

## ORIGINAL ARTICLE

# PREVALENCE AND PERCEIVED SEVERITY OF POST-TRAUMATIC STRESS DISORDER AMONG FLOOD VICTIMS IN KUALA TERENGGANU, MALAYSIA

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## ABSTRACT

Floods can lead to direct economic and property losses and result not only in physical injuries and deaths but also in psychological trauma. Post-traumatic stress disorder (PTSD) is a commonly used indicator to evaluate psychological injuries after disaster. This study aimed to determine the relationship between PTSD prevalence and related perceived severity of post flood impact by economical, non-economical and flood status severity domains besides relevant socio-demographic factors according to gender specific analysis. This cross-sectional study was conducted among community in Kampung Hulu Takir, Kuala Terengganu, Malaysia in 2015 two weeks after flood. It included a total of 98 males and 110 females aged 18 years and above. Data was collected by interview-guided questionnaire to determine the prevalence of PTSD. SPSS version 21.0 was used for analysis of the relationship between socio demographic factors, perceived economic, non-economic and flood severity with PTSD. Finally chi square test was used to assess the predictors of PTSD according to gender. The prevalence of PTSD was 9.2% in males and 10.9% in females, giving a total of 10.1%. Significantly higher prevalence of PTSD was found in severely perceived economic and flood impact categories (33.3% and 23.8% in males; 23.8 % and 37.5% in females) and giving in overall 44.0% and 31.3 % respectively. Effective PTSD management strategies targeting females post flood victims who severely perceived economically and nature flood impact should be implemented in order to prevent further consequences of PTSD.

**Keywords:** *Post traumatic stress disorder (PTSD), prevalence, perceived severity, gender specific analysis*

## INTRODUCTION

Flood is a regular natural disaster in Malaysia which happens nearly every year during the monsoon season. A flood can devastate homes, commercial buildings, agricultural and pastoral lands, public goods, and other physical properties. However, during the flood and its aftermath, there are also threats to one's health and safety.

As part of the northeast monsoon, heavy rains since 17 December 2014 forced 3,390 people in Kelantan and 4,209 people in Terengganu to flee their homes. By 23 December, most rivers in Kelantan, Pahang, Perak and Terengganu had reached dangerous levels. Due to rising water levels, most businesses were affected and about 60,000 people were displaced in the next day. The state of Kelantan had the most evacuees (20,468 to 24,765), followed by Terengganu (21,606), Pahang (10,825), Perak (1,030), Sabah (336) and Perlis (143) The situation continues to worsen in Kelantan and Terengganu, due to heavy rain. Most roads in Kelantan have been closed. The worst-hit district in Terengganu is Kemaman, followed by Dungun, Kuala Terengganu, Hulu Terengganu, Besut and Marang<sup>1</sup>.

Post-Traumatic Stress Disorder (PTSD) following floods is not uncommon and particularly prevalent when the loss is severe and recovery difficult. PTSD is a severe anxiety disorder that can develop after exposure to any event resulting in psychological trauma<sup>2</sup>. The consequences flood may involve the threat of death to oneself or to someone else, or to one's own or someone else's physical, sexual, or psychological integrity, overwhelming the individual's ability to cope. As an effect of psychological trauma, PTSD is less frequent and more enduring than the more commonly seen acute stress response.

During the flood crisis community support is high and the event receives prominence in the media. However, once the event has passed the sense of loss and withdrawal of support can be profound. PTSD is a serious condition that requires professional intervention and management. It is vital that victims of the flood should be encouraged to seek such help.

In Malaysia, the government has established the Natural Disaster Management and Relief Committee (NDMRC) in 1972 and it was given the task of coordinating flood relief operations at

every stage of national, state and district levels with the combined aims of reducing flood damage and to preventing loss of human life. However, the devastating flood in 2014 showed poor coordination at local level and has contributed to poor response following the disaster<sup>3</sup>. This can have psychological consequences such as PTSD among flood victims. After immediate needs are met and before survivors can return home, there is often a period ranging from a few days to several months where a large number of people are housed in temporary facilities. In such a situation, survivors require not only material relief but also psychological support to reduce the psychological trauma arising from the event.

Regarding the global prevalence of PTSD, the prevalence of PTSD documented after natural disasters is often lower than the rates documented after human-made and technological disasters<sup>4</sup>. This may stem from a lower average dosage of exposure among people exposed to the disaster and it is supported by a study in Turkey earthquakes that showed a higher prevalence of PTSD closer to the epicenter compared to 100km away<sup>4</sup>. Overall studies of natural disaster reported prevalence of PTSD ranging from 3.7% to 60% in the first 1-2 years after the disaster, with most studies reporting prevalence estimates in lower half of this range<sup>5,6,7</sup>.

Thus, intervention strategies must be planned to help victims cope with the psychological trauma such as PTSD which may interfere with their lives. Eventhough existing health sector collaborating and coordinating with partners, devastating effects of disaster (flood) to such a mass vulnerable population, it is required to plan this post-disaster (flood) preventable health care services project. Other than that, there are very few studies that had been conducted in Malaysia previously regarding natural disaster and the prevalence of PTSD. Not much literature review can be found regarding post disaster PTSD as compared to post war PTSD. Thus, the knowledge on PTSD is also relatively low among Malaysians and many do not realize that they even have PTSD. This study is also important as it sends a crucial message to the Malaysian government regarding the prevalence of PTSD and related factors, states that this issue needs proper attention from the medical community as well as the government.

## MATERIALS AND METHODS

This cross-sectional study was conducted at Kampung Hulu Takir, Kuala Terengganu. Kampung Hulu Takir is composed of 7 small villages. Out of them, only 4 villages were affected by the flood. Kampung Hulu Takir, with a population of 250

people, was selected for this study survey purposively based on accessibility and availability. Study participants were every adult (18 years old and above) from each house in this area was interviewed by using the questionnaires related to prevalence and predictors of post-traumatic stress disorder among victims in flood affected areas. The questionnaires comprised of 3 main sections with 34 questions all in all: 9 questions in section A for personal identification data and socio-demographic data, 16 questions in section B for the severity of the flood, and 9 questions in section C to for PTSD screening. To check the validity and reliability of the questionnaires, a pilot study had been conducted among 75 adults in Kampung Lembah Harapan, Seberang Takir. Verbal consent had been taken from all respondents prior to the interview conducted by trained third year medical students from Universiti Sultan Zainal Abidin. All interviewees were explained in details about full description of the research, confidentiality and voluntary participation. Universal sampling was applied for the survey. Those who failed to answer all questions and those who were not at home during the study period will be excluded in this study. Samples were collected by means of an interview-guided semi-structured questionnaire for PTSD prevalence.

Data analysis was done using 'Statistical Package for Social Sciences' (SPSS) Version 21.0. Descriptive and statistics analytical tests were computed using this software. Statistical significance level was taken at the  $p$  value  $< 0.05$  with 95% confidence intervals (CI). Data screening and exploration was done with normality test for continuous data distribution using the Kolmogorov-Smirnov test and found that the data was normally distributed. The continuous variables was summarized by using means and standard deviations (SD) and mostly categorized as required and presented as the number (n) and percentage (%). Pearson's chi-square test or Fisher's exact test was applied for categorical variables and Pearson's correlation test for numerical variables.

## RESULTS

### Characteristics of Respondents

A total of 208 respondents of 98 (47.1%) males and 110 (52.9%) females were included in this study (Table 1). Most of them were married (77.9%) rather than being single or had divorced or separated. In terms of educational level, 75.0% had low education (up to secondary school only) and it was similarly distributed in both genders. Forty five percent of the respondents were not working; however unemployed females had rather higher proportion (63.6%) rather than males (24.5%).

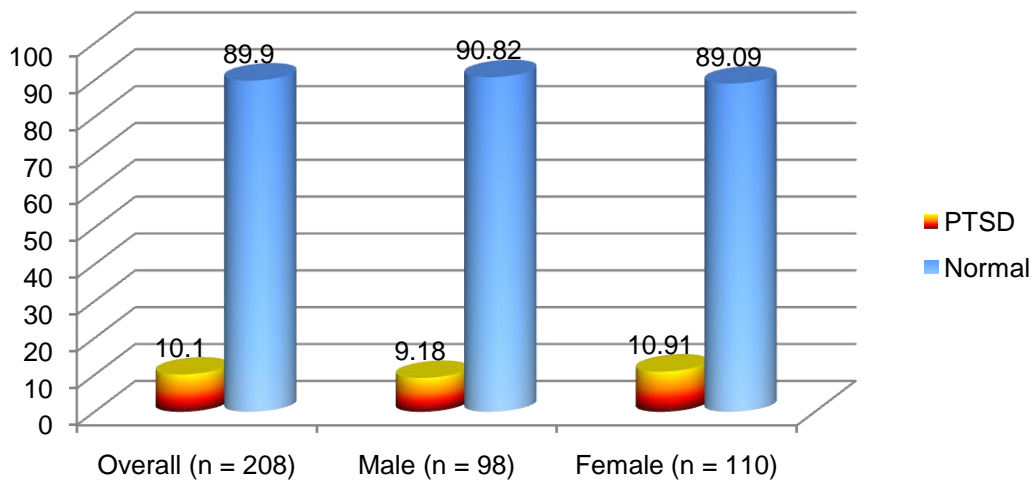


Figure (1) Prevalence of PTSD (%)

Majority of respondents come from low income family and it was similarly distributed in both genders. Ten percent of the respondents had

PTSD; however females had rather higher proportion (10.9%) rather than males having PTSD (9.2%) (Figure 1).

Table 1. Characteristics of Respondents by gender (n = 208)

Characteristics	Total (n=208)	Male n(%) <sup>a</sup> (n=98)	Female n(%) <sup>a</sup> (n=110)
Age (Years)	42(16) <sup>b</sup>	41(16) <sup>b</sup>	43(16) <sup>b</sup>
Age group			
18 to 25 (Young adult)	41(19.7)	18(18.4)	23(20.9)
26 to 55 (Middle age)	125(60.1)	63(64.3)	62(56.4)
56 and above	42(20.2)	17(17.3)	25(22.7)
Marital Status			
Single	46(22.1)	26(26.5)	20(18.2)
Married/Widow/Widower	162(77.9)	72(73.5)	90(81.8)
Occupations			
unemployed	94(45.2)	24(24.5)	70(63.6)
employed	114(54.8)	74(75.5)	40(36.4)
Education Level			
Low Education Level	156(75.0)	77(78.6)	79(71.8)
High Education Level	52(25.0)	21(21.4)	31(28.2)
Income Status			
Below RM2000 (Low Income Status)	175(84.1)	83(84.7)	92(83.6)
RM2000 and above (High Income Status)	33(15.9)	15(15.3)	18(16.4)
Prevalence of PTSD			
PTSD	21(10.1)	9(9.2)	12(10.9)
Not PTSD	187(89.9)	89(90.8)	98(89.1)

<sup>a</sup>= Number (percentage), <sup>b</sup> = Mean (standard deviation), PTSD = Post Traumatic Stress Disorder

Table 2 showed the perceived severity of post flood economic impact by gender. The questionnaire includes the house ownership, living years in house, type of house, furniture damage, electric appliances and vehicles accessibility and availability, direct post flood loss cost and indirect cost of post flood loss such as abstinence from work in days. All questionnaires were responded as

“Yes” and “No” and scored 1 for “Yes” and 0 for “No” response, then sum up and did cutoff score at 6 and categorized sever (>=6) and non-severe (< 6). Twelve percent (25 persons) of overall respondents perceived severely towards post flood economic impact and it was similarly distributed in both genders.

**Table 2. Gender specific perceived severity of post flood economic impact**

Characteristics		Total (n =208)	Male n(%) <sup>a</sup> (n=98)	Female n(%) <sup>a</sup> (n=110)
House ownership	Rent	6(2.9)	2(2.0)	4(4.36)
	Own	202(97.1)	96(98.0)	106(96.4)
Live in house (Yrs)	≥ 5 years	183(88.0)	88(89.8)	95(86.4)
	< 5 years	25(12.0)	10(10.2)	15(13.6)
Type of house	Detached/wooden	199(95.7)	94(95.9)	105(95.55)
	Terrace	1(0.5)	0(0.0)	1(0.9)
	Bungalow	8(3.8)	4(4.1)	4(3.6)
Furniture	Yes	36(17.3)	81(82.7)	19(17.3)
	No	172(82.7)	17(17.3)	91(82.7)
Electric applicants	Yes	14(6.7)	5(5.1)	9(8.2)
	No	194(93.3)	93(94.9)	101(91.8)
Vehicles	Yes	19(9.1)	11(11.2)	8(7.3)
	No	189(90.9)	87(88.8)	102(92.7)
Others	Yes	3(1.4)	2(2.0)	1(0.9)
	No	205(98.6)	96(98.0)	109(99.1)
Household damage	Yes	58(27.9)	29(29.6)	29(26.4)
	No	150(72.1)	69(70.4)	81(73.6)
Direct cost of post flood loss	No loss	151(72.6)	70(71.4)	81(73.6)
	RM <1000	35(16.8)	16(16.3)	19(17.3)
	RM 1000-3000	21(10.1)	12(12.2)	9(8.2)
	RM >3000	1(0.5)	0(0.0)	1(0.9)
Indirect cost of post flood loss (Abstainance from work_days)	>= 3 days	58(27.9)	36(36.7)	22(20.0)
	< 3 days	150(72.1)	62(63.3)	88(80.0)
Perceived economic impact	Severe	25(12.0)	12(12.2)	13(11.8)
	Non-severe	183(88.0)	86(87.8)	97(88.2)

<sup>a</sup>= Number (percentage)

Table 3 showed the perceived severity of post flood non-economic impact by gender. The questionnaire includes the water supply, electricity, food and any depletion of basic amenities; flood related family member loss and health impairment. All questionnaires were responded as “Yes” and “No” and scored 1 for

“Yes” and 0 for “No” response, then sum up and did cutoff score at 3 and categorized sever (=>3) and non-severe (< 3). Only one percent (only two persons) of overall respondents perceived severely towards post flood non-economic impact and it was similarly distributed in both genders.

**Table 3. Gender specific perceived severity of post flood non-economic impact**

Characteristics		Total (n=208)	Male (n=98)	Female (n=110)
Water supply	Yes	1(0.5)	0(0.0)	1(0.9)
	No	207(99.5)	98(100.0)	109(99.1)
Electricity	Yes	5(2.4)	3(3.1)	2(1.8)
	No	203(97.6)	95(96.9)	108(98.2)
Food	Yes	1(0.5)	1(1.0)	0(0.0)
	No	207(99.5)	97(99.0)	110(100.0)
other	Yes	3(1.4)	1(1.0)	2(1.8)
	No	205(98.6)	97(99.0)	107(98.2)
Depleted basic amenities	Yes	10(4.8)	5(5.1)	5(4.5)
	No	198(95.2)	93(94.9)	105(95.5)
Flood related family member loss	Yes	1(0.5)	0(0.0)	1(0.9)
	No	207(99.5)	98(100.0)	109(99.1)
Health Impairment	Yes	10(4.8)	7(7.1)	3(2.7)
	No	198(95.2)	91(92.9)	107(97.3)
Perceived non-economic impact	Severe	2(1.0)	1(1.0)	1(0.9)
	Non-Severe	206(99.0)	97(99.0)	109(99.1)

<sup>a</sup>= Number (percentage)

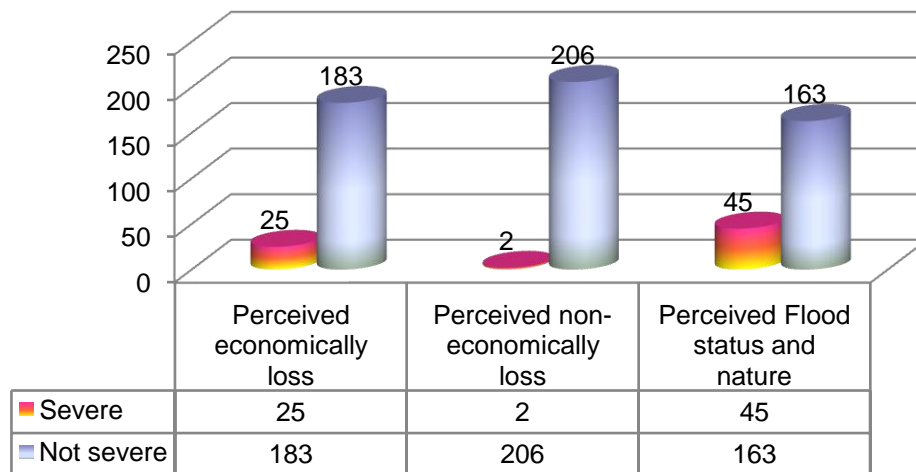


Figure (2) Perceived post flood impact severity (economic, non-economic, flood status & nature) by respondents

Table 4 showed the perceived severity of post flood nature impact by gender. The questionnaire includes the individualized opinion of flood nature severity, frequency of flood experience, flooded inside house, flood level inside house, non-governmental social support, governmental social support, land transportation availability during flood. All questionnaires were responded as “Yes”

and “No” and scored 1 for “Yes” and 0 for “No” response, then sum up and did cutoff score at 4 and categorized sever ( $\geq 4$ ) and non-severe ( $< 4$ ). Twenty two percent (45 persons) of overall respondents perceived severely towards post flood nature impact and it was similarly distributed in both genders (Figure 2).

Table 4. Gender specific perceived severity of post flood nature impact

Characteristics		n(%) <sup>a</sup>		
		Total (n=208)	Male (n=98)	Female (n=110)
Individual opinion of flood severity	Mild	125(60.1)	54(55.1)	71(64.5)
	Moderate	62(29.8)	35(35.7)	27(24.5)
	Severe	21(10.1)	9(9.2)	12(10.9)
Frequency of flood experience	$\geq 3$	149(71.6)	71(72.4)	78(70.9)
	$< 3$	59(28.4)	27(27.6)	32(19.1)
Flooded inside house	Yes	68(32.7)	33(33.7)	35(31.8)
	No	140(67.3)	65(66.3)	75(68.2)
Flood wave high inside house	Yes	19(9.1)	12(12.2)	7(6.4)
	No	189(90.9)	86(87.8)	103(93.6)
Non-Governmental social support	Yes	28(13.5)	15(15.3)	13(11.8)
	No	180(86.5)	83(84.7)	97(88.2)
Governmental social support(Food, Money, Clothes)	Yes	49(23.6)	27(27.6)	22(20.0)
	No	159(76.4)	71(72.4)	88(80.0)
Land transportation availability during flood	Yes	141(67.8)	62(63.3)	79(71.8)
	No	67(32.2)	36(36.7)	31(28.2)
Perceived flood status	Severe	45(21.6)	21(21.4)	24(21.8)
	Non-severe	163(78.4)	77(78.6)	86(78.2)

<sup>a</sup>= Number (percentage)

Table 5 showed the association between socio demographic profile and predictors of perceived severity of post flood (economic, non-economic and flood nature) with PTSD of the respondents. There was significant association between perceived severity of post flood economic impact with PTSD among overall, males and females ( $p =$

0.000,  $p = 0.012$ ,  $p = 0.000$ ) and perceived severity of post flood nature impact with PTSD among overall, males and females ( $p = 0.000$ ,  $p = 0.02$ ,  $p = 0.000$ ). Almost all PTSD prevalent people were perceived not severely towards non-economic post flood impact.

There was no significant association with age, marital status, education, occupation, total family income and non-economic domain of post flood perceived severity with PTSD of respondents. The respondents who were 18 to 25 years old had higher prevalence of PTSD (12.2%) overall, and among females (17.4%) compared to older age group (9.6%) and (9.2%) respectively, however among men had lower prevalence of PTSD (5.6%) compared to older aged men (10.0%). The respondents who currently married had higher prevalence of PTSD (10.5%) overall, and among males (11.1%) compared to unmarried respondents (8.7%) and (3.8%) respectively, however among females had lower prevalence of PTSD (10.0%) compared to unmarried females (15.0%). The

respondents who were passed secondary education level only had higher prevalence of PTSD (13.5%) overall, among males (14.3%) and among females (12.9%) compared to higher educated respondents with PTSD (9.0%) overall, men (7.8%) and women (10.1%) respectively. Employed people had higher prevalence of PTSD among over all (12.3%), men (10.8%) and women (15.0%) compared to unemployed of those groups (7.4%), (4.2%) and (8.6%) respectively. The respondents who come from low income family had higher prevalence of PTSD (10.3%) overall, and among females (12.0%) compared to high income respondents (9.1%) and (5.6%) respectively, however among males had lower prevalence of PTSD (8.4%) compared to counterparts males (13.3%).

**Table (5) Gender specific analysis for associated factors**

Variables		Overall(n=208)		P <sup>a</sup>	Male(n=98)		P <sup>a</sup>	Female(n=110)		P <sup>a</sup>
		n (%)	No		n (%)	No		n (%)	No	
Age	Young age	5(12.2)	36(87.8)	.400 <sup>b</sup>	1(5.6)	17(94.4)	.479 <sup>b</sup>	4(17.4)	19(82.6)	.220 <sup>b</sup>
	Old age	16(9.6)	151(90.4)		8(10.0)	72(90.0)		8(9.2)	79(90.8)	
Marital status	Single	4(8.7)	42(91.3)	.485 <sup>b</sup>	1(3.8)	25(96.2)	.252 <sup>b</sup>	3(15.0)	17(85.0)	.377 <sup>b</sup>
	Married /divorce / widow	17(10.5)	145(89.5)		8(11.1)	64(88.9)		9(10.0)	81(90.0)	
Education status	Low level	7(13.5)	45(86.5)	.247 <sup>b</sup>	3(14.3)	18(85.7)	.296 <sup>b</sup>	4(12.9)	27(87.1)	.452 <sup>b</sup>
Occupation	High level	14(9.0)	142(91.0)	.179 <sup>b</sup>	6(7.8)	71(92.2)	.300 <sup>b</sup>	8(10.1)	71(89.9)	.232 <sup>b</sup>
	Unemployed	7(7.4)	87(92.6)		1(4.2)	23(95.8)		6(8.6)	64(85.0)	
Income status	Employed	14(12.3)	100(87.7)	.565 <sup>b</sup>	8(10.8)	66(89.2)	.415 <sup>b</sup>	6(15.0)	34(85.0)	.378 <sup>b</sup>
	Low	18(10.3)	157(89.7)		7(8.4)	76(91.6)		11(12.0)	81(88.0)	
Perceived economic impact severity	High	3(9.1)	30(90.9)	.000* <sup>b</sup>	2(13.3)	13(86.7)	.012* <sup>b</sup>	1(5.6)	17(94.4)	.000* <sup>b</sup>
	Severe	11(44.0)	14(56.0)		4(33.3)	8(66.7)		7(53.8)	6(46.2)	
Perceived non-economic impact severity	Non-severe	10(5.5)	173(94.5)	.808 <sup>b</sup>	5(5.8)	81(94.2)	.908 <sup>b</sup>	5(5.2)	92(94.8)	.891 <sup>b</sup>
	Severe	0(0.0)	2(100.0)		0(0.0)	1(100.0)		0(0.0)	1(100.0)	
Perceived post flood severity	Non-severe	21(10.2)	185(89.8)	.000* <sup>b</sup>	9(9.3)	88(90.7)	.020* <sup>b</sup>	12(11.0)	97(89.0)	.000* <sup>b</sup>
	Severe	14(31.3)	31(68.9)		5(23.8)	16(76.2)		9(37.5)	15(62.5)	
	Non-severe	7(4.3)	156(95.7)		4(5.2)	73(94.8)		3(3.5)	83(96.5)	

*n (%) = Number (Percentage), a = Pearson Chi-Square Test, b = Fisher's Exact Test*

**DISCUSSION**

**Related socio-demographic factors**

Based on this study, the prevalence of PTSD was 9.2% in males and 10.9% in females, giving a total of 10.1%. Significantly higher prevalence of PTSD

was found in severely perceived economic and flood impact categories (33.3% and 23.8% in males; 23.8 % and 37.5% in females) and giving in overall 44.0% and 31.3 % respectively from 208 respondents of Kg Hulu Takir, Seberang Takir.

PTSD is a common psychological disorder in disaster affected populations. It has been widely used to evaluate the psychological impact of natural disasters, accidents, and war<sup>8-16</sup>. The 10.1 % PTSD rate found in the flood-affected victims observed in this study was lower than that found by Wang and others among earthquake victims (24.2%) or than that observed by Zhou and others among rock-fall victims (43%)<sup>17,18</sup>. Similarly, it was lower than that estimated by Liu and others for victims of traffic accident (38.27%)<sup>19</sup>. Differences in the nature and severity of different types of disasters, in populations studied, and in study methodology make it difficult to reconcile the results from different studies. This study found that the risk of PTSD was higher in female victims than in male victims. Prevalence between genders was not significantly different. This finding is consistent with previous studies<sup>20-24</sup> and suggests that women may be more sensitive to the impact of flood than men. This study also found that males victims aged 25 years and above had higher PTSD rates than did males victims under aged 18 to 25 years while females victims aged 18 to 25 years had higher PTSD rates than did females victims aged 25 years and above but there was no significant difference between age groups. Several studies had also observed an increased risk of PTSD after natural catastrophes in victims aged 35 to 54 years<sup>25-28</sup>. Possibly, the explanation for the observed association between age and PTSD is, again, that older victims are more sensitive than younger victims to floods or other natural disasters for men and since being young females are more sensitive than older female victims.

According to this study, there was no significant association between marital status of respondents and presence of PTSD. Result concluded that there is higher proportion of having PTSD is found in married, divorced and widow respondents (10.5%) compared to the single respondents (8.7%) in overall, (11.1%) compared to (3.8%) in men and (15.0%) compared to (10.0%) for women<sup>29,30</sup>.

Result for women was supported by one research in California where unmarried women were having more stress than married women in whom married couple have most of their time together and they often supporting each other. While in unmarried women, living alone to handle all trouble and daily life activity make them easily stresses<sup>31</sup>. There was no significant association between educational level of respondents and presence of PTSD. There was higher proportion of having PTSD was found in low educational level respondents (13.5%) compared to the high educational level respondents (9.0%) among overall and 14.3%, 7.8% for men and 12.9% , 10.1% for women respectively. Education without self-motivation means nothing unless the individual forced himself to do so. This

study was supported by a statement in a journal; Int. J. Environ. Res. Public Health 2010 where those who are uneducated engage in the least stress , 31.7% compared with 54.76% of those with educations by factors that contributed to this matter are exposure to their status as being a student, office worker. On top of that, educated people are more likely to be involved in high level of work which requires a lot complicated solution while those who are uneducated are more towards simple daily work without stress.

The study revealed that there was no significant association between type of occupations of respondents and presence of PTSD. In conclusion, there is higher proportion of having PTSD was found in respondents who was employed (12.3%) as compared to unemployed respondents (7.4%) among overall and 10.8%, 4.2% for men and 15.0%, 8.6% for women respectively. From other study, it stated that employed person have 2.86 times more PTSD than that is not employed. This situation could be related to the job stress at work<sup>32</sup>. There was no significant relationship between household income and the presence of PTSD. In the literature review, people with lower income are expected to have PTSD compare to those with higher income. This is because, people with lower income are more likely to have problem to recover their loss. The difference in the results may be due to the limitation that occurs during the research<sup>32</sup>.

#### **Related perceived severity of post flood economic, non-economic and flood status**

Findings revealed that economic loss had a highly significant relationship with the presence of PTSD. The result is similar with previous study<sup>33, 34</sup>. Respondent with higher economic loss are more likely to develop PTSD compare to those with lower economic loss. This is because they have to spend more money to recover from their loss.

Besides, there was no significant association between non-economic loss factor and the presence of PTSD (p value is >0.95). The occurrence of PTSD is higher in respondents who were having lesser loss (10.2%) while there is no PTSD in respondents with higher loss. As there are only 2 respondents who were having PTSD associated to less non economical loss, this result is considered not significant and this may because of people there are rarely have any non-economic loss as shown in our result.

Furthermore, there was a significant association between flood status and PTSD (p value is <0.000).The occurrence of PTSD is higher among respondents who thought that the flood was severe (31.3%) as compared to those who thought that the flood was not severe (4.3%). This was because the gradient of severity of the disaster is directly

proportional to the stress endure by the victim<sup>33</sup>. The associations between perceived flood status severity and PTSD and perceived post flood economic impact severity and PTSD are expected and lend validity to these study findings. If floods cause PTSD, there should be a gradient of the relation from floods that are mild to intermediate to severe<sup>34</sup>.

### CONCLUSION

This cross-sectional community-based study suggested that PTSD occurred in 9.2% in males and 10.9% in females, giving a total of 10.1% of flood victims at Kampung Hulu Takir was discovered to be suffering from PTSD after the flood that occurred on Disember 2014. The findings of this study can provide baseline data for monitoring the effectiveness of national programs for the prevention and control of PTSD in Malaysia, especially among women aged 18 to 25 years old, single, unemployed, and come from low income status family with low education status. Resources for the prevention and control of PTSD can be mobilized and allocated based on the factors mainly need to emphasize that prevalence of PTSD varies according to perceived severity of post flood economic impact and type, nature and status of flood impact identified significantly with PTSD. Further studies need to be done to assess the main predictors associated with PTSD in this community.

### ACKNOWLEDGEMENT

We would like to express our gratitude and generous acknowledge to Faculty of Medicine, UniSZA Medical Centre for the support and providing the golden opportunity for me to conduct this community study project. We are grateful to Professor Dr Nordin Bin Simbak, Dean, Faculty of Medicine, UniSZA, Kuala Terengganu Kampus for his support and permission to publish. This study was conducted using the Year 3 M.B., B.S program requisite of community oriented survey data. So our sincerely heartfelt thanks go to year 3 students who involved actively and helpfully during study conduct period.

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