

Special Article - Posttraumatic Stress Disorder

Long Term Prevalence of Depressive Symptoms among Victims of the Sichuan Earthquake

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88,000 lives were lost in the horrifying earthquake happened in May 2008. The Social Work Across Borders (SWAB), a non-governmental organization sponsored by the Government of HKSAR, carried out a 3 years' post disaster service in the town of Leigu, Sichuan. In a post service survey among 197 clients provided with case and group work services respondents still showed higher level of stress in CES-D when compared to the general population. Hope, Optimism and Gratitude however correlate with lower CES-D and higher appreciation for the social work services. This provides insights for future services which should focus more on Hope, optimism and gratitude value strengths.

Keywords: Disaster social work; Community mental health; Positive psychology; International social work and psychosocial recovery

Introduction**Short term and long term prevalence of PTSD**

The devastating earthquake occurred in Sichuan on May 12, 2008, caused huge damage and killed nearly 88,000 people, based on the official statistics [1]. Beichuan County is one area severely hit by the earthquake. Up to July 24 of 2008, 8605 deaths and 9693 injuries were reported for Beichuan [2]. Soon after the earthquake the Social Workers Across Borders (here after referred as SWAB), a humanitarian care organization registered in Hong Kong in 2006 devoted to post disaster social work by providing emotional, spiritual support for victims of natural disasters, decided to take immediate actions. The first team of social worker volunteers arrived Chengdu and Minyang on May 16. In the following years altogether 527 social workers volunteers, with some clinical psychologists, were sent by SWAB in 16 teams to provide services for over 9000 people in the Leigu Town, Beichuan County, Minyang City of Sichuan Province. Subsequently a three-year SWAB Leigu Project supported by the Trust Fund in Support of Reconstruction in the Sichuan Earthquake Stricken Areas was launched in 2009. This enables us to follow up and observe subjects affected by the earthquake up to three years after the impact in 2008.

In this study, we followed and interviewed 197 clients, including youngster age 10 or above to older people the oldest being 90 years of age, who have received case work and group work continuously in the Leigu project. Results show that PTSD prevails even after a lapse of 3 years.

Since the introduction of the diagnosis of PTSD in the third edition of the Diagnostic and Statistical Manual of the American Psychiatric Association in 1980, PTSD has aroused research interests in the disaster field [3-7]. Many findings show that majority of survivors will recover psychologically by themselves given time, resources and support [8].

Steel, Silove, Phan & Bauman [9] found that populations exposed to warfare and displacement tends to show high risks of mental

illness even in the long term. Interviewing 1161 Vietnamese refugees who have resided in Australia, they found that people who had been exposed to more than three trauma events (199) had heightened risk of mental illness (23, [12%]) after 10 years compared with people with no trauma exposure (13, [3%]), measured by International Classification of Disease (ICD-10, version 10). These subjects have an average of 11.5 years residency in Australia and 14.8 years after the most severe exposure to war trauma.

Studying Short-Term versus Long-Term Recovery, Steinglass and Gerrity [10] followed 155 adult participants including 78 women and 77 men in two communities affected by natural disasters. Psychosocial adjustment was measured at 4 months and 16 months after disaster respectively to assess stress-related symptomatology. The Horowitz Impact of Event Scale (HIES) and the Diagnostic Interview Schedule (DIS) were used. It was found that levels of short-term stress symptomatology and diagnosable PTSD were substantial in both communities however significant decrements in these levels occurred by 16-months after disaster.

For recovery, a gradual reduction in traumatic stress reactions over time, is possible with a necessary condition being the presence of consistently and predictably safe and secure recovery environments [11,12]. Another example of social influences to psychological recovery is the study conducted on Post-traumatic symptoms among younger and elderly evacuees in the early stages following the 1995 Hanshin-Awaji earthquake in Japan [13]. Sixty seven younger subjects (under 60 years) and Seventy five elderly subjects (60 years or above) were assessed using the Post-Traumatic Symptom Scale during the third week after the earthquake; whereas 50 younger and 73 elder subjects were interviewed during the eighth week. During the first assessment, subjects from both age groups experienced sleep disturbances, depression, hypersensitivity and irritability. Interestingly, during the second assessment elderly subjects showed a significant decrease in 8 of 10 symptoms, while the percentage of younger subjects experiencing symptoms did not decrease.

This is contradictory to the belief that older people are more

vulnerable to face disaster [13]. Considered that this may have been due to such “social” factors as decreased psychological stress, extensive social networks, and previous disaster experiences in the case of the elderly subjects.

Nevertheless, substantial gender differences (greater levels for women) were observed in both short- and long-term PTSD rates.

From Trauma to Positive Psychological Growth

The above trauma focused, bio-psychiatric and medical approach of studies, however, is challenged by the advocates of the psychosocial approach [14]. Ommeren, Saxena & Saraceno [15] in their Technical Paper prepared for World Health Organization in hope of providing consensus in regards to provide mental health services during disaster, revealed that Trauma-focused interventions increasingly provided to large segments of populations affected by disaster in resource-poor countries can even be harmful. One-off psychological debriefing (organized by international and local organizations) and benzodiazepine medication (prescribed by local physicians) – explained by this World Health Organization report [16], have little evidence of effectiveness [17-19]. Silove and Ekblad [11] pointed out that after disaster “only a minority of persons with acute traumatic stress fall into that category, the remainder comprising those with severe behavioral disturbances arising from psychosis, organic brain disorders, severe mood disorders and epilepsy” [20].

Humanistic psychology, pioneered by Abraham Maslow, Carl Rogers and others, has led to rigorous research focused on human wellbeing and happiness. Along the same line, practitioners suggested that positive psychology can also be applied to develop resilience and positive mental health. Seligman and Csikszentmihalyi [21] published their article “Positive Psychology an Introduction” in a special issue on positive psychology of the Journal of American Psychologist. In this article the authors described the adverse situations during the Second World War and how a few strong souls help to maintain faith, a positive psychology value considered by the authors, for the family and the group of people who have been deprived work, social network, dignity and even the chance to live.

Positive psychologists are interested in prevention. Their research discovered “that there are human strengths that act as buffers against mental illness: courage, future mindedness, optimism, interpersonal skills, faith, work ethics, hope, perseverance, and the capacity for flow and insight”, for example Positive psychotherapy (PPT) contrasts with standard interventions for depression by increasing positive emotion, engagement, and meaning rather than directly targeting depressive symptoms [22]. Studies also revealed that the occurrence of daily positive emotions serves to moderate stress reactivity and mediate stress recovery [23]. We find the 24 Values in Action (VIAs) a powerful tool to help develop resilience and very handy in developing community education programs to promote positive mental health [24].

“Establishing mental health services that are community-based, family-focused and culturally sensitive in the post-emergency phase can create a model that helps shape future mental health policy for countries recovering from disaster” [20].

In fact some research even found post disaster growth among a proportion of the affected population [25,26].

To summarize the literature a Psychosocial Recovery has emerged as a major intervention approach in post disaster services. Survivors do commonly develop PTSD. However most of them will recover automatically provided their environments have returned to normal in terms of safety and security. 16 months after disaster seems to be the turning point for decrement for stress related symptoms. Women are more likely than men to develop PTSD whereas elderly (aged over 60) will recover sooner than their younger counterparts.

Negative and Positive Long Term Impact of Disaster

A more comprehensive assessment of long term impact of disaster suggests a two sided approach, measuring the prevalence of depressive symptoms on one hand and the existence of positive values notably hope and optimism on the other. It is very likely that in the long term both negative and positive emotions are not mutually exclusive.

The focus of this study is to find out the long term effect of trauma after the outbreak of Sichuan Earthquake, in the community of Leigu where our post disaster services were based. The town of Leigu has a count of population estimated at 30,000 before the 512 Earthquake. In the earthquake 7000 people have died. Most families have lost their loved ones or relatives in the disaster. The survivors fled to Minyang City initially after the earthquake and were moved back to the temporary housings in Leigu before the year end of 2008. At this time of resettlement SWAB established a post disaster social work center inside one of the temporary housing rows. We provided psychological comforting and social reconnecting services to the residents. The temporary housing areas were designed to house around 15,000. As some survivors later have to find jobs out of town, the population of Leigu was around 10,000.

The survey employs the Brief Chinese version of the Centre for Epidemiological Studies – Depression Scale, or CES-D-10 [27-30] to assess “depression”, a simplified Chinese version Hope and Optimism Scale to measure “positivism about future” and finally a General Satisfaction Scale to find out how our clients appreciate our services.

The CES-D originally developed by Lenore Radloff composes of 20 items. It is a frequently used instrument to measure community depression [31]. Andresen, Malmgren, Carter & Patrick [27] generated a brief version of CES-D which composes of only 10 items. Kam [30] developed a Chinese version of CES-D and further identified a two-factor structure for the CES-D, the positive affect and the depressed affect, with acceptable level of reliability. According to his findings within older Chinese adults, prevalence rate of depression among the general population of older Chinese adults was 36.3% for females and 18.3% for males. Later a three-factor model formed by positive affect, depressed affect and somatic symptoms was reported by Lee and Chokkanathan [29]. Reliability and validity of the Brief CES-D are further confirmed by their study with a sample of 1013 older adults in Singapore. Zhang, Fokkema, Cuijpers, Li, Smits & Beekman [28] also used the scale to measure the situations among Chinese and Dutch older people.

In addition, two questions were employed to indicate PTSD. It includes whether the respondents find the memory of the disaster still disturbing emotionally to them and whether there are intrusive thoughts of the happening of the disaster, within one month prior to the interview. Normally to classify as PTSD, there should be at least 1 re-experiencing symptoms, at least 3 avoidance symptoms and 2 hyperarousal symptoms [32]. Since avoidance symptoms have already been captured by CES-D scale, adding two questions to detect re-experiencing symptoms is considered adequate.

In order to measure Hope and optimism, a self-constructed Six-item scale is employed. The Adult Hope Scale developed by Snyder, Harris, Anderson, Holleran, Irving & Sigmon [33], introduced the concepts of (1) Agency (i.e., goal-directed energy) and (2) Pathways (i.e., planning to accomplish goals). Later researchers discovered that Hopefulness can also be a dispositional factor, which is related to personality. However Hope Scale in general daily life terms may not be relevant to post disaster situations. During the process of reconstruction victims rely very much on the support of the community particularly that of the government. Whether they have faith in their government actions and whether they have hope that the community environment which encompasses economic, social and cultural aspects will be revitalized, will influence their wellbeing and emotions directly. According to these understanding a Hope and Optimism scale, inspired by Snyder's concept of Hope Agency and Pathways, is designed with reference to the stage of reconstruction in Leigu. The 6 items selected include whether the respondents are confident and optimistic about:

- a) having better life,
- b) housing conditions,
- c) economic environment,
- d) family relations,
- e) neighbor relations and
- f) community services.

The first 3 items are related to Hope Pathways and the other three, Hope Agencies.

Also included in the questionnaire are four questions to find out how clients value Helpfulness of the community recovery services.

Regarding sampling, only and all clients of case services were interviewed. Until the end of 2011, the Leigu Services has provided counseling to 324 individual cases. Most of these cases are related to emotional health, others about employment and economic hardship. Forty groups were organized including developmental groups for young people, interests groups for women and older people, volunteer groups of all ages, and social support groups for those families seriously affected by the earthquake. Most groups last for 4 to 6 weeks with two women groups and one older people group endure for more than 2 years.

As mentioned above our target interviewee population size is 324. We tried to contact all these clients but due to relocation and time limitation only 197 respondents were reached. Group members and volunteers were not included in the survey population because voluntary activities tend to attract participants who are more balanced

and better coping skills. Clients of case service were all invited to join group sessions and participate at community activities. Group members without personal problems on the contrary will not become a case. In other words clients served by the case workers were those who have experienced the full range of integrated psychosocial health services.

Community Recovery Services at Leigu

Before we present the findings of the survey it is suitable to briefly describe the community recovery services that have been offered to the respondents. It is natural to assume that there must be certain connections between the positive and negative emotions of our service clients, inclined towards which direction has yet to be investigate. The aims of the Leigu Project are to provide psychological, emotional support for the victims of the earthquake and trainings for local social work students. It is staffed by a team of 10 social workers, 2 from Hong Kong and 8 local social workers. The former with proper social work training and work experience, were appointed as team leaders whereas the front line posts were filled mainly by social work graduates fresh from Universities of Mainland China.

Immediately after the Impact stage we have to address the needs of the vulnerable groups including children, elderly, women, the sick and the disabled persons. Particular attention should be devoted to alleviate the painful effects on those persons who have lost their loved ones or have become disabled in the earthquake.

During the Resettlement stage we need to help the people to adjust to the life of temporary shelters. Community self-help and self-management are important aspects of in the concepts of recovery through empowerment. During the reconstruction phase other than community participation it is important to encourage cultural reformation and development of community spirits. There is the need to re-identify community identity with optimism. At the individual level it is important to enhance and consolidate post disaster growth.

A simple matrix may help to illustrate how we plan the services. We need to take care of the needs of the post disaster community at different stage of resettlement and reconstruction. By community we means the community at large as well as specific community groups such as the elderly, the disabled persons, women, teenagers and the Qiang minority. A community mental health services model is adopted while integrating case, group and community education services (Table 1).

In the first year the Leigu center mainly provided grief counseling for people in need. Extensive home visits were made by social workers to people who suffered from painful experience. Groups and activity programs were held to help the people rebuild social networks in the community.

Theme of the second year was to promote "whole person recovery". Applying positive psychology approach, leisure and cultural activities were organized to enhance the resilience of the residents through their spiritual fulfillment and positive life attitudes. Moreover, by forming different types of groups, opportunities were created for residents to meet and share recovery experiences.

Entering the third year the need to prepare for termination strongly affected our work plan and service directions. We began

Table 1: Intervention methods at different stages of reconstruction.

Targets	Immediate Post Impact Phase	Resettlement Phase	Reconstruction Phase	Service Termination Phase
Elderly	Case Group	Case Group Health services	Case Group Participation	Home visits, Stress and Strength Survey
Disabled	Case Group	Case Group	Case Group	Home visits, Stress and Strength Survey
Women	Case & Group	Case, Group & Social Enterprise	Case, Group & Support Network	Home visits, Stress and Strength Survey
Children and Youth	Case & Group	Case & Group	Case, Group and positive education*	Home visits, Stress and Strength Survey
Community At large	Condolences activities;	Cohesion	Optimism program; Farming Social enterprises	Positive mental health education

*Education on authentic values derived from Martin Seligman's 24 VIAs (Peterson & Seligman, 2003).

Table 2: Distribution of age (N=197, Missing = 14).

Age Range	frequency	%
10-19	39	21.3
20 to 59	60	32.8
60 to 90	84	45.9
Missing	14	8.0
Total	197	100

Table 3: CES-D-10 scores (N=197, Missing = 10).

CES-D scores	frequency	%
0 to 10	37	18.7
11 to 30	150	81.3
Total	187	100

to utilize more the concepts of positive psychology and launch positive mental health education to different target groups, hoping that our service clients would be able to build up their strength for further development. Under the theme of "Hope" many talks were started as early as February, the first being "Flying with the Wings of Hope". Topics like "Persistency brings Hope", "Integrity brings Trust", "Vitality brings Happiness" and "Go, Go, Go" followed. In May 2012, the Five Years Anniversary month, a "New Leigu, New Face ---- Community Publicity Campaign" was launched. Themes of the Campaign in coming months were 'Caring and Loving Family', "Healthy and Happy", "I am good, Let's Grow", "Charming Ladies", "Ultimate Charm; Unlimited Colors", "I am the Star, My Stage is Waiting", "Bigger Stage for Life, Smaller Stage for Class", "Future I shall have My Say" and "All for Hope" etc.

The above descriptions may be too lengthy however it helps to provide the background of our study subjects and explain why we are interested not only in measuring prevalence of negative emotions but also positive thoughts.

Findings of the Survey

Demographics

Among the respondents there were 154 female and 42 male, 78.6% and 21.4% respectively, with 1 missing case. Their age distribution indicated a rather high percentage of older people. There were 84 or 45.9% of respondents aged over 60, 90 years of age being the oldest. Adults between 20 to 59 years of age there were 60 or 32.8%. The number of young people and children aged below 19 there were 39 or 21.3%. Measuring the duration of case services they received, 70 (35.5%) of them has used case work service from 1 to 6 months, 48

Table 4: CES-D by gender and age (N=197).

		Sum of Squares	df	Mean Square	F	Sig.
Gender	Between Groups	.841	22	.038	.138	1.000
	Within Groups	48.696	176	.277		
	Total	49.538	198			
Age	Between Groups	94.218	22	4.283	.742	.791
	Within Groups	1009.989	175	5.771		
	Total	1104.207	197			

(24%) of them from 7 to 12 months, 12 (6%) of them from 13 to 18 months while 39 (20.8%) of them from 19 to 36 months. We can say that most respondents are long term clients joining the center for more than 6 months (Table 2).

Depressive symptoms

The Leigu Social Work Team revisited 197 clients of case work service in late summer of 2012. Out of 197 valid responses 37 persons or 18.7% of respondents reported less than 11, the score considered to be the cut off point for having depression. Therefore 150 respondents or 81.3% discounting 10 missing cases are having different levels of depression. In fact, 25 or 13.4% of respondents reported scores ranging from 20 to 28, the latter being the highest score. This group of respondents definitely has a high prevalence rate of stress (Table 3).

Further analysis shows that CES-D does not vary due to gender difference and age difference. This is indeed contradictory to other findings such as [13] (Table 4).

Prevalence of PTSD

Among 197 respondents, 10 respondents reported that they still felt "frequently disturbed" while 25 respondents reported they still felt "always upset" about the disaster in the month before being interviewed or 30 more months after the disaster. These 35 uneasy respondents were further asked whether they images and thoughts of the disaster still come back uncontrollably. Ten persons or 5.1% of respondents reported "always" and 8 persons or 4.1% reported "frequently" having intrusive thoughts on the earthquake incidents during the past month. In other words eighteen or 9.2% of the respondents are still susceptible to having prolonged PTSD (Table 5).

Hope and optimism

An overall majority of 168 persons or 88.9% of respondents scored 18 or more points in 6 items, indicating that they were confident and optimistic about having better life, housing conditions, economic environment, family relations, neighbor relations and

Table 5: PTSD symptoms (N=197).

	Feel Upset	%	Intrusive thoughts	%
Frequent	10	5.0	8	4.1
Always	25	12.7	10	5.1
Sometimes	58	29.4	10	5.1
Rarely or never	104	52.8	169	85.7
Total	197	100	197	100

Table 6: Hope and optimism (N=197, Missing = 8).

Hope and Optimism	frequency	%
6 to 17 points	21	11.1
18 to 21 points	132	70.2
22 to 24 points	36	18.7
Total	189	100

better community services. Even though Chinese people want to present them as positive and hopeful, it is overwhelming to see 36 persons or 18% out of 197 scored 22 or more points in the Hope and Optimism scale. We can therefore consider that the majority of residents have developed an optimistic and thus positive attitude towards the future of the community. Such confidence should have been severely destroyed by the earthquake (Table 6).

Depression versus hope and optimism

Conducting the correlation analysis between Depression measured by CES-D 10 and Hope and Optimism, a relation of $r = -0.217^{**}$ was recorded with 17 cases missing. It shows that if a respondent is hopeful and optimistic about personal and social future, he will have less depressive symptoms.

Implications for post disaster services and research

Expect long term depression: Survey results show that depression is still widespread, that is 81.3% among the clients of the Leigu case services. Comparing with Kam's findings [30] of 36.3% for female prevalence rate of depression and 18.3% of male depression among older Chinese adults, 81.3% of depression among Leigu clients is indeed disturbing.

Treat gender and age equally: There are no difference in depression scores between gender and age. This is inconsistent to Kato's findings. One reason possibly is due to the background of the subjects. Our subjects are those who have been seriously affected by the disaster. Therefore gender differences may not have an impact on traumatic subjects. On the other hand in our sample those who are aged 60 or above represented 45.9%. Kato explained that older people may recover faster than young people because of their social situations particularly of less social responsibilities. Bearing in mind that Kato's interviews were conducted only 8 weeks after an earthquake, it may be very different from our interviews which were conducted 3 years after earthquake. Seemingly the social advantage of the older people in short term recovery no longer exists in the long term.

Maintain professional mental health services: Among the 197 respondents 10.6% of them still exhibit PTSD symptoms. It can be considered on the high side in terms of prevalence rate. In the United States, PTSD has a 12 months prevalence rate of 3.5% and lifetime prevalence of 6.8% [34,35]. It is a bit lower than what Steel et al. found

among Vietnamese Refugees which reported a 12% rate of mental illness by ICD-10.

Our findings confirmed that psychosocial care services should not be separated entirely from mental health care services. Undermining the importance of biological interventions may deprive the severely mentally disturbed of proper care.

Silove, Steel and Psychol [20] advocated for the ADAPT Model (Adaptation and Development after Persecution and Trauma) and the need for a multi-level approach to psychosocial interventions that consider the individual, the family and the whole community only in "the presence of specialist mental health services".

Expect hope among depression: It is important to point out that the respondents also indicated to have hope and optimism towards having better life, housing conditions, economic environment, family relations, neighbor relations and community services. It shows that positive and negative emotions can exist alongside. Moreover, Hope and Optimism is negatively though mildly related with CES-D. The absence of pre-service assessment of depression and PTSD does not allow us to tell whether 'improvements' exist among our clients. Lack of controlled study also inhibits us from drawing causal relationship between positive approaches and psychosocial recovery. Nevertheless our findings indicate that in future post disaster service positive psychology should further be utilized.

Prepare recovery for new reality: Psychosocial recovery tends to mean a return to the state of affairs prior to the disaster, i.e. back to normal. Adopting such a narrow definition for psychosocial recovery, however, can mislead our efforts.

After the New Zealand - Canterbury earthquakes, the Psychosocial Recovery Advisory Group of experts to support local organizations and facilitate community recovery pointed out that "to return to previous state of affairs" may not be possible because the realities have been changed by the disasters. The group suggested that it is more important to on coping positively with the disaster, rather than focusing on the return to a pre-disaster state.

The communities need to progress to a new situation that have been changed both physically and psychosocially [36]. The Advisory Group stated clearly that "Recovery will encompass cultural, psychological, social, economic and physical (including housing, infrastructure and physical health) that is part of the regeneration of a community which has experienced adversity".

Our study has shown substantial depressive symptoms exist side by side with hope and optimism towards better physical and social reconstruction. It reflects the fact that many victims cannot forget the past but they have prepared themselves for a better future.

Abandon deadline for reconstruction: As Silove has put it, "Timelines for reconstruction should be set by the community rather than conforming to deadlines driven by the sense of urgency" or else a "culture of passivity and ultimately, resentment" will be developed [11]. The mental health status of the affected people, 81.3% showing depressive symptoms and 10.6% showing PTSD symptoms, suggests that arbitrarily stopping all post disaster services after 3 years in the case of Sichuan may not be desirable.

Focus more on support and gratitude: All can be said is that the respondents have considered our post disaster services very helpful to their recovery. This of course may just be a gesture of courtesy from the respondents as showing gratitude is a Chinese tradition. Gratitude in itself is major character strength, according to Peterson & Seligman [24] which can help survivors in overcoming adversity.

For future research, if we are going to focus more on coping and positive development, it is recommended that data on community capacity, for example sense of belongings and community mutual help, should be collected. Silove and Ekblad [11] reminded us that “one of the greatest errors is to over-rate the ability of outside helpers to understand and shape the recovery process and to under-rate the capacity of affected communities to draw on their own resources to guide and ideally lead these activities”. Therefore, assessment on community capacity building is desirable though impact data derived from community collaborations, training and capacity are difficult to measure.

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