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Impacts of Sense of Community and Satisfaction with Governmental Recovery on Psychological Status of the Wenchuan Earthquake Survivors

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Abstract This research examined the impacts of sense of community and satisfaction with governmental recovery on life satisfaction and depression of the Wenchuan earthquake survivors. A total of 304 valid questionnaires were collected. Bivariate analysis indicated that both sense of community and satisfaction with governmental recovery were correlated significantly with both life satisfaction and depression. Regression analyses showed that the variables of sense of community and satisfaction with governmental recovery were only associated significantly with life satisfaction, controlling socio-demographic and other variables. The research highlighted the importance to examine both positive and negative aspects of psychological status of disaster survivors and to include the factors related to community and social policies in examining their psychological status. Limitation and direction of future studies were address. The implications of the research were discussed in China's social and political contexts.

Keywords Disaster survivors · Psychological status · Governmental recovery · Sense of community · China

1 Introduction

On May 12, 2008, an earthquake quake, measuring 8.0 on the Richter scale, hit Wenchuan County, Sichuan, China and its neighboring regions and caused 69,226 known deaths,

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17,923 missing people and 374,643 injured (State Council 2008). A total of 5.36 million buildings collapsed and more than 21 million buildings were damaged (US Geological Survey 2012). Many studies (Fan et al. 2011; Jia et al. 2010; Ke et al. 2010; Li et al. 2011; Wen et al. 2012; Xu and He 2012; Xu and Song 2011) were conducted to examine the psychological or mental issue of this earthquake survivors. However, the literature mainly focused on psychological problems such as post-traumatic stress disorder (PTSD), depression, and health-related wellbeing. Few studies examined the positive aspect of this disaster survivors' psychological status such as life satisfaction, although literature suggested that some people have coping strategies that make them be less challenged by trauma and probably can experience positive outcomes as a result of exposure to traumatic life events (Karanci and Acarturk 2005; Powell et al. 2003; Tedeschi 1999; Tedeshi and Calhoun 2004). Meanwhile, the predominant research focused on the impacts of factors, such as health, finance and social support on the survivors' psychological status. Based on a survey conducted in July to August 2012, this research contributes to develop a better understanding about the Wenchuan earthquake survivors' psychological status by examining the impacts of sense of community and satisfaction with governmental recovery on both their life satisfaction and depression.

2 Literature Review

Disasters include natural events, social disruptions and political phenomena (Mirzamani and Mohammadi 2007; Quarantelli 1998) and affect individuals, families and communities physically, psychologically and spiritually (Erikson 1976; Myers 1994; Rosenfeld et al. 2010). Research demonstrated that disasters with significant loss of life, widespread damage to property, and serious and ongoing economic difficulties for the community tend to trigger severe, lasting, and pervasive psychological problems such as PTSD, anxiety, and depression (Adams et al. 2002; Davidson et al. 1985; Freedy et al. 1993; Green 1995; Karanci and Rustemli 1995; Logue et al. 1981; Norris et al. 2002a, b; Salcioglu et al. 2007).

Many studies have been conducted to examine the factors associated with disaster survivors' psychological status. The reviews of literature by Gibbs (1989), Lewin et al. (1998), Brewin et al. (2000), Norris et al. (2002b), and Norris (2005) showed that the factors of age, gender, ethnicity, socioeconomic status, severity of exposure to disaster, family factors, pre-disaster functioning and personality, secondary stressors and psychosocial resources including ways and beliefs of coping, social support and resource loss were found to influence disaster survivors' psychological status.

While many variables have been studied to explain psychological outcomes among disaster survivors, much less attention has been paid to the factors related to community and government action in disaster recovery. Community was likely to play an important role in residents' lives through facilitating their social relations and oppose anonymity and loneliness and thus contributing to their psychical health and psychological wellbeing (Marmot 1998; Pretty et al. 2006; Prezza and Costantini 1998). Some researchers (e.g., Cox and Perry 2011; Walsh 2007) also advocated the importance of community resilience and resistance to reduce potential impacts of disasters. However, only a few empirical studies (e.g., Li et al. 2011) examined the impact of sense of community on the psychological outcome of disaster survivors and found significant relationship between them.

Furthermore, Li et al.'s study focused on older survivors living in a transitional community 3 months after the Wenchaun earthquake. Little research was conducted to examine the impact of community factors on disaster survivors' psychological status after they moved to the permanent communities newly constructed after disasters.

Regarding the government action on disaster recovery, disaster survivors' reactions to governmental recovery policies and services would influence on how they feel about their lives given that they were recipients of governmental recovery services in one form or another. With respect to the Wenchuan earthquake survivors, governmental action on disaster recovery tended to influence their livelihood and psychological status due to a large amount of financial and other resources invested by governments. According to the *Regulations on Post-Wenchuan Earthquake Restoration and Reconstruction* promulgated by the State Council on June 8, 2008, the special fund provided by the central government for the subsequent 3 years' recovery was 300 billion Chinese yuan, around 43 billion US dollar then (Ministry of Finance 2009). The *Paired Assistance Program for Post-Wenchuan Earthquake Restoration and Reconstruction* issued on June 11, 2008 by the State Council was estimated to eventually invest additional 70 billion Chinese yuan in the 19 most severely earthquake-affected counties (Xinhua Agency 2009/05/04). Although governmental recovery mainly focused on physical recovery, such as road and house restoration and reconstruction (Huang et al. 2011), it undoubtedly helped restore or improve the survivors' living conditions, which would contribute to their wellbeing. However, to the best of the researchers' knowledge, the relationship between government action on disaster recovery and survivors' psychological status was rarely examined empirically.

3 Research Hypotheses

This paper intended to examine whether sense of community and satisfaction with governmental recovery were associated significantly with psychological status of Wenchuan earthquake survivors 4 years after the earthquake. Based on the above discussion, the following research hypotheses were proposed.

Hypothesis 1 Sense of community would associate significantly and positively with life satisfaction.

Hypothesis 2 Sense of community would associate significantly and negatively with depression.

Hypothesis 3 Satisfaction with governmental recovery would associate significantly and positively with life satisfaction.

Hypothesis 4 Satisfaction with governmental recovery would associate significantly and negatively with depression.

Socio-demographic variables such as sex, age, marital status, education, ethnics, religion, and health status were included as control variables. The variables of disaster impacts such as disaster impact on housing, injury or death of family member, injury or death of relative or friend, and personal life threaten in the earthquake, and social support were also included as control variable because there were often found to be associated with disaster survivors' psychological status (Brewin et al. 2000; Norris et al. 2002b).

4 Method

4.1 Research Participants

Research participants in this research were people aged 18 or above who survived the Wenchuan earthquake in Sichuan. The survey was conducted in five communities, which all located in the most severely earthquake-affected areas. Among five communities, four were in Beichuan county and one in Pengzhou city. The communities were purposely chosen because there were social welfare agencies working in these community and the researchers had contacts with these agencies and could get agencies' help to enter the communities and approach residents. The research used a non-probability sampling method for the following reasons. First, the primary intention of this study was not to generalize the results to broader population, but to gain more insight into the subject of inquiry and hope to contribute to developing a solid foundation for further studies. Second, non-probability sampling is the most economic and fastest approach considering the limited financial support for this research. The researchers approached and interviewed people mainly in parks, social work agencies' activities rooms, and tea houses where local people gathered. Among 322 collected questionnaires, 18 questionnaires were incomplete, leaving a total of 304 completed questionnaires.

4.2 Procedures

A face-to-face interview approach using a questionnaire written in Chinese was adopted in this research. Five interviewers who either had a bachelor degree of social work or had a master degree of social work and spoke local dialects conducted the fact-to-face interviews. Among the 304 completed questionnaires, 33 questionnaires were filled up by the respondents themselves according to their preference. Their self-completed questionnaires were checked by the interviewers for completeness. There was a significant difference in the years of formal education of the 33 respondents (mean = 10.03, standard deviation = 3.36) and other respondents (mean = 5.43, standard deviation = 4.06), $t = 7.26$, $p < .001$. The data were collected in July and August 2012. Each interview lasted about 25–40 min. Informed consent was obtained and the anonymity and confidentiality of replies were emphasized to encourage honest responses.

4.3 Measures

Psychological status was consisted of life satisfaction and depression in this research. *Life satisfaction* was measured by the five-item Satisfaction with Life Scale (SWLS) designed by Diener et al. (1985). The Chinese version of the SWLS translated by Shek (1998) was used in this study. Internal consistencies of the Chinese version of SWLS scores ranged from 0.71 to 0.93 in previous studies (e.g., Bai et al. 2011; Huang 2012; Sachs 2003; Shek 1998). The construct validity of the Chinese SWLS was supported by its correlation with a single item satisfaction measure (Leung and Leung 1992). In this research, the Cronbach's alpha of the SWLS' scale was 0.73.

Depression was measured by the 10-item Center for Epidemiologic Studies Depression Scale (CES-D). The Chinese version of the 10-item CES-D translated by Wong (2009) was used in this study. Participants were asked to rate each item across a Likert type scale (1 = seldom or never, 2 = now or then, 3 = regular, 4 = often). Research indicated that this 10-item version of CES-D can be used in lieu of the 20-item version (Cheng and Chan

2005; Zhang et al. 2012). The Cronbach's alpha of the depression scale was 0.82 in this research.

Satisfaction with governmental recovery No scale that measures satisfaction with governmental recovery was found in the literature. The researchers developed the scale to measure it based on the consultation of and the discussion with social work academia and front line social workers working with the 5.12 Wenchuan earthquake survivors. The scale was composed of ten items including infrastructure recovery, the respondent's family income recovery, the arrangement and assistance to the respondent's family before moving to permanent house, the integral planning for the respondent's community recovery, the fairness of resource distribution in disaster recovery, the openness and transparency of disaster recovery information, the government's respect of public opinions, public participation in disaster recovery planning and implementation, and the overall satisfaction with governmental recovery. Respondents were asked to indicate the degree of satisfaction to each item on a 5-point Likert-type scale ranging from 1 (very dissatisfied) to 5 (very satisfied). Before the scale was used in the survey, four disaster survivors and three social workers working with disaster survivors were approached and consulted. All of them indicated that the scale was clear and local people could understand the items. An exploratory factor analysis (EFA) using IBM Statistical Package for the Social Sciences (IBM-SPSS, version 19.0) for Windows was conducted to examine the scale's factor structure. It was found that all 10 items explain 61.37 % variance, with the first principal component explaining 48.50 % and the other 12.88 % variance. This suggests a unidimensional structure of the scale. Therefore, the overall score of satisfaction with governmental recovery was obtained by adding the scores of all ten items, with higher scores indicating more satisfaction. The reliability of the scale is 0.88.

Sense of community was defined as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan and Chavis 1986: 9). It was measured by an 8-item Brief Sense of Community Scale (BSCS), which was designed to assess the dimensions of needs fulfillment, group membership, influence, and emotional connection defined in the McMillan and Chavis' (ibid) model. Following the recommendations by Peterson et al. (2006), positively worded items were included in the BSCS. All items were designed to refer respondents' neighborhood and used a 5-point Likert-type response format ranging from strongly disagree to strongly agree. BSCS was empirically supported as a valid scale to represent underlying multidimensional theory of SOC (Peterson et al. 2008). The scale was translated into Chinese by the first author of this paper and reviewed and revised by the second author of this paper and a professor of social work in a university in Singapore. Three of them were Chinese-English bilinguals and reached an agreement on the translated scale. In this research, the Cronbach's alpha of the scale was 0.73.

Control variables included earthquake impacts, social support, financial status, health, age, education, marital status, sex, religion, and ethnicity of disaster survivors. Five measures of *earthquake impact* were included in this research. Threat to life was assessed by asking: "Did you feel you life was in danger during the earthquake?" (0 = no, 1 = yes). Injury or death of family member(s) (0 = no, 1 = yes) was the direct result of earthquake to respondents' family member. Injury or death of relative(s) or friend(s) (0 = no, 1 = yes) was also the direct result of earthquake to their relative(s) or friend(s). Furthermore, respondents were asked to indicate the impacts of earthquake on their house and income on a 5-point scale from none (=1) to enormous (=5) respectively.

Social support was assessed with the Social Support Questionnaire by Doeglas et al. (1996). The support included both daily emotional support (five items, e.g., "Does it ever

happen to you that people are warm and affectionate towards you?", "Does it ever happen to you that people sympathize with you?") and daily instrumental support (four items, "Does it ever happen to you that people help you to do odd jobs?", "Does it ever happen to you that people lend you small amounts of money?"). Participants rated items across a Likert type scale (1 = seldom or never, 2 = now or then, 3 = regular, 4 = often). The translation of the scale went through the same process as BSCS. An EFA using IBM-SPSS (version 19.0) was conducted to examine the scale's factor structure. It was found that all nine items explain 72.73 % variance, with the first principal component explaining 58.19 % and the other 14.55 % variance, suggesting a unidimensional structure of the scale. Therefore, the overall score of social support was obtained by adding the scores of all nine items, with higher scores indicating more support. The Cronbach's alpha of the scale was 0.91 in this research.

Financial strain was used to measure respondent's financial status. The scale was developed by Chou and Chi (2002) and consisted of four items. In Chou and Chi's scale, three items asked respondents whether they had enough money to pay for their needs in food, in medical services and daily expenses, using a three-point scale ranging from 1 = enough to 3 = not enough. The fourth item asked respondents to rate how difficult it was for them to pay their monthly bill, using a four-point scale, ranging from 1 = not difficult at all to 4 = very difficult. In this study, we changed the original fourth item to ask respondents whether they had enough money to pay for their bill, using a three-point scale range from 1 = enough to 3 = not enough to make the responses to all items in the same format. A sum of the scores of four items was computed, with higher scores indicating greater financial strain. The Cronbach's alpha of the scale in this study is 0.84.

Other control variables were consisted of *sex* (0 = male, 1 = female), *age* (in years based on identity card), *education* (in years of formal education), *marital status* (1 = married, 2 = single, 3 = widowed, 4 = separated and 5 = divorced), *self-rated health* by asking: "How would you rate your present health?" (1 = very poor, 2 = poor, 3 = fair, 4 = good and 5 = very good), and *ethnicity* and *religion*.

4.4 Data Analyses

The data were coded and analysed by using IBM-SPSS (version 19.0) for Windows. Prior to data entry, all questionnaires were checked for completeness. Prior to data analysis, all data were checked for entry errors. Correlation analyses were first conducted to determine if sense of community and satisfaction with governmental recovery were associated significantly with life satisfaction and depression of disaster survivors. To make a better estimation of the effects of sense of community and satisfaction of governmental recovery on disaster survivors' psychological status, regression analyses were then performed, controlling for socio-demographic and other variables.

5 Results

5.1 Descriptive Statistics

Table 1 shows the frequency distribution of nominal and ordinal variables, means and standard deviations of interval variables. Of the 304 respondents, 29.6 % were male.

With respect to marital status, 81.3 % were married, 4.9 % single, 12.5 % widowed, 0.3 % separated, and 1.0 % divorced. For the convenience of further analyses, the widowed, single, separated, and the divorced were combined into one response category. Regarding ethnicity, 61.2 % are Han, 38.5 % Qian, and only 0.3 % others. Qian and others were combined into one response category for further analyses. For religion, 25.7 % do not have religion, 15.1 % were Buddhists, 1.3 % Christians, and 57.9 % of folk religion. Buddhism, Christian, and folk religion were combined into one response category for further analyses.

Table 1 Descriptive statistics of the variables ($N = 304$)

Variables	%	M(SD)	Range
Male (vs. female)	29.6(70.4)	–	–
Married (vs. single or others)	81.3(18.7)	–	–
Han (vs. Qian or others)	61.2(38.8)	–	–
No religion (vs. religions)	25.7(74.3)	–	–
Self-perceived health		–	1–5
Very poor	5.6		
Poor	19.1		
Neutral	29.3		
Good	31.3		
Very good	14.8		
Life threaten: no (vs. yes)	22.7(77.3)	–	–
Injury or death of family member: no (vs. yes)	69.4(30.6)	–	–
Injury or death of relative or friend: no (vs. yes)	59.9(40.1)	–	–
Earthquake impact on house		–	1–5
None	6.9		
A little	12.8		
Medium	7.9		
Serious	23.4		
Enormous	49.0		
Earthquake impact on income		–	1–5
None	17.8		
A little	13.5		
Medium	13.2		
Serious	21.1		
Enormous	34.5		
Age	–	52.54(15.65)	18–88
Years of formal education	–	5.93(4.24)	0–18
Financial strain	–	7.61(2.31)	4–12
Social support	–	29.14(6.59)	9–36
Sense of community	–	29.54(4.51)	8–40
Satisfaction with governmental recovery	–	30.76(7.31)	10–50
Satisfaction with Life Scale	–	22.05(4.39)	5–30
Depression	–	6.68(5.19)	0–26

M mean, *SD* standard deviation

5.2 Predicting Life Satisfaction and Depression

This study intended to examine the relationships between two independent variables of sense of community and satisfaction with governmental recovery and two dependent variables of life satisfaction and depression. Regression analysis was used to examine the relationships. Before regression analyses, correlation analyses were performed to examine the relationships among all variables. Table 2 presents the matrix of Pearson's correlation coefficients for all variables in this research.

Shown in Table 2, the variables of age, education, financial strain, earthquake impact on income, life threaten, religion, sense of community, and satisfaction with governmental recovery were correlated significantly with life satisfaction. The variables of ethnicity, self-perceived health, age, earthquake impact on income, injury or dearth of relative or friend, injury or death of family member, life threaten, financial strain, social support, sense of community and satisfaction with government support were correlated significantly with depression.

A two hierarchical regression was performed separately to examine the life satisfaction and depression. For life satisfaction, the variables of age, education, financial strain, earthquake impact on income, injury or death of family member, life threaten, and religious were entered to explain life satisfaction first. The variables of sense of community and satisfaction with governmental recovery were then entered into the regression to see whether they predicted life satisfaction beyond the control variables. The results of regression were summarized in Table 3. In step one of the regression analysis, age, financial strain, and life threaten were associated significantly with life satisfaction. In step two, after controlling the sociodemographic variables and earthquake impacts, both variables of sense of community ($\beta = .13$, $p < .05$) and satisfaction with governmental recovery ($\beta = .21$, $p < .01$) were associated significantly with life satisfaction. Regression findings showed that overall model had the value of the F statistic equal to 16.58 ($p < .001$).

With respect to depression, the control variables which were correlated significantly with it were also entered into the regression first. Sense of community and satisfaction with governmental recovery were then entered into the regression to see whether they predicted depression beyond the control variables. Table 4 displays the regression results. In step one of the regression analysis, self-perceived health, age, financial strain, life threaten, and social support were associated significantly with depression. In step two, the entry of sense of community and satisfaction with governmental recovery into regression did not exert significant impact on depression, with a F statistic change of 1.57 ($p > .05$). Both variables of sense of community ($\beta = -.10$, $p > .05$) and satisfaction with governmental recovery ($\beta = .02$, $p > .05$) were not associated significantly with depression. Regression findings also showed that overall model had the value of the F statistic equal to 11.51 ($p < .001$).

It should also be noted that in both regressions on life satisfaction and depression, the results indicated that there was no problem of multicollineality; the values of variance inflation factor for all the independent variables examined in both regression analyses were below 2.0. The normal P–P plot of regression standardized residuals showed that the residuals were normally distributed and the scatter plot of the standardized residuals on the standardized predicted values showed that there was not the problem of heteroskedasticity in regression analysis.

Table 2 The matrix of correlation coefficients

Variables	1	2	3	4	5	6	7	8	9
1. Sex	–								
2. MS	.04	–							
3. ET	.16**	.02	–						
4. SH	−.00	.02	.03	–					
5. Age	−.15**	.14*	−.10	−.25***	–				
6. IH	.04	.01	.12*	−.13*	.03	–			
7. II	.16**	−.08	.39***	−.06	−.16**	.33***	–		
8. IR	.16**	−.00	.43***	.06	−.21***	.07	.45***	–	
9. IF	.09	.03	.29***	−.07	−.11	.11*	.25***	.38***	–
10. LT	.06	.12*	.21***	−.01	−.03	.03	.21***	.17**	.12*
11YF	−.13*	−.07	−.27***	.20***	−.53***	−.06	−.18**	−.12*	−.07
12. FS	.10	−.01	.13*	−.27***	−.01	.01	.37***	.21***	.09
13. SS	−.02	−.07	.04	.13*	.08	−.06	−.02	.05	−.08
14. RE	.11*	−.08	.22***	−.13*	.10	.10	.21***	.23***	.08
15. SOC	.13*	−.01	.05	.06	.23***	−.05	.09	.03	−.02
16. SG	.09	.11	−.00	.13*	.15**	−.03	−.07	−.06	−.13*
17. DE	.11	.07	.22***	−.17**	−.20***	.07	.31***	.23***	.15**
18. LS	−.03	−.05	.03	.03	.41***	−.01	−.15**	−.08	−.11

Variables	10	11	12	13	14	15	16	17	18
1. Sex									
2. MS									
3. ET									
4. SH									
5. Age									
6. IH									
7. II									
8. IR									
9. IF									
10. LT	–								
11YF	−.11*	–							
12. FS	.01	.20**	–						
13. SS	.05	−.09	−.11	–					
14. RE	−.07	−.35***	.13*	.15**	–				
15. SOC	−.05	−.29***	.04	.19**	.16**	–			
16. SG	−.02	−.14*	−.09	.07	.03	.49***	–		
17. DE	.23***	.07	.31***	−.30***	−.02	−.16**	−.12*	–	
18. LS	−.12*	−.25***	−.19**	.06	.11*	.33***	.35***	−.38***	–

$N = 304$. *MS* marital status, *ET* ethnicity, *SH* self-perceived health, *IH* impact on house, *II* impact on income, *IR* injury or death of relative or friend, *IF* injury or death of family member, *LT* life threaten, *YF* years of formal education, *FS* financial strain, *SS* social support, *RE* religion, *SOC* sense of community, *SG* satisfaction with governmental recovery, *DE* depression, *LS* life satisfaction

Significance levels * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed test)

Table 3 Hierarchical regression model on life satisfaction

Independent variables	Step 1		Step 2	
	B(SE)	β	B(SE)	β
Age	.09(.02)	.34***	.09(.02)	.30***
Years of formal education	−.10(.07)	−.11	−.05(.07)	−.05
Financial strain	−.38(.11)	−.20***	−.33(.10)	−.17**
Impact on income	−.10(.17)	−.03	−.11(.16)	−.04
Life threaten: no (vs. yes)	−1.16(.56)	−.11*	−1.00(.53)	−.09
No religion (vs. religions)	.69(.56)	.07	.63(.53)	.06
Sense of community			.13(.06)	.13*
Satisfaction with governmental recovery			.13(.03)	.21***
R^2	.23		.31	
R^2 change			.08	
Adjusted R^2	.21		.29	
F (Sig.)	14.47***		16.58***	
F change			17.96***	

Significance levels * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4 Hierarchical regression model on depression

Independent variables	Step 1		Step 2	
	B(SE)	β	B(SE)	β
Han (vs. Qian or others)	1.03(.61)	.10	1.05(.60)	.10
Self-perceived health	−.62(.25)	−.13*	−.58(25)	−.12*
Age	−.06(.02)	−.17**	−.05(.02)	−.14**
Financial strain	.40(.12)	.18**	.41(.12)	.18**
Impact on income	.34(.21)	.10	.39(.21)	.11
Injury or death of relative or friend: no (vs. yes)	.70(.65)	.07	.71(.65)	.07
Injury or death of family member: no (vs. yes)	−.13(.61)	−.01	−.11(.62)	−.01
Life threaten: no (vs. yes)	2.23(.63)	.18**	2.13(.63)	.17**
Social support	−.21(.04)	−.26***	−.19(.04)	−.25***
Sense of community			−.12(.07)	−.10
Satisfaction with governmental recovery			.02(.04)	.02
R^2	.30		.30	
R^2 change			.01	
Adjusted R^2	.27		.28	
F	13.67***		11.51***	
F change			1.57	

Significance levels * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

6 Discussion

6.1 Contribution to Literature

This research focused on the impacts of sense of community and satisfaction with governmental recovery on psychological status of the Wenchuan earthquake survivors. Correlation analysis revealed that both sense of community and satisfaction with governmental recovery were correlated significantly and positively with life satisfaction and significantly and negatively with depression. Regression analyses found that sense of community and satisfaction with governmental recovery were associated significantly and positively with life satisfaction, after controlling socio-demographic and earthquake impact variables. The first and third research hypotheses of this research were thus supported. The second and fourth hypotheses were not supported.

The positive relationship between satisfaction with governmental recovery and life satisfaction of disaster survivors highlighted the importance of social policies or governmental actions in disaster recovery in disaster survivors' life. This is consistent with Cheung and Leung's (2008) finding that the accountability of the government in China is an effective means to sustain the life satisfaction of citizens. The finding was understandable because government's involvement in disaster recovery would help restore or improve disaster survivors' living environment and thus would contribute to their life satisfaction. It was also possible that despite being negatively affected by the earthquake, survivors might feel satisfied and lucky that government could invest a large amount of money to improve their lives and they did not need to pay additional taxes or money to receive governmental recovery services, which would contribute to their life satisfaction.

Sense of community was also associated significantly with life satisfaction of disaster survivors in regression analysis. This is consistent with the research that indicated significant association between sense of community and psychological status (Li et al. 2011; Mak et al. 2009; Prezza et al. 2001). It was likely that sense of community would foster a sense of identity, safety, and holding valued positions within a community among residents and promote their social relations and oppose anonymity and loneliness, thus contributing to their psychological wellbeing (Pretty et al. 2006; Prezza and Costantini 1998). Furthermore, it should be noted that when this data was collected in July and August 2012, most respondents had just moved into or lived in the new communities reconstructed after the earthquake for a short time. They might be in the process of getting familiar with people and facilities in new communities. Sense of community might show more powerful impacts on their psychological status after they fully settled down and were more familiar with people and facilities in the new communities.

Both satisfaction with governmental recovery and sense of community were not found to be associated with the depression of disaster survivors in regression analyses. Perhaps unlike people's life satisfaction which is stable over extended periods of time (Pavot and Diener 1993; Diener 2000), depression was relatively momentary or situational because CES-D only intends to measure people's mood in the past 2 weeks. Thus, it was possible that depression was more related to situational factors like social support than stable factors like satisfaction with governmental recovery and sense of community.

6.2 Impact of Control Factors on Life Satisfaction and Depression

This research revealed that age and financial strain were significant correlates for both life satisfaction and depression of disaster survivors. It was likely that the older the disaster

survivors, the more life experiences and coping strategies they had to cope with disaster outcomes and thus the more life satisfaction and less depression they reported. Some studies also suggested that older disaster survivors had higher recovery resilience (Tichehurst et al. 1996; Thompson et al. 1993). Although the respondents in this research might not experience other natural disasters, many of them, especially older respondents, experienced China's great famine from 1958 to 1962 (Zhou 2012) and the cultural revolution from 1966 to 1976 (Esherick et al. 2006). Perhaps some of them developed coping strategies from these human-created disasters and these strategies helped them cope with the Wenchuan earthquake. Regarding finance, it is one of the most basic elements for people life and therefore it was not surprising that financial strain was associated significantly and negatively with life satisfaction and significantly and positive with depression of disaster survivors.

Self-perceived health and social support was found be associated significantly and negatively with depression in regression analysis. These were consistent with the prior research (e.g., Dougall et al. 2001; Ke et al. 2010; Xu and He 2012) and in line with the theories of resources and adaptation such as the conservation of resources theory (Hobfoll 1989, 2002). Furthermore, the finding indicated that life threaten in the earthquake was associated significantly with depression in regression analysis. This supported the research finding by Sumer et al. (2005). Maybe a matter of life or death itself could exert long term negative impacts on people's lives. Meanwhile, the respondents whose lives threaten in this study were also impacted more on their income, which was correlated with financial strain, as shown in Table 2. This might also partly explain the positive relationship between life threaten and depression. However, these three variables were not associated with life satisfaction. This pointed to the complexity of factors related to different dimensions of psychological status.

6.3 Limitations

Some limitations of this study should be addressed. First, the study was conducted in five communities affected by the Wenchuan earthquake and the sample was not randomly selected. The respondents were likely to be relatively healthy and active people living in communities. Therefore, the generalizability of the findings was limited. Future studies may apply random sampling and include a larger sample size in more communities. Second, this study was a cross-sectional study which prohibited making a conclusion about the directionality of relationships. Future studies with a qualitative or a longitudinal design with repeated surveys may be able to establish causal relationships. Third, this study only focused on the impacts of sense of community and satisfaction with governmental recovery on disaster survivors' life satisfaction and depression. It is known that there are other elements of psychological status such as happiness and morale and other correlates. There are also other factors related to community and social policy such as the accountability of government (Cheung and Leung 2008) that may exert impacts on disaster survivors' psychological status. In the interests of promoting disaster survivors' wellbeing, additional studies, which should include more psychological elements as well as their correlates, are needed to examine the factors associated with disaster survivors' psychological status. Fourth, this study applied self-reported measure which might reflect some patterns of reporting biases or personal bias, such as the biases related to self-representation and social desirability. Future studies with other kinds of measures should be conducted to examine the correlates of disaster survivors' life satisfaction and depression. Despite the limitations, this study can be regarded as pioneering in nature, given that to date there have been few

studies examining the relationships between sense of community and satisfaction with governmental recovery and both life satisfaction and depression of disaster survivors in China.

6.4 Implications

This research has the following implications. First, the findings show that there were both similar and different correlates between disaster survivors' life satisfaction and depression. This suggests that to develop a comprehensive understanding of disaster survivors' psychological status, both positive and negative dimensions should be examined. The findings also implies that professionals working with disaster survivors should pay attention to both positive and negative dimensions of survivors' psychological status and adopt different ways to enhance survivors' life satisfaction and reduce their depression. For example, according to the findings in this research, promoting disaster survivors' social support and health tends to be more effective to reduce their depression than to enhance their life satisfaction.

Second, the positive association between satisfaction with governmental recovery and survivors' life satisfaction implies that promoting the fair and transparent regulations and service delivery in disaster recovery policies is likely to enhance their life satisfaction. Given that China has a centralized political system and the central government controlled the majority of national revenue (Huang et al. 2011), government policies can have profound effects on people's wellbeing. Making the government a democracy and promoting opportunities for citizens' participation and influence in policies planning and implementation would contribute to fair and transparent governance, which are likely to benefit not only disaster survivors but also other citizens.

Third, the positive association between sense of community and survivors' life satisfaction implies that professionals such as social service workers can organize community activities or foster recreational, self-help, or interest groups among disaster survivors to promote their activity participation and interaction with others to strengthen their sense of community. Research (e.g., Huang and Wong 2013) also indicated that social workers could contribute to psychosocial wellbeing, social network, and community activity participation of disaster survivors through organizing social recreational groups among them.

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