The Impact of Pension Insurance on The Mental Health of Elderly Populations--A Comparative Study of Urban and Rural Areas

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Abstract. With the rapid development of China's economy and social changes, mental health has become an important public health problem and a prominent social problem. This paper focuses on the influencing factors of pension insurance on the mental health of the elderly. Using the data of CHARLS 2020, a multiple regression model with interactive effects is constructed, and a conclusion is drawn that the positive impact of pension insurance on the mental health of the elderly is more obvious in rural areas, and this impact may be achieved through improving diet and socialization.

Keywords: endowment insurance; psychological health.

1. Introduction

According to international standards, when the proportion of people over 60 years of age in a country exceeds 10 per cent, or when the proportion of people over 65 years of age exceeds 7 per cent, it means that the country has entered an ageing society. According to this standard, China officially entered an aging society in 2000. However, at the same time, the life expectancy of China's elderly population has also been increasing. According to the China Statistical Yearbook 2021, the average life expectancy of China's population in 2020 will be 75.37 years for males and 80.88 years for females, which is an increase of about 3 years compared with 2010, but the health condition is not optimistic. Therefore, the health condition of the middle-aged and elderly in China has become one of the issues that the State and society have been paying close attention to in recent years. At the same time, China's pension insurance participation rate is also increasing, the number of people participating in basic pension insurance for urban and rural residents in 2021 will be 547.97 million people, an increase of 5.54 million people compared with 2020 [Source: National Economic and Social Development Statistical Bulletin of the People's Republic of China in 2021], with a large population base, which indicates that there is a certain necessity of exploring the impact of urban and rural pension insurance on the health of the residents.

At present, with China's rapid economic development and social changes, the prevalence of mental illnesses among residents has been rising. Mental health problems have become important public health issues and prominent social problems.Phillips et al. (2009) pointed out that the prevalence of mental illnesses among the Chinese population had reached 17.5 per cent during the period 2001-2005, and depression, as the main type of mental illness, has been ranked among the top three sources of disease burden in China (Kraemer et al.,2014). Therefore, studying the influencing factors and interventions of mental health at this stage is of great practical significance to improve the health of Chinese residents.

This study examines the effects of pension insurance on the mental health status of the elderly population based on differences between urban and rural areas. It does this by using CHARLS2020 data and the multiple regression model in Stata to confirm that pension insurance has a positive effect on the mental health of the elderly population, which is more pronounced in rural areas due to access to better diets and socialization.

2. Review of the Literature

Thus far, research has examined how middle-aged and older adults' health is impacted by having pension insurance. According to Bai Jin et al. (2023), pension insurance for urban and rural residents has a positive impact on the mental health of both contributors and pensioners under the effects of "psychological insurance" and "economic insurance," with a stronger effect on reducing depression in the recipients. Furthermore, Zhou Qin (2018) et al. discovered that receiving NPS pensions considerably enhanced the mental health of senior citizens living in rural areas, particularly those who were women and/or had lower socioeconomic level. Xie Chalk (2015), however, came to the conclusion that the New Rural Insurance had no bearing on the mental health depression index.

Research has demonstrated that the primary ways in which urban-rural basic pension insurance impacts middle-aged and older adults' health are through their income, health-related decision-making, labor, and child support. Through increased food expenditures, child transfers, and labor supply, urban-rural pension insurance improves the mental health of rural middle-aged and older adults while simultaneously increasing the likelihood that their children will live away from home and decreasing the amount of care they receive when visiting. This was discovered through a mechanistic analysis.Using information from the China Learning Health Tracking Surveys for the Elderly (CLHLS) conducted in 2008 and 2011, Cheng et al. discovered that by enhancing relative economic status, boosting dietary intake, and facilitating prompt access to healthcare, the NPS could lessen the likelihood of depression in older adults living in rural areas.

Nonetheless, there is now little hope for the mental health of Chinese middle-aged and older adults. Qin et al. (2016) discovered that 379 percent of Chinese people experienced depressive symptoms based on data from the CFPS 2012. Only 8% of those with mental illness seeking professional care, and only 5% obtaining professional psychotherapy, demonstrate the low level of public knowledge regarding mental health (Phillips et al., 2009).According to Zhang et al. (2010), mental illness is a significant risk factor for suicide in the Chinese population, with over half of those who consider suicide having mental health issues. Studying how pension insurance affects the mental health of the senior population is therefore essential.

3. Research hypothesis

At present, the trend of population aging in China is becoming more and more serious, and pension insurance, as an important part of pension security, is of great significance in maintaining social stability and promoting family harmony. The study demonstrates that pensions are utilized to boost the sense of self-realization and provide a certain amount of additional economic income, both of which help middle-aged and older people's mental health. At the same time, pension insurance significantly increases the probability of transferring payments from children, eases to some extent the conflicts arising from the economy in the family, facilitates family harmony and increases the sense of well-being of middle-aged and elderly people.

As a risk management tool, pension insurance can help middle-aged and elderly people to cope with potential risks of old age, such as living costs, diseases, accidents and so on. According to the results of surveys, the receipt of old-age insurance can significantly increase the per capita food expenditure and medical expenditure of rural elderly households to 1.140 times and 1.406 times respectively. Thus, changes in the health of middle-aged and elderly people should be affected by a certain amount of old-age insurance. Based on this, we propose the following hypotheses:

Hypothesis 1: The positive effect of old-age insurance on mental health of the elderly is more significant in the countryside

After reaching the legal age, the insured will receive a certain amount of pension per month, and older people in rural areas usually face higher financial pressure because they may not have a stable source of pension or retirement. Pension insurance can have a positive impact on mental health by providing rural older people with greater financial security and reducing their financial worries. At the same time, older people in rural areas may be exposed to higher health risks, and an increase in

pensions can increase the likelihood that older people will maintain their physical health, making them more likely to undertake health checks and preventative measures, which can have a positive impact on mental health

Hypothesis 2: The positive effect of pension insurance on the mental health of older people is significant in the countryside due to access to better diet, recreation and socialisation.

Pension can be used for better living, diet, socialising as well as recreation. Due to retirement from work and other reasons, middle-aged and older people will have fewer social and recreational activities, which may cause some mental health problems for middle-aged and older people. Pension income can support them to participate in more activities, and financial improvement will also increase their sense of well-being and acquisition, so as to achieve the effect of improving the mental health of the middle-aged and the elderly.

4. Data sources and variable definitions

4.1. Data and Variables

The data used in this paper comes from the China Health and Aging Tracking Survey (CHARLS).The CHARLS survey was conducted in 2011, covering 17,000 people in about 10,000 households in 150 county-level units and 450 village-level units, and is tracked every two to three years after the initial survey. It is hosted by the National Development Research Institute of Peking University and implemented by the China Social Science Survey Centre, and collects high-quality microdata on households and individuals of middle-aged and elderly people aged 45 and above in China, which is used to analyse the problem of population ageing in China, and to promote interdisciplinary research on the issue of ageing.CHARLS has the characteristics of covering a wide area and a large sample size, and is capable of reflecting the changes in the respondents' situation, which is representative of the general population of China, and providing a good basis for research on the health of middle-aged and elderly. CHARLS has a wide coverage area and a large sample size, which can reflect the changes of respondents with a general representation of Chinese residents and provide informative data for studying the health of the middle-aged and the elderly. This paper uses the CHARLS 2020 survey data for the study.

According to the research needs of this paper, the population data on registration of complete pension insurance status, mental health status and hukou status were retained. In order to study the urban-rural differences in the impact of pension insurance on the mental health status of the elderly group, this paper separated the urban hukou from the rural hukou population, and further screened the samples, and finally used a sample of 5,660 people, of whom 4,127 (72.9 per cent) were urban hukou and 4,127 (72.9 per cent) were rural hukou.) and 1,533 people (27.1 per cent) from rural households.

The independent variables in this paper are the amount of pension insurance and household status, in which the unit of the amount of pension insurance is set as "hundred yuan/year". For the hukou status, urban hukou is assigned a value of 1 and rural hukou is assigned a value of 0. This variable is derived from the question "What is your current hukou status?" in the CHARLS 2020 questionnaire. . Of the 5660 elderly respondents, 72.9% were urban and 27.1% were rural, meaning that most of the elderly surveyed were urban.

The dependent variable in this paper is the mental health of the elderly, and the 10 questions in the depression scale, such as "I am troubled by some small things" and "I find it difficult to concentrate when I am doing something", are processed and assigned a value of 0-30, where the larger the value is, the better the mental health is.

In this paper, we set the mediating variables as diet, recreation and socialisation to examine whether pension insurance further affects the mental health performance of the middle-aged and elderly through influencing their diet, recreation and socialisation.CHARLS 2020 questionnaire asks the middle-aged and elderly "how much money have been spent on food in the last week" and "how many people in the family have spent on food". The CHARLS 2020 questionnaire asked older adults

"how much money they spent on food in the last week" and "how many people eat at home", and the survey results were processed to obtain the "diet" variable, with the unit set to "100 yuan/week". "Expenditure on culture and entertainment in the past month", after processing the survey results, the variable of "entertainment" was obtained, and the unit was set as "100 yuan/month"; middle-aged and elderly people were asked Ask the middle-aged and the elderly "how often they would engage in entertainment and other activities in the past month", after processing the results of the survey, we get the variable "socialising", with the value of 0-24, in which the larger the value, the more social activities they engage in.

Table 1 Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Mental health	5,660	21.246	6.443	0	30
Registered permanent residence	5,660	0.271	0.444	0	1
Annuity	5,660	118.474	175.547	0.6	1440
Diet	5,660	1.159	1.348	0.03	26
Recreation	5,660	0.106	0.524	0	10
Social situation	5,660	1.420	1.963	0	15
Age	5,660	66.173	6.746	50	95
Gender	5,660	0.488	0.500	0	1
Marital status	5,660	0.700	1.467	0	5
Working condition	5,660	110.209	132.377	0	366
Physical health	5,660	1.571	3.601	0	35

Individual characteristic variables among the control variables in this paper include age, gender, marital status, work, and physical health, taking into account, to the extent possible, variables that jointly affect participation choices and respondents' health. As they age, middle-aged and older adults may face more health problems and declining physical functioning, which may put pressure on their mental health. At the same time, social expectations associated with gender may affect the mental health of middle-aged and older adults. For example, women may be more responsible for taking care of their families and loved ones, which may put additional pressure on them; while men may be less likely to seek help, which may lead to neglect of mental health problems. And in terms of marital status, married middle-aged and elderly people may have more social and emotional support, which helps to maintain good mental health. On the contrary, unmarried or widowed middle-aged and elderly people may feel lonely and isolated, which may have a negative impact on their mental health. In addition to this, leaving the workforce may bring about a loss of identity and role for the middle-aged and elderly, which may have an impact on their mental health. At the same time for middle-aged and older people who continue to work, work may provide a way to stay active and socially engaged. Finally, ill health or chronic illness may lead to emotional problems and reduced quality of life. These factors were therefore included as control variables to better explore the impact of rural-urban differences in old-age insurance on the mental health status of the older population.

4.2. Model setting

This study was analysed using the multiple regression model OLS in stata. The dependent variable in this paper is the mental health of middle-aged and elderly people, and the assigned value range is 0-30. the basic measurement model is as follows:

Mental health= $\beta 0 + \beta 1*Ann + \beta 2*Reg + \beta 3*Int + \beta + \varepsilon i$

where $\beta 0$ denotes a constant term, Ann denotes the annuity, Reg denotes the registered permanent residence, Int denotes the interaction term of annuity and registered permanent residence, β denotes the set of control variables: age, gender, marital status, work and physical health, and εi denotes a random error term.

5. Empirical analyses

5.1. The positive effect of pension insurance on the mental health of the elderly group is more significant in villages.

Multiple regression analyses were conducted with mental health as the dependent variable and hukou and pension insurance amount as the independent variables, and the results are shown in Table 2.

Table 2 Baseline model regression results

	No presence control variable	Presence control variable
VARIABLES	Mental health	Mental health
Registered permanent residence	1.331***	1.514***
	(0.331)	(0.315)
Annuity	0.0110***	0.00802***
	(0.00124)	(0.00116)
hy	-0.00544***	-0.00479***
	(0.00149)	(0.00140)
Age		-0.0107
		(0.0125)
Gender		1.801***
		(0.163)
Marital status		-0.304***
		(0.0554)
Working condition		-0.000891
		(0.000633)
Physical health		-0.549***
		(0.0223)
Constant	20.06***	21.31***
	(0.110)	(0.832)
Observations	5,660	5,660
R-squared	0.055	0.180

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Based on the data results, it can be concluded that both hukou status and pension have significant and positive effects on the mental health of middle-aged and elderly people. This may be due to the fact that hukou status affects the social support network of the middle-aged and the elderly, while rural areas usually have a closer social network and community cohesion, with more frequent contact between neighbours and friends and relatives, and this social support plays a more positive role in the psychological well-being of the middle-aged and elderly who do not have a wide range of social contacts.

5.2. The reason for the significant positive effect is access to better food, recreation and socialisation.

The independent variable household type was replaced with dietary, recreational and social situations respectively and regression analyses were carried out separately and the results are shown in Table 3.

Table 3 Mechanism analysis regression results

	Diet	Recreation	Social situation
VARIABLES	Mental health	Mental health	Mental health
Annuity	0.00699***	0.00654***	0.00677***
	(0.000618)	(0.000480)	(0.000598)
Diet	0.214***		
	(0.0806)		
yyi	-0.000554**		
	(0.000244)		
Recreation		0.205	
		(0.202)	
yyu		-0.00125*	
		(0.000642)	
Social situation			0.227***
			(0.0526)
ys			-0.000399**
			(0.000201)
Age	-0.0177	-0.0196	-0.0174
	(0.0124)	(0.0124)	(0.0124)
Gender	1.748***	1.739***	1.766***
	(0.162)	(0.162)	(0.162)
Marital status	-0.317***	-0.309***	-0.321***
	(0.0555)	(0.0554)	(0.0554)
Working condition	-0.00110*	-0.00114*	-0.000972
	(0.000629)	(0.000630)	(0.000630)
Physical health	-0.547***	-0.550***	-0.541***
	(0.0224)	(0.0224)	(0.0224)
Constant	21.80***	22.13***	21.68***
	(0.825)	(0.815)	(0.821)
Observations	5,660	5,660	5,660
R-squared	0.178	0.178	0.180

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Based on the results, it can be concluded that both diet and socialising have a significant positive effect on the mental health of middle-aged and elderly people, while recreation does not have a significant effect.

Diet has a significant positive effect on the mental health of middle-aged and elderly people, which may be due to the fact that the physical functions of middle-aged and elderly people gradually decline with age, and their need for nutrients increases accordingly. By improving diet, we can ensure that they get sufficient nutrients, while some components of diet have positive effects on maintaining and improving cognitive function and mediating mood. In addition, good dietary habits can provide physical and psychological satisfaction, helping middle-aged and elderly people to build a positive self-image and enhance their sense of well-being.

Recreation does not have a significant effect on the mental health of middle-aged and elderly people, i.e. it is not possible to confirm whether it has an effect or not. The reason for this may be that recreational activities are a more personal impact, and different people's participation in recreation

has different effects on mental health. Also, if there is a lack of social and emotional support, it may not have a positive impact on mental health.

Socialising has a significant positive impact on the mental health of middle-aged and elderly people, which may be due to the fact that social activities can help middle-aged and elderly people to establish and maintain social connections and reduce the sense of loneliness and isolation. Communicating and interacting with others can satisfy their social needs, provide emotional support, increase self-identity and sense of value, and effectively improve psychological health.

Regression results can conclude that the positive effect of pension insurance on the mental health of the elderly group is more significant in the countryside, while it improves the mental health of middle-aged and elderly people by influencing their diet and socialisation. Hypothesis 1 is valid and hypothesis 2 is partially valid.

6. Conclusion and Discussion

Using data from CHARLS 2020, this paper constructs a multivariate regression model with interaction effects to analyse the urban-rural gap in the impact of pension insurance on the mental health status of older people and concludes that the positive effect of pension insurance on the mental health of older people is more pronounced in the countryside, and that this pronounced effect is likely to be achieved through improved diet and socialisation.

In conclusion, the improvement of the mental health of the elderly and the balance between urban and rural areas not only depend on the insurance coverage and the perfection of receiving the insurance, but it is more important to follow the current economic situation and further improve the financial situation of the elderly so that they can improve their living conditions. Based on this conclusion, we make the following recommendations:

1. Establish a sound mental health service system: In cities, a sound mental health service system should be established, including community mental health service centres, psychological departments in hospitals, and professional psychological counselling and treatment services.

2. Provide diversified recreational and social activities: In the context of a relatively rich material life, middle-aged and elderly people in cities should pay more attention to spiritual and cultural life. Various interest groups, fitness activities and community gatherings should be organised to help them establish new social circles and reduce their sense of loneliness.

3. Strengthening family and social support: Encourage family members to communicate more with the elderly and care about their life and mental state. Meanwhile, through social organisations and volunteer services, provide emotional support and companionship to the elderly.

4. Encourage the elderly to participate in community affairs: allow the elderly to take part in community governance and activities, so as to enhance their social participation and sense of self-worth.

References

[1] Bai Jin, Li Hua, can "Providing for the elderly" promote the physical and mental health of the elderly in rural areas? - Based on the perspective of social endowment insurance, Social Security Research, No. 4, 2023

[2] Wang Sihan, Qu Xianguo, Huang Shirui, Study on the difference between urban and rural health aging and its influencing Factors, Modern Preventive Medicine, 2022, Vol. 49, NO. 21

[3] Wu Yufeng, Hu Jingbo, Nie Jianliang, Study on the influence mechanism of Basic Endowment Insurance for Urban and Rural Residents on the Health Performance of Rural elderly People, Social Security Research, No.6, 2021

[4] Zhou Qin, Jiang Wege, Guo Xin, The Impact of Social Insurance on the Mental Health of Rural Residents: An Empirical Study based on CHALRS Data, Economic Issues in China, September 2018, No. 5 (Total No. 310)

[5] Chen Mei, Zhang Yongzhi, social endowment insurance for the elderly mental health research [A], the influence of the Modern Preventive Medicine in 2021, 48 (9) Modern Preventive Medicine, 2021, Vol. 48, NO. 9

[6] Zhang Wenjuan, Fu Ming. The health status and its change trend of the elderly population in China from 2010 to 2020: an analysis based on census and sample survey data [C]. Chinese population science.

[7] Liu Zi-lan, ZHENG Xi-wen, Zhou Cheng. The influence of pension insurance on labor supply and retirement decision. Economic Research, No.6,2019.

[8] Zhang Yuyang, Yuan Wei. Can pensions reduce health risks for rural elderly? -- On the synergy of community elderly care Services [A]. Research in Finance and Economics, Vol. 48, No. 11,1001−9952 (2022) 11−0049−15

[9] Zhao Ming, Wang Xiaojun, Li Ziwen. The effect of pension level on labor participation of younger elderly people. Population Studies, Volume 46, number 4, July 2022.

[10] Zhang Yuyang, Chen Dong. Will the new rural insurance policy alleviate the inequality of health opportunities for the elderly in urban and rural areas? Evidence from CHARLS data. Agricultural Technical Economics, No. 8,2023.

[11] Wang Kun, Guan Jiantao, Xia Jun. Lack of incentive policy and fund-raising guarantee mechanism -- diminishing dividend of rural pension insurance. Economic Information Daily. 27 May 2013, no. 005.

[12] ESTHER DUFLO.Child Health and Household Resources in South Africa:Evidence from the Old Age Pension Program.AEA PAPERS AND PROCEEDINGS.MAY 2000.

[13] Gilbert Brenes-Camacho.Favourable changes in economic well-being and self-rated health among the elderly.Social Science & Medicine. 10.1016/j.socscimed.2011.02.027

[14] NEERAJ KAUSHAL. How Public Pension affects Elderly Labor Supply and Well-being: Evidence from India.ScienceDirect . http://dx.doi.org/10.1016/j.worlddev.2013.10.029

[15] Emma Aguila, Mariana Lo´pez-Ortega, Luis Miguel Gutie´rrez Robledo.Non-contributory pension programs and frailty of older adults: Evidence from Mexico. PLOS ONE.November 2, 2018. https://doi.org/10.1371/journal.pone.0206792

[16] Philipp Hessel, Mauricio Avendano, Carlos Rodríguez-Castelán, Tobias Pfutze. Social Pension Income Associated with Small Improvements in Self-Reported Health of Poor Older Men in Colombia. Global Health Policy.: 10.1377/hlthaff.2017.1284 HEALTH AFFAIRS 37, NO. 3 (2018): 456–463©2018 Project HOPE—The People-to-People Health Foundation, Inc.

[17] Carlos Riumallo-Herl, Emma Aguila. The effect of old-age pensions on health care utilization patterns and insurance uptake in Mexico. BMJ Global Health.10.1136/bmjgh-2019-001771