Scientific and Social Research, 2024, Volume 6, Issue 8
https://ojs.bbwpublisher.com/index.php/SSR
Online ISSN: 2981-9946
Print ISSN: 2661-4332

The Effect of Social Support on Self-Rated Health in a Rural Elderly Population: With Depression Level as a Mediating Variable

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Abstract: To explore the relationship between social support, depression level, and self-rated health in rural elderly groups, this paper, based on the 2020 Chinese Longitudinal Healthy Longevity Survey data, first, used the Ordinal Logit regression model and propensity score matching to assess the relationship between social support and self-rated health in rural elderly groups. Secondly, stepwise regression analysis was used to test the role of depression level in the relationship between emotional social support, material social support, and self-assessed health. Lastly, the magnitude of the mediating effect was further tested using KHB decomposition. The results showed that both emotional and material social support had a significant positive effect on the self-assessed health of the rural elderly. Depression level mediated the relationship between emotional social support, material social support, and self-rated health of rural elderly groups, and the type and size of the mediating effect were related to the type of social support. Based on these findings, this paper makes several recommendations.

Keywords: Emotional social support; Material social support; Rural older adults; Self-rated health; Depression level

Online publication: August 23, 2024

1. Introduction

Data from the seventh national census show that the proportion of elderly groups aged 65 years and above in 19 provinces in central and western China, except Tibet, exceeds 7%, and all of them have entered the stage of population aging [1]. As aging intensifies, the prevalence of various physical and mental diseases continues to rise [2]. Self-assessed health is an important indicator of the health level of the elderly population, which is both objective and subjective. Li found a significant positive correlation between self-assessed health and objective health through a comparative study of 202 patients and 243 healthy people [3]. Adequate social support was found to be effective in preventing depression and thus enhancing health [4]. Social support refers to the comfort and help that an individual receives from social relationships, including material and emotional social support, and the social support of the elderly group mainly includes the spiritual and material help and support given to

the individual by family members, relatives and friends, community organizations, and so on [5]. Depression is a common mental disorder and emotional problem in the elderly group, which is mainly manifested as persistent and severe low mood, negative thinking, and loss of interest in daily activities [6]. Jason and Schnittker found that the correlation between the level of depression and self-assessed health in the elderly group was very significant [7–8]. So, what role does depression level play between social support and self-rated health in addition to its direct influence on self-rated health in older age groups? In addition, social support can be categorized into material social support and spiritual social support, is this role related to the type of social support? Based on this, this paper draws data from the 2020 Chinese Longitudinal Healthy Longevity Survey (CLHLS) for the rural older age group to explore the relationship between social support and self-rated health and the role that depression levels play between the two.

2. Theoretical analyses and research hypotheses

Theoretical studies have shown that social support enhances self-assessed health in older age groups. Bailis et al. analyzed data using the Canadian National Population Health Survey and concluded that social support can significantly enhance self-assessed health [9]. Yang et al. and Luan confirmed that social support has the effect of promoting the health level of the elderly group [10–11]. According to the type of support, social support is divided into emotional support, respect support, physical or instrumental support, information support, and network system support. Morgan and Zimmweman distinguished social support into emotional social support and instrumental social support [12]. Lin et al. argued that social support should be divided into emotional social support (such as comforting, caring, understanding, and so on) and substantive social support (such as dealing with things, financial support, and others) [13]. In this paper, social support is divided into two categories: objective material social support and subjective emotional social support [14]. Material social support usually involves the direct provision of material assistance such as money, food, housing, medical care, and so on. Emotional social support is a psychological and social resource where individuals receive emotional comfort, support, and encouragement from others in the face of crisis and stress. This support can come from family, friends, community, organizations, or other social networks and is usually demonstrated through emotions, listening, and providing practical help. Hou et al. found that both financial support and life care significantly affected health self-assessment in older adults using 2018 CLHLS data [15]. Li et al. analyzed 2,587 mobile elderly groups in the western region and concluded that the closer the place of residence was to healthcare services, the better their self-assessed health was [16]. Yu et al. used 2014 CLHLS data and found that older adults with community support had better self-rated health [17]. Since most of the existing studies in the literature do not distinguish between the household characteristics of the elderly group, and rural areas are economically backward, have low internet availability as well as poor infrastructure compared to towns, and therefore rural elderly groups may have worse physical and mental health compared to urban residents, this paper investigates the impact of social support on self-rated health of rural elderly groups, based on which the following hypothesis is proposed.

Hypothesis 1: Social support has a significant positive effect on the self-assessed health of rural elderly groups

Regarding the effect of social support on the level of depression in elderly groups, Xie et al. found that when elderly groups receive more social support, their psychological loneliness and depression are reduced through a survey of senior single elderly living alone in a community [18]. Ye et al. used elderly groups in rural areas of Fujian Province as the research object and found that when elderly groups were widowed in their later

years, the help and support of family children alleviated their low mood and loneliness to a certain extent [19]. Tao et al. used the 2013 CHARLS data to examine the impact of social support on the physical and mental health of rural elderly groups and found that children's provision of daily care and financial help for their parents had a positive impact on their physical and mental health [20]. For the impact of depression level on the self-assessed health of rural elderly groups, Wu et al. found that the self-assessed health status of elderly groups was related to the level of depression through a survey study of 983 elderly residents of Chengdu High-Tech District [21]. Tao et al. pointed out that depressive symptoms of rural elderly groups in the east, midwest, and west were influenced by self-assessment of health [22]. Jiang et al. found that there was a significant negative correlation between depression and self-perceived health level by sampling 322 elderly groups aged 60 years and above in Guangzhou City [23]. Using CHARLS data, Yu found that the lower the level of depression, the better the self-perceived health of the elderly group, and that the level of depression was a mediating variable between social support and self-perceived health of the elderly group [24]. Therefore, the following hypothesis is proposed.

Hypothesis 2: Depression level mediates between social support and self-assessed health of rural elderly groups.

3. Study setting

3.1. Data source

This paper adopts the CLHLS data released in 2020, which is used by many scholars and has a certain authority. According to the needs of the study, those whose residence is rural and whose age is above 65 are retained, and after data cleaning, the final number of eligible samples is 5104.

3.2. Variable setting

3.2.1. Explained variables

For self-assessed health, the question "How do you feel about your health now?" from the CLHLS questionnaire was selected. The question in the CLHLS questionnaire was "How do you feel about your health now?", which was scored on a 5-point Likert scale, with 1 representing "very bad", 2 representing "bad", 3 representing "fair", 4 representing "good", and 5 for "very good."

3.2.2. Core explanatory variables

Social support is divided into two levels: material social support and emotional social support. Physical social support is measured by the questionnaire question "If you are seriously ill, can you go to the hospital in time for treatment?" and assigned a value of 1 if the answer was yes, otherwise 0. The emotional social support is measured by the questionnaire question "What social services are available for the elderly in your community?" The question was converted to "Do you have any of the following social services in your community?", and assigned a value of 1 if one of the options was yes, and a value of 0 if none of the social services were available.

3.2.3. Mediating variables

For the depression level, the CLHLS questionnaire used a depression scale to assess the level of depression in the elderly population. The depression scale includes questions such as "Do you worry about small things?"; "Do you have difficulty concentrating on things now?"; "Do you feel sad and depressed?"; "Do you feel that the older you get, the less useful you are, and that it is hard for you to do anything?"; "Are you full of hope for the future?"; "Are you feeling nervous and scared?"; "Do you feel as happy as you did when you were young?";

"Do you feel lonely?"; "Do you feel unable to go on with your life?"; and "How well do you sleep now?" Ten questions were asked, seven on negative emotions and three on positive emotions. Each question has a five-level scale of 0 to 4. For the question "How is your sleep quality now?", a score of 0 represents "very good" and a score of 4 represents "very bad." For the remaining 9 questions, 0 represents "always", 1 represents "often", 2 represents "sometimes", 3 represents "rarely", and 4 for "never." Negative mood questions were scored reversely, and the scores for the 10 questions were summed to give a total value between 0 and 40, with higher scores indicating higher levels of depression.

3.2.4. Control variables

Relevant academic studies have shown that demographic characteristics and living habits are related to the level of depression in the elderly as follows.

Socio-demographic characteristics variables include gender, which is set as a dichotomous variable, with the male being 1 and the female being 0; age, which is set as a continuous variable.

Lifestyle habit variables include: whether or not you drink alcohol, selected from the questionnaire question "Do you often drink alcohol now?" (yes, assigned to 1, no, assigned to 0); whether to exercise or not, selected from the questionnaire, "Do you now often exercise?", with yes assigned to 1 and no assigned to 0.

3.3. Statistical description of variables

The core variables of the 5104 rural elderly group were counted. Among the self-assessed health, 60 people (1.18%) were very unhealthy, 605 people (11.85%) were relatively unhealthy, 1942 people (38.05%) were generally healthy, 1936 people (37.93%) were relatively healthy, and 561 people (10.99%) were very healthy; 2011 people (39.40%) had no emotional social support, and 3093 (60.60%) with emotional social support; 169 (3.31%) without material social support and 4935 (96.69%) with material social support; and the depression level took the range of 0 to 40 points. Descriptive statistics of all variables are shown in **Table 1**.

Table 1. Variables and their descriptive statistics

Variable		Definition	Mean	Standard deviation
Dependent variable	Self-assessment of health	1 very bad; 2 bad; 3 fair; 4 good; 5 very good	3.457	0.881
Explanatory variables	Emotional	have=1; not have =0	0.606	0.489
	Materiality	Can=1; cannot=0	0.967	0.179
Control variables	Gender	Male =1; Female =0	0.460	0.498
	Age	Continuous variable, greater than or equal to 65	83.133	10.967
	Whether drink alcohol or not	Yes=1; No=0	0.163	0.370
	Whether exercise or not	Yes=1; No=0	0.271	0.444
Mediating variable	Depression level	0~40; Continuous variable	12.284	5.993

3.4. Statistical methods

3.4.1. Ordered multicategorical logistic regression

The explanatory variable in this paper is the self-assessed health of rural elderly groups, which is a five-classified ordered multicategorical variable, so it can be used in ordinal multicategorical logit regression. The precondition of ordinal multicategorical logit regression is parallelism, as the data in this paper satisfy the assumption, so ordinal multicategorical logit regression is used. The specific settings of the model are shown in **Equation 1** and **Equation 2** below.

$$\ln\left(\frac{p(y\leq j|x)}{1-p(y\leq j|x)}\right) = \mu_j - \left(\alpha + \sum_{i=1}^{k}\beta_i x_i\right) \quad (1)$$

$$p(y \leq j|x) = \frac{e^{\mu_j - \left(\alpha+\sum_{i=1}^{k}\beta_i x_i\right)}}{1+e^{\mu_j - \left(\alpha+\sum_{i=1}^{k}\beta_i x_i\right)}} \quad (2)$$

Where y is the explanatory variable rural elderly group self-assessed health rating; x_i is the influencing factor, indicating the ith factor affecting the self-assessed health of the rural elderly group, β_i is the regression coefficient, indicating the direction and degree of the influence of the influencing factor x_i on y; α is the intercept term, and μ_j is the cut-off point.

3.4.2. Propensity score matching model (PSM)

The PSM method is a series of matching processing that can effectively eliminate confounding bias and solve the problem of selectivity bias in observational experiments to a certain extent. Therefore, it is a better method to deal with endogeneity.

Firstly, this study divided the samples into a treatment group (two kinds of social support) and a control group (no social support) respectively. According to the kinds of social support, the study applied the Logit model, matched the samples for each control variable, and estimated the probability of the sample individuals entering into the treatment group according to the observable characteristics. The propensity scores calculated through the Logit model are shown in **Equation 3** and **Equation 4** below.

$$P(X_{1i}) = Pr(D_{1i}=1|X_{1i})=E(D_{1i}=0|X_{1i}) \quad (3)$$

$$P(X_{2i}) = Pr(D_{2i}=1|X_{2i})=E(D_{2i}=0|X_{2i}) \quad (4)$$

In **Equation 3** and **Equation 4**, D_{1i} and D_{2i} are treatment variables, D_{1i} = 1 indicates emotional social support, D_{1i} = 0 indicates no emotional social support; D_{2i} = 1 indicates material social support, D_{2i} = 0 indicates no material social support, X_{1i} and X_{2i} are a series of control variables.

Second, appropriate matching methods were selected to match the samples. Different matching methods have different biases, and to ensure the robustness of the results, the three methods of K-nearest neighbor matching (k = 3), radius matching (r = 0.01), and kernel matching were selected in this study to compute the average treatment effect of emotional and material social support on the self-assessed health of the rural elderly group respectively(Average Treatment effect on the Treated, ATT) as shown in **Equation 5** and **Equation 6** below.

$$ATT = E(Y_{11i}|D = 1) – E\ (Y_{01i}|D =1) \quad (5)$$

$$ATT = E(Y_{12i}|D = 1) – E\ (Y_{02i}|D =1) \quad (6)$$

In **Equation 5** and **Equation 6**, Y_{11i} denotes the self-assessed health of rural elderly groups with emotional social support; Y_{01i} denotes the self-assessed health of rural elderly groups without emotional social support; Y_{12i} denotes the self-assessed health of rural elderly groups with material social support; and Y_{02i} denotes the self-assessed health of rural elderly groups without material social support.

Finally, after completing the matching of the samples by the three matching methods, the control variables of the treatment and control groups after matching were tested for balance.

3.4.3. Stepwise regression

Since the explanatory variable self-assessed health is an ordered 5-categorical variable, which uses ordered multicategorical logistic regression, and the mediator variable depression level is a continuous variable, which uses ordinary least squares regression, the regression methods used by the two are different, resulting in the resulting regression coefficients are not comparable. To solve the problem, the study by Liu et al. was referenced, when the ordered categorical variables are used as the explanatory variables and the variable categories are 5 and above, the mediation effect can be analyzed using the continuous variable method, and the results are less different from those analyzed using categorical variables [25]. The model is specifically set as follows.

Emotional social support as the independent variable:

$$health = \beta_1 + c \cdot emotional + \gamma_1 \cdot control + \varepsilon_1 \quad (7)$$

$$depression = \beta_2 + a \cdot emotional + \varepsilon_2 \quad (8)$$

$$health = \beta_3 + c' \cdot emotional + b \cdot depression + \gamma_2 \cdot control + \varepsilon_3 \quad (9)$$

With material social support as the independent variable:

$$health = \beta_1 + c \cdot material + \gamma_1 \cdot control + \varepsilon_1 \quad (10)$$

$$depression = \beta_2 + a \cdot material + \varepsilon_2 \quad (11)$$

$$health = \beta_3 + c' \cdot material + b \cdot depression + \gamma_2 \cdot control + \varepsilon_3 \quad (12)$$

Where health is the explanatory variable, emotional and material are the explanatory variables, depression is the mediating variable, β_1, β_2, and β_3 are the constant terms; a, b, c, c', γ_1, and γ_2 are the coefficients, ε_1, ε_2, and ε_3 are the residuals of each model. **Equations 7**, **9**, **10**, and **12** reflect the effects of emotional social support and material social support on self-rated health in the rural elderly group before and after the addition of the mediator variable, respectively. In contrast, **Equations 8** and **11** reflect the effects of emotional social support and material social support on the mediator variable depression level, respectively.

4. Analysis of empirical results

4.1. Ordinal logit regression analysis

Table 2 shows the results of ordinal logistic regression analyses of social support on self-assessed health of rural older adults. Model 1 is the baseline model incorporating the control variables. The regression results show that both whether to drink alcohol and whether to exercise have a significant effect ($P < 0.01$) on the self-rated health of the rural elderly group and drinking alcohol has a positive effect on the self-rated health of the rural elderly group, which is consistent with the conclusions of Liu et al. and Yang et al., which may be attributed to the fact that drinking alcohol in moderation brings some health benefits, such as cardiovascular health, antioxidant effects, and social interactions [26–27]. Regular exercise contributes to physical health, in agreement with Shields et al. findings [28]. The effect of gender on self-assessed health in the rural elderly group was not significant; the effect of age on self-assessed health in the rural elderly group was not significant, which is inconsistent with Suzanne's conclusions, which may be because, although the older the person gets, his or her social experience and exposure increases with it, and he or she can be open to acceptance in the face of illnesses and difficulties, which may result in the absence of significance [29]. Model 2 incorporates emotional social support and material social support, controlling for the rest of the variables, both emotional and material

social support have a significant positive effect on the self-assessed health of the rural elderly group ($P < 0.05$), and material social support has a greater effect on self-assessed health of the rural elderly group than emotional social support. Therefore, social support contributes to the self-rated health of the rural elderly group, a result that confirms the first hypothesis proposed in this study.

Table 2. Results of regression analyses of social support on self-rated health of rural elderly groups

Variable	Model 1		Model 2	
	Regression coefficient	Standard error	Regression coefficient	Standard error
Sex	0.010	0.055	0.010	0.055
Age	-0.001	0.002	-0.0003	0.002
Whether drink alcohol or not	0.505***	0.073	0.506***	0.073
Exercise or not	0.402***	0.059	0.393***	0.059
Emotional social support			0.112**	0.053
Physical social support			0.929***	0.147

Note: Model 1's Pseudo R^2 = 0.0083; Model 2's Pseudo R^2 = 0.0117; *** $P < 0.01$; **$P < 0.05$.

The prerequisite for ordinal logistic regression is parallelism, such as the effect of each value level of the independent variable on the dependent variable is the same in each regression equation. The original hypothesis of the parallelism test is that the regression equations are parallel to each other, as can be seen from **Table 3**, the *P*-value of each test is greater than 0.05, which accepts the original hypothesis, indicating that the model passes the parallelism test, and the ordinal logistic regression model established above is valid.

Table 3. Parallelism test of ordered multicategorical logit regression model

	Model 1			Model 2		
	Chi^2	df	$P > Chi^2$	Chi^2	df	$P > Chi^2$
Wolfe Gould	19.43	12	0.079	26.73	18	0.084
Brant	19.32	12	0.081	25.4	18	0.114
score	19.2	12	0.084	26.44	18	0.090
Likelihood ratio	19.4	12	0.079	26.61	18	0.087
Wald	19.18	12	0.084	26.44	18	0.090

4.2. Possible model endogeneity and propensity score matching method test

The possible endogeneity of the ordinal logit model estimation of social support on self-assessed health of rural older adults was tested using the propensity score matching method. Subgroups of rural older adults with and without emotional and with and without material social support were matched separately to estimate the average treatment effect (ATT) of emotional and material social support on the self-rated health of rural older adults to eliminate the problem of model endogeneity.

The average treatment effect on the treated (ATT) was calculated using K-nearest neighbor matching (k = 3), radius matching (r = 0.01), and kernel matching in turn to calculate the average treatment effect on the self-assessed health of the rural elderly group with emotional and material social support respectively (**Table 4**). The average treatment effect on the treated of the three matches for the emotional social support was 0.984, 0.076, 0.076, and the average treatment effect on the treated of the three matches for the material social support were

0.443, 0.433, and 0.446, respectively, and all of them were significant at the 1% statistical level, indicating that social support has a significant positive effect on self-rated health of the rural elderly group.

Table 4. PSM test of emotional and material social support on self-assessed health of rural elderly groups

	Matching method	Eigenvalue		ATT	S. E	T –stat
		Processing group	Control group			
Emotional	K nearest neighbor matching (k=3)	3.486	2.502	0.984	0.048	20.58***
	Radius matching (r=0.01)	3.486	3.410	0.076	0.025	2.97***
	Kernel matching	3.486	3.410	0.076	0.025	2.98***
Materiality	K nearest neighbor matching (k=3)	3.472	3.029	0.443	0.083	5.32***
	Radius matching (r=0.01)	3.472	3.039	0.433	0.075	5.74***
	Kernel matching	3.472	3.026	0.446	0.071	6.31***

Note: *** $P < 0.01$

One of the purposes of propensity score matching is to balance the distribution of the matched variables between the treatment and control groups, so after the variables are completely matched, the results also need to be tested for balance. All three matching methods have passed the balance test, but due to space limitations, this paper only gives the balance test results of K nearest neighbor matching, as shown in **Table 5**. The absolute value of the standardized deviation rate of the matched variables after matching is all less than 10%, which shows that the difference between the treatment group and the control group is not obvious, and the balance of the matching results is better. The results of the balance test indicate that the positive and significant effect of social support on the self-rated health of the rural elderly group is robust.

Table 5. Balance test of K-nearest neighbor matching

	Variable	Mean value before matching		Mean value after matching		Deviation rate after matching (%)
		Processing group	Control group	Processing group	Control group	
Emotional	Sex	0.459	0.461	0.459	0.457	0.5
	Age	83.104	83.179	83.104	83.031	0.7
	Whether drink alcohol or not	0.165	0.159	0.165	0.168	-0.6
	Exercise or not	0.277	0.261	0.277	0.274	0.5
Materiality	Sex	0.462	0.402	0.462	0.444	3.6
	Age	82.98	87.604	82.98	83.236	-2.4
	Whether drink alcohol or not	0.164	0.130	0.164	0.152	3.5
	Exercise or not	0.273	0.189	0.273	0.299	-6.1

4.3. Test of mediating effects

Emotional social support and material social support were used as independent variables, self-assessed health of the rural elderly group was the dependent variable, and depression level was the mediator variable to further explore the relationship between the variables. In this paper, the mediation effect test was conducted using stepwise regression analysis, and the results are shown in **Table 6** and **Figure 1**. The mediation effect test with emotional social support as the independent variable showed that: emotional social support had a significant

positive effect on the self-assessed health of the rural elderly group ($P < 0.01$), indicating the coefficient c(0.068) was significant; emotional social support had a significant negative effect on the level of depression ($P < 0.01$), indicating coefficient a(-0.560) is significant. Including emotional social support and depression level as independent variables in the regression at the same time, the effect of emotional social support on the self-assessed health of the rural elderly group is not significant, indicating the coefficient c'(0.035) is not significant; the effect of depression level on self-assessed health is significant ($P < 0.01$), indicating the regression coefficient b(-0.064) is significant. According to the judgment criteria of Han et al., a and b are significant, so there is no need to perform the Sobel test, and the coefficient c' is not significant, then the level of depression plays a fully mediating role between emotional and social support and self-rated health [30].

Table 6. The mediating role of depression level between emotional social support and self-rated health

Dependent Variable	Independent variable	Indicator				
		Coefficient	Standard Error	t	P > | t |	Adj R^2
Self-rated health	Emotional	0.068	0.025	2.72	0.006	0.0205
Depression level	Emotional	-0.560	0.172	-3.27	0.001	0.0019
Self-rated health	Emotional	0.035	0.023	1.53	0.125	0.2009
	Depression level	-0.064	0.002	-33.94	0.000	

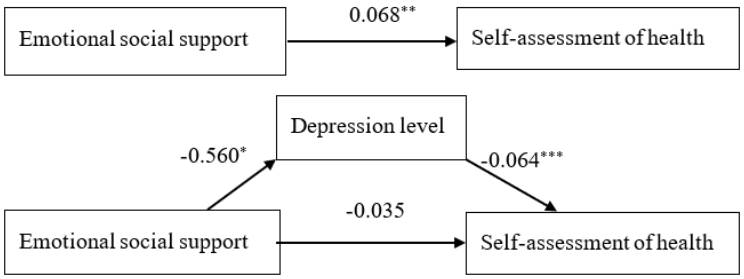

Figure 1. Schematic diagram of the test of the mediating effect of depression level between emotional social support and self-rated health

Table 7 and **Figure 2** present the results of the mediation effect test with material social support as the independent variable. The coefficient c (0.431), coefficient a (-4.253), coefficient b (-0.063), and coefficient c' (0.189) are significant. Since a and b are significant, the Sobel test is not required. Since c'(0.189) < c(0.431), then the level of depression partially mediates the relationship between material social support and self-assessed health of the rural elderly group. Therefore, hypothesis 2 is confirmed by the fact that the level of depression mediates the relationship between social support and self-assessed health of the rural elderly group.

Table 7. The mediating role of depression level between material social support and self-assessed health

Dependent variable	Independent variable	Indicator				
		Coefficient	Standard error	t	P > | t |	Adj R^2
Self-rated health	Materiality	0.431	0.068	6.32	0.000	0.0267
Depression level	Materiality	-4.253	0.465	-9.14	0.000	0.0159
Self-rated health	Materiality	0.189	0.062	3.04	0.002	0.2020
	Depression level	-0.063	0.002	-33.47	0.000	

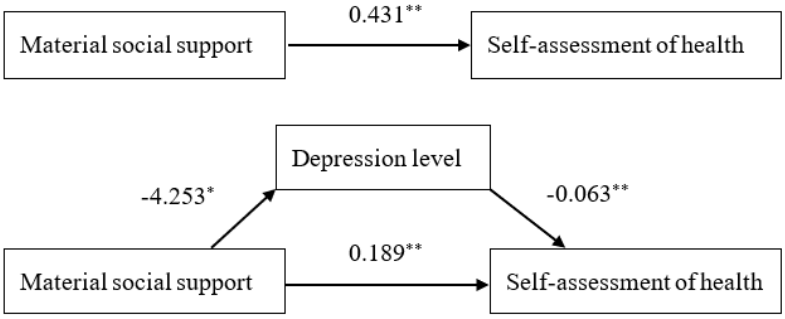

Figure 2. Schematic diagram of the test of the mediating effect of depression level between material social support and self-rated health

4.4. Further analysis of mediating effects

Stepwise regression analysis can only test whether the variables are mediated or not, and cannot reflect the magnitude of the mediating effect. Therefore, the KHB decomposition method proposed by Kohler et al. was used to view the size of the mediating effect and the results are shown in **Table 8** [31]. The mediating effect of depression level between emotional social support and self-assessed health of the rural elderly group is 0.088, and the mediating effect ratio is 59.04%, which is significant at the level of 0.01, indicating that the mediating effect is significant. The mediation effect of depression level between material social support and self-assessed health of the rural elderly group was 0.664 with a mediation effect ratio of 60.33%, which was also significant at the level of 0.01, indicating a significant mediation effect, further confirming hypothesis 2.

Table 8. Further analysis of the mediating effect of depression level

Intermediation Mode	Total effect	Direct effect	Intermediation effect	Intermediation effect ratio (%)
Emotional: Depression Levels — Self-Assessed Health	0.149	0.061	0.088***	59.04
Materiality: Depression Levels — Self-Assessed Health	1.100	0.436	0.664***	60.33

5. Conclusion and recommendations

This paper investigated the effect of social support on the self-assessed health of rural elderly groups. First, the ordinal logit model was used to analyze the effect of social support on the self-assessed health of rural elderly groups. The results of the regression analysis showed that both emotional and material social support had a significant positive effect on the self-assessed health of rural elderly groups. The test of the propensity score matching method, which takes into account endogeneity, also verified the conclusion. Second, the mediating effect of depression level was examined using stepwise regression analysis, and the size of the mediating effect was further examined using KHB decomposition. The results of the mediating effect analysis showed that the mediating variable, depression level, could significantly weaken the influence of emotional and material social support on the self-assessed health of rural older adults, but the types of mediating effects were different, which were the complete and the partial mediating effect respectively, and the mediating effect was larger for material social support. In addition, the self-assessed health of rural elderly groups is also affected by other individual, family, and social factors.

Based on the above research, this paper puts forward the following five recommendations.

First, rural elderly groups should actively participate in social activities, such as social activities, cultural

recreation, volunteer services, and so on. At the same time, those who can do so should actively re-employ themselves, rely on their strengths to improve their economic independence, and reduce their dependence on material social support.

Secondly, children and other family members should be actively encouraged to live nearby, which not only gives free space to both children and parents but also facilitates the timely provision of care and support by children to the elderly.

Third, a sound community support network should be established, including community activity centers for the elderly, volunteer teams, and community medical and health service stations, to provide rich emotional social support for the elderly.

Fourth, healthcare-related departments should provide health checkups, mental health services, chronic disease management, and other healthcare support for rural elderly groups to help them prevent depression and manage their health.

Fifth, local governments should actively implement the Opinions on Strengthening the Work of the Elderly in the New Era put forward by the Central Committee of the Communist Party of China and the State Council, strengthen the construction of rural elderly service institutions and facilities in conjunction with the implementation of the strategy of rural revitalization, and encourage the development of mutual-help elderly care services based on village-level neighborhood mutual-help points and rural welfare homes. The government should increase the control of the Internet as well as fraudulent gangs to prevent the elderly from being deceived and provide economic support, such as social welfare, pensions, and gratuities, to reduce the financial pressure on the elderly and protect their basic needs. The "silver-hair" economy should be actively cultivated and the development of the elderly industry should be supported.

Disclosure statement

The authors declare no conflict of interest.

References

[1] National Bureau of Statistics of China, 2021, Seventh National Population Census Bulletin (No.5) — Age Composition of the Population. China Statistics, 2021(05): 10–11.

[2] Wu M, 2023, Analysis of Regional Differences in the Impact of Social Support on the Health of the Elderly in the Context of Healthy Aging, thesis, Jiangxi University of Chinese Medicine.

[3] Li J, 2001, The Relationship between Self-assessed Health and Objective Health. Journal of Jinan University (Natural Science and Medicine), 2001(01): 140–142.

[4] Zhang YY, 2018, The Mediating Role of Social Support in the Influence of Socioeconomic Status on Health in Old Age, thesis, East China University of Science and Technology.

[5] Wang K, Fu JN, Zhai BY, et al., 2024, Relationship between Different Types of Social Support and Mental Health of Older Adults. Chinese Mental Health Journal, 38(06): 510–512.

[6] Charlton AR, Lamar M, Zhang A, et al., 2013, White-Matter Tract Integrity in Late-life Depression: Associations with Severity and Cognition. Psychological Medicine, 44(7): 1427–1437.

[7] Jason S, 2005, When Mental Health Becomes Health: Age and the Shifting Meaning of Self-evaluations of General Health. The Milbank Quarterly, 83(3): 397–423.

[8] Schnittker J, 2005, Cognitive Abilities and Self-rated Health: Is there a Relationship? Is it Growing? Does it explain Disparities? Social Science Research, 34(4): 821–842.

[9] Bailis SD, Segall A, Chipperfield GJ, 2003, Two Views of Self-rated General Health Status. Social Science & Medicine, 56(2): 203–217.

[10] Yang XJ, Wang FL, Zhang XL, et al., 2018, Impact of Family Caring and Social Support on Health Promotion Behaviors of Older Adults. China Journal of Public Health, 34(09): 1266–1269.

[11] Luan W, Zhu Z, Zhu DP, et al., 2020, A Study on the Correlation between Health Promotion Lifestyle and Social Support and Self-efficacy of Elderly People in Urban and Rural Combined Communities. Journal of Shanghai Jiao Tong University (Medical Edition), 40(01): 107–111.

[12] Morgan A, Zimmerman M, 1990, Easing the Transition to Nursing Homes: Identifying the Needs of Spousal Caregivers at the Time of Institutionalization. Clinical Gerontologist, Special Issue: Mental Health in the Nursing Home, 9(3–4): 1–17.

[13] Lin N, Ye XL, Ensel WM, 1999, Social Support and Depressed Mood: A Structural Analysis. Journal of Health and Social Behavior, 40(4): 344–359.

[14] Zhao RS, Wen MR, 2013, Theoretical and Practical Basis of Social Support for Disadvantaged Groups. Journal of Central South University of Forestry & Technology(Social Sciences), 7(03): 39–43.

[15] Hou JM, Zhang PD, Zhou WJ, 2021, The Impact of Intergenerational Support on the Mental Health Status of China's Elderly Population. Population Journal, 43(05): 88–98.

[16] Li XR, Zhang XM, Ren Z, et al., 2021, Self-assessed Health Status and its Influencing Factors among the Mobile Elderly Population in Western China. Medicine and Society, 34(04): 1–5.

[17] Yu YS, Ma L, Lei J, et al., 2019, Correlation between Community Support and Self-assessed Health Impact in Older Adults. Chinese Journal of Gerontology, 39(01): 210–212.

[18] Xie SF, Xi SS, Jin R, et al., 2007, A Survey on the Health Status of Elderly People Living Alone in the Community. Nursing Journal of Chinese People's Liberation Army, 2007(18): 31–32 + 43.

[19] Ye FF, Ning MX, 2013, An Analysis of the Impact of Living Arrangement Patterns on the Mental Health of Rural Elderly People-taking Fujian Province as an Example. Journal of Fujian Provincial Committee Party School of CPC, 2013(06): 1–6.

[20] Tao YC, Shen Y, 2014, Impact of Social Support on Physical and Mental Health of Rural Elderly. Population and Economy, 2014(03): 3–14.

[21] Wu WD, Ren XH, Li NX, 2016, Analysis of Factors Affecting Health Self-assessment of the Elderly in High-tech District of Chengdu City. Modern Preventive Medicine, 43(10): 1801–1804.

[22] Tao HW, Zhang X, Wang Z, 2018, Depression Status and Influencing Factors of Rural Older Adults in the East, Middle and West Regions of China. Chinese Journal of Disease Control & Prevention, 22(07): 696–699.

[23] Jiang MM, Tan L, Fang YM, et al., 2021, Correlation between Sleep Quality, Self-perceived Health Level, and Depression among Community-dwelling Older Adults in Guangzhou. Chinese Journal of Gerontology, 41(18): 4095–4098.

[24] Yu HN, 2022, Research on the Influencing Factors of Self-assessed Health of Chinese Elderly People, thesis, Jilin University.

[25] Liu HY, Luo F, Zhang Y, et al., 2013, Analysis of Mediating Effects when the Dependent Variable is a Hierarchical Variable. Acta Psychologica Sinica, 45(12): 1431–1442.

[26] Liu H, Chao JX, Yang YC, et al., 2009, Analysis and Comparison of Factors Affecting Self-assessed Health of the Elderly. Chinese General Practice, 12(13): 1161–1163 + 1167.

[27] Yang Y, Li JX, 2017, Analysis of Self-assessed Health Influencing Factors of the Elderly in China — Taking the Data of the China Health and Aging Tracking Survey (CHARLS) as an Example. Scientific Research on Aging, 5(11): 23–36.

[28] Shields M, Shooshtari S, 2014, Determinants of Self-perceived Health. Health Reports, 13(1): 35–52.

[29] Segerstrom SC, 2014, Affect and Self-Rated Health: a Dynamic Approach with Older Adults. Health Psychology, 33(7): 720–728.

[30] Han DL, Qin ZY, Xu MT, et al., 2019, The Relationship between Solitary Living Status and Depression and Anxiety among Retired Workers and the Mediating Role of Social Participation Quality. Journal of Jilin University (Medical Edition), 45(04): 944–949.

[31] Kohler U, Karlson BK, Holm A, 2011, Comparing Coefficients of Nested Nonlinear Probability Models. The Stata Journal, 11(3): 420–438.