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ORIGINAL RESEARCH

Empirical Analysis of the Impact of Employment on the Elderly Mental Health in China

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Background: As China undergoes rapid modernization concurrent with accelerated aging, older adults are exposed to multifaceted cultural dynamics. Consequently, employment may carry multidimensional significance as a status passage. This study aimed to investigate the impact of employment on the mental health of elderly persons in China, leveraging middle-range theory to understand the nuanced social significance of employment as a status passage.

Methods: This paper selected older adults aged 60 to 75 years from three waves (2015, 2018, and 2020) of the China Health and Retirement Longitudinal Study (CHARLS) survey data as the analytical cohort. The analytical approach involved fixed effects models for the core empirical analysis, propensity score matching (PSM) to address selection bias, and instrumental variable techniques to tackle reverse causality.

Results: The study demonstrates that employment retains positive properties of status passage for Chinese older adults in multicultural contexts, with empirical evidence showing significant reduction in depressive symptoms ($\beta = -0.3945$, $p < 0.01$) and consequent improvement in mental health outcomes. However, these effects exhibit substantial heterogeneity across gender, employment types, and rural–urban residency. Notably, male elderly benefitted more from employment due to cultural and structural factors. Properties of employment status passage vary in rural areas of China, where the effect of self-employment is not significant, however the effect of Wage-employment is significant. Retirees may re-enter a social structure through status passages of employment or social participation. The study indicates that employment does not crowd out the elderly social participation but rather promotes their social participation, which is only reflected in elderly women and elderly persons in cities. This underscores the multifaceted mental health benefits of employment beyond mere economic contribution.

Conclusion: It is suggested to implement a flexible delayed retirement policy based on individual wishes, which would result in greater social welfare. For rural areas, it is imperative to address deficiencies in public cultural services while tapping into local cultural resources, thereby enhancing older residents' mental health and well-being.

Keywords: employment, elderly persons, mental health, middle-range theory, status passage

Introduction

In recent years, a new wave of retirement system reforms has swept the world. Numerous countries, including France, South Korea, and China, have initiated delayed retirement policies. The discussion of delayed retirement focuses on the economic perspective, such as the impact on the youth employment and the elderly human capital, which cannot fully reflect effects of policies on well-being. Mental health is closely related to the well-being of older adults. The poor mental health may lead to cognitive decline,[1] disability, and risk of death,[2] as well as an increased risk of suicide.[3] Older adults are vulnerable to a variety of mental problems, with a global depression incidence of 28.4%.[4] As an important method of active aging, employment is indispensable for preventing elderly mental disorders and improving their well-being.[5] According to the seventh population census of China,[6] there are 264 million elderly persons over 60 in China, of which about 20 million (7.33%) rely on employment as their main source of income. More attention should be paid to the mental health of working elderly persons in the context of healthy aging and the flexible retirement policy.

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So, researchers and policymakers are increasingly interested in the effect of the elderly employment on their mental health. However, the effect is still controversial. Some scholars argue that employment is beneficial to the elderly mental health.[7] Retirement entails a loss of the role played by elderly persons for a long time. It can easily cause psychological problems such as depression.[8] Older adults can maintain their original lifestyles by working to keep or improve their satisfaction and happiness.[7] Retirees tend to suffer higher levels of psychological distress than their peers who are still working.[9,10] Employment is also an important form of social participation, providing a platform for communication and, in turn, contribute to keeping the elderly mental health.[11,12] Therefore, employment can reduce their depression levels and improve their mental health.[13,14] Others argue that older adults tend to enjoy life in the twilight years, and employment negatively affects their mental health. Employment encroaches on their leisure time and may harm their mental health.[15,16] Retirees no longer suffer from work-related stress, which contributes to the elderly physical and mental well-being.[17] Mein et al (2003) conducted a longitudinal comparative study on civil servants in London and found that retirement did not adversely affect the elderly health, but mental health of those who continued to work degenerated.[18] Calvo et al (2013) used panel data from the Health and Retirement Study in the United States to study people aged 50–75 years and found that the elderly re-employment was not associated with their health benefits.[19]

Present literature reflects a complex relationship between the employment and mental health. Empirical differences are closely related to biological, psychological, and social factors, such as different sociocultural backgrounds and developmental stages. China has a unique East Asian culture, where enjoying family life in old age is regarded as a symbol of happiness. In 1982, China comprehensively implemented the "one-child" policy, though farmers, residents of border regions, and ethnic minorities were conditionally permitted to have two children. Owing to the One-Child Policy, China has experienced a compressed aging process. According to data from China's National Bureau of Statistics, China's population aged 60 and above accounted for 10.3% in 1999, marking its entry into a mild aging.[20] By 2023, the proportion of elderly people in China surpassed 20% for the first time, transitioning the country into a moderate aging. It took only 23 years for China to transition from mild to moderate aging. During this period, China underwent rapid modernization. Great social changes have challenged the elderly social role, which is set by traditional family culture. China is witnessing the largest rural-to-urban shift of population in history, which has destroyed the traditional family culture. At the same time, employment of older adults is advocated as an important way of productive aging, which contributes to cashing in the second round of demographic dividend. Therefore, the impact of employment on the elderly mental health in China has become uncertain, given their multicultural background. Based on the CLASS cross-sectional data of 2014, Zhu et al (2024) studied people aged 60–69 years, which showed that employment was positively correlated with the mental health of young-elderly and that employment was beneficial to the mental health of young-elderly.[21] Cheng et al (2023) used the 2018 China Health and Retirement Longitudinal Study (CHARLS) cross-sectional data to study people over 60 years old and found that employment was an effective way to improve the elderly mental health, and its positive effect is mainly reflected in rural groups and those with low education.[22] Jia et al (2021) used data from the 2016 China Labor Force Dynamic Survey to study people aged 50–80 years and found that non-agricultural employment and entrepreneurship significantly improved their mental health.[23] Based on the CFPS panel data, Xie et al (2021) drew the opposite conclusion on people aged 45–80 years, that is, employment is not beneficial to the mental health of people over 60 years.[24]

The difference in conclusions may stem from different databases, research methods, and research subjects. Most studies used cross-sectional data, which failed to solve the problem of missing variables of given variables. Mental health impacts employment choice, and the problem of reverse causality between them remains to be solved.[25,26] The sample included people aged 60 and over, 60–69 years, 50–80 years, and 45–80 years. We utilized panel data from the CHARLS and applied a fixed-effects model to address reverse causality and missing variables of given variables. This study aimed to investigate the impact of employment on the mental health of elderly persons in China, leveraging middle-range theory to understand the nuanced social significance of employment as a status passage, whose properties vary across gender, types of employment, and urban-rural populations. Retirees can re-enter a social structure through status passages of social participation or employment, both of which provide meaning to their lives, and influence their mental well-being.[27] So, we also explore whether employment has a crowding-out effect on social participation factors. We believe that our study makes a significant contribution to the literature because it stands out for applying middle-range theory to the

employment-mental health nexus, a novel approach in gerontological research. By conceptualizing employment as a status passage, it sheds light on how cultural, gendered, and locational dynamics shape the mental health outcomes of elderly employment. The focus on China's unique socio-cultural and demographic context enriches global understanding, particularly in rapidly aging societies. This study innovatively introduces middle-range theory, whose core concept of identity channel properties is profoundly shaped by cultural contexts. As such, the analytical framework constructed through this theory to examine how employment affects mental health among older adults provides critical insights into the psychosocial impacts of employment in the context of China's cultural shift from monolithic to pluralistic paradigms.

Theoretical Analysis and Research Hypothesis

Research on the effects of employment on the mental health dates back to the analysis of unemployment in the 1930s.[28–30] Since then, several models and theories have been developed to explain mental health effects of employment. Historically, research has been derived from three theoretical traditions.[31] i) The biomedical tradition, which focuses on physiological mechanisms to explain the correlation between major physical environments and pathological phenomena. ii) The sociological tradition, which focuses on the physical environment that provides conditions and constraints for human development and the environment in which health and disease are formed. iii) The psychological tradition, which focuses on individuals and their actions. These traditions combine to form complex theoretical models. They include: Tiffany's rehabilitation approach,[32] unemployment stages model,[33] Jahoda functional model,[34] Warr vitamin model,[35] Fryer's agency critique theory,[36,37] O'Brien's personal control theory,[38] Ezzy D's middle-range theory,[39] stress model,[40] economic deprivation model,[41] social support model.[42]

These models were initially used to explain the effect of employment on the mental health of young and middle-aged workers, and unemployment was used as a reference for the effect of employment. To apply these models to older adults, it is necessary to consider the following three constraints or application conditions: i) It is normal for older adults not to work. They will not be stigmatized because they do not work. Elderly persons who do not work are not regarded as "unemployment". ii) Older adults are protected from economic deprivation. After retirement, they can draw a pension, enjoy cost-effective medical security, avoid financial pressure, and obtain basic conditions for maintaining good health. These benefits are more generous, lasting, and justified than unemployment benefits. iii) There are other ways for older adults to enjoy benefits from employment. According to hidden function theory, besides the explicit economic function, employment has five hidden functions: time structure, social ties, collective goals, social status, and compulsory activities.[34] These functions explain why employment can be psychologically supportive even in a bad work environment, whereas leisure lacks both explicit and implicit functions of work. However, for older adults, social participation has similar hidden functions, which are closely related to the elderly mental health.[43] Social participation can extend an individual's social network and maintain contact with a wider group.[44] Social participation gives people a sense of belonging, social identity, and opportunities to participate in activities.[45] So, it is possible for elderly persons to play alternative roles after retirement, including re-employment, leisure, and social participation. They have to experience resocialization to achieve a new understanding of self-worth, self-esteem, and psychological satisfaction to combat depression caused by retirement.

So, it is necessary to develop a new model to analyze the effects of employment on the elderly mental health in the context of multiple social roles. Ezzy D's[39] middle-range theory considers unemployment as a status passage, which entails an individual moving into a different part of a social structure, or a loss or gain of privileges, influence, power, a changed identity, and self-awareness.[46] Thus, unemployment is not a static status but the beginning of a new life, including career changes, retirement, or withdrawal from the labor market to take on the role of parents. The theory focuses on the interaction between the individual objective social environment and their subjective interpretation of this environment. It divides status passages into integrative passages and divestment passages. Integrative passages usually refer to a transitional period followed by integration into a defined new status entered through a ceremonial process, such as a marriage, which establishes the passages in their new identities. Divestment passages often contain a transitional phase of uncertain duration, and emphasize separation from a status, such as divorce, which is associated with the failure to successfully maintain or continue in a role. Thus, the distinction is one of the extremes on a continuum. Status

passages may vary in the degree of associated ceremony and ritual, whose properties are not objectively defined. So, properties are key to understanding whether status passages are going to have positive or negative consequences on the mental health. Ezzy D (1993)[39] draws on "identity theory"[47] and the "social identity theory"[48] to explain the variable properties and conceptualizes identity as people's awareness of belonging to a certain group or social category. People give the meaning and interpretation to the employment. Social identities can improve individual well-being by providing a basis for them to obtain and benefit from social support.[49] The variable properties of status passages account for the uncertain relationship between the employment and mental health. Some studies have shown significant differences in well-being among unemployed, economically inactive but not retired, and retired individuals.[50]

Thus, properties of employment status passage determine the relation between the employment of older adults in China and mental health. In traditional Oriental family culture, older adults prefer to enjoy life in the twilight years, and re-employment may have a negative impact on their life satisfaction.[51] However, after the founding of the People's Republic of China, the concept of honorable labor has been actively promoted, where old adults are encouraged to lead meaningful lives. Therefore, there is no predominant social value that compels elderly persons to choose either employment or leisure. Properties of elderly employment status passages are influenced by employment types, group characteristics, and regional factors. Most of employed elderly persons in China originate from rural areas. In 2020, the number of employed elderly persons in rural areas accounted for 70.57% of the total number of employed elderly ones. Therefore, properties of their status passages play a crucial role in determining the overall effect of employment. China's large-scale migration from rural areas to cities began in 1992. Consequently, the proportion of rural elderly persons who have experienced the migration remains relatively low. The majority of elderly persons in rural areas still retain the characteristics of traditional farmers, who will continue agricultural activities provided that their health does not impede them to work. Employment serves to maintain their time structure and is also endowed with the important mission of combating their boring life. Rural elderly persons in China have little entertainment to kill time, and restricted access to rural cultural services.[52] Consequently, rural elderly persons who employ may have the better mental health than those who spend their time at home because their land has been expropriated or leased, or they are in poor health.

Properties of employment status passage of older adults in cities vary by gender. They are subject to mandatory retirement policies, where female workers retire at 50, female officials retire at 55, and men retire at 60. Urban women after retirement often need to play the social role of intergenerational caregivers for a long time.[53] Even when their grandchildren grow up, they are still less inclined to work. They have been out of the labor market for a long time, and their efforts to find employment put pressure on them. At the same time, employment does not relieve them of family responsibility. What's more, they have already found a way to combat the stress of intergenerational care and a boring life. After retirement, Chinese women are keen to enjoy themselves through square dancing[54] and travel.[55] However, urban men are not expected to take on the role of intergenerational caregivers, and their enthusiasm for social participation is significantly lower than that of urban women.[56] The "time structure" function of employment holds particular significance for urban men.

Therefore, based on Properties of employment status passage in rural and urban areas and the proportion of rural elderly persons and their jobs in China, we assume that employment has a positive effect on the elderly mental health.

Study Design

Data

This study uses the CHARLS database, which collects samples of individuals over 45 years old and their families. CHARLS covers approximately 20,000 respondents from 150 county-level units in 28 provinces. Prior to 2025, China's mandatory retirement age remains differentiated by gender and occupational status: 50 years for female frontline workers, 55 years for female managerial personnel, and 60 years for male employees, as stipulated by current labor regulations. In light of the poor physical condition of elderly persons over 75 years old,[57] this study selected respondents aged 60 to 75 years old in three rounds of sample data in 2015, 2018, and 2020 as the research objects and deleted the samples with missing indicators. Elderly persons with mental health problems are often characterized by disability or

partial disability, which affect their employment choices. To address this reverse causality problem and account for the fact that disabled and Partially disabled people tend to be unemployed, their samples were deleted.

Variables

Mental health is measured using the CES-D Depression Scale, which was developed by the US National Institute of the Mental Health in 1977 and is widely used in epidemiological investigations. Ten questions in this study CES-D profiles of the communist party of China, contain eight negative statements: "Because I have some small stuff", "when I was in work hard to focus on", "I feel depressed", "I don't think to do anything difficult", "I am afraid", "I can't sleep", "I felt lonely", and "I think I can continue my life" and the two positive statements: "I'm full of hope for the future" and "I am very happy". Each answer to this question is "little or no, not too much, sometimes, or half the time, most of the time". The two positive statements were reverse-coded, and the four answers were assigned scores of 0, 1, 2, and 3. Scores were assigned between 0 and 30 points, with higher scores indicating higher levels of depression and lower levels of the mental health.

The independent variable is employment. The CHARLS questionnaire classifies employment into employment in agriculture employment, non-agriculture employment, agriculture self-employment, and non-agriculture self-employment. If a respondent had participated in any employment, the independent variable was assigned a value of 1, otherwise 0.

Three categories of control variables are selected: The first category contains basic demographic information of elderly persons, including gender, age, marital status, areas, education level, and number of children. The second category contains the health status of the participants, including smoking, drinking, and health status. The third category contains their socioeconomic characteristics, including whether they had medical and pension insurance, social participation, internet, financial support from their children, and personal income. The descriptive statistics are shown in Table 1.

Model

This study used panel data and selected fixed effect (FE) model after conducting a Hausman test ($P = 0.00$). Fixed effects models effectively controlled for individual-specific, time-invariant omitted characteristics that are inherent to older

Table 1 Descriptive Statistics

Variables	Description	Mean	Standard Deviation	Minimum	Maximum
Mental health	Depression level	8.0752	6.1706	0	30
Employment	Employment =1, unemployment =0	0.6430	0.4791	0	1
Gender	Male =1, female =0	0.5123	0.4999	0	1
Age	Age (years)	66.6974	3.7757	60	75
Education	Three categories of education: low =1, medium =2, and high =3	1.2474	0.4562	1	3
Marriage	Married =1, unmarried =0	0.8475	0.3595	0	1
Household registration	Urban =1, rural =0	0.2672	0.4425	0	1
Number of children	Number of living children (persons)	2.8402	1.2518	1	10
Drinking	Drinking =1, not drinking =0	0.3215	0.4671	0	1
Smoking	Smoking =1, not smoking =0	0.2770	0.4476	0	1
Health	Very good =1, good =2, fair =3, bad =4, very bad =5	3.0484	0.9605	1	5
Medical insurance	With medical insurance =1, without =0	0.9748	0.1568	0	1
Pension	With pension =1, without =0	0.8678	0.3387	0	1
Social participation	Degree of social participation	0.5963	0.7698	0	4
Internet	Surfing the internet =1, not =0	0.0989	0.2985	0	1
Financial support from children	Financial support received from children in the past year (Yuan/year)	5394.7768	14,460.1	0	750000
Income	Income in the past year (yuan/year)	8852.6016	41,201.52	0	4,000,000

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adults, such as enduring habits, cultural preferences, and persistent community cultural environments, which have remained constant across observational periods. The benchmark regression model was set up as follows:

$$Y_{it} = \beta_1 work_{it} + \beta_2 X_{it} + a_i + \varepsilon_{it} \quad (1)$$

Equation (1) formulates the mental health impact model for older adults. In Equation (1), Y_{it}, work_{it} and X_{it} represent individual mental health conditions, employment, and control variables, respectively, during period t; a_i denotes individual-specific intercepts, and ε_{it} represents random errors.

In Model 1, only the independent variable was incorporated. The first category of control variables was then added to Model 2, followed by the second and third categories added to Model 3 and 4, respectively.

Results

Regression Analysis

Table 2 presents the empirical results. According to Model 1, employment significantly reduced depression levels of older adults ($\beta = -0.5111$, $p < 1\%$) and had a significant positive effect on the elderly mental health, which improved

Table 2 Regression Results

Variables	Model 1	Model 2	Model 3	Model 4
Employment	−0.5111***	−0.4860***	−0.3851**	−0.3945***
	(0.1515)	(0.1515)	(0.1506)	(0.1504)
Gender		−9.5522**	−9.4072**	−9.1348**
		(3.9382)	(3.7063)	(3.8572)
Age		−0.0122	−0.0107	−0.0146
		(0.0854)	(0.0852)	(0.0853)
Education		−0.7967***	−0.7537***	−0.7529***
		(0.2326)	(0.2350)	(0.2356)
Marriage		−0.9442***	−0.9289***	−0.9467***
		(0.3527)	(0.3501)	(0.3494)
Household registration		−0.1773	−0.1587	−0.1499
		(0.1906)	(0.1899)	(0.1894)
Number of children		−0.1854	−0.1951	−0.1987
		(0.2142)	(0.2107)	(0.2092)
Drinking			−0.5317***	−0.5373***
			(0.1697)	(0.1695)
Smoking			−0.1337	−0.1384
			(0.2548)	(0.2542)
Health			−0.6328***	−0.6320***
			(0.0705)	(0.0705)
Medical insurance				−0.6413**
				(0.3112)
Pension				−0.3051*
				(0.1588)
Social participation				−0.2153***
				(0.0788)
Internet				0.0191
				(0.1810)
Financial support from children				0.0289*
				(0.0169)
Income				0.0301
				(0.0210)

(*Continued*)

Table 2 (Continued).

Variables	Model 1	Model 2	Model 3	Model 4
_cons	7.9559***	16.0243***	17.9584***	18.7880***
	(0.1144)	(5.9930)	(5.9325)	(5.9776)
N	11580	11,580	11,580	11580
Whether individual FE is controlled for	Yes	Yes	Yes	Yes
Whether time FE is controlled for	Yes	Yes	Yes	Yes

Notes: In the table, asterisks indicate levels of statistical significance. ***is significant at the 1% level, **at the 5% level, and *at the 10% level; Financial support from children and income were taken logarithm.

their health. The results of Model 2 were robust to controlling for demographic features ($\beta = -0.4860$, p < 1%). In Model 3, after controlling for the elderly health status, the effect was still significant ($\beta = -0.3851$, p < 5%). In Model 4, the effect remained significant ($\beta = -0.3945$, p < 1%).

Regarding the control variables, the effect of gender was significant, and elderly women had better mental status than elderly men. Education significantly affected the elderly; the higher the level of education, the better the mental health. Marital status had a significant effect, and the elderly persons with spouses had the better mental health than those without spouses. The significant effect of drinking may be explained by the fact that drinking contributes to relieving the mood, which is particularly important for Chinese people who are not good at expressing themselves. Health had a significant effect, that is, physical health is closely linked to the mental health. Both medical insurance and pension benefited the elderly mental health. The former was significant at the 5% level, and the latter was significant at the 10% level. Social participation was beneficial to the elderly mental health, with a significant effect at the 1% level. Financial support from children increased the level of depression in the elderly, which was significant at the 10% level. Age, household registration, number of children, smoking, internet, and income had no significant effect on the mental health.

Robustness Test

Selection Bias

To solve the problem of selection bias in the elderly employment, this study introduced the propensity score matching (PSM) method. The balance test was carried out on the employment treatment and control groups, and the results were shown in Figure 1. After PSM, there was no significant difference (with the majority of deviations within 10%) in the distribution between the two groups.

This article used the radius and kernel match; the results were shown in Table 3. Employment still significantly reduced elderly depression levels, and the coefficients after radius matching ($\beta = -0.4191$, $p < 5\%$) and kernel matching ($\beta = -0.4218$, $p < 5\%$) were slightly higher than those before matching ($\beta = -0.3945$, $p < 1\%$). The results were still robust after selection bias was addressed.

Reverse Causation

There may be a bidirectional causal relationship between employment and the elderly mental health,[58] and the poor mental health of elderly persons reduced the likelihood of their employment. An IV was used to address the problem. The employment proportion of elderly persons in the community is affected by the elderly employment; however, which was not affected by their mental health. Therefore, this study selected the employment proportion of elderly persons in the community as the IV.[59] The variable satisfied the conditions for a valid IV, with a value over 10 in the F-test. The regression results were shown in Table 4. The effect remained negatively significant ($\beta = -0.4272$, $p < 5\%$), and the benchmark regression results were robust.

Heterogeneity Analysis

Different types of employment may have different effects on the elderly mental health. Wage-employment provided a stable working environment and social support for older adults; self-employment had greater flexibility and autonomy

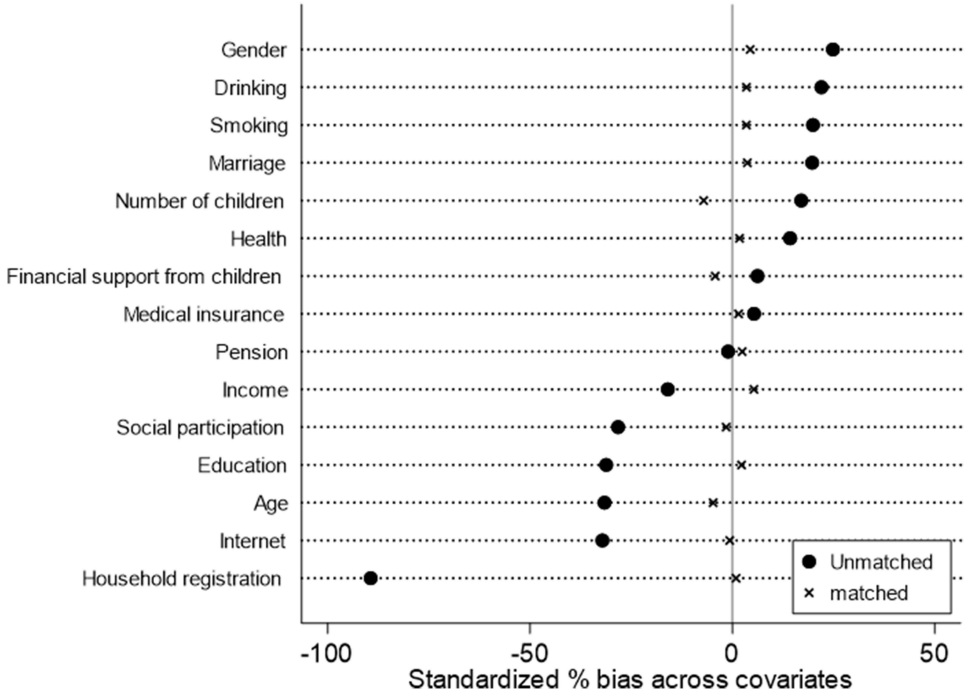

Figure 1 Standardized bias across covariates.

for them, who suffered from high economic pressure and instability. Therefore, we subdivided employment into two types: wage-employment and self-employment,[60] and the results were shown in Table 5. We found that both wage-employment ($\beta = -0.6948$, $p < 1\%$) and self-employment ($\beta = -0.3328$, $p < 5\%$) were significantly negatively correlated with the elderly depression; that is, both wage-employment and self-employment are beneficial to their mental health.

Table 3 PSM Regression

Variables	**(1)**	**(2)**	**(3)**
	Baseline Regression	**Radius of Matching Regression**	**Kernel Matching Regression**
Employment	−0.3945***	−0.4191**	−0.4218**
	(0.1504)	(0.1645)	(0.1646)
Control variables	Control	Control	Control
N	11580	11,155	11155
Whether individual FE is controlled for	Yes	Yes	Yes
Whether time FE is controlled for	Yes	Yes	Yes

Notes: In the table, asterisks indicate levels of statistical significance. ***is significant at the 1% level, **at the 5% level.

Table 4 IV Analysis

Variables	**IV**
Community employment proportion	−0.4272**
	(0.1784)
Control variables	Control
N	11155
Whether individual FE is controlled for	Yes
Whether time FE is controlled for	Yes

Notes: In the table, asterisks indicate levels of statistical significance. ***is significant at the 1% level.

Table 5 Results of Employed and Self-Employed Employment Tests

Variables	
Wage-Employment	−0.6948***
	(0.2147)
Self-employment	−0.3328**
	(0.1547)
Control variables	Control
_cons	18.9230***
	(5.9660)
N	11580
Whether individual FE is controlled for	Yes
Whether time FE is controlled for	Yes

Notes: In the table, asterisks indicate levels of statistical significance. ***is significant at the 1% level, **at the 5% level.

According to the middle-range theory, gender and household registration are important factors that affect the attributes of status passage. Therefore, we conducted a grouped regression analysis by gender and household registration, and the results were shown in Table 6.

Gender grouped regression analysis demonstrated that employment was beneficial to the mental health of both elderly women and men, but its effect was significant only on elderly men. Employment grouped regression analysis found that Wage-employment reduced depression levels of the elderly women and men; the former was significant at the 10% level, and the latter was significant at the 1% level. Self-employment also reduced elderly depression levels, but its effect was significant only on elderly men.

Household registration grouped regression analysis found that employment was beneficial to the elderly mental health in urban and rural areas, but its effect was significant only on elderly persons in rural areas ($\beta = -0.3216$, $p < 10\%$). Wage-employment and self-employment still had no significant effect on elderly persons in urban areas. Self-employment had no significant effect on elderly persons in rural areas, but wage-employed significantly affected them ($\beta = -0.6459$, $p < 5\%$).

Table 6 Grouped Regression Analysis

Variables	(1) Gender				(2) Household Registration			
	Male	Female	Men	Female	Rural	Urban	Rural	Urban
Employment	−0.5529***	−0.2545			−0.3216*	−0.3907		
	(0.2055)	(0.2191)			(0.1875)	(0.3278)		
Wage-employment			−0.7284***	−0.7449*			−0.6459**	−0.7637
			(0.2641)	(0.3919)			(0.2626)	(0.5344)
Self-employment			−0.5072**	−0.1828			−0.2727	−0.2109
			(0.2127)	(0.2238)			(0.1901)	(0.3724)
Control variables	Control	Control	Control	Control	Control	Control	Control	Control
N	5932	5648	5932	5648	8486	3094	8486	3094
Whether individual FE is controlled for	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Whether time FE is controlled for	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: In the table, asterisks indicate levels of statistical significance. ***is significant at the 1% level, **at the 5% level, and* at the 10% level.

Table 7 Results of Interaction Terms

	(1)	(2) Gender		(3) Urban and Rural	
	Full sample	**Male**	**Female**	**Rural**	**Urban**
Employment	−0.3810**	−0.5608***	−0.2356	−0.3154*	−0.3207
	(0.1510)	(0.2062)	(0.2195)	(0.1883)	(0.3341)
Social participation	−0.2290***	−0.2426**	−0.2192*	−0.2550**	−0.1604
	(0.0793)	(0.1054)	(0.1196)	(0.1077)	(0.1313)
Employment × social participation	−0.3120**	0.1346	−0.7628***	−0.1822	−0.5878**
	(0.1348)	(0.1792)	(0.2053)	(0.2226)	(0.2611)
Control variables	Control	Control	Control	Control	Control of
_cons	18.7250***	22.4682***	7.1396	20.1412***	20.5188**
	(5.9570)	(8.2044)	(7.4579)	(7.1441)	(10.1628)
N	11580	5932	5648	8486	3094
Whether individual FE is controlled for	Yes	Yes	Yes	Yes	Yes
Whether time FE is controlled for	Yes	Yes	Yes	Yes	Yes

Notes: In the table, asterisks indicate levels of statistical significance. ***is significant at the 1% level, **at the 5% level, and *at the 10% level; Interaction items are decentralized.

The Relationship Between Two Status Passages

After retirement, older adults may choose multiple status passages to re-enter a social structure, including employment and social participation. Employment is more susceptible to aging and health status than social participation. It is interesting to analyze if employment has a crowding-out effect on social participation. As seen from Table 7, employment not only did not crowd out social participation but also had a spillover effect on social participation ($\beta = -0.3120$, $p < 5\%$). The interaction effect was insignificant on elderly men and significant on elderly women ($\beta = -0.7628$, $p < 1\%$). The interaction effect was insignificant on elderly persons in rural areas and significant on them in urban areas ($\beta = -0.5878$, $p < 5\%$).

Discussion and Conclusion

This study verified the hypothesis that employment significantly reduced the elderly depression levels and was beneficial to their mental health. This finding is consistent with some previous studies.[21–23] Employment not only has an economic function for elderly persons but also helps them combat retirement-induced depression, which is beneficial to the elderly mental health. However, some literatures show a opposite conclusion.[19,24] The inconsistency stems from the different samples and different properties of employment status passage, which are determined by specific culture and social structures. Therefore, we conducted a heterogeneity analysis.

We found that both wage-employment and self-employment had positive effects on the elderly mental health, but the effect of wage-employment was more significant. Older adults, who are wage-employed, usually have a stable work environment and income,[61] which helps them keep a good mental health. Wage-employment is also a lifestyle different from self-employment and leisure, which is of great significance to elderly persons in rural areas. Wage-employment has a significant effect on the mental health of elderly persons in rural areas, whereas no significant effect was observed for self-employment. Based on the research sample, among elderly, self-employment in rural areas predominantly takes the form of agricultural self-employment, which accounts for 85.10% of all self-employment activities. Rural self-employment is regarded as daily household work, which cannot play a role in alleviating the monotony of rural life. Furthermore, self-employment generally does not yield direct income streams, whereas wage-employment can enhance financial earnings, thereby exerting differential impacts on older adults' mental health outcomes through distinct income-mediated pathways. Employment holds greater significance for elderly persons in rural regions compared to their urban counterparts, but the positive property of its status passage is only reflected in the effect of wage-employment. Wage-employment introduces an alternative lifestyle to elderly persons in rural areas, where cultural life appears to be relatively underdeveloped. *Opinions on Accelerating the development of a Modern Public Cultural Service System* is

issued in 2015, which requires that the equalization of basic public cultural services in urban and rural areas should be integrated into the comprehensive plan for national economic and social development, and the elderly cultural needs should be given special attention. At present, the rural public cultural service infrastructure has been significantly improved, but due to a mass exodus from rural areas, rural public cultural services generally lack important carriers (people) of activities, and many older persons live separately from their children, who are partially deprived of the emotional support from their families. The collective life of wage-employment helps them combat boredom and loneliness in the countryside. It can be observed that the employment effect is not significant in cities where cultural activities are rich. Another explanation for different effects is that rural incomes are significantly lower compared to those in urban areas, so employment makes more economic sense for rural people. Employment income alleviates the elderly economic pressures and improves their mental health.[62] Therefore, we find that distinct properties of employment status passage are reflected in older persons in the urban and rural areas.

In East Asian culture, there exists a distinct social division of labor based on gender, so properties of employment status passage may change with gender. Employment has a significant positive impact on the mental health of elderly men, but not of the elderly women. Chinese men are in the culture of "the husband provides for the family and the wife takes care of the family".[63] They play the role of "leader of the family" and assume financial responsibility for the family. Employment makes up for the elderly retirement loss and, more importantly, maintains their influence on society and their family authority.[64] Women play the role of family caregivers and are not under pressure to maintain the authority. Therefore, it can be observed that the employment rate of elderly women (58.50%) is significantly lower than that of elderly men (69.82%). The gender difference in the proportion of self-employment (female = 50.29%, male = 49.88%) is not significant. However, a huge gender disparity exists in the wage-employment rate (female = 8.62%, male = 19.59%). However, there was a significant gender difference in the proportion of wage-employment (female employed employment = 8.62%, male employed employment = 19.59%). Women's self-employment is often seen as an extension of the daily housework and has no significant impact on their mental health. In China, female employees are eligible for retirement at the age of 50 or 55. They, before old age of 60, are often required to take on the role of intergenerational caregivers and are unable to work. So, employees of elderly women need to bear the pressure of reintegration into society. Finally, the effect of employment of elderly women is not significant.

After retirement, the elderly can re-enter society through social participation and employment. Employment did not crowd out the social participation but rather promoted the social participation. However, this effect is only significant in women and elderly persons in urban areas. Elderly women have greater enthusiasm for social participation than men.[65] Employment expands the social networks of elderly women and provides them with opportunities for social participation. Cities possess a greater abundance of cultural resources compared to villages. Employment helps elderly persons in cities have access to rich cultural resources, and thus promotes their social participation. The two status passages, employment and social participation, are complementary.

This study showed that the effects of employment on the mental health of the elderly differ by gender and region. Therefore, it is suggested to implement a flexible delayed retirement policy based on individual wishes, which would result in greater social welfare. The government should further support elderly employment by providing suitable jobs and vocational training. For rural areas, it is imperative to address deficiencies in public cultural services while tapping into local cultural resources, thereby enhancing older residents' mental health and well-being. In urban contexts, priority should be given to fostering elderly-serving social organizations that bridge employment opportunities and social participation needs with existing urban resources. This study demonstrates the strong explanatory power of middle-range theory in understanding senior employment dynamics amidst societal transformation and cultural pluralism. Future research can extend this theoretical framework to investigate workforce participation patterns among middle-aged /younger adult cohorts as well as gender-specific groups.

Limitations

Although this study has made some meaningful findings in exploring the effects of employment on the elderly mental health, it has some limitations.

Mental health involves emotion, cognitive ability, behavior and other elements, which was measured with depression levels in this study. It can also be measured with life satisfaction, happiness and cognitive ability. Unfortunately, the study did not take into account other measurement methods.

This study subdivided employment into two types. But there are actually more than two types of employment, including full-time, part-time, freelance work, etc. Different types of employment may have different effects on the elderly mental health. So, effects of other types of employment should be further studied.

Data Sharing Statement

The raw data supporting the conclusions of this article will be made available at http://charls.pku.edu.cn/index.htm.

Ethics

Ethical approval for all the CHARLS waves was granted by the Institutional Review Board at Peking University. The IRB approval number for the main household survey, including anthropometrics, is IRB00001052-11015; the IRB approval number for biomarker collection was IRB00001052-11014. During the fieldwork, each respondent who agreed to participate in the survey was asked to sign two copies of the informed consent form, and one copy was kept in the CHARLS office, which was also scanned and saved in PDF format. Four separate consents were obtained: one for the main fieldwork, one for the non-blood biomarkers, one for the taking of the blood samples, and another for the storage of blood for future analyses. The study design was approved by the ethical review committee of Anhui University of Finance & Economics. All participants gave written informed consent. All methods were performed following the relevant guidelines and regulations.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

References

1. Ma L. Depression, anxiety, and apathy in mild cognitive impairment: current perspectives. *Front Aging Neurosci*. 2020;12:9. doi:10.3389/fnagi.2020.00009
2. Machado MO, Nicola V, Marcos S, et al. The association of depression and all-cause and cause-specific mortality: an umbrella review of systematic reviews and meta-analyses. *BMC Med*. 2018;16(1):112. doi:10.1186/s12916-018-1101-z
3. Orsolini L, Latini R, Pompili M, et al. Understanding the complex of suicide in depression: from research to clinics. *Psychiatr Study*. 2020;17(3):207–221. doi:10.30773/PI.2019.0171
4. Hu T, Zhao X, Wu M, et al. Prevalence of depression in older adults: a systematic review and meta-analysis. *Psychiatry Res*. 2022;311:114511. doi:10.1016/j.sychres.2022.114511
5. Galkin KA. Employment of older people and active ageing policies in Europe and Russia. *Sotsiologicheskie Issledovaniya*. 2021;(11):156–160. doi:10.31857/S013216250014015-9

6. The Office of the Seventh National Population Census Leading Group of the State Council. *The China Population Census Yearbook 2020*. Beijing: China Statistics Press; 2022.
7. Zhan Y, Wang M, Liu S, Shultz K. Bridge employment and retirees' health: a longitudinal investigation. *Occupational Health Psychol*. 2009;14(4):374–389. in Chinese. doi:10.1037/a0015285
8. Wang M. Profiling retirees in the retirement transition and adjustment process: examining the longitudinal change patterns of retirees' psychological well-being. *Applied Psychol*. 2007;92(2):455–474. doi:10.1037/0021-9010.92.2.455
9. Dave D, Rashad I, Spasojevic J. The effects of retirement on physical and mental health outcomes. *Southern Economic J*. 2008;75(2):497–523. doi:10.3386/w12123
10. Mandal B, Roe B. Job loss, retirement and the mental health of older Americans. *J Mental Health Policy Econ*. 2008;11(4):167–176. doi:10.2139/ssrn.991134
11. Forbes M, Spence K, Wuthrich VM, Rapee MR. Mental health and wellbeing of older workers in Australia. *Work Aging Retirement*. 2015;1(2):202–213. doi:10.1093/workar/wav004
12. Schwingel A, Niti MM, Tang C, Ng TP. Continued work employment and volunteerism and mental well-being of older adults: Singapore longitudinal ageing Study. *Age Ageing*. 2009;38(5):531–537. doi:10.1093/ageing/afp089
13. Christ SL, Lee DJ, Fleming LE, et al. Employment and occupation effects on depressive symptoms in older Americans: does working past age 65 protect against depression? *J Gerontol B Psychol Sci Soc Sci*. 2007;62(6):399–403. doi:10.1093/geronb/62.6S399
14. Menec VH. The relation between everyday activities and successful aging: a 6-year longitudinal study. *J Gerontol B Psychol Sci Soc Sci*. 2003;58(2):S74–S82. doi:10.1093/geronb/58.2.S74
15. Zhang QL, Zhou YM. Work and happiness of the newly retired in urban China. *Acta Psychologica Sinica*. 2017;49(4):472–481. doi:10.3724/SP.J.1041.2017.00472
16. Lee Y, Min J, Chi I. Life transitions and leisure activity engagement in later life: findings from the consumption and activities mail survey (CAMS). *Ageing Soc*. 2018;38(8):1603–1623. doi:10.1017/S0144686X17000216
17. Stenholm S, Vahtera J. Does retirement benefit health? *Preventive Med*. 2017;100:294–295. doi:10.1016/j.ypmed.2017.05.007
18. Mein G, Martikainen P, Hemingway H, Stansfeld S, Marmot M. Is retirement good or bad for mental and physical health functioning? Whitehall II longitudinal study of civil servants. *J Epidemiol Community Health*. 2003;57(1):46–49. doi:10.1136/jech.57.1.46
19. Calvo E, Sarkisian N, Tamborini CR. Causal effects of retirement timing on subjective physical and emotional health. *J Gerontol B Psychol Sci Soc Sci*. 2013;68(1):73–84. doi:10.1093/geronb/gbs097
20. National Bureau of Statistics of China. *China Statistical Yearbook 2024*. Beijing: China Statistics Press; 2024.
21. Zhu H, Ma S, Ding Y, Xia H. Associations between employment and mental health of older workers with disparate conditions: evidence from China. *Geriatric Nurs*. 2024;56:244–251. doi:10.1016/j.g.Erinurse2024.02.023
22. Cheng Y, Lan J, Ci Q. Employment and mental health of the Chinese elderly: evidence from CHARLS 2018. *Int J Environ Res Public Health*. 2023;20(2791):2791. doi:10.3390/ijerph20042791
23. Jia P, Zhuang J, Vaca Lucero AM, Osei CD, Li J. Does participation in local non-agricultural employment improve the mental health of elderly adults in rural areas? Evidence from China. *J Front Public Health*. 2021;96–2565. doi:10.3389/fpubh.2021.746580
24. Xie L, Yao Y, Tang L, et al. Effect of working after retirement on the mental health of older people: evidence from China. *Front Psychiatr*. 2021;12:731378. doi:10.3389/fpsyt.2021.731378
25. Chris D, Michail V, Gail P, Webber DJ. Is temporary employment a cause or consequence of poor mental health? A panel data analysis. *Soc Sci Med*. 2015;134:50–58. doi:10.1016/j.socscimed2015.04.001
26. Butterworth P, Leach LS, Strazdins L, et al. The psychosocial quality of work determines whether employment has benefits for mental health: results from a longitudinal national household panel survey. *Occup Environ Med*. 2011;68(11):806–812. doi:10.1136/OEM.2010.059030
27. Santini ZI, Jose PE, Koyanagi A, et al. Formal social participation protects physical health through enhanced mental health: a longitudinal mediation analysis using three consecutive waves of the survey of health, ageing and retirement in Europe (SHARE). *Soc Sci Med*. 2020;251:112906. doi:10.1016/j.socscimed.2020.112906
28. Jahoda M, Lazarsfeld P, Zeisel H. *Marienthal, the Sociography of an Unemployed Community*. London: Tavistock; 1971.
29. Bakke E. *The Unemployed Man*. New York: Dutton; 1934.
30. Komarovsky M. *The Unemployed Man and His Family*. New York: Dryden Press; 1940.
31. Janlert U, Hammarstrom A. Which theory is best? Explanatory models of the relationship between unemployment and health. *BMC Public Health*. 2009;9(1):235. doi:10.1186/1471-2458-9-235
32. Tiffany D, Cowan J, Tiffany P. *The Unemployed, a Social Psychological Portrait*. Englewood Cliffs (NJ): Prentice-Hall; 1970.
33. Eisenberg P, Lazarsfeld PF. The psychological effects of unemployment. *Psychol Bull*. 1938;35(6):358–390. doi:10.1037/h0063426
34. Jahoda M. Work, employment and unemployment: values, theories, and approaches in social research. *Am Psychologist*. 1981;36(2):184–191. doi:10.1037/0003-066X.36.2.184
35. Warr P. *Work, Unemployment and Mental Health*. Oxford: Clarendon Press; 1987.
36. Fryer D, Payne R. Being unemployed: a review of the literature on the psychological experience of unemployment. In: Cooper C, Robertson I, editors. *International Review of Industrial and Organization Psychology*. New York: Wiley; 1986.
37. Fryer D, Payne R. Proactive behavior in unemployment: findings and implications. *Leisure Stud*. 1984;3(3):273–295. doi:10.1080/02614368400390231
38. O'Brien G. Distortion in unemployment research: the early studies of bake and their implications for current research on employment and unemployment. *Human Relations*. 1985;38(9):877–894. doi:10.1177/001872678503800904
39. Ezzy D. Unemployment and mental health: a critical review. *Soc Sci Med*. 1993;37(1):41–52. doi:10.1016/0277-9536(93)90316-V
40. French JRPJ, Kahn RLA. A programmatic approach to studying the industrial environment and mental health. *J Soc Issues*. 1962;18(3):1–47. doi:10.1111/j.1540-4560.1962.tb00415.x
41. Vidgerhous G, Fischeman G. The impact of unemployment and familial integration on changing suicide rates in the USA 1920–1969. *Soc Psychiatry*. 1978;113(4):239–248. doi:10.1007/bf00582754
42. House JS, Williams DR, Kessler RC. Unemployment, social support and health. In: *Social Support, Health and Disease*. Stockholm: Almqvist & Wiksell; 1986:93–112.

43. Simone C, Mauricio A, Alex B, Ven Lenthe FJ. Social participation and depression in old age: a fixed-effects analysis of social participation and depression in 10 European countries. *Am J Epidemiol*. 2015;182(2):168–176. doi:10.1093/aje/kwv015
44. Webber M, Fendt-Newlin M. A review of social participation interventions for people with mental health problems. *Social Psychiatry Psychiatric Epidemiol*. 2017;52(4):369–380. doi:10.1007/s00127-017-1372-2
45. Lin N, Ye X, Ensel WM. Social support and depressed mood: a structural analysis. *Health Soc Behav*. 1999;40(4):344–359. doi:10.2307/2676330
46. Glaser B, Strauss A. *Status Passage*. London: Routledge & Kegan Paul; 1971.
47. Stryker S. Symbolic Interaction: a Social Structural Version. *British J Sociol*. 1982;33(3):138. doi:10.2307/589488
48. Stets JE, Burke PJ. Identity theory and social identity theory. *Soc Psychol Quarterly*. 2000;63(3):224–237. doi:10.2307/2695870
49. Haslam AS, Jetten J, Postmes T, Haslam C. Social identity, health and well-being: an emerging agenda for applied psychology. *Applied Psychol*. 2009;58(1):1–23. doi:10.1111/J.1464-0597.2008.00379.x
50. Welch S, Brugha T, King M, et al. Mental well-being and mental illness: findings from the adult psychiatric morbidity survey for England 2007. *Br J Psychiatry*. 2011;199(1):23–28. doi:10.1192/BJP.Bp.111.091496
51. Huang WJ, Lu KY. The impact of "reemployment after retirement" on subjective well-being of the elderly: an empirical analysis based on CHARLS data. *Taxation Econ*. 2020;(3):22–31.
52. Lin J, Zhao Z, Chen X. Understanding complexity in the role of market forces in the construction of a public cultural service system: evidence from 435 children's libraries in China. *Systems*. 2023;11(317):317. doi:10.3390/systems11070317
53. Feng J, Zhang XH. Retirement and grandchild care in urban China. *Feminist Econ*. 2018;24(2):240–264. doi:10.1080/13545701.2017.1370120
54. Ou K, Wong MYC, Chung PK, Chui KYK. Effect of square dance interventions on physical and mental health among Chinese older adults: a systematic review. *Int J Environ Res Public Health*. 2022;19(6181):6181. doi:10.3390/ijerph19106181
55. Chen SC. The characteristics and travel behaviors of senior leisure travelers: a cross-cultural comparison between China and the US. *Tourism Rev Int*. 2012;16(3):203–216. doi:10.3727/154427213x13600072840569
56. He T, Huang C, Li M, Zhou Y, Li S. Social participation of the elderly in China: the roles of conventional media, Digital access and social media engagement. *Telematic Informatic*. 2020;13:101347. doi:10.1016/j.t.ele.2020.101347
57. Jin XY. The study on labor participation and mental health of middle-aged and elderly people in rural areas. *People's Tribune*. 2024;(19):62–67.
58. Zhang LY, Liu CB. Effect of reemployment on mental health of urban retired elderly. *Population Economics*. 2022;(3):56–70.
59. Dai W, Zhang QS, Yin ML. The impact of underemployment on household consumption: research evidence from CFPS micro survey data. *Study Pract*. 2023;(12):89–101. doi:10.19624/j.cnki.cn42-1005/c.2023.12.013
60. Zhang XW, Liu F, Sun T. Analysis of the health effects and mechanisms of Self-employed employment in the context of delayed retirement based on the empirical evidence from older workers in CHARLS. *Chinese Health Service Manag*. 2024;9(9):1004–1009+1042.
61. Kitchen P, Williams A, Chowhan J. Sense of community belonging and health in Canada: a regional analysis. *Soc Indic Res*. 2012;107(1):103–126. doi:10.1007/s11205-011-9830-9
62. Lee J, Kim MH. The effect of employment transitions on physical health among the elderly in South Korea: a longitudinal analysis of the Korean retirement and income study. *Soc Sci Med*. 2017;181:122–130. doi:10.1016/j.socscimed.2017.04.002
63. Greenstein TN. Economic dependence, gender and the division of labor in the home: a replication and extension. *Marriage Family*. 2000;62 (2):322–335. doi:10.1111/j.1741-3737.2000.00322.x
64. Wang Z, Lou Y, Zhou Y. Bargaining power or specialization? Determinants of household decision making in Chinese rural migrant families. *SAGE Open*. 2020;10(4). doi:10.1177/2158244020980446
65. Zhang Z, Feng L. Social participation and its gender differences among ethnic minority elders after poverty alleviation relocation. *Humanities Social Sci Communications*. 2024;11(1):1–9. doi:10.1057/s41599-024-03043-z