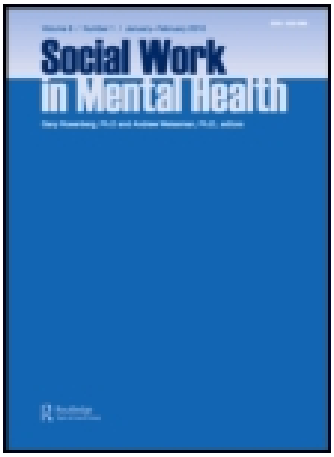

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Associations Among Chinese Cultural Beliefs of Adversity, Income Recovery, and Psychological Status of Wenchuan Earthquake Survivors

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This research examines the associations between Chinese cultural beliefs of adversity, income recovery, and psychological status among the Wenchuan earthquake survivors. A total of 304 valid questionnaires were collected. Regression analyses indicated that positive Chinese cultural beliefs of adversity and income recovery were associated significantly with life satisfaction. The relationship between positive Chinese cultural beliefs of adversity and life satisfaction was also mediated by income recovery. The research has highlighted the importance of examining both positive and negative aspects of psychological status among disaster survivors and adopting different methods to work with different aspects of their psychological status.

KEYWORDS Chinese culture, cultural beliefs of adversity, income recovery, life satisfaction, depression, earthquake survivors

On May 12, 2008, an earthquake measuring 8.0 on the Richter scale hit Wenchuan County, Sichuan, China and its neighboring regions, resulting in 69,226 known deaths, 17,923 missing people, and 374,643 injured (State

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Council, 2008). A total of 5.36 million buildings collapsed, more than 21 million buildings were damaged, and the total economic loss was estimated at USD 86 billion (U.S. Geological Survey, 2012). Many studies (Fan, Zhang, Yang, Mo, & Liu, 2011; Huang & Wong, 2013, 2014; Jia et al., 2010; Ke, Liu, & Li, 2010; Li, Sun, He, & Chan, 2011; Wen, Shi, Li, Yuan, & Wang, 2012; Xu & He, 2012; Xu & Song, 2011) have been conducted to examine the psychological or mental issues confronted by earthquake survivors. However, few studies have focused on the relationship between personal beliefs of adversity among disaster survivors, their recovery, and their psychological status. Through a survey conducted in July to August 2012 with 304 survivors of the Wenchuan earthquake, the present study is significant in examining the associations among Chinese cultural beliefs of adversity, income recovery, and psychological status. The mediating effect of income recovery on the relationship between Chinese cultural beliefs of adversity and psychological status was also studied.

LITERATURE REVIEW

This study defines disasters as natural events, social disruptions, and political phenomena (Mirzamani & Mohammadi, 2007; Quarantelli, 1998) that affect individuals, families, and communities physically, psychologically, and spiritually (Erikson, 1976; Myers, 1994; Rosenfeld, Caye, Lahad, & Gurwitch, 2010). Many studies have 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 posttraumatic stress disorder (PTSD), anxiety, and depression (Adams et al., 2002; Davidson, Fleming, & Baum, 1985; Freedy, Kilpatrick, & Resnick, 1993; Green, 1995; Karanci & Rustemli, 1995; Logue, Hansen, & Struening, 1981; Norris, Friedman, & Watson, 2002a; Norris et al., 2002b; Salcioglu, Basoglu, & Livanou, 2007).

Studies were also conducted to examine the factors associated with the psychological status of disaster survivors. The reviews of literature by Gibbs (1989), Lewin, Carr, and Webster (1998), Brewin, Andrews, and Valentine (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, personality, secondary stressors, and psychosocial resources including ways and beliefs of coping, social support, and resource loss have influenced the psychological status of disaster survivors. Although numerous variables have been studied to explain psychological outcomes among disaster survivors, less attention has been focused on the factors related to cultural beliefs of adversity and income recovery of disaster survivors. These two variables tend to be closely associated with the psychological status of disaster survivors. The rationale behind

the relationship between the two variables and psychological status among the Wenchuan earthquake survivors is described below.

Cultural Beliefs of Adversity and Psychological Status of the Wenchuan Earthquake Survivors

Beliefs can be defined as "concepts about the nature, the causes, and the consequences of things, persons, events and processes" as well as "social constructions that are part of a culture and have guided the socialization of those who share that culture" (Pepitone, 1994, p. 140). Personal beliefs can be significant protective factors for people experiencing adversity (Shek, Tang, Lam, Lam, & Tsang, 2003). This finding is consistent with the assertion of cognitive psychology that people are unaffected by things themselves, but by their interpretation of things as well as the theoretical propositions on optimism and fatalism that suggest a positive association between a stronger endorsement of the belief that one can control one's life and his/her psychological adjustment (Bandura, 1997; Maddux, 1995).

Next, cultural beliefs of adversity can be defined as "those concepts about the nature of adversity such as its causes, consequences, and the proper coping behavior" (Shek et al., 2003, p. 428). Chinese cultural beliefs of adversity fall under two categories: positive beliefs of adversity and people's capacity to overcome adversity, such as the beliefs that hardship increases stature and that man/woman is the master of his/her own fate, and negative cultural beliefs of adversity that emphasize people's inability to change adversity and the negative impact of adversity, such as the belief that whether a life is good or bad depends on fate and that poverty stifles ambition (Shek, 2004, 2005). Chinese cultural beliefs of adversity provide the basis on which Chinese people experiencing adversity make sense of their experience and develop their coping strategies (Shek, 2005). The multicultural model of the stress process (Slavin, Rainer, McCreary, & Gowda, 1991) also suggests that culture serves as an important function in defining the problem and behavioral options in stress coping processes.

Based on the above discussion, we can expect Chinese disaster survivors with the endorsement of more positive Chinese cultural beliefs of adversity to have better capacity to overcome the effects of disasters and display better adjustment and more positive psychological outcomes. Research has also shown that Chinese cultural beliefs of adversity significantly influence the psychosocial adjustment of Chinese adolescents experiencing economic disadvantages (e.g., Shek, 2004, 2005; Shek et al., 2003) and the life satisfaction of older Chinese people (Huang & Wu, 2012). However, to the best of the authors' knowledge, the concept of Chinese cultural beliefs of adversity was never applied in disaster research. In this regard, this study can be considered as pioneering in nature.

Income Recovery and Psychological Status of the Wenchuan Earthquake Survivors

The Wenchuan earthquake was expected to affect the survivors' income in several ways. First, the earthquake might have destroyed the survivors' income resources, such as farmlands and rental houses. Second, the earthquake might have resulted in the closure of factories or companies, making the survivors lose both jobs as well as income. Third, the earthquake might have killed or injured the survivors' family members who are the family's main income earners and thus result in the loss of survivors' income. Given the importance of income to people's basic needs, more complex interest or status needs, and/or culturally learned needs (Diener & Biswas-Diener, 2002; Diener, Sandvik, Seidlitz, & Diener, 1993; Maslow, 1970; Veenhoven, 1991), we can reasonably infer that income loss would be positively associated with disaster survivors' negative psychological outcomes and income recovery would be positively associated with their positive psychological outcomes. However, the association between income recovery and psychological status of disaster survivors was hardly ever examined empirically.

Mediating Effect of Income Recovery

The mechanism of the association between Chinese cultural beliefs of adversity and income recovery among disaster survivors can be explained by the theory of reasoned action by Fishbein and Ajzen (2010) and Ajzen and Fishbein (1980). The theory indicates that human behavior is guided by three kinds of considerations: beliefs of the likely consequences of behavior (behavioral beliefs), beliefs of the normative expectations of others (normative beliefs), and the beliefs of the presence of factors that may influence performance of the behavior (control beliefs). In combination, the three types of beliefs or attitudes form behavioral intentions, and people act on such intentions when they have the necessary skills and when environmental factors do not impede their action.

As discussed earlier, positive Chinese cultural beliefs of adversity emphasize the positive values of adversity and people's capacity to overcome adversity, whereas negative cultural beliefs of adversity emphasize people's inability to change adversity and the negative impact of adversity. With positive Chinese cultural beliefs of adversity, disaster survivors were more likely to have intentions to overcome the effects of disaster and accordingly take action to recover and thus report a higher degree of income recovery. By contrast, with negative Chinese cultural beliefs of adversity, disaster survivors were likely to have fewer intentions to overcome the effects of disaster by themselves and accordingly report a lower degree of income recovery. A few studies have also demonstrated that behavior is significantly influenced by beliefs (Bond, 1972; Swann & Snyder, 1980).

RESEARCH HYPOTHESES

Based on the above literature review and discussion, the following research hypotheses were proposed:

Hypothesis 1: Positive Chinese cultural beliefs of adversity would be significantly and positively associated with life satisfaction among the Wenchuan earthquake survivors.

Hypothesis 2: Income recovery would be significantly and positively associated with life satisfaction among the Wenchuan earthquake survivors.

Hypothesis 3: Positive Chinese cultural beliefs of adversity would be significantly and negatively associated with depression among the Wenchuan earthquake survivors.

Hypothesis 4: Income recovery would be significantly and negatively associated with depression among the Wenchuan earthquake survivors.

Hypothesis 5: The relationship between positive Chinese cultural beliefs of adversity and life satisfaction would be mediated by income recovery.

Hypothesis 6: The relationship between positive Chinese cultural beliefs of adversity and depression would be mediated by income recovery.

Sociodemographic variables such as sex, age, marital status, education, ethnicity, religion, and health status were included as control variables. The variables of disaster impacts such as disaster impact on housing, injury or death of a family member, injury or death of a relative or friend, and threat to personal life during the earthquake as well as social support were also included as control variables because these factors were often found to be associated with the psychological status of disaster survivors (Brewin et al., 2000; Norris et al., 2002b).

METHOD

Research Participants

Participants in this research were aged 18 or above who survived the Wenchuan earthquake in Sichuan. The survey was conducted in five communities, all located in the most severely affected areas. Among the five communities, four were in Beichuan county and one in Pengzhou city. The communities were selected because social welfare agencies were working in these communities, and the researchers had contacts within these agencies who could aid in entry into these communities and in approaching residents.

The non-probability sampling method was chosen for several reasons. First, the primary intention of this study was not to generalize the results to a broader population but to gain more insight into the subject of inquiry so as to contribute to the development of a solid foundation for further studies. Second, non-probability sampling is the most economical and expedient approach considering the limited financial support for this research. The researchers approached and interviewed people mainly in public parks, social work agencies' activity rooms, and tea houses where local people gathered. Among the 322 questionnaires collected, 18 were incomplete, leaving a total of 304 completed questionnaires.

Procedures

A face-to-face interview approach using a questionnaire written in Chinese was adopted. Five interviewers, each having either a bachelor's degree in social work or a master's degree in social work and the ability to speak local dialects, conducted the face-to-face interviews. Among the 304 completed questionnaires, 33 questionnaires were filled out by the respondents themselves according to their preference. Their self-completed questionnaires were checked by the interviewers for completeness. A significant difference was observed 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), $t = 6.26$, $p < .001$. The data was collected in July and August 2012. Each interview lasted approximately 25 minutes to 40 minutes. Given that the data was collected by the first author who originally worked in an institute that did not have an ethical committee at the time of data collection, this research did not go through ethical review. Efforts were made to avoid asking sensitive questions that might result in uncomfortable feelings among research participants. Interviewers were asked to stop asking questions and attend to the participants' needs whenever they encounter emotional reactions such as breaking into tears. Before the interview, informed consent was obtained from the participants, and they were told that they may quit at any time. The anonymity and confidentiality of replies were emphasized to encourage honest responses.

Measures

In this study *psychological status* was measured by two variables: life satisfaction and depression. This study was conducted four years after the Wenchuan earthquake when the survivors' life was likely to return back to normal or be reasonably stable. We thus selected life satisfaction and depression, which are more stable psychological status indicators than PTSD and

anxiety. *Life satisfaction* was measured using the five-item Satisfaction with Life Scale (SWLS) designed by Diener, Emmons, Larsen, and Griffin (1985). The Chinese version of the SWLS translated by Shek (1998) was utilized. The respondents were asked to indicate their degree of agreement with each item on a six-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree). Internal consistencies of the Chinese version of SWLS scores ranged from 0.71 to 0.93 in previous studies (e.g., Bai, Wu, Zheng, & Ren, 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 using 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. Participants rated items across a Likert-type scale (1 = seldom or never, 2= now or then, 3 = regularly, 4 = often). Research indicated that this 10-item CES-D can be used in lieu of the 20-item version (Cheng & Chan 2005; Zhang et al., 2012). The Cronbach's alpha of the scale was 0.82 in this research.

The scale of *Chinese cultural beliefs of adversity* was adopted from the studies by Shek et al. (2003) and Shek (2005). The scale had nine items, including (1) Hardship increases stature; (2) Whether a life is good or bad depends on fate; (3) Where there is a will, there is a way; (4) If you work hard enough, you can turn an iron rod into a needle; (5) Poverty stifles ambition; (6) Diligence is an important factor to overcome poverty; (7) Man/woman is the master of his/her own fate; (8) A contended person is always happy; and (9) Man/woman is not born to greatness, he/she achieves it by his/her own effort. The respondents were asked to indicate their degree of agreement with each item on a six-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree). Items 2 and 5 assessed negative cultural beliefs of adversity, whereas other items assessed positive cultural beliefs. The scores of items 2 and 5 were reversed. The overall score of the scale was obtained by adding the scores of all nine items. Higher scores referred to higher degrees of agreement with positive beliefs of adversity. However, in this research, the deletion of items 2 and 5 resulted in an increase in the Cronbach's alpha of the scale from 0.47 to 0.71. The two items were thus deleted in this research.

Income recovery. No scale that measures income recovery was found in the literature. The researchers developed a scale to measure income recovery based on consultations and discussions with social work academia and front-line social workers working with the Wenchuan earthquake survivors. The scale was composed of two items, including (1) my current income is higher than that of the pre-earthquake and (2) I have good income status relative to pre-earthquake. The respondents were asked to indicate their degree of agreement with each item on a five-point Likert-type scale ranging from 1

(strongly disagree) to 5 (strongly agree). The Cronbach's alpha of the scale was 0.97 in this research.

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 the earthquake to a respondents' family member. Injury or death of relative(s) or friend(s) (0 = no, 1 = yes) was also the direct result of the earthquake to their relative(s) or friend(s). Furthermore, respondents were asked to indicate the effects of the earthquake on their houses and income on a five-point scale from none (= 1) to enormous (= 5).

Social support was assessed using the Social Support Questionnaire by Doeglas et al. (1996). 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, e.g., "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 scale was translated into Chinese by the first author of this article, reviewed, and then revised by the second and third authors of this article. Three of the authors were Chinese–English bilinguals and reached an agreement on the translated scale. An exploratory factor analysis using IBM Statistical Package for the Social Sciences (IBM-SPSS, version 19.0) for Windows was conducted to examine the scale's factor structure. All nine items were found to 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 the financial status of respondents. The scale was developed by Chou and Chi (2002) and consisted of four items. In Chou and Chi's scale, using a three-point scale ranging from 1 = enough to 3 = not enough, three items were asked to the respondents whether they had enough money to pay for their needs for food, medical services, and daily expenses. The fourth item asked respondents to rate how difficult it was for them to pay their monthly bills 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 electricity, water, and other bills, using a three-point scale range from 1 = enough to 3 = not enough to make the

responses to all items consistent. 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 was 0.84.

Other control variables 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), and *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), *ethnicity,* and *religion*.

Data Analyses

The data were coded and analyzed using IBM-SPSS (version 19.0) for Windows. Prior to data entry, all questionnaires were checked for completeness. Before data analysis, all data were checked for entry errors. Correlation analyses were first conducted to determine whether Chinese cultural beliefs of adversity and income recovery were associated significantly with life satisfaction and depression. For a better estimation of the effects of Chinese cultural beliefs of adversity and income recovery on life satisfaction and depression, regression analyses were performed, controlling for other variables.

RESULTS

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 divorced were combined into one response category. Regarding the respondents' ethnicity, 61.2% were Han, 38.5% percent Qiang, and only 0.3% Zang. Qiang and Zang were combined into one response category for further analyses. For religion, 25.7% did not have religion, 15.1% were Buddhists, 1.3% Christians, and 57.9% folk religion. Buddhism, Christian, and folk religion were combined into one response category for further analyses.

Predicting Life Satisfaction and Depression

This study intended to examine the relationships between the two independent variables of Chinese cultural belief on adversity and income recovery and the two dependent variables of life satisfaction and depression.

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. Qiang or Zang)	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	0–18
Financial strain	—	7.61 (2.31)	4–12
Social support		29.14 (6.59)	9–36
Chinese cultural beliefs of adversity	—	36.45 (4.21)	22–42
Income recovery	—	6.18 (2.61)	2–10
Satisfaction with Life Scale	—	22.05 (4.39)	5–30
Depression	—	6.68 (5.19)	0–26

M = Mean, SD = Standard deviation.

Regression analysis was used to examine the relationships. However, before the regression analyses, correlation analyses were performed to examine the relationships among all variables. Table 2 presents the matrix of Pearson's correlation coefficients for the variables. Notably, the variable of Chinese cultural beliefs of adversity was not correlated significantly with depression.

Two hierarchical regressions were performed separately to examine life satisfaction and depression. The variables that were correlated significantly with life satisfaction and depression were entered into the regression. For life satisfaction, the variables of age, education, financial strain, earthquake impact on income, injury or death of a family member, and life threat were entered into the regression first. The variables Chinese cultural beliefs of adversity and income recovery were then entered into the regression to

TABLE 2 Matrix of Correlation Coefficients

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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. IRF	.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*	—								
11.YF	−.13*	−.07	−.27***	.20***	−.53***	−.06	−.18**	−.12*	−.07	−.11*	—							
12. FS	.10	−.01	.13*	−.27***	−.01	.01	.37***	.21***	.09	.01	.20**	—						
13. SS	−.02	−.07	.04	.13*	.08	−.06	−.02	.05	−.08	.05	−.09	−.11	—					
14. RE	.11*	−.08	.22***	−.13*	.10	.10	.21***	.23***	.08	−.07	−.35***	.13*	.15**	—				
15. CC	.02	−.10	.14*	.09	.10	.00	.01	.02	−.05	.05	−.00	−.10	−.11	.12*	—			
16. IR	−.06	.17**	−.12*	.10	.22***	.01	−.26***	−.15**	−.11	−.10	−.06	−.29***	.12*	−.01	.17**	—		
17.DE	.11	.07	.22***	−.17**	−.20***	.07	.31***	.23***	.15**	.23***	.07	.31***	−.30***	−.02	−.05	−.20***	—	
18. LS	−.03	−.05	.03	.03	.41***	−.01	−.15**	−.08	−.11	−.12*	−.25***	−.19**	.06	.11*	.32***	.33***	−.38***	—

$N = 304$. MS = Marital status; ET = Ethnicity; SH = Self-perceived health; IH = Impact on house; II = Impact on income; IRF = 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; CC = Chinese cultural beliefs of adversity; IR = Income recovery; DE = Depression; LS = Life satisfaction

Significance levels: $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$ (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***	.07 (.02)	.24***
Years of formal education	−.10 (.07)	−.11	−.18 (.07)	−.17**
Financial strain	−.38 (.11)	−.20***	−.25 (.10)	−.13*
Impact on income	−.10 (.17)	−.03	−.07 (.16)	−.03
Life threaten: no (vs. yes)	−1.16 (.56)	−.11*	−1.27 (52)	−.12*
No religion (vs. Religions)	.69 (.56)	.07	.14 (.53)	.01
Chinese cultural beliefs of adversity			.27 (.05)	.26***
Income recovery			.31 (.09)	.18**
R^2	.23		.33	
R^2 change			.10	
Adjusted R^2	.21		.31	
F (Sig.)	14.47***		17.93***	
F change			22.14***	

Significance levels: *$p < .05$; **$p < .01$; ***$p < .001$.

determine 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, years of formal education, financial strain, and life threat were associated significantly with life satisfaction. In step two, after controlling for the sociodemographic variable and earthquake impacts, both Chinese cultural beliefs on adversity ($\beta = .26$, $p < .001$) and income recovery ($\beta = .18$, $p < .01$) were found to be significant. Regression findings also showed that the overall model had the value of the F statistic equal to 17.93, with a probability level of .000.

For depression, the control variables that show significant correlation were also entered into the regression first. Income recovery was then entered into the regression to verify whether it predicted regression beyond the control variables. Table 4 displays the regression results. In step one of the regression analysis, self-perceived health, age, financial strain, life threat, and social support were associated significantly with depression. In step two, the entry of income recovery into regression did not exert significant effects on depression. Regression findings also showed that the overall model had the value of the F statistic equal to 12.26, with a probability level of .000.

Mediating Effect of Income Recovery

Given that the variable of Chinese cultural beliefs of adversity was not correlated with depression, the mediation of income recovery over the relationship between Chinese cultural beliefs of adversity and depression did not exist and was not examined. To examine whether income recovery mediated

TABLE 4 Hierarchical Regression Model on Depression

	Step 1		Step 2	
Independent variables	B (SE)	β	B (SE)	β
Han (vs. Qiang or Zang)	1.03 (.61)	.10	1.03 (.61)	.10
Self-perceived health	−.62 (.25)	−.13*	−.62 (25)	−.13*
Age	−.06 (.02)	−.17**	−.06 (.02)	−.17**
Financial strain	.40 (.12)	.18**	.40 (.13)	.18**
Impact on income	.34 (.21)	.10	.34 (.21)	.10
Injury or death of relative or friend: no (vs. yes)	.70 (.65)	.07	.70 (.65)	.07
Injury or death of family member: no (vs. yes)	−.13 (.61)	−.01	−.13 (.61)	−.01
Life threaten: no (vs. yes)	2.23 (.63)	.18**	2.22 (.63)	.18**
Social support	−.21 (.04)	−.26***	−.21 (.04)	−.26***
Income recovery			.01 (.11)	−.01
R^2	.30		.30	
R^2 change			.00	
Adjusted R^2	.27		.27	
F	13.67***		12.26***	
F chang			0.01	

Significance levels: $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

the relationship between Chinese cultural beliefs of adversity and life satisfaction among survivors, regression analyses were performed using a four-step procedure (Baron & Kenny, 1986; Judd & Kenny, 1981). Step one involved the determination of the significant relationship between the independent variable of Chinese cultural beliefs of adversity and life satisfaction. Step two required that the independent variable was associated significantly with the mediating variable of income recovery. Step three required a significant association between the mediating variable of income recovery and life satisfaction, controlling for the independent variable of Chinese cultural beliefs of adversity. Step four required a decrease in the coefficient of the relationship between Chinese cultural beliefs of adversity and life satisfaction, controlling for the mediating variable of income recovery. As shown in Table 2, aside from earthquake, Chinese cultural beliefs of adversity, ethnicity, age, financial strain, injury or death of relative or friend, marital status, social support, and life threat were correlated significantly with income recovery. Thus, these variables were controlled in the regression analysis on income recovery. Table 5 shows the results of the meditational analyses of life satisfaction.

As shown in Table 5, the variable of Chinese cultural beliefs of adversity was associated significantly with life satisfaction ($\beta = .28$, $p < .001$) in step one. In step two, the variable of Chinese cultural beliefs of adversity was associated significantly with income recovery ($\beta = .17$, $p < .01$). In step three, after controlling for disaster impact on income, financial strain was associated with life satisfaction ($\beta = .26$, $p < .001$). In step four, the inclusion of income recovery in the linear regression model resulted in a decrease in

TABLE 5 Mediational Analyses of Life Satisfaction

	Step 1		Step 2		Steps 3 & 4	
Independent variables	B (SE)	β	B (SE)	β	B (SE)	β
Age	.08 (.02)	.29***	02 (.01)	14*	.07 (.02)	.24***
Years of formal education	−.15 (.07)	−.14*	—	—	−.18 (.07)	−.17**
Financial strain	−.33 (.10)	−.17**	−23 (.07)	−.20***	−.25 (.10)	−.13*
Earthquake impact on income	−.14 (.17)	−.05	−22 (.11)	−.13*	−.07 (.16)	−.03
Life threaten: no (vs. yes)	−1.37 (.53)	−.13*	—	—	−1.27 (52)	−.12*
No religion (vs. Religions)	.23 (.05)	.02	—	—	.14 (.53)	.01
CC	.29 (.05)	.28***	.11 (.03)	.17**	.27 (.05)	.26***
Marital status	—	—	1.13 (.36)	.17**	—	—
Ethnicity	—	—	−.29 (.32)	−.05	—	—
IRF	—	—	−.05 (.33)	−.01	—	—
Social support	—	—	05. (.02)	.12*	—	—
Income recovery	—	—	—	—	.31 (.09)	.18**
R^2	.30		.20		.24	
Adjusted R^2	.28		.18		.22	
F (Sig.)	18.13***		9.34***		13.11***	

In step two, the dependent variable is income recovery. In steps one, three, and four, the dependent variables are life satisfaction. IRF = Injury or death of relative or friend: no (vs. yes); CC = Chinese cultural beliefs of adversity.
*$p < .05$; **$p < .01$; ***$p < .001$.

the β value from 0.28 in step 1 to 0.26 for the association between Chinese cultural beliefs of adversity and life satisfaction. These findings indicated that the relationship between Chinese cultural beliefs of adversity and life satisfaction was mediated by income recovery. According to the Sobel test (Sobel, 1982), the indirect effect of Chinese cultural beliefs of adversity over income recovery to life satisfaction was significant ($z = 2.96$, $p < .01$), and the variance of indirect effect was 0.09.

In addition, the results of all above regression analyses indicated that no problem of multicollineality existed; the values of variance inflation factor for all the independent variables examined in 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 no problem of heteroskedasticity in the regression analysis.

DISCUSSION

This research examined the relationships among Chinese cultural beliefs of adversity, income recovery, and psychological status of Wenchuan earthquake survivors. Correlation analysis revealed that both variables of Chinese cultural beliefs of adversity and income recovery were correlated

significantly with life satisfaction. However, only income recovery was correlated with depression. Regression analyses found that Chinese cultural beliefs of adversity and income recovery were associated significantly with life satisfaction, but income recovery was not associated with depression after controlling for sociodemographic and earthquake impact variables. Meditational analyses also revealed that the relationship between Chinese cultural beliefs of adversity and life satisfaction was partly mediated by income recovery. Thus, the research hypotheses 1, 2, and 5 were supported, whereas the research hypotheses 3, 4, and 6 were not.

The finding on the relationship between life satisfaction and positive Chinese cultural beliefs of adversity supported the assertions of the multicultural model of the stress process (Slavin et al., 1991), which indicated that culture has an important function in defining the problem and behavioral options in the stress and coping processes. The finding was also consistent with previous research (Huang & Wu, 2012; Shek, 2005; Shek et al., 2003) and thus extended the literature on Chinese cultural beliefs of adversity to Chinese disaster survivors. Perhaps with the endorsement of positive Chinese cultural beliefs of adversity, the Wenchuan earthquake survivors became more likely to accept the adversities and believed they could overcome adversities in their lives. Thus, they took a more positive perspective toward their lives and had higher life satisfaction.

However, for the scale of Chinese cultural beliefs of adversity, the deletion of two negative cultural beliefs notably resulted in an increase in the Cronbach's alpha of the scale from 0.47 to 0.71 in this study, which was not observed in previous studies (Huang & Wu, 2012; Shek, 2005; Shek *et al*., 2003). The Wenchuan earthquake might have affected the negative beliefs of adversity among the survivors. The sudden deaths and injuries caused by the earthquake might have strengthened or resulted in their beliefs that life or death depends on luck or fate, that people are vulnerable, and so on. Research is warranted to examine this issue. Furthermore, although this study focused on Chinese cultural beliefs of adversity derived from Chinese culture, this focus did not indicate that the beliefs were only specific to the Chinese. The applicability of these beliefs to people of other societies also warrants further research. The relationship between Chinese cultural beliefs of adversity and other psychological constructs such as optimism, pessimism, and fatalism (e.g., Chang, 2001; Morgenstern et al., 2011) should be explored. The positive Chinese cultural beliefs of adversity and optimism apparently share many similarities, and so do the negative Chinese cultural beliefs of adversity and pessimism and fatalism.

Income recovery was associated with life satisfaction and also mediated the relationship between positive Chinese cultural beliefs of adversity and life satisfaction. These findings not only confirmed the importance of income in people's lives, but also supported the theory of reasoned action (Ajzen

& Fishbein, 1980; Fishbein & Ajzen, 2010), which implies that with more positive Chinese cultural beliefs of adversity, disaster survivors might make more efforts to recover by themselves and thus reported a high degree of income recovery. However, income recovery was notably not just a personal matter but was also affected by social factors such as job availability. Caution should be taken and survivors should not be blamed for not exerting efforts to recover by themselves. Furthermore, Diener et al. (1993) highlighted that income might influence psychological status through different ways, such as satisfying people's basic needs, more complex interest or status needs, or culturally learned needs. More research is warranted to explore the mechanism of the relationship between income recovery and psychological status of disaster survivors.

This research has also showed that the variable of Chinese cultural beliefs of adversity was not associated with depression in the correlation analysis, and income recovery was not associated significantly with depression in the regression analysis. Perhaps people's life satisfaction had stabilized over extended periods of time (Pavot & Diener, 1993; Diener, 2000), and depression was relatively momentary or situational because CES-D only intends to measure people's mood in the past two weeks. Thus, depression was likely to be more related to relatively situational factors such as social support than to relatively stable factors such as Chinese cultural beliefs of adversity and income recovery.

This research has revealed that age, financial strain, and life threat were significant correlates for both life satisfaction and depression of disaster survivors. Older disaster survivors possibly had more life experiences and coping strategies to cope with disaster outcomes, such that they reported higher life satisfaction and less depression. Some studies also suggested that older disaster survivors had a higher recovery resilience (Tichehurst, Webster, Carr, & Lwein, 1996; Thompson, Norris, & Hanacek, 1993). Although the respondents in this research might not have experienced other natural disasters, many of them, especially older respondents, had experienced China's great famine from 1958 to 1962 (Zhou, 2012) and the cultural revolution from 1966 to 1976 (Esherick, Pickowicz, & Walder, 2006). Perhaps some of the respondents developed coping strategies from these human-created disasters, and such strategies helped them cope with the Wenchuan earthquake.

Given that finances are among the most basic concerns in people's lives, financial strain was unsurprisingly associated significantly and negatively with life satisfaction and significantly and positively with depression. Regarding the issue of life threats, a matter of life or death itself was likely to exert long-term negative impacts on people's lives. Meanwhile, the respondents whose lives were threatened were also impacted more by their income, which was correlated with financial strain, as shown in Table 2. This observation might also partly explain the negative relationship between life threat

and life satisfaction as well as the positive relationship between life threat and depression.

Self-perceived health and social support was also found be associated significantly and negatively with depression. These findings were in line with the prior research (Dougall, Hyman, & Hayward, 2001; Ke *et al*., 2010; Xu & He, 2012). By contrast, these two variables were not associated with life satisfaction in the correlation analysis. These differences of correlates between life satisfaction and depression among disaster survivors pointed to the complexity of factors related to different dimensions of psychological wellbeing. These observations also suggested that to develop a comprehensive understanding of the psychological wellbeing of disaster survivors, both positive and negative elements of their psychological wellbeing should be examined.

Limitations

The limitations of this study should be addressed. First, the respondents were from five earthquake-affected communities, and the sample was not randomly selected. The generalizability of the findings was thus limited. Future studies may apply random sampling and include research participants in more areas to improve the generalizability of the findings. Second, this study was a cross-sectional study that prohibited a conclusion on the directionality of relationships. Future studies with a qualitative or a longitudinal design with repeated surveys may be used to establish causal relationships. Third, this study only focused on Chinese cultural beliefs of adversity, income recovery, and life satisfaction and depression of disaster survivors. Income recovery was only measured using two items. Future studies may include more elements of psychological status such as PTSD and anxiety reaction as well as more components of income recovery such as business restoration to develop a better understanding of the present research topic. Fourth, this study applied a self-reported measure that might reflect some patterns of reporting biases or personal bias, such as the biases related to social desirability. Future studies with other measures should be conducted. Fifth, the study was conducted four years after the Wenchuan earthquake, and the psycho-economic impacts of the earthquake on the survivors might have been ameliorated by time and maturity factors. Nevertheless, this sample and phenomenon were not frequently studied. This study could thus be regarded as pioneering in nature, given that few studies have examined the relationships among Chinese cultural beliefs of adversity, income recovery, and both life satisfaction and depression among the Wenchuan earthquake survivors.

Implications

The findings of this research have several implications. First, the findings of this research showed that the correlates of disaster survivors' life satisfaction

differed from those of regression. This implies that social workers and other professionals working with disaster survivors should pay attention to both positive and negative aspects of survivor psychological status and adopt different interventions to enhance survivor life satisfaction and reduce their depression. Second, the positive association between positive Chinese cultural beliefs of adversity and life satisfaction as well as the mediation of income recovery over the relationship between cultural beliefs of adversity and life satisfaction imply that encouraging Chinese disaster survivors to develop a more positive perception of Chinese cultural beliefs of adversity may not only enhance their life satisfaction, but also be helpful to their income recovery. Social workers may collaborate with other professionals to encourage or cultivate disaster survivors to hold positive cultural beliefs of adversity and help them debate against the negative cultural beliefs of adversity to promote their income recovery and life satisfaction. Third, the positive association between income recovery and life satisfaction implies that strategies can be adopted to facilitate income recovery of disaster survivors to promote their life satisfaction. For example, asset-based policy through individual development accounts suggested by Sherraden and Page-Adams (1995) may be implemented to help disaster survivors strengthen individual financial management capacity to facilitate income recovery and enhance their life satisfaction.

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