Medicine®

OPEN

Association between social capital and quality of life among urban residents in less developed cities of western China

A cross-sectional study

Bo Gao, PhD, Shujuan Yang, PhD*, Xiang Liu, PhD, Xiaohui Ren, PhD, Danping Liu, PhD, Ningxiu Li, MD*

Abstract

China has experienced rapid urbanization over the past several decades. Social capital is considered a vital human resource, and quality of life (QoL) is an important measure of human health embedded in a physical, mental, and social context. No studies have reported on the association between social capital and QoL in Chinese urban residents. We performed a cross-sectional study to investigate social capital in urban community residents of West China, and its relationship with QoL.

Our study was carried out between June and July of 2015. A total of 1136 households were surveyed. The Chinese-translated version of the Short-Form Health Survey (SF-12) and social capital questionnaire were used to evaluate people's QoL and social capital. Associations between QoL and social capital were evaluated by 3 logistic regression analyses.

A total of 1136 adult participants aged 18 years and older completed the questionnaire. Young residents were more likely to have lower second (SC2), third (SC3), and fourth (SC4) dimensions of social capital. Migrants and residents with higher education levels and high incomes showed lower SC1 and SC2 relative to other participants, and employed residents had relatively low SC1. Unmarried residents had lower SC2 and SC3. Without adjustment for potential confounding factors, participants with higher SC2 had higher average scores for mental components (MCS) of QoL [odds ratio (OR) = 1.48, 95% confidence interval (95% CI): 1.09–2.02], and the same was seen for SC3 (OR = 1.70, 95% CI: 1.24–2.34). After adjusting for socioeconomic status (SES) and risk factors, SC2 and SC3 were still significantly associated with MCS. Social capital was not significantly associated with physical components of QoL in any of the 3 logistic regression models.

In conclusion, social capital is related to MCS of QoL, and increasing it may be an effective way to promote health.

Abbreviations: 95% CI = 95% confidence interval, IRB = Institutional review board, MCS = mental components, OR = odds ratio, PCS = physical components, QoL = quality of life, SC1 = first dimension of social capital (social networks), SC2 = second dimension of social capital (community sentiment and cohesion), SC3 = third dimension of social capital (social support), SC4 = fourth dimension of social capital (trust and security), SD = standard deviation, SES = socioeconomic status, SF-12 = Short-Form Health Survey.

Keywords: quality of life, social capital, urban community residents

1. Introduction

In the past 6 decades, China has seen the largest human migration in history, causing a rise in its urban population from 191.40 million in 1980 to 771.16 million in 2015, most of it attributed to rural-to-urban migration.[1] The urban population of the country first overtook the rural population in 2011.[2] This rapid urbanization is closely associated with economic development. Urbanization offers opportunities for improvements in income, standard of living, and health care, but it also brings substantial risks to health, such as air pollution, occupational hazards, alienation from others, and pressure from finances and work. These factors may increase the risk of neuropsychiatric disorders and noncommunicable chronic diseases and greatly influence quality of life (QoL).[3,4] The impact of urbanization on health is complex and exerted mainly through changing social structures and networks, socioeconomic status, and lifestyle. These changes are associated with alterations in social capital.[5]

Social capital is considered a vital human resource. Putnam defines social capital as "features of social organization, such as trust, norms, and networks, which can improve the efficacy of society by facilitating coordinated actions."[6] The Policy Research Initiative of Canada defines social capital as a social network based on trust, reciprocity, and mutual help, which affords individuals or groups with access to various resources and support.[7] Social capital affects individuals' health through a psychological pathway that promotes adaptation to adversity and access to health-related resources.[8] Berkman and Kawachi[9] report that social capital contributes to

individuals' health through 5 pathways: diffusing knowledge on health promotion, maintaining healthy behavioral norms through informal social control, facilitating access to local health care services and amenities, obtaining psychological and material support, and acquiring mutual respect within social networks. An increasing number of studies have been conducted on the role of social capital on individuals' health in western countries.[10] For example, Kawachi et al[11] demonstrated that high social capital is associated with favorable health outcomes, such as lower total mortality and rates of death from coronary heart disease and malignant neoplasms, in 39 US states. By contrast, only a few studies have investigated the effect of social capital on health among residents of China.[12–14]

QoL is an important measure of human health embedded in a physical, mental, and social context.[15] QoL is associated with individuals' satisfaction or happiness, which are affected by health, and is a vital measure of physical and mental health status. Therefore, evaluation of the relationship between social capital and QoL could shed light on the impact of social capital on health. However, no previous published studies have examined the association between social capital and QoL in Chinese urban residents. Therefore, we performed a cross-sectional study to investigate social capital in urban community residents of West China, and its relationship with QoL.

2. Materials and methods

2.1. Ethics

The study was approved by the Institutional review board (IRB) of the West China School of Public Health, Sichuan University, and was performed in accordance with the Helsinki Declaration of 1964. All of the investigated subjects voluntary participated in our study and signed informed consent forms before enrollment.

2.2. Participants and sampling

Study subjects were selected from Chengdu, which is a pilot area of urban-rural integration in China. A household questionnaire survey was used for primary data collection. A multistage sampling method was used to acquire study subjects. In the first stage, 1 district was randomly selected from the 6 districts of Chengdu. In the second stage, a community was randomly selected from the 7 communities of this district. In the third stage, 8 neighborhoods were selected from the community based on their economic and living situation. Of the total households in each community, 8% were randomly selected for inclusion. The sample size was calculated based on n $= \frac{u_{\alpha/2}^2 \pi(1-\pi)}{\delta^2}$. $\pi=25\%$ (25% of the urban residents were lower than first quartile scores of PCS and MCS), $\delta=3\%$, $\alpha=0.05$ and $\mu_{\alpha/2}=1.96$, and the sample size was calculated to be 1200. A total of 1200 urban community residents were surveyed, and 1136 (94.7%) valid questionnaires were ultimately obtained and analyzed.

2.3. Measuring instruments

A 5-page, 3-part questionnaire was used to perform the investigation. The first part covered demographic characteristics, the second health-related information, and the third social capital and QoL.

2.3.1. Socioeconomic status (SES), lifestyle factors, and medical history. SES was considered to include gender, age, local official registration (also called hukou), marital status, education

level, annual income, and occupation. Lifestyle factors included smoking and participation in moderate-intensity physical activity for at least 30 minutes per day. The medical history covered the occurrence within the past 2 weeks of any diseases, and diagnosis of chronic diseases. Occupations were divided into employed, retired, and unemployed. Individuals were also categorized as never smokers, smokers, and those who had undergone smoking cessation. Individuals who had smoked tobacco daily for over a year were considered smokers, those who had quit smoking at least 6 months before were regarded as smoking cessation, and the rest were treated as never smokers.

2.3.2. Assessment of QoL. The Short-Form Health Survey (SF-12) is one of the most widely used instruments for evaluating QoL.[16,17] The Chinese-translated version of the SF-12 questionnaire has previously been used and verified as a scale with high reliability and validity for the measurement of QoL among urban Chinese.[18] This questionnaire is divided into 2 summary parts: physical components (PCS) and mental components (MCS) of health. PCS and MCS scores were assessed and calculated by t score transformations.[19] Their scores range from 0 to 100.[20] Each respondent's PCS and MCS scores were dichotomized by the cutoff point of the first quartile of PCS and MCS scores: scores lower than first quartile scores meant low QoL.[21]

2.3.3. Social capital measurement. The social capital questionnaire included 4 dimensions, with a total of 27 variables quantifying participants' relationships with family, relatives, friends, neighbors, colleagues, and communities. The first dimension (SC1) measured social networks (relationships and networks with friends, neighbors and colleagues) with 8 variables; the second dimension (SC2) evaluated community sentiment and cohesion (participation in neighborhood activities and sense of belonging) with 6 variables; the third dimension (SC3) concerned social support (available support from family, friends, and neighbors) and had 7 variables; and the fourth dimension (SC4) measured trust and security (the level of trust and security in the neighborhood and community) with 6 variables. The answers consisted of 2-, 4-, and 5-point Likert scales. Each respondent's SC1, SC2, SC3, and SC4 scores were dichotomized by the cutoff point of the first quartile of the corresponding social capital scores: scores lower than first quartile scores meant low social capital.[22] The variables in the questionnaire were based on previous studies, and the questionnaire has been confirmed to have good reliability and validity in urban populations.[23,24]

2.4. Data collection

Our cross-sectional study was carried between June and July of 2015. Investigators conducted a face-to-face interview with all participants. All investigators were graduate students of West China School of Public Health of Sichuan University who were trained before the investigation. The questionnaires were checked daily by the project staff. Data from the social capital questionnaire and the SF-12 were entered by two different persons in a double-blind process.

2.5. Statistical analysis

The database was set up with EpiData 3.0 (The EpiData Association, Odense, Denmark). Descriptive statistics were used to summarize characteristics of the study respondents by expressing the results as mean±standard deviation (SD),

absolute frequencies, or percentage. Crude odds ratios (ORs) and 95% confidence intervals (95% CIs) were calculated with 3 logistic regression analyses to measure associations between QoL and social capital. Adjusted ORs (95% CI) measuring the association were estimated by controlling for SES variables and both SES and potential risk factors. In the first logistic regression analysis model (model 1), we calculated the crude OR (95% CI) for the relationship of social capital with PCS and MCS. In model 2, the OR (95% CI) was adjusted by controlling for SES variables. In model 3, the OR (95% CI) was adjusted by controlling for both SES and potential risk factors. The goodness-of-fit of model 2 and 3 were estimated by Hosmer–Lemeshow test (Supplemental Table 1, http://links.lww.com/MD/C82). All data management and statistical analyses were performed with SPSS 21.0 (SPSS, Inc., Chicago, IL), and $P < .05$ was considered to indicate a statistically significant difference.

3. Results

A total of 1136 adult urban community residents 18 years and older completed the questionnaire. Table 1 presents descriptive characteristics of the study sample. Of the respondents, 439 (38.6%) were male, and 889 (78.3%) had local *hukou* registrations. The mean age of the subjects was 54.8 years (range 18–95 years), and 874 (76.9%) of subjects were married. Of the respondents, 384 (33.8%) had completed junior high, 228 (20.1%) had completed high school, and 235 (20.7%) had a college or graduate/professional education. Over half (625, 55.0%) of participants had annual incomes of between 10,000 and 30,000 yuan. The majority (595, 52.4%) of respondents were employed, 420 (37.0%) were retired, and only 107 (9.4%) were unemployed. Most (811, 71.4%) respondents did not regularly participate in moderate-intensity physical activity, and a total of 251 (22.1%) individuals were currently smokers. One hundred thirty-one (131, 11.5%) participants had been ill over the preceding 2 weeks, and 355 (31.3%) suffered from chronic diseases. The mean scores for PCS and MCS were 50.1 and 53.2, respectively. On the basis of the cutoff points for PCS (45.7) and MCS (48.9), 280 (25.0%) participants were in low PCS and 282 (25.2%) in low MCS. According to the cutoff points for social capital, 228 (20.1%) of respondents were in low SC1, 253 (22.3%) were in low SC2, 283 (24.9%) were in low SC3, and 235 (20.7%) were in low SC4.

Younger residents were more likely to have lower SC2, SC3, and SC4 (Table 2). Migrants and residents with higher education levels and high annual incomes had lower SC1 and SC2. Employed residents had lower SC1, and unmarried residents had lower SC2 and SC3.

The associations between social capital and PCS and MCS in different logistic regression models are summarized in Table 3. SC2 and SC3 were significantly associated with MCS. In model 1, higher SC2 was associated with high MCS (OR=1.48, 95% CI: 1.09–2.02), and the same was seen for SC3 (OR=1.70, 95% CI: 1.24–2.34). After adjusting for SES and risk factors, SC2 and SC3 were still significantly associated with MCS in models 2 and 3. None of the 4 dimensions of social capital were significantly associated with PCS in any of the logistic regression models.

4. Discussion

This study evaluated social capital in urban community residents of West China and its association with QoL. We observed that levels of social capital were relatively low in these residents, and

Table 1

Characteristics of study subjects.

Variable	No. or mean N=1136	Percentage
Gender		
Male	439	38.6
Female	697	61.4
Age, y		
Mean	54.8±16.6	
<35	188	16.5
35~	288	25.4
55~	332	29.2
≥65	328	28.9
Local *hukou*		
Yes	889	78.3
No	247	21.7
Marital status		
Unmarried	94	8.3
Married	874	76.9
Divorced or widowed	168	14.8
Education level		
Illiterate	63	5.5
Primary	221	19.5
Junior high	384	33.8
Senior high	228	20.1
College or above	235	20.7
Unknown	5	0.4
Annual income		
<1500$	148	13.0
1500$–4500$	625	55.0
4500$–7500$	266	23.4
≥7500$	97	8.5
Employment status		
Employed	595	52.4
Retired	420	37.0
Unemployed	107	9.4
Unknown	14	1.2
Moderate-intensity physical activity		
No	811	71.4
Yes	325	28.6
Current smoker		
No	885	77.9
Yes	251	22.1
Ill within the past 2 wks		
No	1005	88.5
Yes	131	11.5
Chronic disease		
No	781	68.8
Yes	355	31.3
QoL		
PCS	50.1±8.3	
Low	280	25.0
MCS	53.2±7.5	
Low	282	25.2
SC1		
Low	228	20.1
SC2		
Low	253	22.3
SC3		
Low	283	24.9
SC4		
Low	235	20.7

Low level of QoL = scores lower than first quartile scores of PCS and MCS, Low level of SC1, SC2, SC3, and SC4 = scores lower than first quartile scores of SC1, SC2, SC3, and SC4, MCS = mental components, PCS = physical components, QoL = quality of life, SC1 = first dimension of social capital (social networks), SC2 = second dimension of social capital (community sentiment and cohesion), SC3 = third dimension of social capital (social support), SC4 = fourth dimension of social capital (trust and security).

Table 2

SES characteristics associated with lower social capital.

Variable	SC1 (N/%)	SC2 (N/%)	SC3 (N/%)	SC4 (N/%)
Gender				
Male	84 (19.1)	105 (23.9)	100 (22.8)	103 (23.5)
Female	131 (18.8)	148 (21.3)	126 (18.1)	132 (19.0)
P	.896	.296	.055	.069
Age, y				
18–34	37 (19.7)	62 (33.0)	51 (27.1)	45 (23.9)
35–54	49 (17.0)	65 (22.6)	58 (20.1)	43 (14.9)
55–64	56 (16.9)	67 (20.2)	63 (19.0)	76 (22.9)
65 and older	74 (22.6)	59 (18.0)	54 (16.5)	71 (21.6)
P	.214	.001*	.032*	.042*
Official registration status (*hukou*)				
Local	157 (17.7)	179 (20.1)	171 (19.2)	180 (20.2)
Migrant	58 (24.4)	72 (30.3)	53 (22.3)	52 (21.8)
P	.019*	.001*	.298	.587
Employment status				
Employed	140 (23.5)	138 (23.2)	125 (21.0)	121 (20.3)
Retired	56 (13.3)	87 (20.7)	76 (18.1)	91 (21.7)
Unemployed	16 (15.0)	24 (22.4)	25 (23.4)	14 (13.1)
P	.000*	.644	.357	.140
Marital status				
Unmarried	23 (24.5)	35 (37.2)	32 (34.0)	22 (23.4)
Married	162 (18.6)	179 (20.6)	153 (19.6)	175 (20.1)
Divorced or widowed	30 (17.9)	38 (22.6)	39 (23.2)	38 (22.6)
P	.359	.001*	.000*	.615
Education level				
Illiterate or primary	69 (24.3)	55 (19.4)	55 (19.4)	53 (18.7)
Junior high	59 (15.4)	74 (19.3)	66 (17.2)	75 (19.5)
Senior high	36 (15.8)	51 (22.4)	47 (20.6)	49 (21.5)
College or above	51 (21.7)	72 (30.6)	58 (24.7)	56 (23.8)
P	.011*	.005*	.155	.470
Annual income				
<1500$	48 (27.9)	31 (18.0)	29 (16.9)	34 (19.8)
1500$–4500$	115 (18.4)	154 (24.6)	132 (21.1)	137 (21.9)
4500$–7500$	49 (18.4)	60 (22.6)	67 (25.2)	57 (21.4)
≥7500$	28 (28.9)	32 (33.0)	22 (22.7)	31 (32.0)
P	.007*	.043*	.216	.111

SC1 = first dimension of social capital (social networks), SC2 = second dimension of social capital (community sentiment and cohesion), SC3 = third dimension of social capital (social support), SC4 = fourth dimension of social capital (trust and security), SES = socioeconomic status.

levels of community sentiment and cohesion and social support were lower than those of social networks, trust, and security. We also found that community sentiment and cohesion and social support greatly influenced MCS levels, but not PCS.

Historically, rapid urbanization has been observed along the eastern coast of China, but rapid expansion has also reached Sichuan Province in recent decades. Chengdu is the capital of Sichuan Province and has a population of 14 million, 2 million of whom are migrant residents.[25] Migrant residents have no official local registration status, or *hukou*, so they lack access to benefits such as subsidized health care and public schools for their children. The migrants are also more mobile and may therefore lack social support, as they tend to stay in a neighborhood for only a short time.[26] Our study found that individuals without local *hukou* had significantly lower SC1 and SC2 when compared with those with local *hukou*, suggesting that migrants have less social capital than local residents. Living in a megacity could bring more stress for all residents as they pursue work, housing, and schooling for their children.[27] These pressures may encourage individuals to prioritize making money, reducing the time they have available to maintain connections with people, and ultimately decreasing their attachment to the neighborhood.

In addition, changes in how China's economy is structured mean that workplace-provided housing is much less common than in the past, and neighbors have changed from colleagues to strangers. Living with strange neighbors means declining interactions with others. Wu et al[28] and Forrest et al[29] report declining social interaction when transitioning from workplace-based to modern or community housing estates. These changing living conditions break the traditional structure of the neighborhood and may reduce neighborhood attachment, trust and security, social support, and sense of community, relative to the strong sense of community that attended living in a workplace area.[26] A previous study reported that residents living in modern residential areas may have lower social capital than rural residents.[30] In our study, we observed that more than 20% of subjects had low social capital, suggesting that the low social capital is common in urban community residents of West China.

Community sentiment and cohesion can be defined as strong feelings of togetherness among neighbors, colleagues, and friends, and a sense of belonging. We observed that community sentiment and cohesion and social support greatly influenced the level of MCS in urban community residents of West China, possibly because strong relationships with neighbors, colleagues,

Table 3

Relationships of SC1, SC2, SC3, and SC4 to physical and mental components of quality of life (N = 1136).

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
PCS			
SC1			
Low	1.00	1.00	
High	1.14 (0.81–1.59)	1.06 (0.73–1.55)	1.25 (0.82–1.91)
SC2			
Low	1.00	1.00	1.00
High	0.82 (0.58–1.14)	0.94 (0.65–1.36)	1.05 (0.7–1.59)
SC3			
Low	1.00	1.00	1.00
High	0.73 (0.51–1.04)	0.76 (0.52–1.13)	0.90 (0.58–1.38)
SC4			
Low	1.00	1.00	1.00
High	0.79 (0.56–1.12)	0.78 (0.53–1.14)	0.76 (0.49–1.16)
MCS			
SC1			
Low	1.00	1.00	1.00
High	0.91 (0.64–1.28)	0.96 (0.67–1.38)	1.00 (0.69–1.45)
SC2			
Low	1.00	1.00	1.00
High	1.48 (1.09–2.02)*	1.60 (1.16–2.22)†	1.74 (1.24–2.44)†
SC3			
Low	1.00	1.00	1.00
High	1.70 (1.24–2.34)†	1.76 (1.27–2.46)†	1.97 (1.40–2.77)†
SC4			
Low	1.00	1.00	1.00
High	1.24 (0.9–1.71)	1.24 (0.89–1.74)	1.27 (0.90–1.79)

Low level of QoL = scores lower than first quartile scores of PCS and MCS, Low level of SC1, SC2, SC3 and SC4 = scores lower than first quartile scores of SC1, SC2, SC3 and SC4, MCS = mental components, Model 1 = Unadjusted, Model 2 = Adjusted for SES (age, gender, marital status, education, income, and occupation), Model 3 = Adjusted for SES and risk factors (smoking, drinking, physical exercise, 2-week illness, chronic diseases), OR = odds ratio, PCS = physical components, SC1 = first dimension of social capital (social networks), SC2 = second dimension of social capital (community sentiment and cohesion), SC3 = third dimension of social capital (social support), SC4 = fourth dimension of social capital (trust and security).

* $P < .05$.

† $P < .01$.

and friends help people effectively deal with the pressures of life. Strong community ties not only improve QoL but also lead to happier and healthier lives, foster feelings of safety and belonging, and can even enhance economic achievement.[3,12] However, changing relationships within communities have accompanied China's rapid urbanization.[26] Individuals tend to be lonelier and more alienated from each other in urban communities due to living in high-rise elevator apartments,[31] and long-term loneliness and isolation may influence mental health. Approximately 17% of adults in urban communities have one or more mental disorders,[32] and changes in social capital greatly influence urban residents' mental health.[33,34]

Social support represents an individual's assessment of the support available in a given situation, including availability of support and satisfaction with support.[35] China has a collectivist culture, leading many people to seek social support and keep social status in the social structure in which they live.[36] However, modern urban life has reconstructed individuals' social networks. We observed that urban residents with high education levels and annual incomes were more likely to have low SC1 and SC2, indicating that those residents may spend relatively more time working and less time cultivating relationships with friends, neighbors, and colleagues. Previous studies have reported that urban residents spend more time on making money and surfing the internet than in the past and communicate with more utilitarianism, leading to social isolation and loneliness.[26,37] In addition, individuals are likely obtain less social support from others due to social isolation. Lack of social support is reportedly associated with low QoL in many patients with cancer, chronic

disease, or infectious diseases.[38–40] In our study, we found that social support greatly affects MCS levels in general urban community residents even after adjusting for all confounding factors of QoL, suggesting that social support is a determining factor in determining QoL. We did not find a significant association between social capital and PCS. Previous studies have reported that QoL of psychological health could influence the physical health.[33,41] Therefore, long-term low social capital could cause low MCS, and consequently it may contribute to the risk of poor PCS.

Two limitations of this study should be considered. First, the questionnaire used for social capital is not an international questionnaire, but was developed to fit conditions in China. However, the questionnaire has shown good reliability and validity. Second, this was a cross-sectional study, meaning it had low power to detect causal effects. Therefore, prospective studies are needed to confirm our findings.

5. Conclusion

The present study suggests that social capital levels are low in urban community residents, and that community sentiment and cohesion and social support are significantly associated with MCS. Social capital is related to MCS of QoL, and could represent an effective target for health promotion.

6. Authors' contributions

BG conceived, designed, and coordinated the study, and critical revised the paper. SY participated in the data collection, took part

in the analyses and interpretation, conducted the literature search and review, and cowrote the first draft of the paper. XL and XR participated in the design of the study and the statistical analysis. DL participated in the data collection. NL conceived, designed, and coordinated the study.

Acknowledgments

References

[1] China NBoSo. National Statistics Yearbook. 2016. Available at: http://www.stats.gov.cn/tjsj/ndsj/2016/indexch.htm. Accessed November 1, 2017.

[2] China NBoSo. China's Total Population and Structural Changes in 2011. 2011. Available at: http://www.stats.gov.cn/english/newsandcomingevents/t20120120_402780233.htm. Accessed March 15, 2017.

[3] Gong P, Liang S, Carlton EJ, et al. Urbanisation and health in China. Lancet 2012;379:843–52.

[4] Chen J, Chen S, Landry PF. Urbanization and mental health in China: linking the 2010 population census with a cross-sectional survey. Int J Environ Res Public Health 2015;12:9012–24.

[5] Yue Z, Li S, Feldman MW, et al. Floating choices: a generational perspective on intentions of rural-urban migrants in China. Environ Plan A 2010;42:545–62.

[6] Putnam RD. Making Democracy Work: Civic Traditions in Modern Italy. Princeton University Press, New Jersey:1993.

[7] Initiative PRSocial Capital as Policy Tool (project report). Ottawa, Canada:2005.

[8] Wilkinson R. Unhealthy Societies—the Afflictions of Inequality. London: Routledge; 1996.

[9] Berkman LF, Kawachi I. Social Epidemiology. New York: Oxford University Press; 2000.

[10] Murayama H, Fujiwara Y, Kawachi I. Social capital and health: a review of prospective multilevel studies. J Epidemiol 2012;22:179–87.

[11] Kawachi I, Kennedy BP, Lochner K, et al. Social capital, income inequality, and mortality. Am J Public Health 1997;87:1491–8.

[12] Wang C, Zhu J, Cai Y, et al. Community-based study of the relationship between social capital and cognitive function in Wuhan, China. Asia Pac J Public Health 2016;28:717–24.

[13] Du H, Li X, Lin D. Individualism and sociocultural adaptation: discrimination and social capital as moderators among rural-to-urban migrants in China. Asian J Soc Psychol 2015;18:176–81.

[14] Jiang N, Lou VW, Lu N. Does social capital influence preferences for aging in place? Evidence from urban China. Aging Ment Health 2016;22:405–11.

[15] Development of the World Health Organization WHOQOL-BREF quality of life assessment. The WHOQOL Group. Psychol Med 1998; 28:551–8.

[16] Ware JE, Kosinski M, Keller SD. A 12-item Short-Form Health Survey: construction of scales and preliminary test s of reliability and validity. Med Care 1996;34:220–33.

[17] Moheddine Y. Health-related quality-of-life measures: evidence from Tunisian population using the SF-12 health survey. Value Health Reg Issues 2015;7:54–66.

[18] Li NX, Liu DP, Liu CJ, et al. Assessing quality of life in an urban population in Chengdu using the SF-12. Sichuan Da Xue Xue Bao Yi Xue Ban 2010;41:1044–6.

[19] Hu J, Gruber KJ, Hsueh KH. Psychometric properties of the Chinese version of the SF-36 in older adults with diabetes in Beijing, China. Diabetes Res Clin Pract 2010;88:273–81.

[20] Montazeri A, Vahdaninia M, Mousavi SJ, et al. The Iranian version of 12-item Short Form Health Survey (SF-12): factor structure, internal consistency and construct validity. BMC Public Health 2009;9:341.

[21] Khedmat H, Karami GR, Pourfarziani V, et al. A logistic regression model for predicting health-related quality of life in kidney transplant recipients. Transplant Proc 2007;39:917–22.

[22] Kouvonen A, Kivimäki M, Vahtera J, et al. Psychometric evaluation of a short measure of social capital at work. BMC Public Health 2006;6:251.

[23] Gui Y, Huang RG. Measuring community social capital: an empirical study. Sociol Res 2008;03:122–43.

[24] Hamdan H, Yusof F, Marzukhi MA. Social capital and quality of life in urban neighborhoods high density housing. Soc Behav Sci 2014;153: 169–79.

[25] Statistics SPBo. Sichuan Statistical Yearbook. 2016. Available at: http://www.sc.stats.gov.cn/tjcbw/tjnj/. Accessed January 31, 2017.

[26] Wu F. Neighborhood attachment, social participation, and willingness to stay in China's low-income communities. Urban Aff Rev 2012; 48:547–70.

[27] Li XY, Li ZG. A study on residents' neighborhood interaction in affordable housing community of Guangzhou, China. J South China Normal Univ (Natural Science Edition) 2015;47:108–14.

[28] Wu F, He S. Changes in traditional urban areas and impacts of urban redevelopment: a case study of three neighbourhoods in Nanjing, China. Tijdschr Econom Soc Geogr 2005;96:75–95.

[29] Forrest R, Yip NM. Neighbourhood and neighbouring in contemporary Guangzhou. J Contemp China 2007;16:47–64.

[30] Xu Q, Perkins D, Chow JC. Sense of community, neighboring, and social capital as predictors of local political participation in China. Am J Community Psychol 2010;45:259–71.

[31] Antonicelli L, Marchetti P, Accordini S, et al. The heterogeneity hidden in allergic rhinitis and its impact on co-existing asthma in adults: a population-based survey. Int Arch Allergy Immunol 2015;168:205–12.

[32] Phillips MR, Zhang J, Shi Q, et al. Prevalence, treatment, and associated disability of mental disorders in four provinces in China during 2001–05: an epidemiological survey. Lancet 2009;373:2041–53.

[33] Hassanzadeh J, Asadi-Lari M, Baghbanian A, et al. Association between social capital, health-related quality of life, and mental health: a structural-equation modeling approach. Croat Med J 2016;57:58–65.

[34] Jones R, Heim D, Hunter S, et al. The relative influence of neighbourhood incivilities, cognitive social capital, club membership and individual characteristics on positive mental health. Health Place 2014;28:187–93.

[35] Folkman S. The case for positive emotions in the stress process. Anxiety Stress Coping 2008;21:3–14.

[36] Kleinman A, Wang WZ, Li SC, et al. The social course of epilepsy: chronic illness as social experience in interior China. Soc Sci Med 1995;40:1319–30.

[37] Wen M, Wang G. Demographic, psychological, and social environmental factors of loneliness and satisfaction among rural-to-urban migrants in Shanghai, China. Int J Comp Sociol 2009;50:155–82.

[38] Colloca G, Colloca P. The effects of social support on health-related quality of life of patients with metastatic prostate cancer. J Cancer Educ Jun 2016;31:244–52.

[39] Hu F, Niu L, Chen R, et al. The association between social capital and quality of life among type 2 diabetes patients in Anhui province, China: a cross-sectional study. BMC Public Health 2015;15:786.

[40] Lan GL, Yuan ZK, Clements-Nolle KD, et al. Social capital and quality of life among people living with HIV/AIDS in southeast China. Asia Pac J Public Health 2016;28:325–35.

[41] Karube N, Sasaki A, Hondoh F, et al. Quality of life in physical and psychological health and social environment at posthospitalization period in patients with stroke. J Stroke Cerebrovasc Dis 2016;25:2482–7.