41, SD 4.17), community support (mean: 22.15, SD 3.57), emotion (mean: 5.82, SD 1.96), behavior (mean: 8.10, SD 1.54), school support (mean: 60.97, SD 7.64), culture (mean: 37.93, SD 10.17), spirituality (mean: 61.02, SD 11.21) and physical activity (mean: 25.25, SD 4.33).

C. Variables Affecting Resilience of School-Aged Children who Exposed the Floods

In order to identify variables significantly affecting resilience, multivariate analysis was conducted. Variables associated with resilience in bivariate analysis were family support, peer

support, community support, behavior, culture, spirituality and physical activity. Then, all of these variables were entered into multiple regression with enter method.

Table-4. Factors affecting to resilience (n = 162)

Variables	beta	P
Family Support	.276	.000**
Peer Support	.264	.002**
Culture	.221	.002**
Spirituality	.108	.124
Community Support	.095	.248
Behavior	-.033	.634
Physical activity	.060	.409
	R^2	.346
	Adj R	.317

As the finding, family support (b = .276, P < .01), peer support (b = .264, P < .01), and culture (b = .221, P < .01) were identified as significant variables affecting resilience. Meanwhile, variables such as spirituality, community support, behavior and physical activity were not showed as significant affecting to resilience. All variables in the regression model explained 31.7% of resilience in this study (Table 4).

DISCUSSION

A. Resilience

Flooding is causing the loss of human life, such as death and damages of property (Marfai *et al.*, 2008). Concerning to the finding, 16.7% children reported were low resilience. This is remarkably that after one and half year time-lapse of flood incident, there are children were still showed not well functioning. According to the reports of the schools in Undar Andir, many of children showed declining of academic performance. Consistent with previous studies, a lot of people suffered from loss of property and their environment which is directly affected to the physical and mental health status (The Floods We Won't Forget, 2011), especially for those who live in low income and un-insurance (Milojevic *et al.*, 2011). Common significant symptoms of children who exposed the flooding are headache and heart palpitation, followed by a sleep disorder which is typically as stress symptoms (Eun-Hee Chae *et al.*, 2005).

This result supports the consideration that in the challenging situation, children required resources to force them becoming resilient. Furthermore, Grotberg said that children need resources to overcome many adversities. However, if the resources are not available, so resilience is not easy to develop (Grotberg, 1995).

B. Factors Affecting Resilience of School-Aged Children who exposed the Floods

According to multiple regression with enters method, there were family support, peer support and culture significantly affecting resilience in children who exposed the major flood. Current study recognizes that support from environmental factors was important to the level of resilience. In addition, this study supports the previous finding that the more children get supportive from others, the better resilient they are Im and Kim (2012). It means that the vulnerability of children in spite of adversity would be decreased by supportive from family and peer. Moreover, this study reported that children who have better understanding of their culture showed a higher resilient. In this study, the significant finding was Bantenese culture recognized as the resources to increase children's ability to become resilient. Therefore, this is supports the previous findings mentioned that the local culture is influencing the resilience level of people who experienced the disaster (Shaumi, 2012; Ungar and Liebenberg, 2013).

Interestingly, family support was the most affecting variables among significantly associated variables to resilience. It is important to find family's supports to the children's resilience. As revealed in previous study, children have limited ability and they are dependent to adult or family

from potential risk (Fraser and Pakenham, 2009). Therefore, supports from family recognized as protective factor to reinforce children's capability to become resilient and to overcome the potential risks related to flood incident.

Even though many of children stay closer to their family, peer was remarked as another variable significantly affecting the resilience of children who experienced the major floods. This finding supports previous study said that children who have a positive relationship with peer are easy to overcome hardship situation (Im and Kim, 2012). As the finding of this study, supportive from peer and family were directed to the children's resilience. Fascinatingly, the understanding of local culture cannot be ignored as the significantly variable affecting the resilience. Children who were knowledgeable of their culture are having power to be confident in making decision of daily life. This is consistent with previous study found that children who were culturally competent are able to maintain their ability to act positively and become resilient (Fara, 2012).

CONCLUSION

This study aimed to identify factors affecting resilience of elementary school-aged children exposed to major floods. There were three factors affecting resilience in children, including family support, peer support and culture. Children who reported receiving many supportive resources showed a higher resilience score than the opposite. Considering the elementary school-aged children who are typically built relationship with family at home, this study revealed that amongst significantly influence variable, family support showed the most powerful impact to resilience. However, the two variables such as peer support and culture also cannot be disregarded as the significant affecting to the children's resilience. This finding can be as a reference to set the program for elementary school-aged children who experienced the floods. The program can be set as an intervention for children at home and at school with culturally approaches, so they can increase their resilience and decrease the potential negative impact of the floods event.

RELEVANCE TO CLINICAL PRACTICE

Set up nursing intervention in building the relationship and support from family and peer group would be helpful in order to build resilience of children who exposed major floods. The cooperation with health care providers, school and family is important to the success of the program. However, to create the program be made acceptable, approaching with the local culture would be valuable to promote resilience.

LIMITATION

Even though this study has reached its aims, there were some unavoidable limitations. First, due to some questionnaires have many items of question, so by using a fewer questionnaire will be more effective for children as the participants. Second, the time-lapse of floods incident and data collection is one and a half year, so the memory of children regarding to the floods might be impaired. Therefore, study on population who had just experienced of flooding incident is recommended.

CONTRIBUTION

This study contributes in the existing resilience study by Taylor (2011) which mentioned exposing floods children is active engaging in Indonesian cultural activity, especially *gotong royong* which means work together. This current study revealed important finding that family support was the most powerful impact to the increasing of resilience.

AKNOWLEDGMENT

This research was supported by the Indonesian Directorate General of Higher Education (DGHI), the Ministry of Research, Technology and Higher Education of the Republic of Indonesia.

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