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Commentary on "Health-related Quality of Life and Post-traumatic Stress Disorder in Inpatients Injured in the Ludian Earthquake: A Longitudinal Study"

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Posttraumatic stress disorder (PTSD) is a common psychiatric disorder after experiencing trauma exposure and characterized by at least one symptom from the four clusters: intrusion, avoidance, negative mood and cognitive alterations, as well as abnormal arousal and reactivity [1,2]. The lifetime prevalence of PTSD is estimated at roughly 3.9% worldwide, ranging from 1.7% to 9.2% [3]. Previous studies reported that younger, female, unemployed, unmarried, less educated, and with lower family incomes are more likely to develop PTSD [2,3]. Furthermore, increasing studies have disclosed that PTSD is associated with functional impairments [4], chronic diseases [3], early mortality [5], increased violence [6], poor subjective quality of life [7,8], and so on. Some studies reported that symptoms of PTSD were associated with decreased health-related quality of life (HRQoL) in injury patients, and PTSD may hinder the full recovery of patients [8,9].

Similarly, in the manuscript titled "Health-related quality of life and post-traumatic stress disorder in inpatients injured in the Ludian earthquake: a longitudinal study", we used the follow-up study to explore the relationship between PTSD and HRQoL among the injured after the Ludian earthquake in China. It is also demonstrated that HRQoL of the injured was inversely correlated to the severity of their PTSD symptoms. It is worth noting that the prevalence rates for PTSD among the injured were 23, 14, and 7% in the first, third and eighteenth months after the Ludian earthquake, respectively. Most of injured patients had a good recovery and only 7% of patients were diagnosed with PTSD in 18 months after the disaster. Thus, we wonder what factors affect the maintenance or treatment of PTSD.

It is well known that resilience is a new viewpoint and method for prevention and treatment [9,10]. Moreover, resilience has been shown to be significantly associated with QOL in psychiatric disorders [11-13]. Resilience is described as the ability to successfully adapt to adverse conditions such as tragedy, trauma, hardship, and ongoing significant life stressors [14]. Resilience usually refers to a range of personal qualities including hardiness, personal control, optimism and self-efficacy [9,14]. Resilience-related protective factors include emotional adjustment, cognitive restructuring and reappraisal, positive coping, and the ability to dig and utilize social support, which can play an integral role in recovery from trauma [10,14]. Loads of studies have shown that families provide support or resources for family members in coping with adversity and cultivate resilience among family members [9, 11,15,16]. According to Froma Walsh's family resilience, family resilience is regarded as the ability of families to withstand and rebound from disruptive life challenges, strengthened and more resourceful [15,17,18]. To sum up, resilience focuses on individuals, families, and other resources associated with them [16], and provides an expanded view on these resources to cope with adversity and preventing or treating physical and mental dysfunction in post-disasters [9,10].

Basing on the perspective of resilience, our aim of further study is therefore to compare experience and recovery processes of these injured with PTSD or non-PTSD and explore the features of resilience of them. The inclusion criteria of participants were: (1) participants had been

diagnosed as PTSD symptom in 1 month after the disaster, (2) middle-aged person; (3) participants were willing to participate in this study and signed the informed consent. Then, we selected 12 of the 147 injured, of which 6 were diagnosed as PTSD and the other 6 were non-PTSD in 18 months after the disaster. The demographic and clinical characteristics of the two groups, including age, educational level, occupations, disaster exposure, the injury assessment and the CAPS score in 18-month were similar (shown in Table 1). We conducted face-to-face interviews according to the interview outline. Questions assessing are the following: (1) What changes have taken place in your life after the earthquake? Which changes were negative and which were positive? (2) What factors helped you get over the difficulties after the disaster, such as your own characteristics, past experience, your family and your community, etc.? (3) Did you feel supported by your family members? What changes in your family were happened to help family members get over difficulties? (4) Did your community have sufficient resources, including material, information, policies, etc., to help you get over difficulties after the disaster? Were you satisfied with the government's disaster relief or post-disaster reconstruction?

We used Content Analysis to organize and analyze the in-depth interview data. Based on the resilience theory, the data was grouped into the A*B classification. A dimension included two resilience–related factors (positive and negative), and B dimension included 3 factors (individual, family and community). As shown in Table 2, we got 24 resilience–related factors, of which 12 were negative and positive, respectively. The average number of positive factors reported in the PTSD group and the non-PTSD group was 7 and 12, respectively, while the average number of negative factors reported was 7 and 4, respectively. Therefore, this study also found that there were some differences in resilience between the PTSD group and the non-PTSD group.

Firstly, in non-PTSD group, participants tend to have positive features, such as hopeful (Sense of purpose), optimistic, grateful and positive pre-experiences, which in PTSD group, participants tend to have negative features

Code/ group	Age	Educational level	Occupation	Disaster exposure	The injury assessment	CAPS score
Non-PTSD group						
F1	41	illiteracy	peasant	buried and witness the death of her children (1 son, 1 daughter)	severe	60
F2	42	illiteracy	peasant	buried	severe / the amputation of left leg	60
F3	33	Primary school	peasant	bereavement (husband)	minor / 12 weeks pregnant	57
M4	50	college	worker	buried	severe / the amputation of left arm	56
M5	38	middle school	peasant	buried	severe	47
M6	43	middle school	peasant	buried	minor	50
PTSD group						
F7	33	primary school	peasant	buried and witness the death of her children(1 son, 2daughter)	severe	89
F8	35	college	teacher	buried/ bereavement (1 son)	severe	72
F9	47	illiteracy	peasant	Buried	severe	67
F10	50	illiteracy	peasant	buried/ bereavement (1 daughter, 1 grand daughter)	severe	84
F11	38	illiteracy	peasant	buried/ bereavement (husband)	severe	68
M12	34	college	civil servant	bereavement (1son)	minor	67
Note: F and M were represented for female and male, respectively. All subjects were married.						

Table 1: The demographic and clinical characteristics of 12 injured after the Ludian earthquake.

Dimension Characteristics		**Positive factors**	**Negative factor**
Individual		Hopeful (Sense of purpose) Optimistic Grateful Positive pre-experience	Helplessness Pessimistic Low self-esteem Negative pre-experience
Family	belief systems	Positive outlook The sense of mission	The lack of goals The lack of responsibility
	organization patterns	Flexibility	Rigid
	communication processes	Intimacy Truthful	Blame Mistrustful
Community		Mutual assistance Kindness Health or economic resources	Complain Unfriendly Financial hardship

Note: 1. Positive pre-experience represents encouragement and successful experience.

2. Negative pre-experience represents destructive experience such as feelings of failure, negative life events and so on.

3. Flexibility is the ability to effectively organize family resources and cope with stress. It regards as "shock absorber" suffering from stress or crisis.

4. Rigid means that families are failing to use the family resources in response to stress or crisis.

5. Intimacy means the emotional connection of family members, such as mutual supports, love, harmony, and so on.

Table 2: Framework of resilience features among 12 injured after the Ludian earthquake.

such as pessimistic, low self-esteem, helplessness and negative pre-experience. Our findings were in consistency with existing researches. The last decade has also witnessed a growing interest in individuals with positive psychological characteristics on resilience, such as optimistic, self-esteem, sense of meaning and purpose [9]. Some research showed that sense of purpose, responsibility or the ability to find meaning in adversity was more likely to recover from negative experience [19,20]. Further, losing a child is recognized as especially disruptive and challenging of life events. Neimeyer et al. found that some bereaved parents had a positive process of healing and recovering from to trauma and loss by reconstruction of meaning [21]. In our study, F1 who lost two children in the Ludian disaster found a job in the local orphanage. F1and her husband felt meaningful and valuable life due to taking care of orphans, though they were engaged in cooking with low salary. In a word, PTSD group is more likely to report resilience – related negative factors.

Secondly, guided by Walsh's family resilience framework, the processes of family resilience in our study could be classified into three key domains: family belief systems, family organization patterns, and communication processes [18]. Families of non- PTSD group were full of positive outlook, flexibility and family intimacy, while PTSD group's families were more likely to blame, complain and lack life goals, flexibility and intimacy. Notably, our findings indicate that some of the processes correspond with the Western families, there were also some unique characteristics to the resilient processes of Chinese families in this study. In Walsh's (2006) family resilience framework, organizational patterns in resilient families include adaptability, connectedness, and the use of social and economic resources. In our study, most families were bereaved in the earthquake. In face of the inevitability in the post-disaster, we noted there were different pathways to restore stability in families: moving to another cities and countries (going away from the sadness place); re-negotiating roles within the family; spending time together as a family; reconstituting family; trying more meaningful work. These responses did not only manifest flexibility and adaptability of the entire family, but also the willingness of individual family members to act together collectively. In addition, Chinese traditional culture is based on "family-center" and "blood relations", which is a valuable resource

for resilience in families post-disaster. The concept of "family" is more important to encourage emotional, financial or practical supports from extended family or clan, when family members suffer from difficulties.

Finally, in non-PTSD group, participants got more supports from their communities, such as mutual assistance, kindness, health resources, economic supports, while the PTSD group was characterized by financial hardship and a lack of trust in the local government. Kin and social networks, community groups become vital lifelines [18] in the aftermath to offer practical and emotional support to the injured and those in bereavement. In contrary, it may be high risks for recovery that the injured lived in indifferent and marginalized communities. Furthermore, it is generally accepted that a government's effective relief actions can reduce the negative impact of disaster and increase the disaster resilience of the community, particularly those who have suffered economic losses as well as those who have lost their close family members. By providing immediate first aid and rescue, financial support and temporary shelters, local government can bring a sense of security to the people. In this regard, the Chinese government has been quite successful and swift in terms of disaster rescue and reconstruction. The traditional Chinese saying "when a disaster strikes, help will come from all corners". This kind of multi-level support helps to restore a sense of confidence to the survivors of a disaster and strengthens resilience in the Chinese context.

In summary, this study showed that PTSD patients are more likely to report resilience-related negative factors, while non-PTSD patients reported resilience-related protective factors. It is may be speculated that resilience may weaken the PTSD symptoms or help to recover from disasters. The resulting is consistent with existing studies [10,14]. Meantime, our findings also show that the family resilience framework proposed by Walsh was applicable in Chinese culture, though contents of family resilience had some difference.

There are essential limitations in the current research. First of all, this is an exploratory study based on a small Chinese sample of disaster survivors after an earthquake that is cannot be replicated. Second, we use content analysis to analyze the data of in-depth interview. To some extent, the results were speculative rather than confirmatory. Therefore, our results should to be verified in the further studies. Third, this study didn't clarify the interactional relationship between the various resilience factors and processes in among the 12 injured. Finally, we need to identify the generic and idiosyncratic resilience factors in Chinese culture when compared to other cultures. Despite these limitations, this was the first study conducted in China to explore the differences in resilience between PTSD and non-PTSD group. The findings could contribute to the design of evidence-based interventions to promote resilience and prevent PTSD after disasters.

Ethical Considerations

We received approval from the Ethics Committee of Sichuan University in Chengdu, China (2014) in accordance with the Declaration of Helsinki and its later amendments. Informed consent has been obtained from the participants for collecting and analyzing their data.

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Declaration of Interest

The authors declare that they have no competing interests.

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