

ORIGINAL ARTICLE

**PSYCHIATRIC MORBIDITIES AMONG POST FLOOD  
ELDERLY VICTIMS IN KELANTAN, MALAYSIA**

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**Abstract**

**Objective:** The objective of this study was to assess the depression, Post-Traumatic Stress disorder (PTSD) and its associated factors among the elderly flood victims in Tumpat, Kelantan. **Methods:** A cross-sectional study was conducted in February 2015 in three villages in Tumpat, Kelantan. Face to face interviews were conducted using socio-demographic performa, Malay version Geriatric Depression Scale 14 (M-GDS 14), Malay version Trauma Screening Questionnaire (TSQ) and flood-related questionnaires. **Results:** One hundred elderly respondents completed the study. The prevalence of depression and traumatic stress was 15.0% and 17.8%, respectively. The risk factors for depression are being female (Odds ratio [OR] = 5, 95% Confidence Interval [CI]: 1.27, 19.99), family history of mental illness (OR = 39.5, 95% CI: 1.41, 1063.08) and elderly with traumatic stress (OR= 5.38, 95% CI: 1.53, 18.9). There was significant correlation between depression and traumatic stress ( $r= 0.36$ ,  $p<0.001$ ). **Conclusion:** In the aftermath of a natural disaster, female and those who have PTSC are more likely to develop depression. It is suggested to expand this research to a bigger population as well as another flood affected states in Malaysia. *ASEAN Journal of Psychiatry, Vol. 17 (2): July – December 2016: XX XX.*

**Keywords:** Older Adults, Elderly, Post Traumatic Disorder, Depression, Psychological Impact, Post Disaster

**Introduction**

In Malaysia, floods are a natural disaster. However, the floods that hit from 15 December 2014 – 3 January 2015 was one of the worst floods to hit Malaysia, particularly the state of Kelantan [1]. Kelantan is one of the eleven states in Peninsular Malaysia. More than 200,000 people were affected while 21 were killed on the floods. This flood has been

described as the worst floods in the decades. There are ten districts in the state of Kelantan and Tumpat was one of the most affected districts in Kelantan, recording around 26,000 evacuees [2]. The population in this district is around 143,793. Majority of the population are Malays, and its economic activities are primarily centered on agriculture and as a tourist industry.

Mental disorders such as post-traumatic stress disorder (PTSD) and depressive illness are the common psychological effects among survivors of natural disaster [3]. Numerous studies have shown that elderly is one of the vulnerable groups that prone to be more affected by life events stress particularly natural disaster [4-6]. Rapid assessment of the Sichuan earthquake suggested that the greatest morbidity was among those over 60 years of age [5]. Study done among elderly Qiang citizens after Wenchuan earthquake in China showed that post-traumatic stress disorder remained elevated 3 years after the event [7]. This suggested that rapid needs assessment of older adults is important due to few reasons. One of the reasons is because this group constitute a substantial proportion of the population, especially in severely affected states and determining the prevalence of the vulnerable groups among this population will help in further planning. Furthermore, this group of people would need extra assistance to recover from the disaster [6].

The prevalence of depression among the elderly in Malaysia varies from 6.3% - 18%, depending on the location where the study was conducted or assessment scale used [8-11]. In the state of Kelantan, Malaysia, the prevalence recorded during a survey of elderly patients in the outpatient clinic in Hospital Universiti Sains Malaysia is 13.9% [8]. The prevalence is thought to be higher in the wake of natural disasters such as a flood. We conducted a community-based study two months after the event of major flood to determine the prevalence of psychiatric morbidities and its associated factors among elderly post-flood victims in Tumpat, Kelantan.

## **Methods**

A cross-sectional study was conducted from February to March 2015, 8 weeks after the flood at three villages in Tumpat, Kelantan, Malaysia. The study included aging respondents aged 60 years and above who has faced the recent flood in December 2014 and signed informed consent. Elderly who suffered from existing major psychiatry disorder such as schizophrenia, mood disorders and dementia were excluded from this study. Stratified sampling has been applied to choose three villages in Tumpat, Kelantan as the study

location for this research. The sample size was calculated based on the study by Imran et al. (2009) where the prevalence of depression is 13.9% [8], a confidence interval (CI) of 95% and 20% drop-out rate. The total sample size calculated was 120. However, only 100 participants were available in the villages chosen during the survey conducted. Universal sampling of the respondent was applied in this study, and written informed consent was taken. Subjects were interviewed to fill out the study tools. Three study tools have been used in this study: 1) A questionnaire on socio-demographic, medical, psychiatry and degree of house damage by the floods, 2) Malay version Geriatric Depression Scale (M-GDS-14), 3) Malay Version Trauma Screening Questionnaire (TSQ).

The basic socio-demographic questionnaire includes items such as age, gender, education and marital status. It also accessed the family dynamics of the respondents. Besides that, any past medical history, as well as any personal or family history of mental illness was also recorded. The researcher also inquired about the degree of house damage during the flood from the respondents.

The M-GDS-14 was chosen because it has been studied and proven effective in detecting depression among local elderly population [8, 12]. It comprises 14 items, making it a relatively easy scale to be used especially in the frail elderly. Furthermore, it has been translated and validated for the local population [12]. This questionnaire can be completed in five to seven minutes. It is a self-rating questionnaire and was administered with the help of a trained assistant. Subjects with the score of 8 and above on M-GDS-14 are in the depression group, while those with the score of less than 8 belong to the non-depression group [12]. In regard to TSQ, it is designed to use with survivors of all types of traumatic stress [13]. The 10 items questionnaire consists of five re-experiencing items and five arousal items. In this study, the validated Malay version of TSQ was used. At the optimal cut-off score of 5, the sensitivity, specificity, positive predictive value and negative predictive value of the questionnaire are 0.80, 0.85, 0.48 and 0.96 respectively. [14]

### **Data Analysis**

All data collected were analyzed using the SPSS version 22.0. The continuous variables were described in mean and standard deviation. Categorical data were described in frequency and percentage. Simple logistic regressions were performed on all the independent variables. Variables with *p* value < 0.25 were selected for multiple logistic regression analysis. The fitness of the model was tested using Hosmer and Lemeshow Test, classification table and receiver operating curve (ROC) curve for overall fit of the model. The Pearson correlation test was performed to assess the correlation between M-GDS-14 and TSQ.

### **Study Ethics**

The research proposal was approved by the Human Research Ethics Committee, Universiti Sains Malaysia (Reference number:

USM/JEPeM/15020035). Written informed consent was used in this study. The respondents who were found to have depression or post-traumatic stress disorder were referred to the nearest healthcare services for further evaluation and treatment.

### **Results**

There were a total of 100 respondents with 47% male and 53% female respectively in the study. Table 1 showed the characteristic of the respondents. Majority of the respondents are in the age group of 60-64 years old (33%). All the respondents were Malay. Majority of the respondents (76%) stayed with partner or extended family. None of our respondents had any history of mental illness. The prevalence of depression and post-traumatic stress disorders in this study were 15.0% and 17.8% respectively. The proportion of elderly survivors who met both criteria for PTSD and depression is 7% (n = 7).

**Table 1. Socio-demographic and clinical characteristic of the participants**

<b>Variables</b>	<b>ALL (N= 100) N (%)</b>	<b>Depressed (N=15) N (%)</b>	<b>Non-depressed (N=85) N (%)</b>	<b>P- value<sup>a</sup></b>
<b>Age</b>				
60-64	38 (38.0)	4 (26.7.0)	34(40.0)	-
65-69	24 (24.0)	6 (40.0)	18(20.2)	0.095
70-74	24 (46.0)	3 (20.0)	21(25.0)	0.677
75-79	10 (10.0)	0 (0.0)	10(11.9)	0.159
80 and above	4 (4.0)	2 (13.3)	2(2.4)	0.047
<b>Gender</b>				
Male	47 (47.0)	6 (40.0)	41(48.2)	-
Female	53 (53.0)	9 (60.0)	44(51.8)	0.013
<b>Marital Status</b>				
Single	1 (1.0)	0 (0.0)	1(1.2)	
Married	75 (75.0)	10 (60.0)	65(76.5)	0.908
Divorced	1 (1.0)	0 (0.0)	1(1.2)	1.000
Widowed	23 (23.0)	5 (40.0)	18(21.2)	1.000
<b>Education</b>				
Not Schooling	24	5 (33.3)	19 (22.4)	0.518
Primary School	52	10 (66.6)	42 (49.4)	0.458
Secondary School	20	0 (0.0)	20 (23.5)	0.959

Tertiary Education	4	0 (0.0)	4 (4.7)	-
<b>Family Members Living Together</b>				
Alone	8 (8.0)	2 (13.3)	6(7.0)	-
Partner only	16 (16.0)	0 (0.0)	16(18.8)	0.334
Children only	32 (32.0)	5 (33.3)	27(31.8)	0.825
Includes grandchildren	36 (36.0)	7 (46.7)	29(34.1)	0.732
Others	8 (8.0)	1 (6.7)	1(1.2)	0.999
<b>Presence of Caretaker</b>				
Present	76 (76.0)	10 (66.7)	66(77.6)	0.661
Absent	24 (24.0)	5 (33.3)	19(22.4)	
<b>Presence of Diabetes Mellitus</b>				
Present	30 (30.0)	5 (33.3)	25(29.4)	0.134
Absent	70 (70.0)	10 (66.7)	60(70.6)	
<b>Family History of Mental Illness</b>				
Present	2 (2.0)	1 (6.7)	1(1.2)	0.214
Absent	98 (98.0)	14 (93.3)	84(98.8)	
<b>Post-traumatic stress disorder</b>				
Present	17 (17.0)	7 (46.7)	10 (11.8)	0.004
Absent	83 (83.0)	8 (53.3)	75 (88.2)	

<sup>a</sup> analysis by simple logistic regression

Table 2 showed the degree of house damage due to the flood. Most of the houses (44%) are not damaged but are surrounded by water. Only nine per cent of the houses are damaged and not repairable. The percentage of the

respondents' houses that were not damaged but were surrounded by water was higher in the depression group (73.3%) however the percentage of house damage was higher in the non-depressed groups (30.6%).

**Table 2. Degree of house damage by the floods**

Variables	Overall (N = 100) N (%)	Depression (N =15) N (%)	No Depression (N =85) N (%)	P-value <sup>a</sup>
Total loss	0 (0.0)	0 (0.0)	0 (0.0)	
Damaged and not repairable	9 (9.0)	1 (6.7)	8 (9.4)	0.965
Damaged but repairable	20 (20.0)	2 (13.3)	18 (21.2)	0.382
House is inundated and evacuation is necessary	27 (27.0)	1 (6.7)	26 (30.6)	0.426
House is not damaged but is surrounded by water	44 (44.0)	11 (73.3)	33 (38.8)	

<sup>a</sup> analysis by simple logistic regression

Table 3 showed the risk factors for depression among the elderly participants. In the multivariate analysis, female (odds ratio (OR)

= 5.03, 95% CI: 1.27, 19.99; p = 0.002), having post- traumatic stress (OR = 5.38, 95% CI: 1.53, 18.91; p = 0.027) and presence of

family history of mental illness (OR = 39.5, 95% CI: 1.47,1063.08; p = 0.029). Pearson correlation test showed there was significant

correlation between post-traumatic stress disorder and depression (r= 0.36, p<0.001).

**Table 3. Multiple logistic regression analysis of associated factor for depression among elderly flood victims in Tumpat, Kelantan**

Variables	OR <sup>a</sup>	95% CI <sup>b</sup>	Wald <sup>c</sup>	p-value
Female	5.03	1.27, 19.99	5.26	0.002
Post-traumatic stress disorder (PTSD)	5.38	1.53, 18.91	6.90	0.027
Family history of mental illness	39.5	1.47, 1063.08	4.79	0.029

OR<sup>a</sup> = Adjusted OR<sup>a</sup> ; 95% CI<sup>b</sup> = Confidence interval; Wald<sup>c</sup> = Wald statistic

## Discussion

Elderly are vulnerable to higher morbidity following disaster, including psychological disorder [6]. Reasons for this vulnerability included due to pre-existing medical comorbidities, physical impairment, socioeconomic limitations, mental capacities to cope with sudden change in environment and dependency on others [5, 15]. Research has suggested that the type of disaster is not crucial in determining the psychological outcomes to those exposed to it [16]. Since there is limited research done on the effect of flooding [17] especially pertaining to the impact on elderly, other non-flood natural disaster such as earthquake, tsunami and hurricane is useful for comparison.

We noted that the prevalence rate of PTSD in this study is lower compared with most studies in elderly population [4, 5, 7]. In comparison, the prevalence of PTSD among the elderly after the Wenchuan earthquake in China was 26.3% [4] at 1 year and 22.7% at 3 years after the event [7]. Another study of PTSD among the elderly survivors showed prevalence of 22.5% after the Sichuan earthquake [5]. However, the prevalence of PTSD among elderly after Hurricane Mitch in Honduras is 13.6%, which is lower than our study [18]. In comparison with the local data, study on adult's survivors post tsunami December 2004 in Malaysia showed that the prevalence of PTSD is 19% [19]. However, the sample size in that study is very small (n = 64) [19].

Study regarding depression among elderly survivors after disaster is very limited. Most studies have been focusing on PTSD, therefore, lacking of attention to other types of

psychological morbidity such as depression [20]. In comparison, the prevalence of depression among an elderly conducted one year after Wenchuan earthquake is 35.2%, which is more than twice higher compared to our study [4]. However, our result is comparable to the prevalence of depression among elderly in Honduras (Mitch Hurricane) which is 18.8% [18]. We noted that our study prevalence rate was higher than the reported local prevalence [8], thus adding to the evidence that disaster is likely to increase the rates of mental disorder (new cases, relapses of old cases and aggravated pre-existing cases) [20].

The prevalence rates and types of the psychiatric morbidities reported varies possibly due to diversity in study methods, disaster type, magnitude of disaster, cultural difference in somatization and coping with the disaster [21]. The time frame after the disaster is also a crucial variable as the rate is expected to fall over time [20]. The other issue that needed to be considered is the difference in assessment instruments [3, 20]. Most of the assessment instruments used are mainly for general adult and may not be specific to assess the psychiatric problems in elderly. Furthermore, the assessment instrument should be validated to be used in that specific culture or language. The low prevalence rates in this study could be due to magnitude of the disaster, where flood is considered as low intensity and due to religious or cultural specific coping mechanism [21, 22].

Few risk factors were identified in our assessments that were women, having PTSD and family history of psychiatry illness. Studies have shown that women were more

likely to be depressed following a natural disaster than men in adult or elderly survivors [7, 23]. Researchers also have shown that women are more sensitive to threats, less likely to use effective coping strategies and tend to interpret disasters more negatively than men [4].

In this study, we found significant correlation between PTSD and depression. Those who have PTSD also have five times risk getting depression. Almost 50% of those depressed elderly in this study also had PTSD symptoms (n = 7). The relationship between PTSD and depression has been shown in many studies [24, 25]. There is the substantial amount of a symptom overlap between PTSD and depression. It has been suggested that high rates of comorbidity may be simply an epiphenomenon of the diagnostic criteria used. This high degree of a symptom overlapped can contribute to diagnostic confusion [24].

From our study, family history of psychiatry illness was found to be the risk factor for depression. This factor needed to be treated with caution because this factor probably was significant not because they were associated factor, but because of the vast discrepancy in the number of between depressed and non-depressed groups. Thus, we suggested large study of incidence is needed before any conclusive findings of associations between the factor discovered, and depression can be established. Screening for history of mental illness or family history of mental illness is difficult in Malaysia due to cultural stigma attached to mental health. Thus few many respondents will admit even if they do have the risk factors.

Some limitations of this study needed to be mentioned. The sample size of this study is small and cross-sectional in design. The questionnaire also limits assessment on other important factors related to post disaster issues such as bereavement, loss of income post-disaster, history of injury or witnessing injury/death, social or physical support or number of days evacuated.

However, this study does provide implications, especially to the public health authority or primary care provider. The rapid assessment done 8 weeks post disaster can highlight the

range number of elderly who are potentially in need of psychiatry attention. Elderly people are less likely to seek medical attention compare to younger adult, but they are more vulnerable [22]. Systematic screenings of the victims are preferable to routine clinical evaluation since most of the victims may suffer in silence, rather than seek psychological help, due to cultural stigma attach to mental health. Outreach services in the community may be effective targeting those at risk. Last but not least, intervention should be multidisciplinary not only for mental but also, physical, social, economic and spiritual or religious support. People use religion in various ways to cope with stressful situations [26]. Religious coping can be used as one of the ways to help the elderly cope with a stressful life event [26]. It can be defined as used of religious behaviours and practices to adapt or to deal with stressful events [27]. All the subjects in this study are Malay where Islam is the religion. Religious programme conducted for these groups of elderly would be helpful to help them cope with the stressful life events. As for the social support, providing group support or psychological aid is beneficial. In this part of the region, family plays an important role for social support. Thus strengthening the bonding among family members could provide support for the vulnerable groups.

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