An Innovation of Psychological Instrument to Measure Floods Victims' Mental Distress

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Psychological testing is the process of measuring psychology-related variables by means of devices or procedures designed to obtain a sample of behaviour. It is a very important field of study to help people to categorise and to rank mental and human behaviour as well as to propose appropriate interventions and treatments. Realising the needs of measuring the psychopathology symptoms among Malaysian flood victims in the digital development era, e-Psychological Instrument for Flood Victims version I (e-PIFV-I) has been developed to provide a social innovation tool to solve community mental issues efficiently. The e-PIFV-I is a digital self-report inventory that has 84 items with 4 subscales, namely stress, anxiety, depression and trauma. Three types of validation studies have been done to validate the instrument. Study I is for face validity, study II is for content validity, and study III is for content coefficient validity. Results showed that e-PIFV-I has face, content and content coefficient validity. In the study III-a, results showed that the content coefficient validity for each sub-scale of e-IPFV-I ranging from moderate to very strong validity, whereas in the study III-b coefficient values were improved to a solid validity. This study supports the theoretical framework and provides practical implication in the field of mental distress.

Keywords: *Innovation of psychological instrument, Validity, Psychopathology, Floods victims, Mental distress.*

Introduction

Every year natural disasters kill around 90 000 people and affect close to 160 million people worldwide. Natural disasters include earthquakes, tsunamis, volcanic eruptions, landslides, hurricanes, floods, wildfires, heatwaves and droughts. The World Health Organisation (WHO) reported that natural disasters have a longer-term impact on human health and their well-being. Floods are the most common type of global natural disasters and have caused a high mortality rate in less developed countries. Floods also are the highest natural disasters happen in Malaysia (National Disaster Management Agency, 2016).

Due to the current alarming mental distress and the need of an effective flood management system in Malaysia5, a psychological instrument to help Malaysian flood victims to identify the symptoms of mental distress is in demands (O'Connor et al., 2010). In addition, most instruments for measuring stress, anxiety, depression and trauma originally have been developed overseas and have adopted paper and pencil forms6-19 (Hussain et al., 2014). Therefore, e-Psychological Instrument for Flood Victims Version I (e-PIFV-I) has been developed to provide a social innovation tool to solve community mental issues efficiently.
The stress/depression/anxiety/trauma subscale of the instrument is operationalised as the extent to which a flood victim experiences stress/depression/anxiety/trauma that is characterised by symptoms of stress/depression/anxiety/trauma in terms of physiological, cognitive, emotional and behavioural aspects (O'Connor et al., 2010). Figure 1 is the conceptual framework of e-PIFV-I.

Figure 1. Conceptual framework
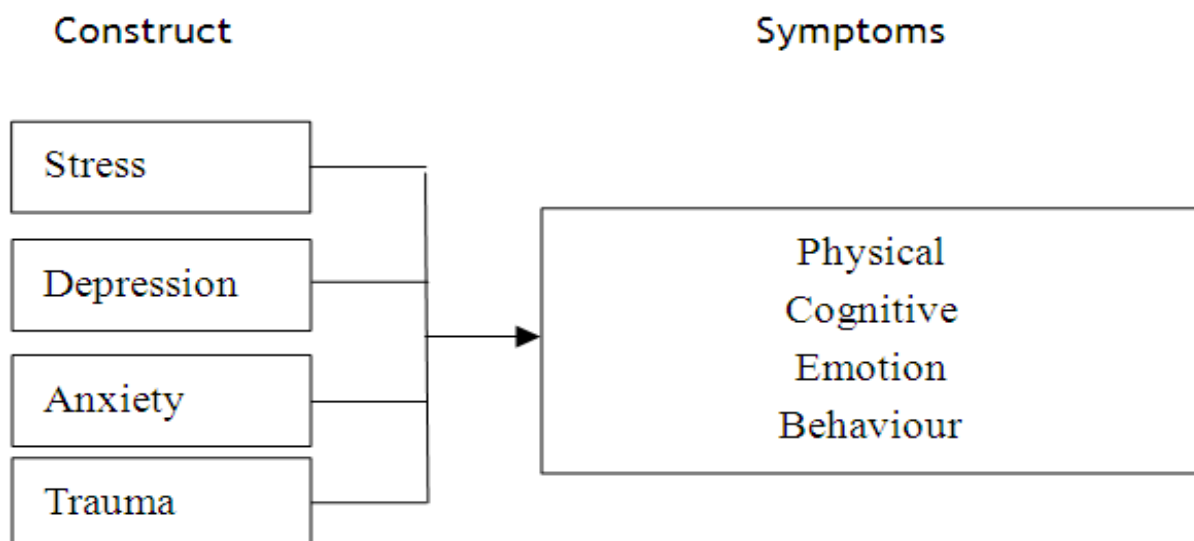
Methodology

The process of developing e-PIFV-I was done based on integrating the three models. Cohen proposed five steps for the development of a psychological test, while Gregory proposed six steps and Crocker recommended nine steps. The purpose of e-PIFV is to measure digitally stress, anxiety, depression and trauma among flood victims from age 12 years and above. The instrument uses 3 points Likert scales; yes, no and not sure (Yes = 3 marks, No = 0 mark, not sure = 1 mark). The score is used to prescreen the level of stress, anxiety, depression and trauma symptoms. The score of e-PIFV ranging from 0 – 63. They are three score level; 0 – 21 (low), 22 – 42 (moderate) and 43 – 63 (high) (Abdullah et al., 2015).

The e-IPFV-I covers four domains; physical, cognitive, emotional and behavioural reactions for each subscale. The examples of stress symptoms are "The muscles in my body feel tense" (physical stress symptom), "My mind is chaotic" (cognitive stress symptom), "I get upset easily" (emotional stress symptom) (Alshagga et al., 2015) and "I have a hard time getting up early" (behavioural stress symptom). The examples of anxiety symptoms are "I have chest pain frequently" (physical anxiety symptom), "I cannot control my anxiety" (cognitive anxiety symptom), "I am afraid of living alone" (emotional anxiety symptom) and "I find it difficult to relax" (behavioural anxiety symptom) (Chan et al., 2016). The examples of depression symptoms are "I get tired easily" (physical depression symptom), "I think slowly" (cognitive depression symptom) (Sauer et al., 2013). "I feel sad" (emotional depression symptom) and "I find it difficult to relax" (behavioural depression symptom). The examples of trauma symptoms are "My heart was pounding when reminded of floods" (physical trauma symptom), (Sipon, 2015). "I find it difficult to recall important experiences/events during the flood occurrence" (cognitive trauma symptom), "I feel frustrated when I am reminded of the flood disaster" (emotional trauma symptom) and "I often have nightmares" (behavioural trauma symptom) (Elklit et al., 2016).

The e-PIFV-I was designed as a digital self-administered instrument for non-illiterate individuals. However, the instrument also can be administered to illiterate individuals with the help of a reader or interviewer (Whittle, 2012). The e-PIFV-I takes 20 - 25 minutes to be completed. Three studies were conducted to screen and review items of e-PIFV-I. Study I was conducted to determine face validity, study II is to determine content validity and study III to determine content coefficients validity (Ezzati et al., 2014).

Study I

Face validity was derived from the evaluation of three experts in the field of language, psychology and counselling. A total of 264 items were developed at the beginning, which equally representing symptoms of stress, anxiety, depression and trauma based on theories,

models, concepts, literature and interview with the flood victims. Based on the evaluations, a total of 154 items were dropped due to repeated items. Therefore, the total items left for e-PIFV-I were 110 items (Mustaffa et al., 2014).

Study II

Content validity was derived from the evaluation of two experts from the field of psychology and counseling. As a result, a total of 26 items more were dropped which contained the same meaning items (Yusoff, 2014). Therefore, the total items left for e-PIFV-I were 84 items (Nasir, et al. 2012). There were 21 items for each subscale. Items for stress subscale were 4, 9, 10, 11, 12, 13, 14, 18, 27, 35, 42, 43, 44, 59, 60, 68, 69, 73, 74, 79, 82 ; anxiety subscale were 2, 3, 5, 6, 16, 17, 20, 21, 24, 28, 29, 37, 39, 40, 41, 48, 49, 63, 71, 75, 78; depression subscale were 1, 7, 8, 15, 22, 23, 25, 26, 30, 32, 34, 45, 47, 50, 51, 52, 53, 55, 57, 58, 67; trauma subscale were 19, 31, 33, 36, 38, 46, 54, 56, 61, 62, 64, 65, 66, 70, 72, 76, 77, 80, 81, 83, 84. The items or statements in the e-PIFV were in Malay language and were translated to English just for the purpose to write this paper (Table 1).

Table 1: Items/statements in the e-IPFV-I

No	Item	Subscale
1	*Saya rasa sedih* I feel sad	Depression
2	*Saya rasa resah* I feel restless	Anxiety
3	*Saya kerap panik* I often panic	Anxiety
4	*Saya rasa tertekan* I feel depressed	Stress
5	*Saya mudah cemas* I get anxious easily	Anxiety
6	*Pernafasan saya laju* I breathe rapidly	Anxiety
7	*Saya mudah rasa letih* I get tired easily	Depression
8	*Saya sukar untuk tidur* I have a hard time falling asleep	Depression
9	*Saya kerap rasa cemas* I often get anxious	Stress
10	*Saya rasa tidak tenang* I do not feel calm	Stress
11	*Saya mudah terasa hati*	Stress

	I am sulky person	
12	*Saya sukar bangun awal* I have a hard time getting up early	Stress
13	*Saya mudah rasa marah* I get upset easily	Stress
14	*Fikiran saya berkecamuk* My mind is chaotic	Stress
15	*Saya hilang selera makan* I lost my appetite	Depression
16	*Saya sukar untuk berehat* I find it difficult to relax	Anxiety
17	*Saya kerap rasa sakit dada* I have chest pain frequently	Anxiety
18	*Corak tidur saya terganggu* My sleeping pattern is disturbed	Stress
19	*Badan saya rasa tidak stabil* I feel unstable	Trauma
20	*Saya kerap rasa seram sejuk* I often feel goose bumps	Anxiety
21	*Perut saya rasa tidak selesa* I feel uneasy in the stomach	Anxiety
22	*Saya berfikir dengan perlahan* I think slowly	Depression
23	*Saya rasa tidak bersemangat* I feel hopeless	Depression
24	*Saya rasa sukar untuk menelan* I find it hard to swallow	Anxiety
25	*Ingatan saya semakin merosot* My memory is declining/deteriorating	Depression
26	*Saya rasa lebih baik saya mati* I think I would rather die	Depression
27	*Saya sentiasa berfikiran negatif* I always think negatively	Stress
28	*Saya kerap rasa berdebar-debar* I often feel anxious	Anxiety
29	*Saya takut tinggal berseorangan* I am afraid of living alone	Anxiety
30	*Saya rasa diri saya tidak berguna* I think I am useless	Depression
31	*Saya asyik berfikir hal yang sama*	Trauma

	I keep thinking the same thing	
32	*Saya lambat memberi tindakbalas*	Depression
	I was slow to react / My reaction is slow	
33	*Saya kerap teringatkan imej banjir*	Trauma
	I keep on seeing flood images	
34	*Saya rasa saya tiada masa depan*	Depression
	I feel I have no future	
35	*Otot-otot badan saya rasa tegang*	Stress
	The muscles in my body feel tense	
36	*Saya kerap mendapat mimpi buruk*	Trauma
	I often have nightmares	
37	*Saya rasa seolah-olah nak pengsan*	Anxiety
	I feel as if I am going to faint	
38	*Saya tidak mahu fikir tentang banjir*	Trauma
	I refuse to think about flood	
39	*Tapak tangan saya kerap berpeluh*	Anxiety
	My palms sweat profusely	
40	*Saya rasa bimbang sepanjang masa*	Anxiety
	I feel worried all the time	
41	*Tapak tangan saya kerap rasa sejuk*	Anxiety
	My palms often feel cold	
42	*Diri saya sukar untuk ditenteramkan*	Stress
	I am having difficulty to calm myself down	
43	*Saya sukar untuk berfikir dengan baik*	Stress
	I find it difficult to think properly	
44	*Saya sukar untuk membuat keputusan*	Stress
	I find it difficult to make decisión	
45	*Saya sukar untuk memulakan sesuatu*	Depression
	I find it difficult to start something	
46	*Saya panik apabila hujan semakin lebat*	Trauma
	I am in a panic state whenever it rains heavily	
47	*Saya rasa saya membebankan orang lain*	Depression
	I guess I am a burden to others	
48	*Saya kerap rasa tangan saya menggeletar*	Anxiety
	I often feel my hands trembling/shaking	
49	*Saya tidak dapat mengawal kerisauan saya*	Anxiety
	I cannot control my anxiety	
50	*Saya hilang minat untuk melakukan sesuatu*	Depression
	I lost interest to do something	

51	*Saya sukar fokus terhadap sesuatu perkara* I find it difficult to focus on something	Depression
52	*Saya rasa saya tiada harapan untuk berjaya* I feel like it is hopeless to succeed	Depression
53	*Saya rasa tidak berdaya untuk ubah hidup saya* I feel helpless to change my life	Depression
54	*Saya rasa tidak berdaya hadapi bencana banjir* I feel helpless to cope/deal with the flood disaster	Trauma
55	*Saya langsung tidak merasai kebahagiaan hidup* I did not feel the joy of life at all	Depression
56	*Saya mengelak daripada bercakap tentang banjir* I avoid from talking about floods	Trauma
57	*Saya tidak berdaya untuk mengatasi rasa murung* I am powerless to overcome depression	Depression
58	*Nada suara saya menjadi perlahan daripada biasa* The tone of my voice become slower than usual	Depression
59	*Daya penyelesaian masalah saya semakin menurun* My ability to solve problem is decreasing / declining	Stress
60	*Saya rasa tidak dapat menampung tugas harian saya* I feel that I am unable to cope with my daily task	Stress
61	*Secara tiba-tiba, saya berasa banjir akan berlaku lagi* Suddenly, I felt the flood coming again	Trauma
62	*Saya rasa kecewa apabila teringatkan bencana banjir* I feel frustrated when I am reminded of the flood disaster	Trauma
63	*Saya akan risau selagi sesuatu masalah tidak berakhir* I will be worried as long as something goes wrong	Anxiety
64	*Saya menjadi sangat takut apabila tiba musim tengkujuh* I am scared of monsoon season / I became very scared when the monsoon season happen	Trauma
65	*Saya rasa sesak nafas apabila teringatkan bencana banjir* I feel breathless / out of breath when reminded of flood disaster	Trauma
66	*Saya menjadi sangat takut apabila dengar bunyi air hujan* I became very scared when it rains	Trauma
67	*Saya rasa tidak gembira dengan semua yang saya lakukan* *I do not feel good about everything I do*	Depression
68	*Saya sukar untuk menerima sesuatu yang di luar jangkaan* I find it difficult to accept an unforeseen event	Stress
69	*Saya tidak ambil peduli apa yang berlaku di sekeliling saya* I do not care what happens around me	Stress

70	*Saya rasa seolah-olah bencana banjir akan berlaku semula* I feel like the flood is about to happen again	Trauma
71	*Saya rasa takut seperti sesuatu yang buruk mungkin berlaku* I fear that something bad is going to happen	Anxiety
72	*Jantung saya berdebar-debar apabila teringatkan bencana banjir* My heart was pounding when reminded of floods	Trauma
73	*Saya sering kecewa walaupun disebabkan hal yang remeh temeh* I always feel disspointed when dealings with trivial things	Stress
74	*Saya melepaskan geram kepada apa-apa sahaja secara tiba-tiba* I experience sudden angry outbursts	Stress
75	*Saya cuba mengelak perkara-perkara yang membimbangkan saya* I try to avoid things that worry me	Anxiety
76	*Saya menjadi sangat takut apabila melihat paras air semakin tinggi* I was scared when the level of water raising rapidly	Trauma
77	*Saya sukar untuk mengingati pengalaman penting ketika banjir berlaku* I find it difficult to recall important experiences/events during the flood occurrence	Trauma
78	*Saya risau dengan sesuatu yang tidak biasa dilakukan walaupun senang* I worried with unusual tasks even though it is easy	Anxiety
79	*Saya tidak dapat sabar jika ada sesuatu yang menghalang keinginan saya* I am impatient / intolerent if there is a distraction to my longing / desire	Stress
80	*Saya cuba menafikan bahawa saya pernah terlibat dengan bencana banjir* I am trying to deny that I have ever been involved in a flood disaster	Trauma
81	*Saya tidak mahu terlibat dengan apa-apa aktiviti yang berkait dengan banjir* I do not want / refuse to engage in any activities associated with flood	Trauma
82	*Saya cenderung bertindak keterlaluan apabila berhadapan dengan sesuatu masalah* I tend to over-react when faced with problem	Stress
83	*Saya rasa bersalah kerana tidak dapat elak daripada terlibat dengan bencana banjir* I feel bad for not being able to avoid getting involved in a flood disaster	Trauma
84	*Tragedi banjir menyebabkan saya hilang minat terhadap perkara yang saya suka sebelum ini* The occurrence of flood disaster caused me to lose interest in the things that I use to like	Trauma

Study III

Statistical analysis was done to determine content coefficients of the instrument. Two experts (a clinical psychologist and a psychiatrist) evaluated and reviewed the Othman et al.'s, (2016) items by completing a standardised rating form privately and returned the completed form to the researchers within two weeks. Data that retrieved from feedback forms were counted and then put in the 2 x 2 contingency table as in Figure 2.

Figure 2. 2 x 2 contingency table

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

Statistical analysis was done to determine content coefficients index based on the following content coefficient formula:

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

Results

Results showed that e-PIFV-I has face, content and content coefficient validity. In the study III-a, results showed that the content coefficient validity for each sub-scale of e-IPFV-I ranging from moderate to very strong validity, whereas in the study III-b coefficient values were improved to a very strong validity (Table 2).

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

Study III	Stress Subscale	Anxiety Subscale	Depression Subscale	Trauma Subscale	Overall Scale
a	0.6	0.9	1	0.6	0.8
b	0.8	0.9	1	0.8	0.9

Conclusion

This paper presents multiple validation studies to establish the content validity of e-PIFV-I. The researchers aim to apply the scepticism core value of scientific research which is accepted findings as accurate after they have been repeatedly verified. The other three core values which are applied are: accuracy which data is gathered and evaluated as carefully and error-free as possible, objectivity which data is gathered and evaluated without bias and open-mindedness, which is willing to change views when evidence suggests those views are inaccurate. In addition, this instrument is meant to prescreen mental distress symptoms for the flood victims. It is important to establish the content of the instrument based on multi resources including theory, literature and experts in a particular region because their experiences dealing with mental distress among locals are a vital need to establish good content validity. This instrument has a good content validity in the first place, however, with repeated studies of expert judgement method, the coefficient values have increased to a very strong level.

The e-PIFV-I is developed based on a synergistic approach which involves experts from various fields; psychology, counselling, languages, information technology and social innovation. The e-PIFV-I is planned as a research output and becomes an effective social innovation tool to prescreen flood victims' mental distress. It is aimed to offer alternative solutions to the flood administrators and the victims by producing a more objective and effective tool to cater to mental distress. This instrument will be a beneficial tool as it can help to save energy, time, expenses and experts limitation to serve in the ground in a particular of time.

Acknowledgement

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