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Association among high blood pressure health literacy, social support and health-related quality of life among a community population with hypertension: a community-based cross-sectional study in China

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ABSTRACT

Objectives The prevalence of hypertension is increasing worldwide. Hypertensive patients in China have limited high blood pressure health literacy (HBP-HL) and social support (SS), which may have an impact on health-related quality of life (HRQoL) and lead to poorer clinical outcomes. However, the potential mechanism of HBP-HL, SS and HRQoL remains unclear. The aim of this study was to investigate the association among HBP-HL, SS and HRQoL among community patients with hypertension in China.

Design A community-based cross-sectional survey.

Setting The community health service center in Huzhou, China.

Participants 406 community patients with hypertension were investigated from June to October 2019.

Primary outcome measures HRQoL was assessed using the Quality of Life Instruments for Chronic Diseases-Hypertension V2.0, HBP-HL was assessed with the HBP-Health Literacy Scale into Chines and SS was assessed with the Social Support Rating Scale.

Results Compared with moderate level of HRQoL and SS, HBP-HL of community hypertensive patients was significantly deficient. Overall, 93 patients (23.2%) lacked HBP-HL, 308 patients (76.8%) had a medium level of HBP-HL, and none of them had sufficient HBP-HL. Correlation analysis showed that HBP-HL, SS and HRQoL were positively correlated (p<0.01). The significant differences in HRQoL and SS were detected in HBP-HL level (p<0.001). In multiple linear regression models, HRQoL was significantly associated with 'Print HL' and 'Medication Label' of HBP-HL (p<0.05) and all three dimensions of SS (p<0.05). In addition, The bootstrap method was used to examine the indirect effect among variables. The results showed that SS played a mediating role between HBP-HL and HRQoL (p<0.001).

Conclusion There is an association among HBP-HL, SS and HRQoL in community hypertension patients. HBP-HL can directly affect HRQoL, and through SS mediate the HRQoL. Community intervention for hypertension management should consider HBP-HL promotion and

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The study is the first of its kind regarding the association and potential mechanism of high blood pressure health literacy (HBP-HL), social support (SS) and health-related quality of life (HRQoL) of community hypertension patients in China.

⇒ The community-based study used multidimensional assessments of physical, social, HBP-HL and HRQoL to examine the physiological, psychological and social dimension of community hypertension patients.

⇒ The research subjects only included community patients with hypertension from nine communities in Huzhou City, which has certain limitations.

⇒ The design of this study was cross-sectional study, we cannot infer causal relationship.

social engagement as the breakthrough points to increase the impact on patients' HRQoL.

INTRODUCTION

Hypertension is one of the major risk factors and main death causes of cardiovascular and cerebrovascular diseases, which is considered as a major public health problem in the world.[1 2] Cardiovascular Disease Report in China has shown that the number of hypertensive patients in China is 245 million (the prevalence rate is 23.2%), and it is still growing.[3] Since hypertension is a disease with a slow, gradual process of change, primary healthcare centre has become the first line of the prevention, treatment and management of hypertension.[4] The local community healthcare centres established health records for all diagnosed hypertension patients in their areas, which is also part of the public health services in China.[5] Thus, there is an

urgent need to strengthen the health management of hypertension in primary healthcare setting.

Health-related quality of life (HRQoL) has become an important indicator used to evaluate the health management of hypertension.[6 7] It not only reflects physical and mental health but also shows the social function, disease status and overall health perception of hypertensive patients.[5] Significantly, HRQoL is a valuable measure for hypertensive patients, in terms of physical and mental health outcomes, is superior to parameters such as morbidity and cure rate.[8] Meanwhile, previous studies have shown that high blood pressure health literacy (HBP-HL) is one of the significant factors for HRQoL in hypertensive patients and is positively correlated with HRQoL.[9–11]

HBP-HL refers to the ability to obtain and use hypertension-related knowledge and healthcare services to manage hypertension.[12] A 10-region prospective study in China showed that the prevalence of hypertension was highest in Zhejiang (44.4%), but only 6.83% of hypertensive patients have adequate HL.[13 14] The lower the HBP-HL, the worse the ability to understand health information, and the worse the ability to adopt health behaviours and manage the health.[15] A cross-sectional investigation by our team confirmed that HBP-HL was a major influenced factor of HRQoL in hypertensive patients from Xinjiang, China.[16] Moreover, there is growing evidence that HBP-HL is an independent predictor of blood pressure control.[14] Therefore, HBP-HL not only has an effect on the disease progression but also is pivotal in improving HRQoL of hypertensive patients.[17 18]

Another important factor to consider is the social support (SS) which will also impact the HRQoL and health outcome of hypertensive patients.[19] Along with the change of medicine pattern from the biomedicine pattern to the biopsychosocial pattern, the effeect of psychosocial factors become increasingly prominent. And SS, a mediator of psychosocial stress, is particularly critical to provide emotional support and improve treatment adherence to promote hypertensive patients' HRQoL.[20] Lee et al[21] found that SS was positively associated with HRQoL in patients with chronic diseases. In addition, SS is one of the powerful indicator for determining the level of HL and can promote hypertensive patients to adopt self-management behaviours, so as to control blood pressure and optimise HRQoL.[22]

Based on previous studies, it is necessary to fully understand the association among HBP-HL, SS and HRQoL in patients with hypertension. However, most previous studies have assessed the simple correlations between HBP-HL or SS with HRQoL. None of them has explored the association and potential mechanism among HBP-HL, SS and HRQoL of hypertensive patients within primary care setting. This is surprising, given the high visiting rate of hypertension in community healthcare centres, which is at least 100 million in 2020.[23] Therefore, in this study investigated the association among HBP-HL, SS and HRQoL in community patients with hypertension.

METHODS
Study population
A cluster sampling was performed in community health service centre in Huzhou City, China between June and October 2019. Three of the 28 streets were randomly selected, then 3 communities were selected in each street and a total of 9 communities were included. Finally, we used the community hypertension health records to randomly select participants under the permission of community healthcare centres in the selected communities. In this cross-sectional study, the target population was hypertensive patients aged 18 years or older who have been diagnosed with hypertension for at least 1 year in community, and did not have severe mental disorder or cognitive impairment.[24] The sample size was estimated using mean sampling formula: $N=(U_\alpha S /\delta)2$. U_α is the corresponding value of the test level. By checking the standard normal distribution quantile table, $U_\alpha=1.96$. S is the overall SD. According to the epidemiological survey of metabolic syndrome of Zhejiang province, the systolic blood pressure of hypertensive patients was (143. 89±18. 33) mm Hg and S=18.33.[25] δ is the allowable error, which is 2 in this study. Thus, $N=(1. 96×18.33/2)2=322.68=323$. Then adding 20% non-response rate, sample size became 388. Considering the need to lay a population foundation for the subsequent intervention study, as well as to reduce sampling errors, the sample size of this study was 406.

Data collection
Prior to data collection, 30 community hypertensive participants were randomly selected for a preliminary investigation to test the reliability and validity of the questionnaires used in this study. The formal data collection was carried out by face-to-face survey in the community healthcare centre for about 20–30 min. The informed consent was obtained from the participants. During the data collection, the trained researcher explained the purpose and significance of the research with uniform instructions. As soon as a questionnaire is completed, it was strictly screened, and if there is any missing data, it was completed in time. All data collection was completed, encoded and inputted by two people, and questionnaires with obvious errors were removed.

Instruments
Sociodemographic questionnaire
The questionnaire is a self-administered survey and made up of two parts, one is the demographic data including age, gender, education, occupation, financial status and marital status, and the other is disease-related data including smoking status, history of hypertension, family history of hypertension and complications of hypertension. Family history and complications of hypertension were assessed according to the Guideline on the Assessment and Management of Cardiovascular Risk in China.[26] A hypertensive patient was considered to have complications of hypertension if he/she also suffered from any of the following illnesses: diabetes, heart failure, coronary

Table 1 Demographic characteristics and health status of all participants (n=401)

Variables	N (%)
Gender	
Male	212 (52.9)
Female	189 (47.1)
Age (M±SD)	66.91±8.82
≤59	59 (14.7)
60–69	193 (48.1)
≥70	149 (37.2)
Education level	
Primary school or below	191 (47.6)
Junior high school or above	210 (52.4)
Marital status	
Single/widowed/divorced	44 (52.4)
Married	357 (89.0)
Smoking status	
Yes	126 (31.4)
No	275 (68.6)
Occupation	
Cadre	137 (34.2)
Worker	110 (27.4)
Farmer	100 (24.9)
Retired	54 (13.5)
Family annual income	
Below ¥1000	7 (1.7)
¥1000–¥3000	208 (51.9)
¥3000–¥5000	154 (38.4)
Above ¥5000	32 (8.0)
History of hypertension (year)	
<1	21 (5.2)
1–3	41 (10.2)
3–5	51 (12.7)
5–10	56 (14.0)
>10	232 (57.9)
Family history of hypertension	
Yes	239 (59.6)
No	81 (20.2)
NC (M±SD)	35.34±3.09
Normal	234 (58.4)
Abnormal	167 (41.6)
WHR (M±SD)	0.95±0.07
Normal	57 (14.2)
Central obesity	344 (85.8)
Blood pressure (M±SD)	SBP 135.35±16.35 DBP 74.43±9.86
Controlled	211 (52.6)

Continued

Table 1 Continued

Variables	N (%)
Uncontrolled	190 (47.4)
Complications of hypertension	
Yes	194 (48.4)
No	207 (51.6)

WHR, waist hip rate; NC, neck circumference; SBP, systolic blood pressure; DBP, diastolic blood pressure.

heart disease, stroke and chronic kidney disease. Also, if the first-degree relative of a hypertensive patient had early-onset cardiovascular disease, the patient was considered to have a family history of hypertension.

Quality of Life Instruments for Chronic Diseases-Hypertension V2.0

Quality of Life Instruments for Chronic Diseases-Hypertension V2.0 (QLICD-HY V2.0) was used as a measure of HRQoL in this study, which developed by Wan.[8] It consisted of 41 items, and contains 2 subscales of QLICD-General Module (QLICD-GM) and a hypertension-specific module. QLICD-GM includes 28 items with 3 dimensions: physical function (9 items were used to measure whether hypertension impede normal physiological activity), psychological function (11 items were used to measure whether hypertension cause mental health problems) and social function (8 items were used to measure the effects of hypertension on social activities). The hypertension-specific module containing 13 items which evaluated whether the symptoms of hypertension and side effects of drugs, psychological feelings affect the patients. It used 5-point Likert scale (never/rarely, once in a while, sometimes, usually and all the time). There are positive and negative items in the scale, and negative items are scored in reverse. The HRQoL was divided into three levels: a total score <75 points reflected a low level of HRQoL, 75–85 points indicated as middle level of HRQoL and a total score >85 points indicated a high level of HRQoL. The Cronbach's α for the overall score was 0.823, and the teat–retest reliability for the overall instrument and all domains was at a range of 0.75–0.91. The Cronbach's α of the scale in our study was 0.86. In order to make domain scores comparable to QLICD-HY V2.0, domain scores were standardised.

HBP-Health Literacy Scale into Chinese

HBP-HL was measured by the HBP-Health Literacy Scale into Chinese (C-HBP-HLS), which was translated and validated by Zhang et al[27] in a Chinese community. C-HBP-HLS was a scale-based measures with total 15 items in 5 dimensions (Print Health Literacy, Medication Label, Understanding Ability, Newest Vital Sign Test, and Avoiding Food Allergy). According to the Test of Functional Health Literacy in adults classification criteria,[28] the total score ranged from 0 to 60 points. The HBP-HL was divided into three levels: a total score <32 points

Table 2 Current situation of HRQoL, HBP-HL and SS (n=401)

Variable	Mean±SD	Min	Max	Score classification			
				Low, N (%)	Middle, N (%)	High, N (%)	Very high, N (%)
Score of HRQoL	81.42±5.02	62.2	90.85	43 (10.7)	261 (65.1)	97 (24.2)	–
Social function	86.57±6.64	46.88	100	–	–	–	–
Special modules	86.03±4.74	67.31	94.23	–	–	–	–
Psychological function	80.16±10.07	38.64	100	–	–	–	–
Physical function	71.70±6.80	50	88.89	–	–	–	–
Score of HBP-HL	38.94±17.56	0	60	93 (23.2)	308 (76.8)	0	–
Print HL	23.25±11.94	0	30	–	–	–	–
Avoiding food allergy	4.60±1.24	0	5	–	–	–	–
Medication label	4.51±3.74	0	10	–	–	–	–
Newest vital sign test	3.88±2.79	0	10	–	–	–	–
Understanding ability	2.69±2.46	0	5	–	–	–	–
Score of SS	35.29±5.93	19	53	1 (0.2)	96 (23.9)	231 (57.6)	73 (18.2)
Subjective support	18.85±2.97	10	26	–	–	–	–
Objective support	10.69±2.33	3	18	–	–	–	–
Support utilisation	5.76±2.69	3	12	–	–	–	–

HBP-HL, high blood pressure-health literacy; HRQoL, health-related quality of life; SS, social support.

reflects a lack of HBP-HL; a total score ranging from 32 to 40 points indicates an intermediate level of HBP-HL and a total score ≥40 points represents a high level of HBP-HL. The Cronbach's α coefficient of the scale was 0.78, and the retest reliability was 0.96. The Cronbach's α of the scale in this study was 0.83.

Social Support Rating Scale

SS was assessed by Social Support Rating Scale, which developed by Xiao[29] in 1994 and contains three dimensions: objective support (3 items), subjective support (4 items) and utilisation of support (3 items) with a total score of 66. If the answer is 'no source', 0 points are counted for item 6 and item 7, and if the answer is 'the following sources', 1–9 points are counted for the number of sources. And item 5 contains five questions with a total score of 5–20 points. While other items are scored on a 4-points Likert scale. The SS was categorised into four groups based on the total scores. A score below 20 indicates a low level of SS, 20–30 scores indicated as middle SS, 30–40 scores indicated as high SS and the score above

40 indicates a very high levels of SS. The Cronbach's α for the scale was 0.882 and 0.86 in this study.

Clinical measurements

Blood pressure was measured by the surveyor with an Omron HEM-7211 electronic sphygmomanometer after the patient has rested quietly for at least 5 min. The measurement was repeated at intervals of at least 5 min, and the average of the two readings were recorded. Patients' blood pressure was considered controlled or uncontrolled according to the Guideline on the assessment and management of cardiovascular risk in China.[26] A blood pressure was considered controlled if it was (1) below 140/90 mm Hg in patient aged under 80 years old without complications, (2) below 150/90 mm Hg in patient aged 80 years and over with treated hypertension and (3) below 130/80 mm Hg in patient with both hypertension and diabetes.

Anthropometric measurements, including neck circumference (NC) (cm), waist circumference (WC) (cm) and hip circumference (cm), were measured by researchers for all participants in lightweight clothing. The NC, WC and hip circumference were measured using a clinical tape measure. The parameters measured and recorded to the nearest 0.1 cm. NC was determined by measuring the horizontal circumference of the neck between the lower margin of the thyroid cartilage (Adam's apple) and the upper margin of the seventh cervical vertebra. WC was measured at the midpoint between the lateral anterior superior iliac spine and the lower border of the tenth rib. Then using criteria from the WHO for the Chinese population,[30] a waist hip rate ≥0.9 for men and ≥0.8 for women

Table 3 Correlations among HBP-HL, HRQoL and SS (n=401)

	HRQoL	HBP-HL
HBP-HL	0.273*	
SS	0.227*	0.327*

*P<0.01.
HBP-HL, high blood pressure-health literacy; HRQoL, health-related quality of life; SS, social support.

Table 4 Differences in HRQoL and SS according to HBP-HL level (n=401)

Variable	N (%)	HRQoL		SS	
		M±SD	T (p value)	M±SD	T (p value)
Lacking HBP-HL	93 (23.2)	79.20±5.03	−5.000 (<0.001)	32.29±5.16	−5.790 (<0.001)
Medium level of HBP-HL	308 (76.8)	82.08±4.82		36.2±5.86	

HBP-HL, high blood pressure-health literacy; HRQoL, health-related quality of life; SS, social support.

is considered centripetal obesity. NC is a predictor of potential cardiovascular disease, a NC ≥40 cm for men and ≥36 cm for women is considered abnormal.

Patient and public involvement
No patients were involved in the design of this study, nor were they involved in the recruitment to and of the study. There are no plans to disseminate the results of the research to study participants.

Statistical analysis
All statistical analysis was performed using SPSS V.23.0 and SPSS process macro. Descriptive statistics was used to process sociodemographic data, of which observable variables were presented as the mean±SD (x±s) for continuous variables and frequencies and percentages for categorical variables. Correlation analysis, t-test and multiple linear regression analysis was used to determine the relationship among variables. Then, we used 95% bias-corrected bootstrap CIs, with 1000 bootstrap samples, to examine the indirect effect among variables. A p<0.05 was considered statistically significant.

RESULTS
A total of 406 community hypertensive patients participated in the study, and 401 participants with complete data on all variables were included in the final analysis, with an effective recovery rate of 99%.

Demographic characteristics and health status of the participants
The mean age of the participants was 66.91±8.82, and more than half of them were male (52.9%), married (89.0%) and non-smokers (68.6%). The majority of the participants had an annual family income of less than ¥5000 (92.0%). In addition, 207 (51.6%) patients had hypertension only, 194 (48.4%) had complications of hypertension. Around 60% participants had a hypertension history for more than 10 years, and about two-thirds of the participants were centripetal obese (85.8%). The average systolic blood pressure was 135.35±16.35 mm Hg, and the average diastolic blood pressure was 74.43±9.86 mm Hg for the participants (see table 1).

HRQoL, HBP-HL and SS of participants
The overall HRQoL score of community hypertension patients was 81.42±5.02. In each dimension of HRQoL were: the social function (86.57±6.64), the specific module (86.03±4.74), the psychological function (80.16±10.07) and the physical function (71.70±6.80). Overall, 43 patients (10.7%) had a low level of HRQoL, 261 patients (65.1%) had a medium level of HRQoL and only 97 patients (24.2%) were considered to had a high level of HRQoL. The total score of HBP-HL was 38.94±17.56. Moreover, for the HBP-HL subdimensions, print HL had the highest score (23.25±11.94), followed by avoiding food allergy, medication label, newest vital sign test, while understanding ability had the lowest score (2.69±2.46). Overall, 93 patients (23.2%) lacked HBP-HL, 308 patients (76.8%) had a medium level of HBP-HL, and none of them had sufficient HBP-HL. The total score of SS was 35.29±5.93, including 1 patient (0.2%) with low SS, 96 patients (23.9%) with medium SS, 231 patients (57.6%) with high SS and 73 patients (18.2%) with very high SS. The scores of each dimension of SS from high to low were: the subjective support (18.85±2.97), the objective support (10.69±2.33), the support utilisation (5.76±2.69) (see table 2).

The association among SS, HBP-HL and HRQoL
Correlation analysis (table 3) shown that HRQoL was significantly and positively correlated with HBP-HL (0.273, p<0.01) and SS (0.227, p<0.01). Moreover, there was a statistically significant positive correlation between HBP-HL and SS (0.327, p<0.01). According to the result of t-test (table 4), significant differences in HRQoL and SS were detected in HBP-HL level. Higher HRQoL was associated with patients had higher level of HBP-HL (t=−5.000, p<0.001), and greater SS was also associated with better HBP-HL (t=−5.790, p<0.001).

Multiple linear regression models were constructed to show the effects of HBP-HL and SS on HRQoL (table 5). Three dimensions of SS, namely objective support, subjective support, and support utilisation were significantly associated with HRQoL (p<0.001, p<0.001, p=0.013, respectively). 'Print HL' and 'Medication Label' of HBP-HL were significantly associated with HRQoL (p=0.018 and 0.002, respectively). However, other dimensions of HBP-HL had no statistical significant effect on HRQoL (p>0.05).

Based on the results mentioned above, a bootstrap method was used to examine the indirect effect among variables (table 6). Then mediating model of SS, HBP-HL and HRQoL was constructed (figure 1). The results showed that HBP-HL can directly affect HRQoL, and also through SS mediate the HRQoL. The total effect

Table 5 The effects of HBP-HL and SS on HRQoL

Dependent variable	Independent variable	B	SE	β	T	P value
HRQOL	HBP-HL					
	Print HL	0.064	0.027	0.151	2.372	0.018*
	Medication label	0.218	0.071	0.163	3.089	0.002*
	Understanding ability	0.002	0.130	0.001	0.014	0.989
	Newest vital sign test	0.060	0.118	0.033	0.506	0.613
	Avoiding food allergy	0.156	0.207	0.039	0.756	0.450
	SS					
	Objective support	0.448	0.115	0.208	3.906	0.000*
	Subjective support	0.345	0.097	0.205	3.570	0.000*
	Support utilisation	−0.238	0.096	−0.127	−2.487	0.013*

*P<0.05.
HBP-HL, high blood pressure-health literacy; HRQoL, health-related quality of life; SS, social support.

value of HBP-HL on HRQoL was 0.272 (95% CI 0.125 to 0.375) and SS played a mediating effect (p<0.001). The percentage of indirect effect to total effect was 18%.

DISCUSSION

This study has significant clinical implications both in local and international context, as it adds to existing body of literature on HBP-HL, SS and HRQoL in primary health-care setting. The results of this study explicitly reveal that HRQoL and SS status of Huzhou community hypertensive patients belong to superior middling. This result is similar to a cross-sectional investigation conducted among hypertension patients in Jilin Province, China.[31] However, the HBP-HL of Huzhou community hypertensive patients is significantly deficient, which had been previously documented among Chinese hypertensive patients.[32] The weak point in understanding hypertension-related knowledge may partly explain the result.

In our study, HBP-HL and SS are significantly and positively correlated with HRQoL, and higher HBP-HL indicates better SS and HRQoL. That's probably because patients with adequate HBP-HL can receive disease prevention and healthcare knowledge and search for information on health and self-management.[33 34] They

can acquire the best opportunity for prevention and treatment with an decreased incidence of complications. Moreover, three dimensions of SS, namely objective support, subjective support, and support utilisation were significantly associated with HRQoL. That may be because the majority of our participants live with their families, and they had received a great deal of support from their family, including financial and psychological support. According to Zhao,[35] subjective and objective support from family members can effectively improve patients' psychological and social functions, and encourage them to actively seek external support, thus improving their HRQoL. In addition, HBP-HL can directly affect HRQoL, and also through SS mediate the HRQoL. Not surprisingly, patients with any sort of SS had better HRQoL compared with patients with no SS. They might have better communication skill and interpersonal interaction, and can get along well with their family members, friends and even medical staff. According to Zhou et al,[36] sufficient SS will reducing the probability of illness and increasing the recovery rate. Therefore, the self-perceived HBP-HL of them is better than those with low SS, which would promote disease management and subsequently would result in better HRQoL.[37 38]

Table 6 The mediating effect of SS in the association between HBP-HL and HRQoL (n=401)

	Coefficient	SE	P value	95% CI	Ratio of indirect effect to total effect
HBP-HL→SS→HRQoL					18%
Total effect (c path)	0.272	0.065	*	0.125 to 0.375	
Direct effect (c')	0.222	0.504	*	0.123 to 0.322	
HBP-HL→SS (a)	0.327	0.047	*	0.207 to 0.456	
SS→HRQoL (b)	0.154	0.050	0.002	0.042 to 0.257	
Indirect effect (a*b)	0.050	0.018			

*P<0.001.
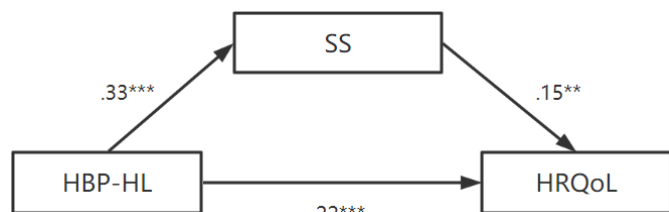HBP-HL, high blood pressure-health literacy; HRQoL, health-related quality of life; SS, social support.

Figure 1 Mediation model of SS, HBP-HL and HRQoL (n=401). HBP-HL, high blood pressure-health literacy; HRQoL, health-related quality of life; SS, social support. **P<0.01, ***p<0.001.

In China, poor HBP-HL among community patients with hypertension is alarming. Studies show that HL will influence patients' ability to acquire, understand and apply disease-related knowledge,[39 40] which in turn affects patients' HRQoL and clinical outcomes.[41] However, it is remarkable that intervention for patients with low HBP-HL can effectively improve their health status.[42] Due to the slow and gradual process of hypertension, community plays a key role in providing a positive social network for hypertensive patients.[4] In China, community-based social network affects hypertensive patients' physical and psychological well-being by buffering stress and promoting health relevant behaviours.[43] As a mediating variable between HBP-HL and HRQoL, SS might results in better HBP-HL and subsequently enhancing their HRQoL. Therefore, primary healthcare providers should assess HBP-HL, HRQoL and SS status during the first meeting with hypertensive patients, and emphasise the importance of HBP-HL, HRQoL and SS to patients in the follow-up consultations. Addressing HBP-HL through improved educational materials and intervention strategies is a potentially successful strategy, which helps optimise patients' understanding, improve their HBP-HL and HRQoL, and enhance their self-efficacy and self-management behaviours. At the same time, guiding patients to make more use of various social resources, and collaborating with patients' families to give them health support, so that they can face the disease with a positive mindset and make reasonable use of information related to disease prevention and improve their HRQoL.

LIMITATIONS

This study presents certain limitations. First, the sample size of this study was obtained through stratified cluster random sampling of community hypertensive patients in Huzhou City, and the representativeness of the sample size needs to be strengthened. Second, recall bias is frequently associated with self-reported measures. Therefore, the use of self-reported questionnaires in this study might have misestimated the level of HBP-HL and SS, and subsequently its association with the HRQoL. Last, since this was a cross-sectional study, the direction of association cannot be ascertained. It calls for further research into HBP-HL, SS and HRQoL among different socioeconomic classes, and role of healthcare professionals in improving patients' HBP-HL.

CONCLUSION

In conclusion, there is an association among HBP-HL, SS and HRQoL in community hypertension patients. HBP-HL can directly affect HRQoL, and through SS mediate the HRQoL. The results highlight that comprehensive interventions aimed to improve HBP-HL and SS together are essential and promising strategy for improving the HRQoL of community hypertensive patients. In addition, further policies and interventions, focus on improving the HBP-HL, SS and HRQoL among the community hypertension patients in China, are urgent needed.

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