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Feature Article

Social support as a mediator between depression and quality of life in Chinese community-dwelling older adults with chronic disease

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ABSTRACT

The older adults with chronic disease usually show poor mental health and experience low quality of life (QOL). This study aimed to examine the mediating role of social support in the relationship between depression and QOL in community-dwelling older adults with chronic disease. A total of 387 Chinese older adults aged 60 or above with chronic disease were included in this cross-sectional study. Social support was negatively associated with depression and positively associated with physical component scale (PCS) and mental component scale (MCS). Depression and social support were all predictors of PCS and MCS. Mediation analysis suggested that social support partially mediated the impact of depression on PCS and MCS. Understanding the mediating role of social support might be beneficial in reducing the adverse impact of depression on QOL in community-dwelling older adults with chronic disease.

Introduction

According to the United Nations report, the world population of older people is growing with an annual rate of 2.6%, more than twice the growth rate of the whole population.[1] A consequence of the increasing percentage of older people is a surge in the incidence and prevalence of age-related diseases.[2] Chronic disease not only produces a heavy economic burden on the individual, family, and society, but also seriously influences the individual's quality of life (QOL).[3]

Chronic diseases and their treatments influence the patients' physical and psychological health. Depression is one of the most common psychological disorders in older adults,[4] and even more prevalent in older adults with one or more chronic diseases.[5] In the literature, the prevalence of depression in older adults with chronic diseases ranged from 34.0% to 65.2%.[6–9] Prior studies have demonstrated an association between depression and poorer QOL.[10,11] Depressive symptoms may compromise QOL through physiological and behavioral factors, including autonomic nervous system dysfunction, inflammation, endothelial dysfunction, and reduced engagement in health-promoting activities.[12] It is important to reduce the adverse impact of depression on QOL.

Social support may reduce the adverse impact of depression on QOL. Social support has been defined as the perception that one person is cared about, respected and valued by others, and is a member of a social network which provides mutual assistance.[13] Social support can improve an individual's social adaptability, and the ability to cope with the adverse event. Social support has been found to alleviate the negative impacts of chronic diseases on QOL.[14,15] Psychological factors may influence perceptions of support and contribute to negative social interactions, such as appraisals, distress and depression.[16] Depression was associated with lower social support from family, friends and significant others.[17]

Social support mediated the relationship between depressive symptoms and mental health or QOL.[18,19] Improving the informal social support networks may help alleviate the adverse effect of depression on adherence and life satisfaction.[20,21] Previous studies have also explored the mediating effect of social support on depression. These studies reported that social support can mediate the effects of insomnia, functional ability, physical disability and loneliness on the depressive symptoms.[22–25] If social support is a significant mediator of depression and QOL in older adults with chronic

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disease, intervention or implementation of social support may mitigate the adverse impact of depression on their QOL.

In the context of high prevalence of chronic disease and depression in older adults, it is critically important for nurses and other health providers to pay attention to interventions to improve the QOL in this population. Previous studies have shown a relationship of depression with QOL or social support. However, the role of social support in the association between depression and QOL has not yet been thoroughly explored among this population. Therefore, this study aimed to understand how social support may mediate the association between depression and QOL in a group of community-dwelling older adults with chronic disease. We hypothesized that social support would partially mediate the relationship between depression and QOL.

Material and methods

Study design and participants

This study was a cross-sectional study which was conducted from June 2015 to December 2015. Five community health service centers in Chongqing City, China were selected for recruiting participants. Community health service center is the institution that provides primary health care for community residents. Five nurses were invited to recruit participants who visited the community health service centers. Using a convenience sampling method, totally 387 older adults with chronic disease were recruited. The inclusion criteria were as follows: (1) Chinese ethnicity; (2) age of 60 years or above; (3) suffering from one or more chronic diseases which must have been formally diagnosed according to the medical record; (4) voluntary to participate in this survey. Exclusion criteria included the older adults with cognitive impairment, mental diseases and currently suffering from aphasia, deafness or other communication disorders that influenced the completion of surveys. Cognitive function evaluation for the potential participants was performed by the nurses using the Hastgawa Dementia Scale. A total score of 30 or more indicates normal cognitive function.

Ethical considerations

The study protocol was approved by the Ethics Committee of the First Affiliated Hospital of Chongqing Medical University. The survey was anonymous and voluntary. All participants were informed about the right to not answer any questions or to withdraw at any time during the survey.

Measurements

The basic characteristics included age (in years), gender, education level (less than primary school, junior middle school, and more than high school), and number of chronic diseases.

QOL was evaluated by the Medical Outcomes Study 36-item Short-Form Health Survey (SF-36).[26] The SF-36 includes eight dimensions: physical functioning, physical role functioning, bodily pain, general health, vitality, social functioning, emotional role functioning and mental health. These dimensions can be divided into two summary scales: the physical component scale (PCS) and the mental component scale (MCS). The Chinese version of SF-36 has been demonstrated good reliability and validity in Chinese population. The Cronbach's alpha for the PCS and MCS were 0.90 and 0.91, respectively.[27] Subscale score ranges from 0 to 100, with higher scores indicating better QOL.

Depression was assessed by Geriatric Depression Scale (GDS). The GDS is a self-report scale with 30 items, which was developed to assess depressive symptoms for older adults.[28] The Chinese version of GDS has been widely used in different settings with good psychometric properties. The Cronbach's alpha and test-retest reliability for the GDS were 0.89 and 0.85, respectively.[29] The overall score ranges from 0 to 30. A total score of 11–20 indicates mild depressive symptoms and 21–30 moderate or severe depressive symptoms.

Social support was measured by Social Support Rating Scale (SSRS).[30] It consists of 10 items and three dimensions: subjective support (perceived interpersonal network that the individual can count on), objective support (actual support that the individual received in the past), and support utilization (the individual's behavior pattern when seeking social support). Most of the items were scored by a four-point Likert scale (1 = never, 2 = seldom, 3 = sometimes, and 4 = actively seek help from others). The score of the total SSRS ranges from 12 to 66, subjective support from 8 to 32, objective support from 1 to 22, and support utilization from 3 to 12. Higher scores indicate better social support. It has been used in a wide range of Chinese populations because of its good reliability and validity. The test-retest reliability and Cronbach's alpha were 0.92 and 0.89, respectively.[30]

Statistical analysis

Data was analyzed using SPSS 20.0 software (IBM Corporation, Armonk, NY). Categorical data were calculated by frequencies and percentages, and continuous data by means with standard deviations (SD). Bivariate Pearson's correlation was used to test the correlations among QOL, depression and social support. All statistical tests were two-sided ($\alpha = 0.05$).

Mediation analysis involves testing the effect of the independent variable on the dependent variable, accounting for the influence of the mediator. Based on the previous studies,[18–21] the mediation model in our study included the following variables: depression was the independent variable, social support was introduced as the mediator variable, and QOL was the dependent variable (Fig. 1). In this model, the total effect (path *c*) refers to the effect of the independent variable on the dependent variable. The total effect consists of a direct effect (path *c'*) of the independent variable on the dependent variable, and an indirect effect (mediated: path $a + b$) of the independent variable on the dependent variable through the mediator. Two methods were used to approach the mediation analysis. We conducted analyses controlled for covariates that may confound the relationship between depression and PCS/MCS including age, gender, education level and number of chronic diseases.

Using Baron and Kenny's technique,[31] mediation was present with following conditions: (1) the independent variable (depression) was associated with the dependent variable (PCS/MCS) in the absence of the mediator (social support); (2) the independent variable (depression) was associated with the mediator variable (social support); (3) the mediator (social support) was associated with the dependent variable (PCS/MCS); (4) the standardized coefficient for independent variable on the dependent variable was reduced when the mediator was added to the model.

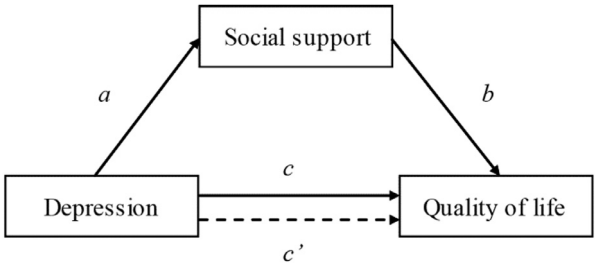

Fig. 1. Model of the mediating effect of social support on the relationship between depression and quality of life.

We also conducted a series of regression analyses to assess for statistical significance of the mediation pathways. A bootstrapping procedure was used to estimate the coefficients for the direct, indirect and total effects. A bootstrapping procedure involves repeatedly sampling with replacement from the original sample and estimating the indirect effect to build an empirical approximation of the sampling distribution of the indirect effect. If the bootstrapped confidence intervals (CI) of the estimates of the indirect effect does not include zero, the mediating effect is considered significant. Mediation analyses were implemented by the SPSS PROCESS macro. We used 5,000 bootstrap samples for 95% bias-corrected bootstrap CI to estimate the direct, indirect and total effects.

Results

Sample characteristics

The characteristics of the participants are listed in Table 1. The mean age of the 387 participants was 73.62 ± 6.67 years, with the range from 60 to 87 years. Most (73.6%) of the participants had lower education level (junior middle school or below). 31.5% (122/387) of the participants had active depressive symptoms as defined by a score of 11 or more.

Correlations of PCS, MCS, depression and social support

The mean scores for subjective support, objective support, support utilization, depression, PCS and MCS are shown in Table 2. The results of Pearson's correlation analysis showed that PCS was significantly correlated with depression ($r = -0.252$, $p < 0.01$) and the three dimensions of social support ($r = 0.324$, 0.297, 0.295, respectively; $p < 0.01$). MCS was negatively correlated with depression ($r = -0.281$, $p < 0.01$), and positively correlated with the three dimensions of social support ($p < 0.01$). Moreover, depression was significantly correlated with the three dimensions of social support ($p < 0.01$).

Mediation analysis

The results of mediation analysis are presented in Table 3. We found that depression was negatively associated with PCS ($\beta = -0.69$, $P < 0.01$). When the three dimensions of social support were included in the model, the three dimensions of social support were positively associated with PCS ($\beta = 0.77$, 0.82 and 1.06, respectively; $P < 0.01$), and the regression coefficient for depression was reduced from 0.69 to 0.42. This suggested that social support played a partial mediating role on the relationship between depression and PCS. The estimates of the coefficients for the indirect effects of the three dimensions of social support were all statistically significant (Table 4). Social support mediated approximately 39% of the total effect of depression on PCS.

As shown in Table 3, depression and the three dimensions of social support were the predicators of MCS. Social support partially mediated the relationship between depression and MCS, in that the regression coefficient for depression was reduced from 0.84 to 0.52 when the three dimensions of social support were added to the model. We found that the coefficients for the indirect effects of subjective support, objective support and support utilization were −0.13, −0.09 and −0.09, respectively ($P < 0.01$). Social support mediated about 38% of the total effect of depression on MCS (Table 4).

Table 1
Sample characteristics ($n = 387$)

Characteristics		Frequency	Percentage (%)
Age (years)			
	60–69	115	29.7
	70–79	188	48.6
	80–89	84	21.7
Gender			
	Male	186	48.1
	Female	201	51.9
Education			
	≤primary school	151	39.0
	Junior middle school	134	34.6
	≥high school	102	26.4
Number of chronic diseases			
	1	115	29.7
	2	187	48.3
	≥3	85	22.0
Severity of depression			
	None	265	68.5
	Mild	95	24.5
	Moderate or severe	27	7.0

Table 2
Means, standard deviations and correlations between the study variables

Variables	Mean	SD	1	2	3	4
1 Subjective support	20.50	3.41	1			
2 Objective support	8.10	2.43	0.348**	1		
3 Support utilization	7.11	1.71	0.288**	0.366**	1	
4 Depression	10.79	4.79	−0.213**	−0.229**	−0.236**	1
5 PCS	57.45	14.38	0.324**	0.297**	0.295**	−0.252**
6 MCS	55.58	15.75	0.365**	0.318**	0.313**	−0.281**

PCS: physical component scale; MCS: mental component scale; ** $P < 0.01$.

Discussion

In the present study, the relationship of QOL, depression and social support was examined in a group of community-dwelling older adults with chronic disease. As hypothesized, depression was significantly associated with lower social support and poorer PCS and MCS, and social support was independently associated with PCS and MCS. Our data suggested that social support partially mediated the relationship between depression and QOL.

In accordance with previous studies,[10,11] depression had significantly negative impact on QOL in older patients in this study. In addition, depression was significantly and negatively associated with social support, which supported the previous studies.[25,32,33] As described earlier, depression was significantly associated with lower social support in older patients with coronary artery disease,[24] as well as in the community-dwelling older adults.[32] Increased depressive symptoms were associated with tendencies toward social isolation.[34] Depressed older adults were less prone to seek or sustain social relationships and less likely to have satisfactory social support.[33]

Social support is health-promoting for its facilitating healthier behaviors and better adherence to the medication regimens.[16] Older adults who perceived themselves to have good social support were more likely to obtain better health outcomes. Previous studies revealed that adequate social support was positively correlated with physical and mental QOL in older adults with chronic disease.[14,35] Social support played a positive role in diabetes-specific QOL and self-management practices.[15] Given the previous and our findings, social support appeared to be strongly related to QOL in older adults with chronic disease.

Our study has extended the scientific understanding of the relationship between depression and QOL by establishing that social support could be an important mediator of this relationship in older adults with chronic disease. Our findings showed social support mediated about 39% of the total effect of depression on PCS, and 38% of the total effect of depression on MCS. Social support had both

Table 3
Sequential regression analyses for mediation effects of social support between depression and PCS/MCS

	PCS		MCS	
	Model without social support β (95% CI)	Model with social support β (95% CI)	Model without social support β (95% CI)	Model with social support β (95% CI)
Age	0.12 (−0.14, 0.38)	0.04 (−0.21, 0.29)	0.23 (−0.05, 0.51)	0.14 (−0.13, 0.41)
Gender	0.36 (−2.39, 3.11)	1.08 (−1.54, 3.70)	−0.32 (−3.30, 2.66)	0.53 (−2.28, 3.34)
Education level	2.88 (1.15, 4.61)**	1.76 (0.08, 3.45)*	3.36 (1.49, 5.24)**	2.04 (0.24, 3.85)*
Number of chronic diseases	−4.04 (−6.48, −1.61)**	−2.57 (−4.92, −0.22)*	−4.57 (−7.22, −1.94)**	−2.82 (−5.34, −0.31)*
Depression	−0.69 (−0.98, −0.40)**	−0.42 (−0.71, −0.14)**	−0.84 (−1.15, −0.53)**	−0.52(−0.83, −0.22)**
Subjective support	–	0.77 (0.35, 1.19)**	–	1.01 (0.56, 1.46)**
Objective support	–	0.82 (0.20, 1.42)**	–	0.89 (0.25, 1.54)*
Support utilization	–	1.06 (0.20, 1.91)*	–	1.18 (0.26, 2.09)*
R^2	0.11	0.21	0.13	0.24
F	9.84**	12.41**	11.64**	15.27**

PCS: physical component scale; MCS: mental component scale; β: Standardized coefficients; CI: confidence interval; * $P < 0.05$, ** $P < 0.01$.

Table 4
Coefficients and confidence intervals for mediation analysis

Dependent Variable	Mediator	Indirect effect (path a + path b)	Direct effect (path c')	Total effect (path c)
		β (95% CI)	β (95% CI)	β (95% CI)
PCS	Subjective support	−0.10 (−0.22, −0.03)*	–	–
	Objective support	−0.09 (−0.18, −0.03)*	–	–
	Support utilization	−0.08 (−0.17, −0.02)*	–	–
	Total	−0.27 (−0.45, −0.16)**	−0.42 (−0.71, −0.14)**	−0.69 (−0.98, −0.40)**
MCS	Subjective support	−0.13 (−0.26, −0.05)**	–	–
	Objective support	−0.09 (−0.20, −0.03)*	–	–
	Support utilization	−0.09 (−0.19, −0.02)*	–	–
	Total	−0.32 (−0.49, −0.18)**	−0.52(−0.83, −0.22)**	−0.84 (−1.15, −0.53)**

Models adjusted for age, gender, education level and number of chronic diseases.
PCS: physical component scale; MCS: mental component scale; β: Standardized coefficients; CI: confidence interval; * $P < 0.05$, ** $P < 0.01$.

direct and mediating effects on QOL. Our findings were consistent with previous researches,[18,36] in which social support was recommended to be evaluated and improved to alleviate the negative effect of depression on QOL. However, in one study by Chung et al, though perceived social support and depressive symptoms were all predictors of QOL in patients with heart failure, perceived social support did not mediate the relationship between depressive symptoms and QOL.[37]

According to Buffer Theory, people could benefit from social support to buffer or reduce the stresses of daily life, or the potential impact of adverse life events.[38] Our study suggested social support might be particularly important for older adults with chronic disease because those with chronic disease were more frequently confronted with adverse effect of depression on their QOL. Social support could provide faith to them and lead them to resolve the health problems more effectively. However, older adults may experience a lack of emotional and instrumental social support from their families and other social networks due to the aging and the concurrent chronic disease. Inclusion of social support may help nurses and other health providers in planning program of disease development, patient or caregiver education and effective use of health care resources.

Our findings also have significant international impacts. The world is aging rapidly. The high prevalence of depression in older adults with chronic disease is existing not only in China, but also in other countries.[6–8] Therefore, the adverse impact of depression on QOL should be taken into consideration in the whole world. Additionally, social networks in old age are certainly reduced in size. Improving social support is beneficial in alleviating the impact of depression on QOL for older adults with chronic disease from China and other countries. Future research is needed to determine how to provide social support to them and whether social support intervention is a useful strategy to reduce the negative impact of depression on QOL in older adults with chronic disease.

Several limitations in the current study should be considered. First, the cross-sectional study design could carry result bias. The causality of the relationship between the QOL, depression and social support could not be explored. Thus, we could not conclude whether depression or social support precede the development of QOL. A longitudinal research is needed to explore the detailed causal relationship. Second, we collected data using a convenience sample of older adults with chronic disease in the community, which limited the generalizability of the results. Third, data were collected using the self-report scales, which may result in recall and reporting bias.

Conclusion

Depression has adverse impact on QOL, which is a crucial consideration for older adults with chronic disease. It is important to understand which factors might mediate this relationship in order to find better target interventions to mitigate this problem. The present study found that social support may be an important mediator of the association between depression and QOL among community-dwelling older adults with chronic disease. It is recommended that interventions focused on the improvement of social support may be helpful in alleviating the adverse impact of depression on QOL. In consideration of the limitations, a longitudinal and more large-scale study is needed to substantiate these findings.

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Competing interests

The authors declare no conflict of interest.

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