

Research Article

Flood Risk Awareness and Preparedness Knowledge and Perceptions: Evidence from Thai Citizens

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Abstract: The purpose of this study was to examine perceived flood risk awareness and preparedness in terms of levels of flood risk preparedness knowledge and training experience differences. A total of 414 high school students who lived in flooding areas in Phetchaburi province was gathered for data collection through flood risk preparedness test and perceived flood risk awareness and preparedness questionnaire. Analysis of independent samples t-test indicated no statistically significant difference in perceived flood risk awareness and preparedness knowledge between participants with different levels of knowledge ($t = .879$, $Sig = .380$). On the other hand, findings revealed a statistically significant difference in perceived flood risk awareness and preparedness between different groups of training experience ($t = 2.315$, $Sig = .021$). Further recommendations and research implications were also discussed.

Keywords: Flood Risk Awareness, Flood Risk Preparedness, Flood Preparedness Knowledge, Thai Citizens

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INTRODUCTION

Flood is one of the most devastating disasters that have the massive impact on people, environment, infrastructure, and economics. Flood risk disasters are anticipated to upsurge in various areas in the near future due to climate change and people expansion (Wang *et al.*, 2018). To manage flood, the traditional approaches primarily focused on flood resistance with the aim of mitigating the likelihood of flooding. Nevertheless, the structural solution solely cannot effectively solve the problems (O'Neill *et al.*, 2016). More attentions have been paid non-structural measures such as risk assessment, individual awareness and household preparedness, etc. as a new paradigm shift approach of flood risk management, which require an involvement from flood-prone or flooding area household to flood risk reduction. The fundamental approach is to measure individuals in flood-prone/ flooding area on flood risk awareness and preparedness perception. Previous studies revealed that individuals with low risk awareness who lived in flood-prone areas were more likely to have low flood preparedness leading to inadequate response to the hazard (Fuchs, 2017). Flood risk preparedness perception is essential for government and public agencies to explore the level of preparation an individual has when encountered with floods.

Measuring flood risk perception can help increase the effectiveness of flood risk management (Kellens *et al.* 2011).

Past research indicated that education plays a vital role in natural disaster responses and survival (Frankenberg *et al.*, 2013). Educated people are aware of disaster effects and demonstrated a key role in flood loss reduction (Paul & Routray, 2010). Previous research found that highly educated persons were more likely to have better disaster preparedness and response, experience lesser negative effects, and recuperate quicker than lower educated individuals (Muttarak & Lutz, 2014). Additionally, past experiences and related received knowledge can boost the preparedness and response of individuals in flood risk (Santoro *et al.*, 2019).

An exploration of factors that determine flood risk perception has increasingly become an interesting topic in flood risk management (Lechowska, 2018). Nevertheless, an investigation on flood risk preparedness knowledge and training experience has been overlooked in particular Thai context. Since Phetchaburi province has consecutively encountered flood risk incidents in the past three years, it would be

beneficial for flood risk management research to place an emphasis on exploring these factors in different settings. Thus, the objective of this present study was to investigate perceived flood risk awareness and preparedness in terms of levels of flood risk preparedness knowledge and training experience differences.

METHODOLOGY

Data were collected from high school students whose school located in the flooding area in Phetchaburi province. Simple random sampling technique was used to select the list of schools in different flooding areas. A total of 4 schools in three different flood areas in Phetchaburi province was finally chosen. The researchers sent the consent letter to each school director to get the permission for data collection. After their approval for gathering data, the researcher sent them a set of flood risk preparedness knowledge test and perceived flood risk awareness and preparedness questionnaire. Students of each school were randomly selected using simple random sampling approach. A total of 414 students from 4 different schools agreed to get involved in this study and completed the questionnaire.

The instruments used in this study were a 10-item of flood risk preparedness knowledge test and a 30-item of perceived flood risk awareness and preparedness questionnaire. Flood risk preparedness knowledge test was dichotomous test, which two alternatives were proposed (true/false). This instrument was adopted from the original version developed by Promsri and Chaigusin (2015). Perceived flood risk awareness and preparedness questionnaire was a 5-point rating scale ranging from 1 (strongly disagree) to 5 (strongly agree). This measurement scale was modified from the 40-item of flood risk awareness and preparedness scale created by Promsri (2017).

To determine the quality of these instruments, difficulty and discrimination analyses were conducted to ensure the appropriateness of utilizing flood risk preparedness knowledge for data collection. This scale

has acceptable discrimination. Participants who were in the below average group had lower scores than participants with high knowledge in flood risk preparedness. In addition, this scale has acceptable level of difficulty. Reliability with Cronbach's alpha test was calculated to identify the suitability of using these measurement scales. The alpha scores for both scales were acceptable, which the flood risk preparedness knowledge test had an alpha score of 0.5 while perceived flood risk awareness and preparedness scale had alpha score of 0.926. Independent samples t-test was calculated to test research hypotheses of this study.

RESULTS

Results indicated that females were the major group of participants in this study (63.8%). Over 50 percent of them had ever experienced flood incidents (54.8%). More than 60 percent of respondents reported that they had never been provided training about flood risk preparedness. The overall perceived flood risk awareness and preparedness among this group of participants was at a high level (M = 4.27, S.D. = .398). Analysis of flood risk preparedness knowledge found that question#4 "learning to use first-aid kits is a must for everyone in family before flood" was the easiest question among 10 questions in which 88.6 percent of respondents could get the correct answer for this question while question#2 "if evacuation is done, individuals can return to their place when level of water decreases" was found to be the most difficult answer among 10 questions in which 76.3 percent of respondents wrongly answered this question. Additionally, findings of flood risk preparedness knowledge analysis revealed that almost equal proportion of respondents were separated into a low knowledge group (n = 210) and a high knowledge group (n = 214). To divide groups of participants into different levels of flood risk preparedness knowledge, the average of 60 percent was used. Table 1 demonstrated no statistically significant difference in perceived flood risk awareness and preparedness knowledge between below average group and above average group of flood risk preparedness knowledge (t = .879, Sig = .380).

Table 1: Independent Samples T-test Analysis for Perceived Flood Risk Awareness and Preparedness according to Level of Flood Risk Preparedness Knowledge (n = 414)

Low Knowledge Group (n=210)		High Knowledge Group (n=214)		df	t	Sig
M	S.D.	M	S.D.			
4.29	.398	4.25	.398	412	.879	.380

Table 2 displayed a statistically significant difference in perceived flood risk awareness and preparedness between different groups of training experience (t = 2.315, Sig = .021). Ever-provided-

training group (M = 4.33) was reported to have a greater perceived flood risk awareness and preparedness than never-provided-training group (M = 4.23).

Table 2: Independent Samples T-Test Analysis for Perceived Flood Risk Awareness and Preparedness according to Training Experience (n = 414)

Training Experience				df	t	Sig
Ever Provided (n=158)		Never Provided (n=256)				
M	S.D.	M	S.D.			
4.33	.368	4.23	.412	412	2.315	.021*

DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

This study aimed at scrutinizing perceived flood risk awareness and preparedness in terms of levels of flood risk preparedness knowledge and training experience differences. This study found no statistically significant difference in perceived flood risk awareness and preparedness between participants with different levels of flood risk preparedness knowledge. This can be described that regardless of their level of flood risk preparedness knowledge, participants were equally concerned the importance of flood risk preparedness as this group of respondents were a high school student who were sufficiently educated the effects of flood disasters. This finding supported Paul and Routray (2010) who found that educated individuals were aware of disaster impacts and demonstrated a key role in flood loss reduction. Also, this study showed statistically significant difference in perceived flood risk awareness and preparedness between respondents with different training experiences. This confirmed the previous findings in flood risk management in which the linkage between what individuals knew and perceived about flood risks could encourage the preparedness and response (Santoro *et al.*, 2019). Results of this study can help solve problems in the flood risk management as it attempted to explore whether flood risk preparedness knowledge and flood risk preparedness training experience determined flood risk awareness and preparedness perception. This was consistent with prior findings in flood risk management research (Lechowska, 2018).

Since this study randomly selected high school students in different flooding areas in Phetchaburi province and used as the representatives of Phetchaburi citizens, this might not reflect the whole citizens who previously experienced flood incidents in Phetchaburi in the past three years. Thus, the further research should extend its focus to people in different settings and areas in Phetchaburi. Also, as the knowledge scale measurement used in this study contained only 10-item of true/false questions, which might not be properly adequate to separate groups of low level and high level of knowledge, the next study should develop additional items of flood risk preparedness knowledge to increase the appropriateness of the scale.

Findings of this study can provide guidelines for disaster management agencies and local

organizations to account flood risk preparedness training as part of their flood management programs. In addition, flood protection and flood risk management plans for Phetchaburi citizens can be developed based on these findings particularly risk-based flood management approaches. Further examinations on past experiences in flood disasters should be included in the future study. People in other flooding areas in different parts of Thailand should be investigated their flood risk preparedness knowledge and perceived flood risk awareness and preparedness.

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