



## Screening of post-traumatic stress disorder (PTSD) among flood victims in Indonesia<sup>☆</sup>



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### KEYWORDS

Flood;  
Post-traumatic stress disorder

### Abstract

**Objective:** The aim of this study was to screening PTSD among flood victims in Indonesia.

**Method:** Quantitative non-experimental research method with a descriptive cross-sectional study. There were 356 flooding victims who participated in this study using purposive sampling techniques. The questionnaire used was PCL 5 DSM-V to determine the incidence of PTSD.

**Results:** The results of the study reported that 52% experiencing PTSD, and 48% did not experience PTSD. The majority of symptoms of PTSD were re-experiencing (98.3%).

**Conclusions:** It can be concluded that the incidence of PTSD could arise at any age, gender, level of education and occupation by experiencing symptoms of re-experiencing, avoidance, negative alteration in mood cognition and hyperarousal. Hence, this study suggested improving intervention to decrease symptoms of PTSD.

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### Introduction

Flood is one of the most severe and preventable forms of natural disasters.<sup>1</sup> The number of disasters in Indonesia since 2011–2016 was dominated by hydro-meteorological disasters as much as 90%, where flooding events are the highest

occurrence at 30%, while whirlwind was 28%, landslides 22%, drought 5%, and forest & land fires around 3%.<sup>2</sup> According to The National Disaster Management Agency, flooding is an annual disaster and the most occurred in 2017 was 978 incidents in all regions of Indonesia which affected around two million people evaluated, 162 died and 106 injured. While the flooding in 2018 until February 2019 has reached 866 events.<sup>3</sup>

Natural disasters could impact indirect economic and property losses, physical injuries, deaths, and psychological injuries.<sup>1</sup> People who have witnessed the flood disaster will be at risk for experiencing Post Traumatic Stress Disorder (PTSD).<sup>4</sup> PTSD is a psychiatric disorder by people who have experienced in traumatic events included natural

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disasters, serious accidents, terrorist acts, war or fighting, rape, or other attacks. The main symptoms of PTSD are re-experiencing/intrusive (experiencing recurrence), avoidance symptoms (avoidance), negative stress and feelings and hyperarousal symptoms (symptoms of tension).<sup>5</sup> One study showed that PTSD symptoms in flood victims show a range between 8% and 80%.<sup>6</sup>

There were some factors related incidence of PTSD. The severity, duration, and closeness of exposure to traumatic conditions are risk factors for PTSD.<sup>7</sup> Coping and social supports were factors influences on PTSD.<sup>8</sup> Therefore, untreated PTSD is also a risk factor for increased suicide in major depressive disorders.<sup>9</sup> Individuals with PTSD experience increased sympathetic nerve activity which triggers an increase in catecholamine and heart rate which can be a risk factor for cardiovascular disorders and can also trigger metabolic disorders.<sup>10</sup> Some research in Indonesia was examined PTSD in Post-Tsunami Indonesia.<sup>11</sup> Studies that more comprehensive screening PTSD among flood victims in Indonesia are lacking. This study is the first to our knowledge to screening PTSD among flood victims in Indonesia. The aim of this study was to screening PTSD among flood victims in Indonesia.

## Method

This was a descriptive cross-sectional study encompassing 356 flooding victims who recruited by using purposive sampling techniques. This study was conducted in Jeneponto Regency, Indonesia. Some village was affected by floods. At the time of the floods, the village residents were shifted to nearby refugee tents built by the government and donation.

The data were collected using a questionnaire. The questionnaire used was PCL 5 DSM-V to determine the incidence of PTSD with symptoms of re-experiencing, avoidance, negative alterations in mood cognition. This questionnaire was developed by Weathers et al. (2013) with index Content Validity (CVI) 0.96.<sup>12</sup> This questionnaire has been translated and modified into Indonesian and has been validity and reliability measurment.<sup>13</sup> The researcher also tested the questionnaire with  $n = 356$  and obtained  $r \geq 0.113$ .

The results of the Cronbach's alpha of 0.875 on the reliability test conducted indicate that the instrument of PTSD signs and symptoms is reliable for use. In this study's validity and reliability, tests have been carried out, Cronbach's alpha test was 0.672. Data were analyzed using SPSS version 20. Frequency distributions and descriptive statistics were conducted to show participant characteristics.

The research received an ethics review and approval from relevant institutional review boards of the University with the ethical number 398/UN4.6.4.5.31/PP36/2019. The study was according to the Helsinki Declaration. Written informed consent was obtained after receiving an explanation of the aims and requirements of the research. Respondents could withdraw from the study at any time.

## Results

A total of 356 participants were included in the analysis. The majority of participants were adults with raging age 26–45 years old. Most of the participants were male

**Table 1** Characteristic of the sample.

Variable	<i>n</i>	%
<i>Age</i>		
18–25 years old (Late adolescent)	53	14.9
26–35 years old (Early adult)	87	24.4
36–45 years old (Late adult)	94	26.4
46–55 years old (Early elderly)	90	25.3
>55 years old	32	9.0
<i>Gender</i>		
Male	148	41.6
Female	208	58.4
<i>Marital status</i>		
Married	247	69.4
Not married	82	23.0
Widow/widower	27	7.6
<i>Educational level</i>		
Primary school	98	27.5
Junior high school	100	28.1
Senior high school	117	32.9
University	41	11.5
<i>Occupation</i>		
Farmer	93	26.1
Housewife	147	41.3
Government employee	11	3.1
Entrepreneur	54	15.2
Retired	1	0.3
Un-employee	50	14.0
<i>Time experienced</i>		
One month ago	77	21.6
Two months ago	279	78.4
<i>Exposure</i>		
One time	101	28.4
Two times	230	64.6
Three times	25	7.0
<i>Lost due to flooding</i>		
No	72	20.2
Family	12	3.4
Assets	259	72.8
Family and assets	12	3.7

**Table 2** Distribution of incidence of PTSD due to flooding.

Incidence of PTSD	<i>n</i>	%
Experiencing PTSD	185	52
Did not experience PTSD	171	48
Total of sample	356	100

(41.6%) and have married (69.4%) with occupation as a housewife (32.9%). The majority of participants are senior high school (32.9%), and 11.5% was graduated from university. The respondent felt at most two months ago with the most exposure to the incidents two times and lost the most assets due to flooding (Table 1).

Table 2 summarizes the distribution of the incidence of PTSD. The results showed that respondents who experienced

**Table 3** Frequency distribution of PTSD symptoms in flood victims.

Screening of symptoms	Incidence of PTSD			
	PTSD		Not PTSD	
	<i>f</i>	%	<i>f</i>	%
Re-experiencing	182	51.1	168	47.2
Avoidance	153	43.0	137	38.5
Negative Alteration in Mood Cognition (NAMC)	109	30.6	90	25.3
Hyperarousal	152	42.7	137	38.5

**Table 4** Cross-distribution of respondents' characteristics with symptoms of PTSD.

Variable	Total		The symptoms of PTSD								Did not experience PTSD	
			<i>Re-experiencing</i>		<i>Avoidance</i>		NAMC		Hyperarousal			
			<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
<b>Age</b>												
18–25 years old (Late adolescent)	53	52	98.1	40	75.5	27	50.9	39	73.6	34	64.2	
26–35 years old (Early adult)	87	86	98.9	73	83.9	52	59.8	70	80.5	43	49.4	
36–45 years old (Late adult)	94	94	100.0	82	87.2	53	56.4	81	86.2	35	37.2	
46–55 years old (Early elderly)	90	89	98.9	71	78.9	50	55.6	73	81.1	40	44.4	
>55 years old	32	29	90.6	24	75.0	17	53.1	26	81.3	19	59.4	
<b>Gender</b>												
Male	148	146	98.6	120	81.1	89	60.1	117	79.1	85	57.4	
Female	208	204	98.1	170	81.7	110	52.9	172	82.7	86	41.3	
<b>Marital status</b>												
Married	247	244	98.8	206	83.4	145	58.7	204	82.6	112	45.3	
Not married	82	80	97.6	61	74.4	41	50.0	61	74.4	50	61.0	
Widow/widower	27	26	96.3	23	85.2	13	48.1	24	88.9	9	33.3	
<b>Educational level</b>												
Primary school	98	96	98.0	84	85.7	57	58.2	79	80.6	48	48.9	
Junior high school	100	99	99.0	80	80.0	55	55.0	85	85.0	58	58.0	
Senior high school	117	115	98.3	96	82.1	72	61.5	98	83.8	41	35.0	
University	41	40	97.6	30	73.2	15	36.6	27	65.9	24	58.5	
<b>Occupation</b>												
Farmer	93	92	98.9	78	83.9	53	57.0	74	79.6	48	51.6	
Housewife	147	145	98.6	125	85.0	85	57.8	125	85.0	48	32.7	
Government employee	11	10	90.9	6	54.5	3	27.3	6	54.5	8	72.7	
Entrepreneur	54	53	98.1	44	81.5	35	64.8	43	79.6	28	51.9	
Retired	1	0	0	1	100.0	0	0	1	100.0	1	100.0	
Un-employee	50	49	98.0	36	72.0	22	44.0	40	80.0	38	76.0	
<b>Time experienced</b>												
One month ago	77	77	100.0	69	89.6	54	70.1	58	75.3	35	45.5	
Two months ago	279	273	97.8	221	79.2	145	52.0	231	82.8	136	48.7	
<b>Exposure:</b>												
One time	101	101	100.0	82	81.2	64	63.4	84	83.2	44	43.6	
Two times	230	225	97.8	190	82.6	123	53.5	187	81.3	109	47.4	
Three times	25	24	96.0	18	72.0	12	48.0	18	72.0	18	72.0	
<b>Lost due to flooding</b>												
No	72	72	100.0	59	81.9	40	55.6	60	83.3	52	72.2	
Family	12	12	100.0	10	83.3	8	66.7	11	91.7	2	16.7	
Assets	259	253	97.7	211	81.5	144	55.6	210	81.1	112	43.2	
Family and assets	13	13	100.0	10	76.9	7	53.8	8	61.5	5	38.5	

NAMC: Negative Alteration in Mood Cognitions.

PTSD in flood-affected were 52.0%, while those who did not experience PTSD were 48.0%.

The results of the study showed that the symptoms of PTSD most experienced by respondents were the symptoms of re-experiencing (98.3%), with experiencing PTSD as much as 51.1% and did not experience PTSD (47.2%) (Table 3).

Table 4 describes of cross-tabulation of characteristic respondents and the symptoms of PTSD. This study showed that the majority of respondents who experienced PTSD symptoms were late adulthood (36–45 years) reported re-experiencing symptoms by 100%, avoidance by 87.2%, and hyperarousal by 86.2% while NAMC in early adults was 59.8%. Both males and females were shown re-experiencing the symptoms of PTSD. The majority of jobs experiencing PTSD symptoms were housewife 98.9%, 85.0% avoidance, and 85.0% hyperarousal, the majority of farmers experienced 98.9% re-experiencing and 64.8% NAMC for Entrepreneur.

## Discussion

This study described screening PTSD among flood victims in Indonesia. This study showed that the majority experienced in PTSD had ages ranging from 26 to 55 years old or middle adulthood. In middle adulthood, the demands of work, family, and family responsibilities could enhance stress reactivity and reduce coping resources.<sup>14</sup> Related to gender, the most experiencing PTSD was female. The synthesis of female serotonin is lower, where serotonin would carry input to neurotransmitters in the brain. A low level of serotonin would affect one's susceptibility to depression. Female was more sensitive to threats, stressors and use less effective coping and think of a disaster faced negatively.<sup>15</sup>

As well as exposure to events, loss of relatives, property, and even though not lose anything, it shows that respondents experienced PTSD events. Loss of family/relatives and property would affect the welfare of one's life after experiencing a traumatic event.<sup>16</sup> The results showed that symptoms of re-experiencing were the highest symptoms experienced by residents who affected by flooding. Repeated memories experienced by respondents about the events experienced by almost half of respondents namely 98.3%. Othman et al. (2016) revealed that there are flashbacks of memories about traumatic events experienced by people experiencing PTSD. All age levels of respondents almost all of them experienced symptoms of re-experiencing.<sup>17</sup> The memory of a traumatic event in PTSD sufferers will remain, where certain stimuli could recall a traumatic event that someone has experienced.<sup>18</sup>

This result obtained that avoidance and hyperarousal symptoms almost equally had several respondents that experienced PTSD event. Some respondents said that they tried to avoid things that reminded of the recent flood events because they were so traumatized. This avoidance is also a person's strategy to make the experience of trauma as a form of coping with increasing mastery of oneself.<sup>19</sup> Meanwhile, the symptoms of negative alterations in mood and cognition were the lowest symptoms experienced by respondents. This is related to symptoms that cause a person to experience excessive emotions and erroneous emotions such as negative evaluations of oneself, others and the environment around.<sup>20</sup>

## Conclusions

It can be concluded that the incidence of PTSD could arise at any age, gender, level of education, and occupation by experiencing symptoms of re-experiencing, avoidance, negative alteration in mood cognition and hyperarousal. Symptoms felt after a traumatic event and repeated exposure and loss during a disaster will be a risk of PTSD. Hence, this study suggested to improving intervention to decrease symptoms of PTSD.

## Conflict of interest

The authors declare no conflict of interest.

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