

Validation of e-psychological instrument for flood victims version-II



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ABSTRACT

This study aims to validate a newly developed of e-Psychological Instrument for Flood Victims Version II (e-PIFV-II) by using expert judgment method. Measuring the psychopathology symptoms among flood victims is an important step for intervention and treatment. However, there is a gap of a valid, reliable and efficient instrument to measure flood victims' mental health in Malaysia. The e-PIFV-II is a digital self-report inventory that has 56 items with 4 dimension scales namely stress, anxiety, depression, and trauma. Results showed that there was strong content coefficient validity for each subscale of the instrument and the coefficient value for trauma subscale in the e-PIFV-II was increased. The coefficient value of stress was 0.8, anxiety was 0.9, depression was 1.0, trauma was 0.9 and overall was 0.9. This study supports the theoretical framework and provides practical implication in the field of clinical psychology and flood management.

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1. Introduction

The World Health Organization (WHO) reported that natural disasters have an immediate impact on human lives and often result in the destruction of the physical, biological, social and environment of the affected people, thereby having a longer-term impact on their health, well-being and survival (WHO, 2017). In fact, floods are the most common type of global natural disasters responsible for almost 53,000 deaths in the last decade (Alderman et al., 2012). Yet, these catastrophic events usually have a high mortality rate in less developed countries (Kundzewicz and Kundzewicz, 2005). In Malaysia, the National Disaster Management Agency reported that from 2011 to 2016, floods are the highest natural disasters happen in Malaysia.

According to the Director-General of Health Malaysia, the severe floods that hit several states on the east coast of Peninsular Malaysia, Kelantan, Terengganu and Pahang has caused physical damage, loss of property, depression and trauma to

the victims (MOH, 2015). Besides, Ministry of Health Malaysia reported that environmental factors also contributed to mental health problems over the past 10 years (10.6% in 1996; 11.2% in 2006) (MOH, 2016). Overall, The National Health and Morbidity Survey found that 1 in 3 Malaysian experiences mental health problem (MOH, 2015). Therefore, mental health issue of flood victims in Malaysia needs to be addressed wisely and effectively because flood takes place frequently and involves many victims simultaneously throughout the country.

Due to the current alarming mental health problems, an effective flood management system in Malaysia is required (Hussain et al., 2014). It is a crucial need to find ways how to identify the symptoms of mental health problems proactively and efficiently prior to any intervention and treatment. Based on the shortcomings in the previous studies particularly in terms of administration of e-Psychological Instrument; Flood Victims Version I (e-PIFV-I) among flood victims especially during the floods is necessary. Present study aims to validate a shortened version of e-Psychological Instrument for Flood Victims Version II (e-PIFV-II) in order to reduce time taken to complete the instrument.

Based on literatures, most of the instruments for measuring stress, anxiety, depression and trauma originally have been developed in overseas and there

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is a lack of such instruments that are designed in the context of developing countries. Research has also suggested for not blindly import measures used in another culture without adaptation (Goh et al., 2017) as well as taking into consideration the uniqueness and diversity of human being (Morris and Maisto, 2016). A very few of such instruments have gone through the process of adaptations (Musa et al., 2007). Most of the instruments also cover limited constructs in a single instrument and have been administered on paper and pencil basis, which are less efficient to be used in the context of flood victims especially during flood (Musa et al., 2007; Abdullah et al., 2015; Alshagga et al., 2015; Chan et al., 2016; Cohen and Williamson, 1988; Ezzati et al., 2013; Ho et al., 2007; Mustaffa et al., 2014; Lee, 2012; Nasir et al., 2012; Othman et al., 2016; Otto et al., 2006; O'Connor et al., 2010; Pallant and Tennant, 2007; Sauer et al., 2013; Sipon et al., 2014, 2015; Shoeb et al., 2007; Whittle et al., 2012; Yusoff et al., 2014; Zigmond and Snaith, 1983). Therefore, e-PIFV-II has been set up to fill the gaps in measuring stress, anxiety, depression and trauma symptoms in a single instrument in the Malaysian context as well as to adopt Industrial Revolution 4.0 of the digital management.

Past literature has also found the uniqueness of human beings and the nature of stress, depression, anxiety and trauma. Human being is a unique organism that consists of physical, mind and overt behavior. The mind includes cognitive, emotion, value and motives. The research found that stress, depression, anxiety and trauma responses also include biological, mental and behavioral reactions. The nature and reactions of the four constructs are outlined as follows.

Firstly, stress is a negative emotional experience or physiological response that is produced following exposure to life circumstances that are threatening or represent harm or loss to the individual or those things valued by the individual. These events are commonly referred to as stressors. Stressors exist on a continuum and may take from a variety sources (Reyes et al., 2008). It is as internal process that occurs as people try to adjust to events and situations, especially those that they perceive to be beyond their coping capacity. Stress promotes survival because it forces people to adapt to rapidly changing environmental conditions. This type of adaptive stress is known as eustress. However, when the stress is too powerful and beyond people's capacity, it would cause negative effect to them. Such this maladaptive stress is sometimes referred to as distress. Stress reactions involve the physical and psychological responses that occur in the face of stressors (Taylor, 2002). Hans Selye found that physical reactions to stressors include an initial alarm reaction, followed by resistance and exhaustion. This three stage pattern of responses triggered by the effort to adapt to stressors is known as The General Adaptation Syndrome (GAS). The model has been very influential, but it has also been criticized for underestimating the role of

psychological factors in stress, such as changes in emotions, thoughts and behaviors. These criticisms led to the development of psychobiological models which emphasized the importance of psychological as well as biological stress responses (Ganzel et al., 2010; Lazarus and Folkman, 1984).

Secondly, depression is a persistent, pervasive disorder that causes a low, sad, hopeless mood, inability to take interest or find pleasure in almost anything. Other mental, emotional, physical and behavioral symptoms occur as well, and the net effect of all these symptoms is serious distress or significant problems in daily life (Andrews, 2010). Depression differs from simple grief or mourning which is a proper emotional response to the loss of love persons or objects. Biology as well as psychological mechanisms is important in producing and maintaining depressive symptoms. The biochemical cause appears to be the defective regulation of the release of neurotransmitters in the brain, particularly norepinephrine and serotonin. Reduced quantities or reduced activity of these chemicals in the brain is thought to cause the depressed mood in some sufferers. A person who is depressed usually experiences several symptoms such as feelings of sadness, hopelessness, pessimism, lowered self-esteem, a decrease or loss of ability to take pleasure in ordinary activities, reduced energy and vitality, slowness of thought or action, loss of appetite and disturbed sleep or insomnia.

Thirdly, anxiety is an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure. People with anxiety disorders usually have recurring intrusive thoughts or concerns. They may avoid certain situations out of worry. They may also have physical symptoms such as sweating, trembling, dizziness or a rapid heartbeat (Kazdin, 2000). Anxiety also includes future-oriented negative thoughts such as "What if I look foolish in front of the audience?" or "What if he doesn't like me?" It is when the anxiety is out of proportion to the event that we say a person may suffer from an anxiety disorder (Reyes et al., 2008). Anxiety also occurs when having a feeling of dread, fear, or apprehension, often with no clear justification. Anxiety is distinguished from fear because the latter arises in response to a clear and actual danger, such as one affecting a person's physical safety. Anxiety, by contrast, arises in response to apparently innocuous situations or is the product of subjective, internal emotional conflicts the causes of which may not be clear to the person himself. Some anxiety inevitably arises in the course of daily life and is considered normal. But persistent, intense, chronic, or recurring anxiety not justified in response to real-life stresses is usually regarded as a sign of an emotional disorder.

Fourthly, trauma is defined as events that are emotionally shocking or horrifying, which threaten or actually involve death or a violation of bodily integrity (such as sexual violation or torture) or that render the affected person helpless to prevent or stop the resultant psychological and physical harm

(Reyes et al., 2008). Besides, Trauma has been a sudden, potentially deadly experience, often leaving lasting, troubling memories (Figley, 2012).

In terms of psychological testing, it is a process of measuring psychology related variables by means of devices or procedures designed to obtain a sample of behavior. Firstly, it is typically to obtain some gauge, usually in numerical in nature, with regard to an ability or attribute. Secondly, testing may be individual or group in nature. After test administration the tester will typically add up the number of correct answers of certain types of responses. Thirdly, the tester is not the key to the process and a tester may be substituted for another tester without especially affecting the evaluation. Fourthly, testing typically requires technician-like skills in terms of administering and scoring a test as well as in interpreting a test result. Finally, typically testing yields a test score or series of test scores (Cohen et al., 2012; Gregory, 2004).

The process of developing an instrument basically occurs in five stages. They are instrument conceptualization, construction, tryout, item analysis and revision. Instrument conceptualization occurs when the idea for an instrument is conceived. Test construction occurs when writing test items, rewriting or revising items, formatting items, setting score rules. Once a preliminary form of an instrument is developed, it is administered to a representative sample of test takers under conditions that simulate the conditions that the final version of the instrument will be administered. The data from the tryout will be collected and test takers' performance on the test as a whole and on each item will be analyzed. Statistical procedure such as item analysis are employed to make judgments about which items are good, which items need to be revised and which items should be discarded. Item analysis may include analyses of item reliability, item validity and item discrimination (Cohen et al., 2012; Gregory, 2004).

In a dramatically changing world, psychological testing does not have the choice of standing still. Technology has become a fixture in our daily life and psychological testing must also keep up with changing times. Electronic and digital options in daily personal and professional lives are quickly becoming the preferred way for people to function. In fact, today's adolescents are considered digital natives as they were born into a technological world. Now, we live in the new reality, with digital, electronic, online and computerized world. Computers are now being used for test administration, item scoring, transformation of scores, test interpretation and data storage. In fact, digital have become a powerful asset for psychological testing and assessment and will likely continue to enhance and advance our work in the field (Butcher, 2003; Cayton et al., 2012; Butcher et al., 2004).

Previously, five studies have been done to validate e-PIFV-I based on the three models (Cohen et al., 2012; Gregory, 2004). Study I for face validity,

study II for content validity and study III, IV and V for 2 x 2 content coefficient validity. Past results showed that content coefficient for each subscale of the e-PIFV-I ranging from moderate 0.6 to very strong validity 1.0 (Table 1).

Table 1: Content coefficient for each subscale of e-IPFV-I

Study	Stress	Anxiety	Depression	Trauma	Overall
III	0.6	0.9	1.0	0.6	0.8
IV	0.7	0.9	1.0	0.6	0.8
V	0.8	0.9	1.0	0.8	0.9

Based on theories and literatures of stress, depression, anxiety and trauma, Fig. 1 is the conceptual framework for the present study.

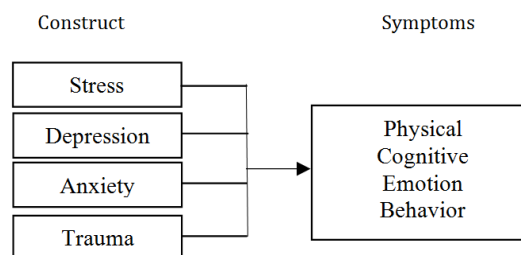


Fig. 1: Conceptual framework

2. Methods

This study was designed to validate a newly developed of e-IPFV-II. The purpose of e-PIFV-II is to measure digitally stress, anxiety, depression and trauma among flood victims from age 12 years to late adulthood. The score is used to prescribe the level of stress, anxiety, depression and trauma symptoms. The instrument uses 3 points Likert scales; yes, no and not sure (Yes = 3 marks, No = 0 marks, not sure = 1 mark). The e-IPFV-I has 84 items and each subscale has 21 items whereas e-IPFV-II has 56 items and each subscale has 14 items. Both instruments covers four domains; physical, cognitive, emotional and behavioral reactions. The e-PIFV-II only takes 10-15 minutes whereas e-PIFV-I takes 20-25 minutes to be completed. This study also adopts similar models used in previous studies. The models emphasis on test conceptualization, test construction, test tryout, item analysis and test revision (Cohen et al., 2012; Gregory, 2004). There were four phases in this study:

- Phase I: Three experts were involved (two clinical psychologists and a psychiatrist). An informal consent was obtained from each expert before a formal letter of appointment sent to them. Then, a letter of appointment was sent to all experts together with a standardized rating form. The form contains a list of items based on each construct, rating column with two options (appropriate or inappropriate) and a column for comments and suggestions. They reviewed the instrument privately and took two weeks to return the completed forms.
- Phase II: Based on the experts rating, items which were agreed by the three experts in consensus

were maintained. Then, several items in the instrument were improved based on experts comments and suggestions on words and sentences used.

- Phase III: Several items from each subscale of instrument were deleted based on alpha Cronbach coefficient value if item deleted. The second version of e-IPFV has 14 items for each subscale with a total of 56 items.
- Phase IV: Two experts were involved (a clinical psychologist and a psychiatrist). They reviewed and validated the e-IPFV-II through a statistical method of expert assessment to get the content coefficient validity index. An informal consent was obtained from each expert before a formal letter of appointment sent to them together with a standardized rating form. They reviewed and validated the instrument privately and took two to four weeks to return the completed forms. Fig. 2 shows the validation process.

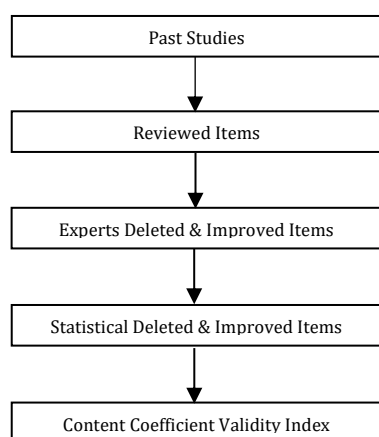


Fig. 2: Content validation process of e-IPFV-II

Data that retrieved from feedback forms were counted and then put in the 2 x 2 contingency table as Fig. 3.

		Expert 1	
		Appropriate	Inappropriate
Expert 2	Appropriate	A	B
	Inappropriate	C	D

Fig. 3: 2 x 2 contingency table

After completing the 2 x 2 contingency table, then index for content coefficient validity was calculated using the following formula:

$$\text{Content coefficient validity} = \frac{D}{(A+B+C+D)}$$

3. Results and discussion

Statistical analysis was done to obtain content coefficients of the instrument. The content validity coefficients showed that e-IPFV-II had a high content validity. The coefficient value for trauma subscale was increased compared to the subscale in the e-IPFV-I (Table 2).

Realizing that diagnosis in clinical settings need to the holistic and multi-method approach in

identifying mental health (Cohen et al., 2012), therefore e-IPFV-II is only considered as a prescreening tool of four types of mental health symptoms especially for the flood victims. The e-IPFV-II score is aimed to categorize people with less or more symptoms of stress, anxiety, depression or trauma. Even though e-IPFV-II may not be sufficient tool to evaluate an individual's mental health, at least it can help to provide early inputs to professionals more objectively, easier, faster and cover a wide range of ages.

Table 2: Content coefficient for each subscale of e-IPFV

e-IPFV	Stress	Anxiety	Depression	Trauma	Overall
Version I	0.8	0.9	1	0.8	0.9
Version II	0.8	0.9	1	0.9	0.9

4. Conclusion

The present study shows that the coefficient value of e-IPFV-II content validity is increased. The instrument supports the existing theories or models of stress, depression, anxiety and trauma that the nature and reactions of all constructs encompass both physical and psychological aspects (Figley, 2012; Andrews, 2010; Ganzel et al., 2010; Reyes et al., 2008; Taylor, 2002; Kazdin, 2000; Lazarus and Folkman, 1984). Therefore, it is important to take note that flood victims are not only exposing to physical risk but also cognitive and emotional risk. The government, organization, volunteers and experts should provide assistance which cover biological needs as well as cognitive and emotional supports.

The results of this study complement the previous studies for the purpose of using of such instrument in Malaysia context. This study also contribute to the development of such instrument with the value added which is a single instrument with broader dimensions and more efficient administration of the instrument through technology (Abdullah et al., 2015; Alshagga et al., 2015; Chan et al., 2016; Cohen and Williamson, 1988; Ezzati et al., 2013; Ho et al., 2007; Musa et al., 2007; Mustaffa et al., 2014; Lee, 2012; Nasir et al., 2012; Othman et al., 2016; Otto et al., 2006; O'Connor et al., 2010; Pallant and Tennant, 2007; Sauer et al., 2013; Sipon et al., 2014; 2015; Shoeb et al., 2007; Whittle et al., 2012; Yusoff et al., 2014; Zigmond and Snaith, 1983).

The e-IPFV-II is planned as a research output and becomes an effective social innovation tool to prescreen flood victims' mental health. It is also aimed to offer an alternative to solve the Malaysian mental health issues by producing more objective, effective, sustainable, contextual, a general and faster tool to cater mental health problems among flood victims. This instrument will be a very helpful tool as it can help to save energy, time, expenses and experts limitation such as counselors, clinical psychologists and psychiatrist to serve in the ground. In addition, it can help the public to address, perceive and report mental health issues more objectively, especially in the situation where

professional teams are not available or before the affected flood victims can be reached by them.

A shortened version of this instrument is highly recommended to screen flood victims' mental health especially to be used during very traumatic flood events such as the flood that hit Malaysia in 2014. The researchers also find that digital instrument is a good approach to draw attention of adolescent group as well as to get their cooperation. This group has very positive attitude toward digital application. Whereas other groups such as the adult and old people their attitude toward digital instrument are neutral. However, they prefer to get help from the instrument administrator to operate the application for them. But for those who are not familiar with digital tools or applications, they refuse to operate the instrument by themselves and ask the instrument administrator to operate for them. It shows that the attitude's gap toward the digital instrument between the groups is not only related to the generation basis but more on their familiarity with the digital applications.

As e-IPFV-II is a newly developed instrument, we suggest replicating this study in order to confirm the findings. Further studies involving flood victims from diverse backgrounds, cultures, environments and flood severity as well as a large sample and populations need to be done to establish generalization. Theoretically this instrument is suitable for measuring stress, anxiety and depression for flood victims as well as the others. Therefore, this instrument can be widely used in various settings. However, the reliability of the instrument must be tested before it can be claimed as a reliable instrument for other particular group of clients. Meanwhile, the trauma subscale is only suitable for flood victims because all items in this subscale specifically focus on traumatic flood events. This instrument is also limited to be used for children aged 12 years to elderly as to understand most of the items in this instrument need to a particular stage of cognitive maturity that is formal operational stage (Bernstein et al., 2011).

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Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

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