

The Prevalence and Mental Rehabilitation Outcome of Psychiatric Diseases and Quality of Life in Taiwan Survivors after Morakot Typhoon

Frank Huang-Chih Chou^{1,2}, MD, MS, PhD, Huei-Wen Angela Lo, EdD³, Joh-Jong Huang MD, MS⁴, Shu-Fang Su, MS¹, Min-Wei Huang MD, MS, PhD⁵, Pesus Chou Dr PH⁶, Chao-Yueh Su, MEdu⁷, Cheng-Chung Chen, MD, PhD¹.

¹Kai-Suan Psychiatric Hospital

²Adjunct Associate Professor, Meiho University

³Faculty of Medicine, College of Medicine, Kaohsiung Medical University

⁴Family Medicine, Yuan's General Hospital

⁵Department of Psychiatry, Chiayi Branch, Taichung Veterans General Hospital

⁶Community Medicine Research Center and Institute of Public Health, National Yang-Ming University

⁷Department of Nursing, I-Shou University

Abstract

Background and purposes: Post-disaster mental rehabilitation is not just a short-term intervention, but also need to be mid-term and long-term follow up. Therefore, this project is going to explore the prevalence and mental rehabilitation outcome of posttraumatic stress disorder (PTSD), major depressive episode (MDE), quality of life and the impact of risk factors in the survivors of Morakot typhoon within two years.

Method: We conducted the pilot project and 5,055 community survivors were received survey. Conducting a community with a mobile medical screening for case finding and classification (high, medium and low risk groups), and follow-up by providing the survivors care and service in the acute stage. Then, we conduct screening to investigate prevalence and risk factors, and provide follow-up care to the person who has mental and emotional disorders caused by posttraumatic stress syndrome, and the continuing community care also carry out by medical case management model from two aboriginal villages nearby two years later. All the subjects are investigated by the reliability and validity of the questionnaire --- Disaster-Related Psychological Test (DRPST) and short form-12 (SF-12) after disaster in acute stage, and two-year respectively data are analysis with SPSS 17.0 Chinese version.

Results: The survivors who lived in more serious damage area had 41% probable PTSD and 59% MDE. When the survivors had probable PTSD, their quality of life was prominently lower than those of without probable PTSD. There were no prominently abnormal findings of quality of life between aborigines (338) and non-aborigines (88) except “general health” and “role limitations due to physical problems”.

Conclusion: The more serious damage area the survivors lived in, the higher prevalence of probable PTSD or MDE, the survivor had. When the time passed away, the prevalence of probable PTSD or MDE decreased.

Key words: Posttraumatic stress disorder (PTSD), major depressive episode (MDE), quality of life, Disaster-Related Psychological Test (DRPST) and short form-12 (SF-12)

Background

In the past two decades, natural disasters have caused the deaths of millions of people worldwide, and hundreds of millions of people have suffered various types of physical or mental trauma; Internationally, from 911 terrorist attacks in 2001 caused panic in the United States and around the world; the 2004 South Asian earthquake (Richter 9) caused by the tsunami, resulting in hundreds of thousands of casualties in coastal areas in South Asia; to 2008, Sichuan, China hundreds of thousands of earthquake casualties. The small size of Taiwan's past ten years, traffic accidents, such as China Airlines, Singapore crash, Alishan train derailment, Pingtung Bridge breakdown, Lincoln Mansions collapse in Taipei County, etc.; to large-scale disasters: such as the Chi-Chi earthquake catastrophic destruction in 1999, the power of 2003 swept through Taiwan's Severe Acute Respiratory Syndrome (SARS), by 2009 the 88 floods in southern Taiwan, major disasters, and more resulting in the tragic Xiaolin village off the village! These disasters change people's thinking and the concept of security ----- disaster is not a special case, but the norm, these are highlighted the importance of disaster psychiatry and mental rehabilitation [1].

The prevalence of PTSD varies with natural disasters of different types and severity levels, ranging from 1.5% to 74% [2-3]. Several studies have documented that the prevalence of PTSD following natural disasters is lower than that in human-made and technological disasters. This difference is likely due to lower average severity of exposure to natural disasters because of the large-scale affected geographic area, where part of area residents are not “directly” exposed to the disaster [4-5]. There are three categories of PTSD: re-experience, avoidance/numbness and arousal. Their prevalence varies in different disasters [3,6]. The reasons for such variances include the timing of assessments, the tools used and process differences, the demographic variables of sampled populations, sampling methods, the presence of administrative resources and the nature of the disaster [3]. Therefore, all these factors should be taken into account in the estimates of the prevalence of psychiatric diseases suffered by survivors and a foundation for the allocation of psychiatric or psychological professionals required for mental rehabilitation.

On August 7, 2009, Typhoon Morakot landed at Hualian, Taiwan, bringing torrential rainfall, which caused mudflows and landslides, devastating the hillsides in southern Taiwan. According to the same sources of information, as of February 4, 2010, 673 people died and 26 were missing as a result of this catastrophe, and it was

more serious at Xiaolin Village, Kaohsiung County, where 474 people were buried immediately by landslides. This catastrophic disaster highly impacted Taiwan's government, which gave many resources, including human resources, into the disaster areas. But no sufficient data exist to estimate the required manpower, especially for post-disaster psychiatric/mental rehabilitation [7].

Post-disaster mental rehabilitation is not just a short-term intervention, but also need to be mid-term and long-term follow up. Therefore, this project is going to explore the prevalence and mental rehabilitation outcome of posttraumatic stress disorder (PTSD), major depressive episode (MDE), quality of life and the impact of risk factors in the survivors of Morakot typhoon within two years.

Method

Instrument

Five psychiatrists and two public health professionals designed the Disaster-Related Psychological Screening Test (DRPST) draft to collect background information on residents and check for psychological symptoms resulting from disaster-related psychiatric disorders (including 17 items for PTSD and 9 items for major depressive episode (MDE) according to DSM-IV criteria; the questionnaires were designed to account for local language grammar. Because the DRPST is typically used for the first phase of a two-phase survey, items that measure duration and severity are not included due to time limitations and because such items increase the sensitivity of the test [8]. The established DRPST (1st Edition) was published in 2003. It includes a 7-symptom scale for selection for probable PTSD screening. Scores of 4 or higher on the PTSD scale were used to define a group of survivors with a high likelihood of having PTSD, who would provide useful information for the patient cohort and who would be valuable in long-term follow-up studies of the prevalence of psychiatric diseases after a natural disaster. When compared with the Mini-International Neuropsychiatric Interview in a population similar to that used in the present study, the sensitivity of the DRPST was 76.1%, its specificity was 99.8%, its positive predictive value was 97.2%, and its negative predictive value was 97.4% [8]. Because in this work we focus on the comparison of the prevalence of post-traumatic stress symptoms, we used PTSD -17 symptoms in the DRPST draft to survey post-Chi-Chi earthquake survivors and to survey post-Morakot Flood survivors. The SF-12 is one of the most commonly used HRQoL questionnaires. It

has become widely used in community-based health surveys and outcome assessment of physical and mental illnesses because of its brevity and psychometric performance [9-12]. The SF-12 incorporates two dimensions: physical component summary (PCS) and mental component summary (MCS), for estimating health-related functions along eight subscales: physical functioning, role limitations caused by physical problems, bodily pain, general health (components of PCS), role limitations caused by emotional problems, vitality, social functioning, and mental health (components of MCS) [13-14]. All scores were transformed to a 0–100 scale; 0 indicated the lowest well-being and 100 indicated the highest.

Subjects and Procedures

We conducted pilot project and 5,055 community survivors were received survey. Conducting a community with a mobile medical screening for case finding and classification (high, medium and low risk groups according to the scores of DRPST), and follow-up by providing the survivors care and service in the acute stage. Then, we conduct screening to investigate prevalence and risk factors, and provide follow-up care to the person who has mental and emotional disorders caused by posttraumatic stress syndrome, and the continuing community care also carry out by medical case management model from two aboriginal villages nearby two years later. All the subjects are investigated by the reliability and validity of the questionnaire --- Disaster-Related Psychological Test (DRPST) and short form-12 (SF-12) after disaster in acute stage, and two-year respectively data are analysis with SPSS 17.0 Chinese version.

Results

We surveyed 5,055 community survivors and divided them into four groups (none: 3761; low risk: 780; moderate risk:1456; and high risk:121) according to DRPST scores after half a year. In advanced, we purposefully sampling survivors of two townships (high damage area VS low damage area).The survivors who lived in more serious damage area had 41% probable PTSD and 59% MDE. (Table 1)

Table 1. The comparison of probable PTSD and MDE between more serious damage area and mild to moderate damage area

	Non-PTSD		Probable PTSD		Non-MDE		Probable MDE	
	N	%	N	%	N	%	N	%
Jiaxian/Shanlin township	19	59	13	41	13	41	19	59
Taouan township	36	78	10	22	34	74	12	26

In advanced, we survey survivors of two aboriginal townships one more years later, The respondents are 426 (Male : 176, Female : 250 , the average age: 45.64 ± 18.75 years old; the marital status of most respondents have married: 282 (65.7%); 332 (77.9%) are belong to aboriginal people) for prevalence, and risk factors of psychiatric diseases and quality of life. There are 45 (10.5%) who have probable PTSD and 33 (7.8%) who have suspected MDE. When the survivors had probable PTSD, their quality of life was prominently lower than those of without probable PTSD (Table 2). There were no prominent abnormal findings of quality of life between aborigines (338) and non-aborigines (88) except “general health” and “role limitations due to physical problems””. (Table 3)

Table 2 The comparison of quality of life (SF-12) between probable PTSD and Non-PTSD (N=426)

	PTSD n = 45		Non-PTSD n = 381		P
	Mean	SD	Mean	SD	
Physical functioning	70.00	29.96	83.20	28.56	0.004
General health	28.42	27.54	53.66	28.79	0.000
Bodily pain	73.33	14.50	84.97	15.88	0.000
Role physical	54.72	27.99	75.46	24.23	0.000
Vitality	63.89	14.65	74.21	12.80	0.000
Social functioning	53.33	19.66	72.57	22.56	0.000
Mental health	50.28	18.75	69.65	17.29	0.000
Role emotional	51.67	21.09	78.35	22.53	0.000

Table 3 The comparison of quality of life (SF-12) between aborigine and non-aborigine N=426

	Aborigine n = 338		Non-Aborigine n = 88		P
	Mean	SD	Mean	SD	
Physical functioning	82.25	28.88	80.11	29.40	0.539
General health	52.88	29.68	43.73	28.59	0.010
Bodily pain	84.02	15.53	82.67	18.32	0.484
Role physical	74.85	24.36	67.19	28.51	0.012
Vitality	73.08	12.92	73.30	15.06	0.892
Social functioning	70.71	22.21	69.89	26.03	0.765
Mental health	67.34	18.17	68.61	19.42	0.567
Role emotional	76.52	23.11	71.73	26.16	0.093

Discussion

From the pilot study, the more severe damage area where the respondents lived in, the more severe PTSD symptoms they had. In advanced they suffered from MDE symptoms more than PTSD symptoms. These higher prevalence PTSD might suggest that survivors' psychiatric symptoms severity had the does-dependent effect of acute disaster impact. They faced on the acute disaster impacts, and their PTSD symptoms prominently increased. However, the 88 flood is an one-session attack, so their PTSD symptoms would gradually decrease when time passed away and no similar terrible image happened as earthquake. On the contrast, the survivors faced on the destruction of their own house and environment change, they suffered from financial loss and changeable lifestyle and habits for a persistent time, so they had more MDE symptoms than PTSD symptoms. One more years later, either PTSD or MDE symptoms prominently decreased in survivors of two townships, these results might show there have a time-effect about disaster-related psychiatric symptoms.

There are more symptoms of numbness/avoidance category in flood survivors with the comparison of those in earthquake survivors who had more symptoms of hyper arousal category. We influence the possibilities of difference: because the earthquake survivors suffered from thousands aftershocks, these aftershocks made them nervous and hyper arousal reaction. However, flood disaster is an one-episodic impact that the survivors witnessed and reminded terrible image to make them to have

more numbness/avoidance symptoms.

There are prominently lower in eight domains of SF-12 in the probable PTSD survivors after one and half a years. So the quality of life in the probable PTSD survivors was generally lower than there in non-PTSD survivors. There are no prominent differences of quality of life between aboriginal and non-aboriginal respondents, except general health and role limitation due to physical problem.

The survivors who lived in more serious damage area had 41% probable PTSD and 59% MDE. In advanced the rescue medical professionals had 26% probable MDE. There are 45 (10.5%) probable PTSD and probable 33 (7.8%) MDE. When the survivors had probable PTSD, their quality of life was prominently lower than those of without PTSD. Also, there were no prominent abnormal findings of quality of life between aborigines (338) and non-aborigines (88) expect "general health" and "role limitations due to physical problems" .

Conclusion

The more serious damage area the survivors lived in, the higher prevalence of probable PTSD or MDE, the survivor had. When the time passed away, the prevalence of probable PTSD or MDE decreased.

References

1. Lo AH, Su CY; Chou FH. Disaster Psychiatry in Taiwan: A Comprehensive Review. *Journal of Experimental & Clinical Medicine* [Taipei] 2012 (on line available)
2. Garrison CZ, Bryant ES, Addy CL, Spurrier PG, Freedy JR, Kilpatrick DG: Posttraumatic stress disorder in adolescents after Hurricane Andrew. *J Am Acad Child Adolesc Psychiatry* 1995; 34: 1193-201.
3. Chou FH, Tsai KY, Wu HC, Su TT, Chou P: Disaster and posttraumatic stress disorder. *Taiwanese Journal of Psychiatry* [Taipei] 2006; 20: 85-103.
4. Neria Y, Nandi A, Galea S: Post-traumatic stress disorder following disasters: a systematic review. *Psychol Med* 2008; 38: 467-80.
5. Galea S, Nandi A, Vlahov D: The epidemiology of post-traumatic stress disorder after disasters. *Epidemiol Rev* 2005; 27: 78-91.
6. Maes M, Delmeire L, Schotte C, et al.: The two-factorial symptom structure of post-traumatic stress disorder: depression-avoidance and arousal-anxiety. *Psychiatr Res* 1998; 81: 195-210.
7. Lo AH, Chen CC; Chou FH*, Chang HT. The Comparison of Prevalence of Post-Traumatic Stress Symptoms between Post-Chi-Chi Earthquake Survivors and Post-Morakot Flood Survivors. *Taiwanese Journal of Psychiatry*[Taipei] 2011; 25(3): 167-79.
8. Chou FH, Su TT, Ou-Yang WC, Chien IC, Lu MK, Chou P: Establishment of a disaster-related psychological screening test. *Aust N Z J Psychiatry* 2003; 37: 97-103.
9. Brazier JE, Roberts J. The estimation of a preference-based measure of health from the SF-12. *Med Care* 2004; 42(9): 851-859.
10. Bohannon RW, Maljanian R, Lee N, Ahlquist M. Measurement properties of the short form (SF)-12 applied to patients with stroke. *Int J Rehabil Res* 2004; 27(2): 151-154.
11. Burdine JN, Felix MR, Abel AL, Wiltraut CJ, Musselman YJ. The SF-12 as a population health measure: an exploratory examination of potential for application. *Health Serv Res* 2000; 35(4): 885-904.
12. Lenert LA, Sherbourne CD, Sugar C, Wells KB. Estimation of utilities for the effects of depression from the SF-12. *Med Care* 2000; 38(7): 763-770.
13. Ware JE, Kosinski M, Keller SD. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. *Med Care* 1996; 34: 220-233.
14. Jenkinson C, Layte R, Jenkinson D, et al. A shorter form health survey: can the SF-12 replicate results from the SF-36 in longitudinal studies?. *J Public Health Med* 1997; 19(2): 179-186.