



## Research Article

## Psychological Distress and Health-related Quality of Life in Relocated and Nonrelocated Older Survivors after the 2008 Sichuan Earthquake

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## SUMMARY

**Purpose:** The purposes of the study were to examine psychological distress and health-related quality of life (HRQoL) in relocated and nonrelocated survivors aged 60 years and older, and to analyze predictors for psychological distress and HRQoL in older survivors 5 years after the 2008 Sichuan earthquake.**Methods:** This was a cross-sectional descriptive study with 112 relocated older survivors and 156 non-relocated older survivors. Our study used a multistage sampling method. The measurements used in the study included self-reporting questionnaire-20, medical outcomes study 36-item short form health survey, and an instrument measuring demographic and disaster-related characteristics. Descriptive and multiple linear regression analysis were performed to determine factors that contributed to psychological distress and HRQoL.**Results:** The prevalence of psychological distress in relocated group (20.5%) was significantly higher compared to those in nonrelocated group (4.8%). Scores for HRQoL in relocated older survivors was significantly lower than those in nonrelocated older survivors. Relocation from preearthquake residence was the most significant predictor for psychological distress and HRQoL in the total sample. Other predictors were advanced age, lower educational level, the loss of family members during the earthquake, and the presence of chronic illnesses as well as the death of a spouse after the earthquake.**Conclusions:** Strategies can be designed in postdisaster recovery program, particularly for older survivors at high risk for psychological distress and poor HRQoL.

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## Introduction

Natural disasters such as hurricanes, floods and earthquakes can occur rapidly and unpredictably leading to the loss of human lives and damage to personal properties, and disaster survivors may suffer from long-term psychiatric disorders and reduced health-related quality of life (HRQoL) [1,2]. For instance, it was reported that the rates of major depression, post-traumatic stress disorder (PTSD) and prolonged grief disorder in bereaved Norwegians 2 years after a tsunami ranged from 5.2% to 34.4% [3]. The prevalence of depression and PTSD in adult survivors 4 years after the Turkey earthquake was 11.0% and 25.0%, respectively [4]. Approximately

7.5% of survivors living in the rural areas 8 years after the Italy earthquake experienced psychological disorders [5]. Poor HRQoL has also been reported in many disaster-affected populations. For example, the survivors who were directly exposed to the Turkey earthquake reported significantly lower scores in psychological and environmental HRQoL than did those not exposed [6]. More than half of the survivors 2 years after Hurricane Katrina experienced poor mental health summary scores in the 36-item short form health survey (SF-36) [7].

Due to decreased physical and psychosocial functioning, older people are the most vulnerable to physical injury during disasters, which may affect their resilience to acute traumatic events [8,9]. Natural disasters have long-term negative impacts on older survivors' mental health and HRQoL. For instance, 3 years after the Japan earthquake, the rate of psychological distress in older survivors was 24.0% [10]. The findings of the Wu et al study [11] indicated that the prevalence of PTSD, major depression and other psychiatric diseases (such as panic disorder, bipolar disorder, alcohol or drug

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abuse) in survivors aged 65 years and older were significantly higher than those younger than 65 years 3 years after the Chi-Chi earthquake in Taiwan [11]. Similarly, it was reported that older age was significantly related to poorer HRQoL [12].

Relocation or migration after mass traumatic events has been identified as a significant predictor for psychological disorders and poor HRQoL among disaster survivors in many previous studies. The majority of these studies have focused on the effects of relocation on children and adult populations. For example, Abramson et al [7] reported that psychological distress was common in children and adult survivors who experienced long-term relocation 2 years after Hurricane Katrina and Hurricane Rita [7]. In a sample of survivors 8 weeks after the Hurricane Tsunami, Van Griensven et al [13] reported that the prevalence of anxiety, depression and PTSD in relocated group was significantly higher than those in non-relocated group [13]. Similarly, another study indicated that displacement from one's predisaster residence was strongly related to PTSD in adult survivors 6 months after Hurricane Katrina [14]. It is known that older populations are frailer to physical injury during disasters and tend to experience more psychological distress and poorer HRQoL after disasters [15,16]. Relocation from one's familiar residence may result in less visiting frequency with friends and/or neighbors, and disrupting one's social network. Relocation is regarded as a significant risk factor for psychological disorders [7]. However, to our knowledge, studies that aimed to explore the long-term effects of relocation after disasters on psychological disorder and HRQoL in older survivors are few.

On May 12, 2008, an earthquake with a magnitude of 8.0 occurred in northwest Sichuan province, China. As one of the most severe natural disasters in the history of China, this earthquake has resulted in 69,227 deaths, 374,643 individuals injured and 17,824 individuals missing [17]. Many disaster survivors had to move to a new place to live in after the earthquake due to total damage to their houses, concerns about seeking help from relatives or friends and finding a new job. Relocation may be a risk factor for psychological distress such as anxiety, depression and PTSD through the destruction of social networks [4]. Nevertheless, to date, whether differences exist in psychological distress and HRQoL between the relocated and nonrelocated older survivors 5 years after the 2008 Sichuan earthquake has not been explored.

Therefore, the aims of this study were to examine psychological distress and HRQoL in relocated and nonrelocated older persons 5 years after the 2008 Sichuan earthquake, and to analyze predictors for psychological distress and HRQoL in the total sample.

## Methods

### Study design

This was a cross-sectional descriptive study using the Self-Reporting Questionnaire-20 (SRQ-20) [18] and medical outcomes study SF-36 [19] to investigate 112 relocated older survivors and 156 nonrelocated older survivors 5 years following the 2008 Sichuan earthquake.

### Setting and sample

Ten cities are identified as the hardest-hit areas in which hundreds of thousands of houses completely collapsed during the disaster. After the earthquake, a large number of severely damaged villages in these hardest-affected cities have been rebuilt, and many disaster survivors from other disaster-exposed districts have relocated to these newly-built villages to live a new life because of total damage to their houses [20].

A multistage sampling method was used to recruit the participants for our study. First, one city (Dujiangyan City) was randomly selected from the 10 hardest-affected cities in the 2008 Sichuan earthquake [20]. Second, one newly-rebuilt village (Juyuan Village) was randomly chosen from the selected city. Third, 2 of the 11 communities (Longquan Community and Yangqiao Community) in the village were randomly selected. The randomization procedure was accomplished via a random number generator according to the names of cities, villages and communities that were arranged in alphabetical order, respectively. Finally, all the disaster survivors aged 60 and older in the two selected communities who met the following inclusion criteria were recruited for the study.

The inclusion criteria were as follows: (a) aged 60 years and older; (b) personally experienced the 2008 Sichuan earthquake. Older disaster survivors who refused to participate in the study or had cognitive impairment were excluded. In our study, the Chinese Mini-Mental State Examination (MMSE) [21] was performed to assess cognitive impairment of the participants. According to the results of the Chinese MMSE, three different cut-off scores were used depending on the participant's educational level with a score > 17 (illiterate), > 20 (primary school) and > 24 (junior high school or above), suggesting no cognitive impairment [22]. As a result, a total of 14 older survivors (6 relocated survivors and 8 nonrelocated survivors) were excluded based on their MMSE scores, and 8 older survivors (5 relocated survivors and 3 nonrelocated survivors) refused to participate in our study. In conclusion, 268 older people (112 relocated older survivors and 156 nonrelocated older survivors) successfully completed the survey with a response rate of 91.1% and 93.4%, respectively (Figure 1).

### Ethical consideration

Ethical consideration was obtained from the Human Subjects Ethics Subcommittee of Sichuan University. Participants were told the purpose and importance of this study before the survey. Written informed consent was obtained from each participant who was literate. As for each illiterate participant, oral informed consent was received. They were assured of anonymity, confidentiality and their rights to withdraw from the study at any time.

### Measurements

SRQ-20 is a common tool for evaluating general psychological distress. It includes 20 items assessing anxiety, depression and psychosomatic complaints with score 0 indicating "no" (symptom absent) and score 1 indicating "yes" (symptom present). The total scores range from 0 to 20 with higher scores suggesting higher levels of general psychological distress. This measure has been translated into various versions, and the optimal cut-off scores are significantly different in different cultures, languages and settings [23,24]. The SRQ-20 has been validated in Chinese people with good reliability (Cronbach  $\alpha = .91$ , test-retest  $r = .94$ ). According to the optimal cut-off point (6/7), respondents with scores greater than 7 were identified as experiencing psychological distress [25]. Cronbach  $\alpha$  was .81 in the present study.

SF-36 is a widely used instrument measuring HRQoL for the general population. This scale includes eight subscales which are defined as physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, mental health, and their summarized physical component summary (PCS) and mental component summary (MCS) dimensions. The responses are based on a Likert scale of 3, 5, or 6 points. The PCS dimension assesses physical functioning, role physical, bodily pain and general health. The MCS dimension measures vitality, social functioning, role-emotional and mental health. Cronbach  $\alpha$  of the eight subscales

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