



The Role of Hopelessness in the Health of Low-Class Rural Chinese Residents

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Abstract

It is well known that health inequality has been happening between rural and urban Chinese populations, however, the health differences among rural Chinese residents remain unclear. This study aims to assess the physical and mental health of rural Chinese residents in different social classes, and then to examine the mediating role of hopelessness between social class and health-related quality of life (HRQOL). A stratified multi-stage sampling was used to recruit 2003 rural residents responding to the 12-item Short Form Health Survey (SF-12). The results showed that lower-class rural Chinese residents reported lower physical and mental health as well as a higher level of hopelessness. Furthermore, hopelessness could fully mediate the association between social class and physical and mental health. These findings will generate significant implications for identifying those at particular risk for lower quality of life and designing social work intervention programs in rural China's context.

Keywords Lower-class populations · Physical and mental health · Hopelessness · Rural China

Introduction

Over the past three decades, Chinese economy has dramatically developed since the 1978 market reforms. However, the rural–urban income gap is widening against this backdrop (Sutherland and Yao 2011). The net per capita disposable income of rural Chinese residents has increased from 133 RMB *yuan* (1.684 RMB *yuan* = 1 USD) in 1978 to 8895 RMB *yuan* (6.133 RMB *yuan* = 1 USD) in 2013, while these numbers are 343 and 26,955 RMB *yuan* for urban residents (National Bureau of Statistics of the People's Republic of China 2014). Rural residents, accounting for the majority of China's population, have borne the brunt of imbalanced development in all aspects (Liu et al. 1999). With regards to health, rural Chinese residents were much worse in self-rated health and mental well-being (Qi 2006) and they have

consistently been in a disadvantaged position in health service access than their urban counterparts. For instance, health insurance, public hospitals, and mental health professionals are in great need in rural areas (Jian et al. 2010; Tang et al. 2008). Furthermore, health inequality may be happening to rural residents with different social classes, as social class denotes an open stratification system that is associated with a systematically unequal allocation of resources and constraints (Henry 2004).

The association between social class and health inequality has been intensively studied in the U.S., Europe, and developing countries (Kohler and Soldo 2005; Krokstad et al. 2002; Macintyre 1997; Martikainen et al. 2001; Zimmer et al. 2007). Numerous results from both developed and developing country have shown that people at a higher ladder of social class usually owns a longer and happier life (Smith and Goldman 2007; Mackbenbach et al. 1989). In China's settings, a review of literature commented that most studies on this topic have focused on urban Chinese residents, especially the elderly, students, and patients (Liang and Wu 2014; Wan et al. 2015). However, rural populations, as well as the different socioeconomic groups within rural residents, are uncovered in relevant studies. A few urban studies were conducted using representative samples, but they were limited to only one province (Li et al. 2001; Wang

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et al. 2008). It is really high time to understand the health status of rural Chinese people associated with social classes based on a population-based sample.

Health-related quality of life (HRQOL) measures the individual's satisfaction or happiness with the dimensions of their lives as affected by health, which include physical, psychological, and social functioning of those individuals (World Health Organization 1948). It is a comprehensive way to capture both physical and mental health and has become an international concept to address health problems among many populations (Ware et al. 1995; Li et al. 2003). It is hoped that the empirical evidence on HRQOL associated with social class in rural China would inform health professionals to design prevention and intervention programs as well as make comparisons with their western counterparts.

One of the psychological impacts of living in the lower-class in developing countries is the hopeless experience (Patel and Kleinman 2003). Previous studies have pointed out that hopelessness includes two core elements: one refers to the expectations that either a highly desired outcome would not occur or that highly negative outcomes would occur; another means the belief that there is nothing one can do to change the expected outcomes (Shatte et al. 1999). Psychological studies have revealed that perceived control over one's environment and fate, actual self-control, and emotional control increase with social class (Kraus et al. 2009; Taylor and Seeman 1999). In contrast, reported stress and pessimistic outlook and persistence of negative affect are more likely found within lower class (Thoits 2010; Brunner 1997; Fiscella and Franks 1997). It is thus hypothesized that rural Chinese people in the lower-class would report a higher level of hopeless experience than those in the middle- and higher-class.

Hopelessness theory argues that hopelessness usually causes depressive effects and it has direct physiological impact on the immune and cardiovascular systems (Henry and Mather 2001) and psychological impact on suicidality (Gooding et al. 2015). So hopelessness would be a strong predictor of poor physical and mental health. One longitudinal study has shown that individuals with lower income have a significantly higher level of hopelessness and life dissatisfaction at baseline compared with those in higher class, and these psychological constructs significantly predict mortality risk (Salokangas and Putanen 1998). In addition, substantial evidence indicates that there is an inverse association between income and depressive symptoms (West et al. 1998). As income represents one dimension of social class, hopelessness may work as a mediator in the association between social class and HRQOL of rural Chinese people.

Based on a representative sample of rural China, this study has two primary purposes: Firstly, to report the association between social class and HRQOL of rural Chinese residents, that is, to examine the class difference of HRQOL;

Secondly, to explore the mediating role of hopelessness between social class and HRQOL. The present study would provide a broad picture of the physical and mental health status of rural Chinese residents in different social class, and link one possible psychological mechanism between social class and HRQOL. This could be helpful to identify those at particular risk for lower quality of life and accordingly suggest ways to improve their quality of life via specific intervention programs.

Methods

Participants and Procedures

The data for this study was based on the Chinese General Social Survey (CGSS) of 2010, which was conducted by the National Survey Research Center at Renmin University of China. It is a comprehensive and consecutive social survey program at the nation level and has been conducted every two years since 2003. It covers a wide range of social issues, including social class and health in rural and urban areas, and intends to track the trends of social changes in contemporary Chinese society. This dataset is available to the public (<http://www.cssod.org/cgss/download.php>).

A stratified multi-stage cluster sampling method was adopted during data collection. Firstly, 100 towns were selected as the primary sampling units. Secondly, four villages were randomly selected in each town, and 25 families were approached in each village. Finally, when more than one candidate was eligible per household, one participant was randomly selected to participate in the survey according to Kish method. Thus, the total sample was around 6040 people with rural identity in mainland China and the data were collected through face-to-face interviews. Since only a segment of the participants were randomly selected to answer the HRQOL section, the final rural sample for our data analysis was 2003, and they were similar in sociodemographic characteristics to those who did not answer the HRQOL questionnaire.

Measurements

Health-Related Quality of Life (HRQOL)

It was measured by the 12-item Short Form Health Survey (SF-12), which is an abbreviated form of the SF-36, and it included both Physical and Mental Health Component Summaries (PCS and MCS). The eight subscales of SF-12 were physical function, role limitations due to physical problems, bodily pain, general health, vitality, social function, role limitations due to emotional problems, and mental health. The SF-12 is an internationally validated measurement

of HRQOL (Ware et al. 1995) and the Chinese version of SF-12 has been well validated in the Hong Kong Chinese populations (Lam et al. 2005). The internal consistency reliability of the SF-12 scale was 0.86 in this study. The total and subscale scores of SF-12 in this study were computed following the steps on the scoring algorithms manual (Ware et al. 1995).

Social Class

In our study, social class was assessed with one single item (“How do you perceive your current social class?”) and the respondent was asked to report his/her perception of social position in rural society on a 10-point Likert scale ranging from 1 (lowest-class) to 10 (most upper-class), with higher numbers reflecting higher social class. The advantage of this measurement is that the respondents from different provinces can be conveniently grouped by social class, and the disparity in socioeconomic development conditions among provinces will not interfere with forming the index of social class. The proportion of each class was 10.9, 12.2, 17.2, 19.3, 28.0, 8.1, 1.7, 1.4, 0.2, and 0.6% respectively in this study. To comply with previous studies (Leonard 2004), social class was constructed as a categorical variable and three groups of people were defined as lower-class (1–2), middle-class (3–6), and upper-class (7–10) respectively.

Hopelessness

It was assessed with two items, which was originally developed by Whitaker, Miller, and Clark (Whitaker et al. 2000). One item measured one’s expectation towards the future (“My future is hopeless and I believe things will not go in a better direction”), the other measured the loss of motivation (“It is impossible for me to achieve my objectives”). The respondents were asked to rate on a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree). An index variable was computed with higher total scores indicating higher levels of hopelessness. The reliability of the hopelessness scale in this study was 0.74.

Several socio-demographic variables were included in the study. A respondent’s age was recorded by birth year, and was coded as a continuous variable. Gender was coded 0 for a male and 1 for a female. Education was self-reported, which was coded as primary or below, secondary, or tertiary education. Self-reported marital status was coded as married, single, and divorced or widowed. Perceived economic status was a subjective evaluation of his/her economic situation, and coded as three groups of lower than average, average, and higher than average. As previous studies showed, age, gender, education, marital status, and perceived economic status should be controlled in model analyses (Wang et al. 2008; Lam et al. 2005).

Data Analysis

To achieve the research purposes of this study, we used SPSS 20.0 to conduct the statistical analyses. Two analyses were performed to examine the HRQOL of lower-class rural Chinese residents. First, *t* tests for continuous variables and ANOVA tests for categorical variables were run to provide the characteristics of lower-class populations in comparison with the other two groups. The class difference of hopelessness was examined as well. Second, following the procedures by Baron and Kenny (1986), the presence of mediation requires four criteria: (1) there is a significant relationship between the predictor and the outcome variable (Path c); (2) the predictor is significantly related to the proposed mediator (Path a); (3) the mediator is significantly related to the outcome variable after controlling for the predictor (Path b); (4) the magnitude of the relation between the predictor and the outcome variable is significantly reduced after controlling for the mediator. When Path c is reduced to zero, the mediator is said to produce complete mediation. If Path c is not zero but the magnitude is significantly smaller than the coefficient before controlling for the mediator, partial mediation is said to occur. So, two hierarchical multiple regression (simple OLS regression) tests were performed to examine the proposed mediating models after controlling for the socio-demographic variables. All tests were two-tailed and performed at the significance $p = .05$ level.

Results

Among the 2003 rural residents, over one-fifth (23.1%) perceived themselves in the lower-class, over one-half (72.5%) thought they came from middle-class, four percent (4.0%) reported coming from upper-class, and ten people (0.5%) did not report their class status, who were excluded from the final analysis. The sociodemographic characteristics of all the participants are shown in Table 1. The average age (SD) of the participants was 46.8 (15.0) years, males accounted for 48.3% of the total sample, over one-half (54.1%) only received primary or below education, more than eighty percent (82.0%) were married, and less than half (43.2%) perceived that they were in a lower economic status compared with the majority. Respondents from the lower-class were similar with those from the other two classes in age. However, the former were more likely to be male, divorced, and with less education and income ($\chi_1^2 = 6.87, p < .05$ for gender; $\chi_1^2 = 22.54, p < .001$ for marital status; $\chi_1^2 = 22.05, p < .001$ for education; $\chi_2^2 = 351.11, p < .001$ for perceived income, respectively).

Table 2 shows the comparisons of the adjusted mean and 95% confidence intervals (CI) of HRQOL scores among lower-, middle-, and upper-class of rural Chinese residents.

Table 1 Descriptive statistics of lower-class populations and other classes in rural China ($N=1993$)

Characteristics	Total sample	Lower-class (n=460)	Middle-class (n=1444)	Upper-class (n=79)	<i>p</i> value
Age mean (<i>SD</i>)	46.8 (15.0)	47.3 (15.0)	46.24 (15.0)	49.1 (15.3)	.09
Gender (%)					.03
Male	48.3	51.9	46.0	44.3	
Female	51.7	48.1	54.0	55.7	
Education (%)					.000
Primary or below	54.1	59.9	49.8	54.4	
Secondary	43.7	38.8	47.2	44.3	
Tertiary	2.3	1.4	3.0	1.3	
Marital status (%)					.000
Married	82.0	77.8	84.4	92.4	
Single	8.1	9.1	7.7	3.8	
Divorced	9.9	13.2	7.9	3.8	
Perceived economic status (%)					.000
Lower than average	43.2	66.1	28.5	13.9	
Average	48.9	31.9	60.8	54.4	
Higher than average	8.0	2.0	10.6	31.6	

SD standard deviation

Table 2 Comparisons of adjusted mean and 95% CI of physical component summary (PCS) and mental health summary (MCS) and hopelessness between lower-class and other classes ($N=1993$)

Variables	Lower-class (L) (n=460)		Middle-class (M) (n=1444)		Upper-class (U) (n=79)		<i>p</i> value	Post-hoc
	Mean	95% CI	Mean	95% CI	Mean	95% CI		
Physical function (PF)	77.07	74.73–79.41	84.52	82.92–86.12	82.91	77.20–88.62	0.000	L < M,U
Role limitations due to physical problems (RP)	65.07	62.99–67.15	75.30	73.76–76.84	72.78	67.06–78.50	0.000	L < M,U
Bodily pain (BP)	67.12	64.74–69.49	77.07	75.37–78.77	69.93	62.36–77.51	0.000	L < M,U
General health (GH)	61.49	59.29–63.69	74.61	73.00–76.22	72.34	65.73–78.94	0.000	L < M,U
Vitality (VT)	59.80	57.83–61.76	69.40	67.90–70.90	71.83	65.79–77.87	0.000	L < M,U
Social function (SF)	68.23	66.09–70.38	76.64	75.12–78.16	70.88	64.84–76.92	0.000	L < M,U
Role limitations due to emotional problems (RE)	68.92	67.22–70.61	75.89	74.61–77.16	75.47	70.74–80.20	0.000	L < M,U
Mental health (MH)	64.06	62.49–65.63	72.72	71.52–73.91	71.99	66.97–77.01	0.000	L < M,U
Physical component summary (PCS)	46.61	45.74–47.47	50.27	49.67–50.88	48.70	46.29–51.12	0.000	L < M,U
Mental component summary (MCS)	45.55	44.84–46.25	49.23	48.70–49.76	49.13	47.03–51.22	0.000	L < M,U
Hopelessness	5.04	4.89–5.18	4.11	4.00–4.22	3.49	3.10–3.87	0.000	L > M > U

Higher scores in each domain of SF-12 indicate higher levels of physical or mental health respectively. The larger of the number also reflects the higher level of hopelessness. Post-hoc analyses were performed between any two groups respectively

CI confidence intervals

Lower-class rural respondents reported significantly lower scores on the PCS ($F=23.19$, $p<.001$) and MCS ($F=36.08$, $p<.001$) than those in the middle- and upper-class. However, the other two groups reported similar PCS and MCS to each other ($t=1.21$, $p=.22$ for physical health; $t=0.1$, $p=.92$ for mental health, respectively). Lower scores of HRQOL were also found in physical function, role limitations due to physical problems, bodily pain, general health, vitality, social function, role limitations due to emotional

problems, and mental health among lower-class populations, compared with the other two groups ($p<.001$ for all comparisons), however, no significant difference was found between middle and upper-class group. Furthermore, lower-class rural residents reported a higher level of hopelessness than those in the middle- and upper-class ($F=43.54$, $p<.001$).

Considering that physical and mental health were different dimensions of HRQOL, two separate mediation tests were performed. To explore the mediating role of

hopelessness between social class and physical health, multiple hierarchical regression analyses were run as shown in Table 3. Due to the moderate correlation between perceived economic status and social class ($r_s = 0.39, p < .01$), it was excluded from the model. Education was kept in the model, as its association with social class was low ($r_s = 0.15, p < .01$). In regression A, demographic variables and social class accounted for a significant 26 and 1% of the variance of PCS, respectively. To be specific, older, female, and divorced respondents reported poor physical health. Only lower-class status was significantly associated with PCS ($\beta = -0.10, p < .05$), which satisfied the Criterion (1) In regression B, demographic variables and lower-class status accounted for a significant 14 and 4% in the variance of hopelessness, respectively. Therefore, only lower-class status consistently met Criterion (2) In regression C, hopelessness significantly added an incremental 2% in the variance of PCS beyond the lower-class status, which satisfied Criterion (3) Physical health was only associated with hopelessness significantly ($\beta = -0.16, p < .001$, respectively), and lower-class status became nonsignificant ($\beta = -0.04, p > .05$). All the results indicated that hopelessness fully mediated the relationship between social class and PCS as indicated in Criterion 4.

The above procedures were carried out repeatedly on MCS to examine the mediating role of hopelessness between social class and mental health. As shown in Table 4, older

females reported poorer mental health. Mental health was significantly predicted by the lower-class status ($\beta = -0.18, p < .001$). When adding hopelessness to the model, the association between lower-class status and mental health became nonsignificant ($\beta = -0.06, p > .05$). Hopelessness significantly added an incremental 8% in the variance of MCS beyond the lower-class status ($\beta = -0.32, p < .001$). Similarly, hopelessness fully mediated the relationship between social class and MCS.

Discussion

Based on a representative population-based sample of rural populations in contemporary China, the present study examined the physical and mental health status of rural residents across different social class and the mediating role of hopelessness between social class and health outcomes. First, we predicted that rural Chinese residents in the lower-class would report lower scores of HRQOL than those in the middle- and higher-class. This hypothesis was supported, which is consistent with previous findings on the worse physical and mental health reported by lower-class populations in the West and urban China (Elo 2009; Lachman and Weaver 1998; Wu and Zhang 2016). To compare with the normative data of SF-12 and its subscales in general populations in

Table 3 Hierarchical regression analyses for predicting physical component summary (PCS) (N=1993)

Independent variables	Regression A: PCS				Regression B: hopelessness				Regression C: PCS			
	B	SE	β	ΔR^2	B	SE	β	ΔR^2	B	SE	β	ΔR^2
Block 1: control variables				.26***				.14***				.26***
Age	-.31	.01	-.42***		.03	.003	.23***		-.28	.01	-.38***	
Gender	-2.31	.44	-.10***		.15	.08	.03		-2.13	.44	-.09***	
Education												
Primary or below												
Secondary	2.72	.49	.11***		-.63	.09	-.15***		2.22	.49	.09***	
Tertiary	1.86	1.58	.02		1.25	.30	-.09***		.80	1.56	.01	
Marital status												
Married												
Single	-1.14	.88	-.02		.19	.16	.02		-1.02	.87	-.02	
Divorced	-2.24	.78	-.05**		.38	.15	.05**		-1.74	.77	-.04	
Block 2: predictors				.01***				.04***				.01***
Lower class	-2.39	1.14	-.10*		1.52	.21	.36***		-1.12	1.14	-.04	
Middle class	.61	1.13	-.10		0.72	.21	.17**		1.11	1.12	.04	
Upper class												
Block 3: mediator												.02***
Hopelessness									-.93	.11	-.16***	
R^2_{total}				.28***				.18***				.30***
$R^2_{Adjusted}$.27***				.18***				.30***

In regression A and C, the dependent variable is PCS. In regression B, the dependent variable is hopelessness

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4 Hierarchical regression analyses for predicting mental component summary (MCS) (N = 1993)

Independent variables	Regression A: MCS				Regression B: hopelessness				Regression C: MCS			
	B	SE	β	ΔR^2	B	SE	β	ΔR^2	B	SE	β	ΔR^2
Block 1: control variables				.04***				.14***				.04***
Age	-.05	.01	-.08**		.03	.003	.23***		-.004	.01	-.007	
Gender	-1.96	.42	-.10***		.15	.08	.03		-1.74	.41	-.09***	
Education												
Primary or below												
Secondary	1.93	.47	.09***		-.63	.09	-.15***		.98	.46	.05*	
Tertiary	2.19	1.52	.03		1.25	.30	-.09***		.30	.81	.009	
Marital status												
Married												
Single	.05	.85	.001		.19	.16	.02		.30	.81	.009	
Divorced	-1.16	.75	-.03		.38	.15	.05**		-.60	.72	-.01	
Block 2: predictors				.03***				.04***				.03***
Lower class	-3.59	1.10	-.18**		1.52	.21	.36***		-1.17	1.07	-.06	
Middle class	-.12	1.08	-.006		0.72	.21	.17**		1.10	1.04	.05	
Upper class												
Block 3: mediator												.08***
Hopelessness									-1.54	.10	-.32***	
R^2_{Total}				.07***				.18***				.16***
R^2_{Adjusted}				.07***				.18***				.16***

In regression A and C, the dependent variable is MCS. In regression B, the dependent variable is hopelessness

* $p < .05$, ** $p < .01$, *** $p < .001$

western countries and urban areas in China (Andrews et al. 2001; Bazos et al. 2001), lower-class rural Chinese residents reported much lower HRQOL scores. Given that the social class inequalities within rural China may further widen in the near future, the worse physical and mental health of the lower-class rural Chinese residents should attract more attention and efforts from the government and academia to help improve their easy access to health services.

Second, as hypothesized, lower-class populations reported a higher level of hopelessness than their middle- and upper-class counterparts in rural China, which is similar with the findings of previous studies (Lachman and Weaver 1998; Lachman 1985; Wu and Zhang 2016). The rationale behind the hopelessness of lower-class rural residents may lie in that they are suffering from economic stress in getting what they expect, and meanwhile they are short of resources to prevent negative events from happening during their lives (Jian et al. 2010). On the contrary, those with higher income and more education in rural China may have more economic resources and social network to influence their future (Henry 2004; Gurin and Brim 1984). Although rural residents in China enjoy much less physical and mental health services than urban people, one previous study showed that Chinese people would like to feel fair based on the comparison with those around them, instead of those far from them (Seligman 1998). Therefore, lower-class rural residents may be subject

to sneer and discrimination from neighbors and relatives in higher social class, which makes them feel hopeless, and vice versa due to the cross-sectional design of this study.

Third, this study supported the hypothesis that hopelessness works as a mediator between social class and HRQOL among rural Chinese populations, suggesting that hopelessness is one psychological mechanism through which lower-class rural residents tend to display lower scores of HRQOL. It is possible that lower-class rural residents often feel hopeless and stressful in daily life and thus depressive affects negatively influence their physical and mental health (Henry and Mather 2001). Another plausible explanation is that hopelessness associated with lower-class status may hold rural residents back from performing health-promoting behaviors, thus generating negative impacts on HRQOL (Ma and Liu 2000). In addition, the full mediating effects of hopelessness on physical and mental health imply that hopelessness is really an important psychological variable for lower-class rural residents, which characterizes their daily experience and exerts negative influences on their well-being. Due to a lack of temporal relationships between these variables, hopelessness could also possibly be a confounder if hopelessness caused a person fell into a low social class and thus led to poor HRQOL.

Several limitations of the present study should be addressed: First, only subjective evaluation was adopted to

conceptualize social class, due to the nature of the community survey. As a complex and culturally sensitive concept, objective dimensions of social class should be included in operationalization in future studies. Second, the Chinese version of SF-12 was less often employed in mainland China. Although the reliability of the scale in this study was satisfactory, more studies are needed to validate the scale. Third, a cross-sectional design in the study prevented establishing a causal relationship between social class and HRQOL. It is also possible that poor physical/mental health causes hopelessness or causes a person falls into a lower social class. Finally, there are multiple pathways of social class to influence HRQOL. Future studies should explore other medical or behavioral mechanisms, such as access to health care and health behaviors.

The findings of this study have several significant practical implications: Firstly, with the most recent Chinese general social survey, lower-class populations in rural China, characterized by lower education and/or economic status, were shown to be with poorer physical and mental health compared with those perceiving themselves in the middle- and upper-class. The government and social organizations should take measures to help those of lower social class to manage their HRQOL and to minimize the negative influences of lower socioeconomic status on other aspects of their lives. For example, health-promoting social services should target the poor and lower-status groups in rural community. Secondly, lower-class rural residents displayed a higher level of hopelessness. Social policy should be designed to offer more opportunities for their employment, and health system reform should provide easy access to health care for them, thus bringing hope to them. Thirdly, this study suggests one way to improve HRQOL of lower-class populations, that is, mental health professionals are recommended to improve the sense of hope towards future in designing programs and providing services for lower-class rural residents. To conclude, it is imperative for the government to promote the quality of life of lower-class populations and bring hope to poor people in rural areas/., especially with the ever-increasing income gap and stressful situation of lower-class rural Chinese residents.

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Compliance with Ethical Standards

Conflict of interest The authors declare that there is no any conflict of interest.

Ethical Approval This study has been approved by the Ethics Committee of the National Survey Research Center at Renmin University of China

Informed Consent Informed consent was obtained from all individual participants included in this study.

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