The Enhancement of Adaptation and Psychological Well-Being among Victims of Flooding and Landslide in Thailand

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Objective: *To explore the needs of potential enhancement for adaptation and to examine the effectiveness of the potential enhancement program for adaptation and psychological well-being among victims of flooding and landslide in Lublae district Uttaradit Province, Thailand.*
Material and Method: *3 step of research and development; the needs of potential enhancement for adaptation among victims of flooding and landslide were analyzed by focus group discussion, the potential enhancement program (PEP) was designed by brainstorming of three groups of stakeholder; victims, health volunteers and health personnel and the effectiveness of PEP was tested by the difference of adaptation and psychological well-being perception among victims of flooding and landslide between before and after intervention.*
Setting: *Thumbun Maepou, Lublae district, Uttaradit Province, Thailand.*
Results: *The needs of potential enhancement among victims of flooding and landslide were set up warning network along the risk canal and mountain, first aid training for health volunteer, and program of psychological health promotion. The PEP composed of community flooding and landslide rehearsal training, health education and dissemination and knowledge management. Total adaptation and psychological well-being of samples after intervention were significantly higher than that of before intervention at 0.05 and 0.001, respectively.*
Conclusion: *The restoration of adaptation and psychological well-being among victims of flooding and landslide were essential to maintained holistic health.*

Keywords: *Flooding, Landslide, Adaptation, Psychological well-being*

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Flood is the most destructive of natural disaster affecting various countries every year on a global scale, and the damages caused by it is increasing[1]. Heavy flooding occur simultaneously with landslide in mountainous area over many countries. Flooding directly causes few deaths but long lasting detrimental effect include damage to homes, destruction communication and grain. The health impacts of flooding include infectious disease, morbidity exacerbated by crowded living conditions and compromised personal hygiene, contamination of water sources, disruption of sewage service and solid waste collection. The stress and exertion required for cleanup following a flood caused significant morbidity (mental and physical) and mortality (*e.g.*, myocardial infarction)[2]. Posttraumatic stress disorder (PTSD) and other psychiatric disorder were common after natural disasters and others form of mass trauma[3]. From rapid survey of person residing in tsunami-affected areas in Southern Thailand revealed that factors associated with higher prevalence of anxiety were being female, age of 35 to 54 years, having low educational level,

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experiencing injury to self or a family member, or having household member contemplate suicide and factors associated with increasing depression were being female, being older, having a family member who died or was missing, loss of livelihood, and being injured as a result of the tsunami[4].

Northern part of Thailand, mountainous environment, is encroaching flooding and landslide prone areas. On 22 May 2007, flooding and landslide occurred in Uttaradit province, northern part of Thailand and destroyed infrastructure such as; electric system, transportation, water supply, sanitation. 169 and 373 of houses were totally and partially damaged and the fields were disable to bring about farm products. That impacted not only on infrastructure but also caused sudden death of 16 people and affected 3,125 families physically and emotionally heath. Moreover, food and medical supplies were depleted[5]. So, victims in this area were suffering and needed mentally and physically support and assistance during post-impact phase of flooding and landslide.

Roy described humans in terms of holistic adaptive system, human system function as a wholes in one unified expression of meaningful human behaviors. Adaptation is seen as human coping process in regulator system and cognator system. Regulator system response automatically neural, chemical and endocrine coping channel. The second major coping, cognator system responds through cognitive-emotive channel, perception and information processing, learning judgment and emotion. There are four modes, physiological, self-concept, role function and interdependence mode, that responsed to and interaction to environment were carries out and adaptation can be observed[6]. Dupuy[7] developed General Psychological well-being questionnaire composed of anxiety, depress mood, positive well-being, self control, general health and vitality to identify human psychological health. Therefore, four modes of adaptation and psychological well-being were suitable to determine holistic health of people.

Beside flooding and landslide effects, the people in Lublae district, Uttaradit province, were suffering and needed for support and assistance. This research were to explore the needs of potential enhance-ment for adaptation and to examine the effectiveness of the potential enhancement for adaptation and psychological well-being of people who have suffered from flooding and landslide in Uttaradit Province, Thailand since May 2006.

Objective

To explore the needs of potential enhancement for adaptation among victims of flooding and landslide.

To examine the effectiveness of the potential enhancement for adaptation and psychological well-being among victims of flooding and landslide.

Material and Method

Methods

There were three stages of research design. Firstly, the needs of potential enhancement for adaptation among victims from flooding and landslide in Lublae district, Uttaradit province, Thailand, were analyzed by focus groups discussion. Secondly, the potential enhancement program (PEP) was designed by brainstorming of three groups of stakeholder; victims, health volunteers and health personnel. Lastly, the effectiveness of the potential enhancement program was tested by the difference of adaptation and psychological well-being of victims, between before and after the program intervention.

Population and sample

The samples who participated in the focus group discussion for an analysis of the potential enhancement for adaptation need were 50 victims from each village of Thumbun Mae Pou, Lublae district. The second sample group, participated in brainstorming for designing the PEP were 50 health volunteers and 5 health personnel who have live in Thumbun Mae Pou, Lublae district. The last group of sample which were used to test the effectiveness of the PEP contained 360 victims selected by simple random sampling from 3,125 families who had suffered from this flooding and land-slide, this sample size was calculated by formula of Yamane[8].

Material

Three instruments were used; focus groups discussion guideline, adaptation questionnaire and psychological well-being questionnaire. Focus groups guideline was developed by researchers, proved by three experts and used for examined the needs of potential enhancement for adaptation after received the impact from flooding and landslide. An adaptation questionnaire was developed by researchers in accordance with The Roy Adaptation Model[6], 6 rating scales (0-5 score) composted of fours parts 1) physiological mode; twenty one items of oxygen, nutrition, elimination, activity and rest, protection,

water and electrolyte, neurological function and endocrine function 2) self-concept mode; thirteen items of body sensation, body image, self-consistency, self-idea, moral-ethical spiritual self 3) role function mode; ten items of primary role, secondary role and tertiary role and 4) independence mode; nine items of significant person, giving and receiving behaviors, and supportive system. This questionnaire was proved by the same three experts and its reliability was 0.90. The criteria for interpretation the meaning of adaptation was divided as 0-1.00 = poor adaptation, 1.01-2.00 = slightly adaptation, 2.01-3.00 = moderate adaptation, 3.01-4.00 = good adaptation, 4.01-5.00 = very good adaptation, respectively. A psychological well-being questionnaire was developed by Hanucharoenkul, Intharasombat & Putwatana[9] in accordance with Dupuy's General Well-Being[7], 14 items of 6 rating scales (0-5 score) and 4 items of 10 rating scales (0-10 score) of anxiety, depress mood, positive well-being, self control, general health, and vitality which were approved by the same three experts. Its reliability of Cronbach's coefficient was 0.70. The criteria for interpretation of the psychological well-being meaning were 0-54.19 = low psychological well-being, 54.20-90.72 = moderate psychological well-being, and 90.73-110.00 = high psychological well-being, res-pectively.

Data collection and analysis

The needs of potential enhancement for adaptation from the focus groups discussion and the PEP from brainstorming were collected by tape recorder and analyzed by content analysis. The adaptation and psychological well-being among flooding and landslide victims before and after PEP were collected. Adaptation and psychological well-being data before and after PEP among the sample were analyzed by using percentage, mean, standard deviation and paired t-test.

Results

As focus group results, the potential enhancement for adaptation among victims from flooding and landslide needed to have village broadcasting system and set up warning network along the risk canal and mountain, first aid training for health volunteer and program of psychological health promotion.

The PEP was developed in step 2 by brainstorming composed of community flooding and landslide rehearsal training, health education and dissemination and knowledge management. Community flooding and landslide rehearsal training composed of notification, line of coordination, evacuation, triage, and supportive care. Health education and dissemi-nation had 2 steps; 1) researchers provided 4 topics with contents of self-care for physical health, self concept development, family strengthening and stress management for 50 health volunteers from each village of Thumbun Maepou, Lublae district and 2) this health volunteers disseminated all content to the victims of flooding and landslide in each village during Thai traditional festival and 11 health volunteers, representative from each village disseminated the 4 contents knowledge to the people by using village broadcasting every week for 5 months. Two knowledge management, sharing the experiences of health education and dissemination of health volunteers were to set up at week 10th and 20th after program intervention (Fig. 1).

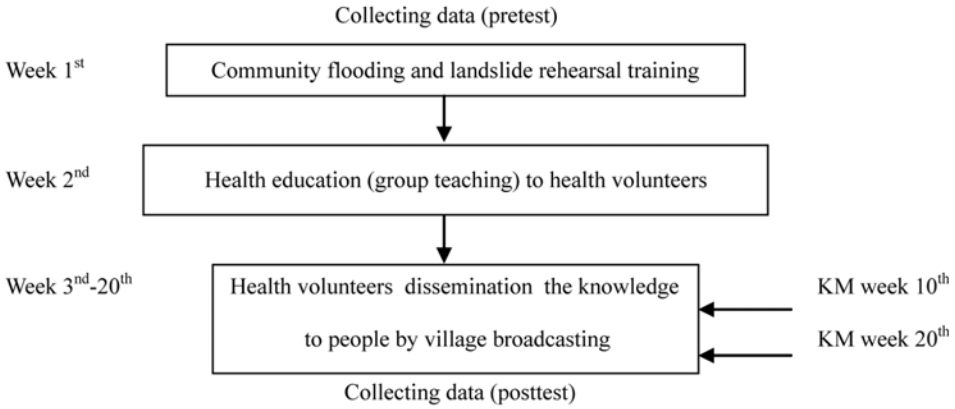

Fig. 1 Summary of the potential enhancement program (PEP)

The effectiveness of the PEP were tested by the difference of adaptation and psychological well-being of victims between before and after intervention. The results from 354 victims (98.3% of total settleable sample) of Thumbun Maepou, lublae district, Uttaradit province were analyzed. Out of this sample, 49.3% of them were male and 50.7 were female. Age between 40-59 years old (59.0%), 20-39 years old (21.8%) and age 60 years old and over (19.2%). Mostly, they graduated from primary school level (71.5%), secondary school level, technical level, bachelor degree and none at 15.3%, 5.7%, 5.1%, and 2.3%, respectively. Their occupations were agriculture (69.8%), employee (13.0%) and others (17.2%). Mostly they lost means of existence (56.7%), home (31.6%) and both lost means of existence and home (11.3%), part of home (31.6%) and family member (0.4%). The results found that total physiological mode adaptation, protection and endocrine system function of the sample after intervention were significantly higher than those of before intervention at 0.001 level, elimination, activity and rest of the sample after intervention were significantly higher than those of before intervention at 0.01 level and oxygenation, neurological function of the sample after intervention were significantly higher than those of before intervention at 0.05 level. Body sensation and body image of self-concept mode of the sample after intervention was significantly higher than that of before intervention at 0.001 level. Only primary role of role function mode after intervention was significantly higher than that of before intervention at 0.001 level. On interdependence mode, significant person and supportive system after intervention were significantly higher than those of before intervention at 0.001 level. Moreover, total adaptation after intervention was significantly higher than that of before intervention at 0.05 level (Table 1).

Out of psychological well-being, total psychological well-being, positive well-being and vitality of sample after intervention were significantly higher than those of before intervention at 0.001, while

Table 1. The difference of average score of adaptation between before and after the PEP among victims of flooding and landslide (n = 354)

Adaptation	$\bar{x} \pm SD$		Paired t-test	p-value
	Before	After		
Total physical mode	3.51 ± 0.51	3.68 ± 0.49	-5.110	0.000
Protection	3.15 ± 0.90	3.56 ± 0.78	-7.190	0.000
Endocrine function	3.20 ± 1.04	3.59 ± 0.86	-5.637	0.000
Elimination	3.83 ± 0.83	3.98 ± 0.75	-2.849	0.005
Activity and rest	3.44 ± 0.92	3.58 ± 0.79	-2.725	0.007
Oxygenation	3.24 ± 0.62	4.02 ± 0.62	-2.244	0.025
Neurological function	3.46 ± 0.69	3.55 ± 0.70	-2.069	0.039
Water and electrolyte	3.75 ± 0.88	3.86 ± 0.83	-0.110	0.530
Nutrition	4.04 ± 0.88	4.02 ± 0.76	0.422	0.673
Total self-concept mode	3.68 ± 0.45	3.68 ± 0.62	-0.206	0.837
Body sensation	3.28 ± 0.99	3.58 ± 0.97	-3.620	0.000
Body image	3.08 ± 0.86	3.58 ± 0.97	3.845	0.000
Self-consistency	3.97 ± 0.74	3.94 ± 0.80	0.523	0.601
Self-idea	4.03 ± 0.75	4.08 ± 0.80	-1.035	0.301
Moral-ethical-spiritual self	3.82 ± 0.63	3.79 ± 0.82	0.720	0.472
Total role function mode	3.87 ± 0.50	3.87 ± 0.62	0.000	1.000
Primary role	3.42 ± 0.72	3.58 ± 0.76	-3.289	0.001
Secondary role	4.00 ± 0.62	4.01 ± 0.68	-0.401	0.689
Tertiary role	3.99 ± 0.75	3.96 ± 0.75	0.568	0.570
Total interdependence mode	3.77 ± 0.03	3.81 ± 0.64	-1.119	0.264
Significant person	4.42 ± 0.72	4.24 ± 0.68	-3.886	0.000
Supportive system	3.00 ± 0.05	4.24 ± 0.03	-4.610	0.000
Giving and receiving behaviors	4.02 ± 0.64	4.06 ± 0.08	-1.160	0.245
Total adaptation	3.71 ± 0.40	3.76 ± 0.51	-2.123	0.034

Table 2. The difference of average score of psychological well-being between before and after the PEP among victims of flooding and landslide (n = 354)

Psychological well-being	$\bar{x} \pm SD$		Paired t-test	p-value
	Before	After		
Total psychological well-being	68.77 ± 12.98	73.04 ± 12.31	-5.324	0.000
Anxiety	10.83 ± 5.31	8.26 ± 5.11	7.200	0.000
Positive well-being	13.48 ± 3.47	14.36 ± 2.72	-4.212	0.000
Vitality	13.58 ± 3.20	14.28 ± 2.36	-3.972	0.000
Concern of general health	10.01 ± 3.10	6.00 ± 1.66	21.065	0.000
Depress mood	5.89 ± 2.16	5.76 ± 1.97	0.821	0.412
Self control	10.15 ± 2.30	10.71 ± 2.06	-1.449	0.148

anxiety and concern of general health of sample after intervention were significantly lower than those of before intervention at 0.001 (Table 2).

Discussion

Out of three potential enhancement for adaptation needs of flooding and landslide victims, the realization village broadcasting system and setting up warning network along the risk canal and mountain were the first need. All of village in Thailand had village broadcasting using for communication massage to villager. Warning signal is giving at the first possible sign of danger to community and giving the earliest possible warning is crucial to prevent loss of life and minimizing damage. Disaster personnel should call on any other available methods to alert community and keep citizen informed. The community must be educated to heed the warning and to recognize the threat as serious[10]. Early warning system was recommended to long term preventive measure[11]. First aid training for health volunteer was the second need which was an essential use for urgent care in disaster events[1]. The last need of them was health education regarding both physiological and psychological health promotion. Health education is one critical component of adaptation of people who received the impact of flooding for their health promotion[12].

Three step of PEP were community flooding and landslide rehearsal training, health education and dissemination and knowledge management. Community flooding and landslide planning were composed of notification, line of coordination, evacuation, triage and supportive care. Village broad casting signal was used as notification and alert people in community, coordination in this situation was designed the communication among head of villager, sub-district organization, primary care unit, and the hospital. Triage was used in flooding area for rapid assessment, first aid and transportation by using color code tag, black, red, yellow and green tags indicated health status of victims for quick appropriate treatment. We evaluated the accomplishment of flooding and landslide plan by using the knowledge management of the personnel and people reviewed the protocol and informed the problem and improvement of each procedure. This procedure mimicked to the element of typical disaster plan[13]. Second step of the PEP, heath education and dissemination, knowledge management sharing were intervened for five months. Heath education was effective tool for promoting health in population group in which instructor should engage systematic process of prioritized of learning needs, identify goals and level of prevention, developing specific learning objectives, prepare material and evaluation[14]. Four topics content were choose by the stakeholder is that, self-care for physical health, self-concept development, family strengthening and stress management use for promoting four mode of adaptation in accordance with Roy adaptation model[6]. After health education, the health volunteers disseminated all content to people in each village during Thai traditional festival by using appropriate time to communicated the information which it was one technique of effective teaching[14]. Moreover, 11 health volunteers, representative from each village disseminated the 4 topics content to the neighborhood by using village broadcasting every week for 5 months. This process was designed for empowerment the transformation health education of health volunteers through village mass media that it was closet communication to the people[15]. Knowledge management was designed by sharing the experiences

of health education and dissemination providing by health volunteers at week 10th and 20th after the PEP intervention. Knowledge management was process involving creating, storing/retrieving, transferring and applying knowledge which worldwide strategic activity for both develoment and evaluation[16].

For testing the effectiveness of the PEP found that total adaptation after intervention of the sample were significantly higher than those of before intervention at 0.05 level (Table 1). This meant that the PEP which composted of three group activities; community flooding and landslide rehearsal training, health education and dissemination and knowledge management liked social support, promoted mostly parts of physical mode, body sensation of self-concept mode, primary role of role function mode, significant person, and supportive system of interdependence mode of victims because of this rehearsal training that set at week one of PEP intervention and stress management of health education and dissemination by using village broadcasting may promote adaptation of victims similar to the lessens in posttraumatic stress from Venezuela floods and Nairobi bombing suggested that use community activities, involve community leader and use the media to ease fear and provide information were tailor intervention for the victims[17]. Moreover, results from the lessen learn after community flooding and landslide rehearsal training suggested that there were some problems of communication among head of village, sub-district organization and primary care unit, which should develop protocol of this step clearly before the plan will start and first aid skill of health volunteers needed more practice.

Total psychological well-being after intervention of the sample were significantly higher than those of before intervention at 0.001 level (Table 2). This meant that PEP was effective to increased positive well-being and vitality but decreased anxiety, and concern of general health of victims. Because of having family member who died or was missing, loss of livelihood, and being were factors associated to anxiety and depression[4] and during recovery phase, psychological recovery must should be addressed for victims[17]. Therefore, PEP had capability to increased adaptation and psychological well-being of victims refer that it provided mental health services to support victims recovery.

Conclusion

This PEP could promoted adaptation and psychological well-being among victims of flooding and landslide and were essential to maintained holistic health.

Limitations

The limitation of this research were that the PEP was done aftermatch 8 months which go on during rehabilitation phase. However, it still in the posttraumatic phase which change could be expected.

Implication for Future Research

There are so many factors affect adaptation among victims of flooding and landslide. Nevertheless, disaster management should be done to reduce health impact and mitigation which stakeholder, that are government official, NGO, and people should learn how to manage before, during, and after disaster.

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พัฒนาศักยภาพการปรับตัวและสภาวะจิตใจของผู้ประสบอุทกภัยและแผ่นดินถล่มในประเทศไทย

นงนุช โอบะ, จรรจา สันตยากร, รุ่งศรี แสงแก้วศรี, เชาวนี ล่องชูผล, อิศเรศ โลหิตพินทุ, ทองใบ คำศรี

วัตถุประสงค์*: เพื่อวิเคราะห์ความต้องการเสริมสร้างศักยภาพ การปรับตัวต่อการเปลี่ยนแปลงของผู้ประสบอุทกภัยและแผ่นดินถล่ม และศึกษาการปรับตัว และสภาวะจิตใจของผู้ประสบอุทกภัย และแผ่นดินถล่มก่อน และหลังการได้รับการสร้างเสริมศักยภาพการปรับตัว*

วัสดุและวิธีการ*: การวิจัยเชิงพัฒนา มี 3 ขั้นตอน ได้แก่ วิเคราะห์ความต้องการเสริมสร้างศักยภาพการปรับตัว โดยการสนทนากลุ่มผู้ประสบอุทกภัย สร้างรูปแบบการสร้างเสริมศักยภาพการปรับตัว โดยการระดมสมองของผู้เกี่ยวข้อง 3 ฝ่ายได้แก่ ผู้ประสบอุทกภัย อาสาสมัครหมู่บ้าน และทีมสุขภาพ และประเมินประสิทธิผลของการสร้างเสริมศักยภาพการปรับตัว โดยเปรียบเทียบการปรับตัว และสภาวะจิตใจของผู้ประสบอุทกภัย ก่อนและหลังการสร้างเสริมศักยภาพ*

สถานที่ทำการวิจัย*: ตำบลแม่พูล อำเภอลับแล จังหวัดอุตรดิตถ์*

ผลการศึกษา*: ผู้ประสบภัยพิบัติมีความต้องการจัดตั้งกลุ่มเตือนภัย ที่อาศัยอยู่ใกล้ลำน้ำ และภูเขาที่มีความเสี่ยง การฝึกปฐมพยาบาลสำหรับอาสาสมัคร และการสร้างเสริมสุขภาพจิต รูปแบบการสร้างเสริมศักยภาพ การปรับตัวของผู้ประสบอุทกภัยและแผ่นดินถล่มประกอบด้วย การซ้อมแผนอุบัติภัยน้ำท่วมและแผ่นดินถล่ม การให้ความรู้และการเผยแพร่ความรู้แก่ประชาชนและการแลกเปลี่ยนเรียนรู้ การปรับตัวและสภาวะจิตใจของผู้ประสบอุทกภัยและแผ่นดินถล่ม หลังได้รับโปรแกรมการสร้างเสริมศักยภาพสูงกว่าก่อนได้รับโปรแกรมอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 และ 0.001 ตามลำดับ*

สรุป*: การส่งเสริมการปรับตัวและสภาวะจิตใจเป็นสิ่งจำเป็นเพื่อการคงไว้ซึ่งสุขภาพดีแบบองค์รวมของผู้ประสบอุทกภัยและแผ่นดินถล่ม*