

## ORIGINAL ARTICLE

HEALTH RELATED OUTCOMES OF TSUNAMI VICTIMS  
RESIDING IN THE COASTAL AREAS OF THE NORTHEAST  
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## ABSTRACT

A cross-sectional study was undertaken between April 2005 to July 2005 to determine the extent of the health problems experienced by individuals involved in the December 2004 tsunami wave disaster in the Northeast District of Penang, Malaysia. The overall health status of the respondents were evaluated using the Short Form 36 (SF-36) questionnaire. Out of 171 respondents, 160(93.6%) were Malays, 8(4.7%) were Chinese and 3(1.8%) were Indians. The mean age of respondents was 45.4 years + 15.9 years. Ninety-four of the respondents were males (55.0%) while 77(45.0%) were females. The overall mean physical component score was significantly lower ( $66.9 \pm 23.0$ ) amongst respondents with low education level compared with those with high education level ( $76.3 \pm 19.1$ ,  $p=0.004$ ). This mean score was also significantly much lower ( $68.7 \pm 22.3$ ) amongst those who are married compared to those who were not married ( $79.8 \pm 17.4$ ,  $p=0.003$ ). The overall mental health score was significantly much higher ( $78.8 \pm 14.6$ ) amongst those who were not married compared to those who were married ( $68.5 \pm 19.2$ ,  $p=0.001$ ). The overall mental health score was also significantly higher amongst those in the younger age-group ( $62.3 \pm 16.1$ ) compared to those in the older age-group ( $72.4 \pm 18.9$ ,  $p=0.005$ ). Based on the scores obtained on the Physical Health and Mental Health dimensions of the SF-36 questionnaire, it can be concluded that the health of victims with low education, elderly and those who were married were more adversely affected than others. Therefore, it is vital that medical as well as psychological attention should be channeled to these risk groups who responded more adversely to disasters.

**Key words:** Health outcomes tsunami victim, Penang

## INTRODUCTION

Disasters whether it is man-made or natural may adversely affect the life of individuals. The majority of individuals will experience physical, emotional and psychological distress in the immediate aftermath of a large scale disaster. This is a human response to inordinate adversity which naturally remit over time. However, some people experienced sustained difficulties that require professional intervention<sup>1</sup>. Major outcomes following a traumatic event include specific psychological problems such as Post-Traumatic Stress Disorder (PTSD), non-specific distress and other health problems and concerns such as somatic complaints, verified medical conditions and increase physiological indicators of stress<sup>2</sup>. Unless immediate actions are taken to overcome such problems, these may result in further deterioration of the general health of these individuals and may impede the rehabilitation process. This study is undertaken to determine the extent of the health problems experienced by individuals who were involved in the December 2004 tsunami wave disaster in the Northeast District of Penang, Malaysia. It is hoped that by identifying high risk individuals, help could be rendered to them appropriately.

## METHODOLOGY

A cross-sectional study was undertaken between April 2005 to July 2005 amongst adults aged 18 years and above residing in the tsunami stricken areas of the Northeast District of Penang. An adult aged 18 years and above from each household of the tsunami stricken areas who was involved in the tsunami disaster was randomly selected from the list of adults in every household. A standardized pre-tested questionnaire was used to collect data from the respondents. A one year license (Invoice No:F1-030305-21659) was obtained from Quality Metric Incorporated, USA to formally use and incorporate the SF-36 questionnaire into the standardized questionnaire. Since the SF-36 questionnaire was more relevant for adults, children were excluded from this study. The two main dimensions in the SF-36 questionnaire include "Physical Health" and "Mental Health". The components in "Physical Health" include scores on physical functioning, role physical, body pain and general health. Vitality, role emotional, social functioning and mental health scores contributed to the overall "Mental Health" score. Scores from all the various component of "Physical Health" and "Mental Health" were transformed

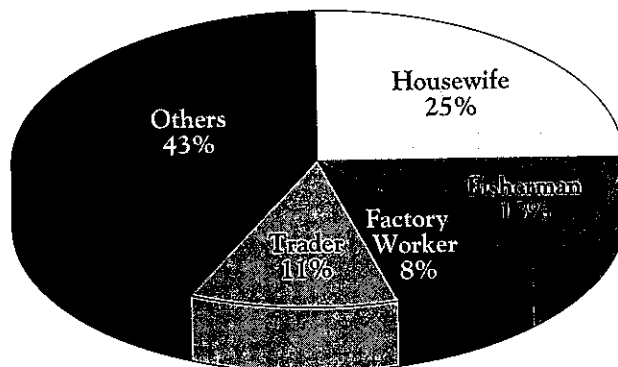
accordingly. Trained enumerators from local universities interviewed the respondents in either the Malay or English Language. Data was processed and analyzed using the SPSS software. The student t-test was used to determine whether there was any significant difference between the means of the two independent groups.

## RESULT

A total of 171 subjects responded in the study. Of these 160(93.6%) were Malays, 8(4.7%) were Chinese and 3(1.8%) were Indians. The mean age of respondents was 45.4 years + 15.9 years. Ninety-four of the respondents were males (55.0%) while 77(45.0%) were females. Out of the 171 respondents, 138(80.7%) were married while the remaining 33(19.3%) were either not married, divorced or widowed.

Figure 1 shows the distribution of respondents by occupation with the majority of the respondents being housewife (24.6%). Twenty-two (12.9%) of the respondents were fishermen while 18(10.5%) were traders.

Figure 1. Distribution of respondents by occupation



A total of 133 (77.8%) respondents were within the tsunami disaster area when the tsunami wave struck them with a total of 131 (76.6%) respondents actually witnessed and were directly involved with the tsunami wave disaster. The remaining 38 (22.2%) who were away from their homes during the disaster experienced destruction of their properties by the tsunami wave.

Table 1 shows the distribution of respondents by socio-demographic features and physical functioning and physical role scores. There was a significantly lower physical functioning score amongst those with lower education compared with those with higher education. The mean physical functioning and role physical score was significantly lower amongst those in the old age-group (60 years and above) compared to those in the younger age-group (below 60 years of age).

Table 2 shows the mean body pain and general health score which was significantly lower amongst those with lower education. The general health score was significantly lower in the older age-group compared to the younger age-group.

The overall mean physical component score was significantly lower amongst respondents with low education level (66.9+23.0) compared with those with high education level (76.3+19.1,  $p=0.004$ ). This mean score was also significantly much lower amongst those who were married (68.7+22.3) compared to those who were not married (79.8+17.4,  $p=0.003$ ).

Table 3 shows the distribution of respondents by the mean vitality and social function score. Although the mean scores for both vitality and social functioning was relatively higher amongst those with high education, not married, Malays and younger age-group these were not statistically significant.

Table 1. Distribution of respondents by socio-demographic features and physical functioning and role physical scores

Socio-Demographic Variables	Mean + SD of Physical Functioning Score	p-value	Mean+ SD of Role Physical Score	p-value
1. Education				
Low	72.6+31.3	*0.020	54.5+46.3	0.072
High	86.5+23.6		67.4+44.9	
2. Marital Status				
Not married	86.5+24.1	0.380	80.3+36.8	0.038
Married	76.1+29.7		55.1+46.8	
3. Ethnic				
Others	64.5+33.6	0.109	40.9+49.1	0.109
Malay	79.0+28.5		61.3+45.7	
4. Age-group				
Old	49.8+34.6	*0.000	21.9+41.3	*0.000
Young	84.9+22.9		69.0+42.5	

\*  $p < 0.05$

Table 2. Distribution of respondents by socio-demographic features and body pain and general health scores.

Socio-Demographic Variables	Mean + SD of Body Pain Score	p-value	Mean+ SD of Gen. Health Score	p-value
1. Education				
Low	83.8+23.4	*0.105	56.5+18.8	* 0.018
High	89.2+18.2		63.1+16.3	
2. Marital Status				
Not married	90.2+18.9	0.230	62.4+15.9	0.261
Married	85.1+21.9		58.5+18.5	
3. Ethnic				
Others	89.7+14.6	0.560	67.7+17.8	0.107
Malay	85.9+21.9		58.7+17.9	
4. Age-group				
Old	82.9+25.4	0.293	47.3+18.5	*0.000
Young	86.9+20.4		62.1+16.8	

\* $p < 0.05$ 

Table 3. Distribution of respondents by socio-demographic features and vitality and social functioning scores

Socio-Demographic Variables	Mean + SD of Vitality Score	p-value	Mean + SD of Social Function Score	p-value
1. Education				
Low	61.4+16.7	0.327	91.2+18.7	0.365
High	63.8+14.3		93.4+13.6	
2. Marital Status				
Not married	66.8+15.9	0.072	92.4+13.6	0.903
Married	61.3+15.6		92.0+17.4	
3. Ethnic				
Others	59.1+ 7.0	0.169	90.9+23.1	0.807
Malay	62.6+16.1		92.2+16.3	
4. Age-group				
Old	60.2+14.6	0.363	91.7+20.2	*0.867
Young	62.9+15.9		92.2+15.9	

 $p < 0.05$ 

There was a significantly higher mental health and role-emotional score amongst those who were not married compared to those who were married (Table 4). The mean role emotional score was higher amongst the younger age-group (67.6+45.4) compared with those in the older age-group (27.3+42.9).

The overall mental health component was significantly much higher (78.8+14.6) amongst those who were not married compared to those who were married (68.5+19.2,  $p=0.001$ ). The overall mental health component was also significantly higher amongst those in the younger age-group (62.3+16.1) compared to those in the older age-group (72.4+18.9,  $p=0.005$ ).

Table 4. Distribution of respondents by socio-demographic features and mental health and role emotional score

Socio-Demographic Variables	Mean + SD of Mental Health Score	p-value	Mean + SD of Role Emotional Score	p-value
1. Education				
Low	67.6+19.2	0.976	56.2+48.0	0.245
High	67.5+21.5		64.8+46.7	
2. Marital Status				
Not married	74.2+19.6	*0.035	81.8+37.4	*0.001
Married	65.9+19.9		54.6+48.3	
3. Ethnic				
Others	60.7+ 17.0	0.245	42.4+47.5	0.210
Malay	68.0+20.3		61.0+47.5	
4. Age-group				
Old	70.1+17.1	0.427	27.3+42.9	*0.000
Young	66.9+20.8		67.6+45.4	

$p < 0.05$

## DISCUSSION AND CONCLUSION

Different individuals react differently to disasters. In a study by Ouimette *et al*<sup>3</sup> on 134 medical patients, it was shown that there were both objective and subjective indices of poorer health as a consequence of trauma. However, the level of health impairment as a consequence of a traumatic event is much influenced by various socio-demographic factors such as age, gender, socio-economic status and ethnicity<sup>4</sup>.

It has been shown from this study that the overall health status of individuals after exposure to a disaster varies according to the marital status, education level and age-group. Married individuals had poorer health status than single individuals probably due to the added stress of being a parent and at the same time having to cope with the disaster that had befallen them. Norris<sup>2</sup> had shown that being a parent, elderly individuals and those from the lower socioeconomic group had poorer health outcomes after a disaster compared to other individuals. In another study by Evelyn *et al*<sup>5</sup>, it was similarly shown that older adults and those with low education are at higher risk of poor health outcome following exposure to a disaster compared to others.

Therefore in providing help to disaster victims, vulnerable groups such as the elderly should be given due attention. Apart from medical and social support, these individuals may require psychological support to help them recover from the aftermath of a disaster. The earlier these risk groups receive social and psychological support, the chance to regain good health will be better for them. The support rendered to these groups should be tailored according to their needs and this should be given due attention by various organizations that provide aid to disaster victims.

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