

The Impact of Family Caregiving on Midlife Employment: An Analysis Based on the 2018 CHARLS Data

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Abstract

This paper employs a multiple regression model and utilizes data from the 2018 China Health and Retirement Longitudinal Study (CHARLS) to analyze the impact of family elderly care on children's employment. Additionally, it examines the moderating effects of gender, urban-rural status, and education on this relationship. The main findings of this study can be summarized as follows: First, participation in family care (including care for the elderly and grandchildren) reduces the working hours of children. Second, involvement in the care of grandchildren is associated with a decrease in children's work income. Third, through heterogeneity tests, the study further verifies the impact of family elderly care on the employment of middle-aged children, considering differences in individual and family characteristics. The results indicate that family elderly care has a negative impact on children's employment and that this impact is heterogeneous.

Keywords

Family caregiver, midlife employment; working hours, employment income, population aging.

1. Introduction

Population aging is an inevitable stage in the process of social development and changes in population structure, and it is also a concrete manifestation of economic progress and the improvement of social productivity. Against the backdrop of advancements in science and technology and the gradual improvement of people's material living standards, the average life expectancy of humans continues to increase, and the scale of the aging population is growing. According to data from the National Health Commission, as of 2022, while eradicating absolute poverty, China has established the largest education system, social security system, and medical and health system in the world over the past decade. The average life expectancy of Chinese people has increased from 74.8 years to 78.2 years. At the same time, however, the birth rate in China has been declining year by year. The National Bureau of Statistics' (2022) Statistical Bulletin on the National Economic and Social Development for 2021 shows that in 2022, the total number of births in China was 9.56 million, with a birth rate of 6.77‰; the natural population growth rate was -0.60‰, a decrease of nearly one per thousand compared to 2021[1]. The continuous increase in life expectancy and the sustained decline in the birth rate have exacerbated the trend of population aging in China. Aging is often accompanied by disability. Data from the Fourth National Sampling Survey on the Living Conditions of Urban and Rural Elderly People in China show that in 2015, the number of disabled and semi-disabled elderly people nationwide was 40.63 million, accounting for 18.3% of the total elderly population[2]. Experts such as Luo et al. (2021), estimate that by 2030, the number of disabled elderly people in China will exceed 77 million, and on average, each disabled elderly person will experience a disability period of 7.44 years.

2. Literature References

Since the beginning of the 21st century, China has rapidly entered an aging society, with an increasing number of elderly people living with illness and unable to take care of themselves. Given that the primary model of elderly care in China is home-based care, the responsibility of providing care for the elderly naturally falls on family members. However, for working-age laborers, it is often difficult to balance the responsibility of caring for the elderly with their own employment. Therefore, the impact of family-based elderly care on the employment status of laborers has become a topic of common concern for both society and academia.

Academic research on the relationship between family-based elderly care and labor employment dates back to the 1980s. Soldo used nationally representative data to examine caregivers across three types of families and found that providing care for the elderly impedes children's employment[3]. Brody surveyed widowed and disabled elderly women who received care from their adult daughters and discovered that those with unemployed daughters received more assistance in personal care and domestic services than those with employed daughters[4]. Stone based on data from the 1982 National Long-Term Care Survey, found that informal caregivers for disabled elderly individuals were predominantly female (71.5%), with adult daughters accounting for 28.9% and wives 22.7%[5]. Early conclusions were primarily drawn from macro-level data, which were not sufficiently reliable. Since the study by Wolf et al. , scholars have begun to recognize the potential endogeneity between family-based elderly care and caregivers' employment, and have employed more rigorous and scientifically sound econometric methods to validate this relationship[6]. Ettner identified three main sources of endogeneity: First, children's employment status may influence the allocation of caregiving responsibilities within the family. Second, family members may fail to meet the caregiving needs of their parents. Third, children may opt to place their parents in formal care institutions rather than provide informal family care[7].

To address the endogeneity issue, scholars have primarily employed three methods. First, Carmichael et al. directly treated family care as an exogenous variable, ignoring the potential endogeneity between the two[8]. Second, the instrumental variable (IV) method has been widely used to address this issue[9,10]. Third, panel data analysis has been adopted to control for unobservable heterogeneity[11]. However, the international literature has not reached a consensus on the causal relationship between family-based elderly care and children's labor participation. For instance, Wolf et al.[12] found no significant association between caring for elderly parents and reduced employment or working hours among married women. In contrast, most studies suggest that family-based elderly care significantly decreases children's labor participation rates or working hours.

In China, empirical research on the relationship between family-based elderly care and caregivers' employment started relatively late, and there is still considerable room for further exploration. Jiang et al.[13] employed the instrumental variable method and a two-part model to demonstrate that caring for the elderly has a significant negative impact on the employment probability and working hours of adult children. Liu et al. [14] and Ma et al. [15] respectively examined the impact of elderly care by married women on their employment status from the perspectives of rural and urban contexts. Their studies revealed that caring for in-laws significantly reduces the non-agricultural labor time of married women. Moreover, urban married women who provide care face greater difficulty entering the labor market, with an employment rate 29.6% lower than that of non-caregivers. In recent years, the research subjects and content in this field have been further enriched and deepened. Yanhua Wu et al. found a negative correlation between family-based elderly care and women's informal employment, with higher intensity of elderly care leading to a greater propensity for women to engage in informal employment[16]. Yueping Song examined the impact of cohabitation with

parents on the labor participation of urban married women and discovered that as women age, cohabitation with parents increasingly exerts a negative influence on their labor participation[17]. Jiangyao Xiong et al. focused on the differences in labor supply between only-child and non-only-child caregivers[18]. Huamin Chai et al. concentrated on the relationship between caregiving intensity and non-agricultural labor time[19]. Jianping Yang mainly explored the impact of family-based elderly care on children's employment[20].

3. Data, Model and Hypotheses

This study utilizes data from the 2018 wave of the China Health and Retirement Longitudinal Study (CHARLS), a survey hosted by Peking University. The primary objective of CHARLS is to examine the social, economic, and health conditions of middle-aged and elderly individuals aged 45 and above, as well as their family-related circumstances in China. The CHARLS sample covers 150 counties (cities, districts) and 450 villages (communities) across the country, with respondents distributed nationwide. The survey content includes individual and family information, such as demographic characteristics, health status, medical care and insurance, employment and retirement situations, among others. It provides a representative sample of the middle-aged and elderly population in China and offers a scientifically robust data foundation for research in the field of social security.

For this study, we employ a matched sample of individuals aged 45 and above, along with their parents and grandchildren, to minimize potential sample biases. We apply multiple linear regression models and interaction effect models to investigate the impact of family care, gender, education, and other factors on employment across different occupations. This research aims to provide new insights into the study of family-based elderly care and enrich the analysis of factors influencing labor force participation.

The employment situation of children who participate in family-based elderly care is analyzed from two aspects: labor force participation and working hours. The corresponding models are specified as follows:

$$Houri = f(Care1i, Care2i, Xi, \delta i, \epsilon i) \quad (1)$$

$$Incomei = f(Care1i, Care2i, Xi, \delta i, \epsilon i) \quad (2)$$

Equation (1) represents the model for the working hours of middle-aged children who participate in family-based elderly care, while the robustness check Equation (2) is the model for the annual employment income of middle-aged children. There are two dependent variables in this study: *Houri* denotes the annual working hours of child *i*, and *income i* represents the employment income of middle-aged child *i*. The core explanatory variables are *Care1i* and *Care2i*. *Care1i* indicates whether child *i* participates in family-based elderly care, taking a value of 1 if participating and 0 otherwise. *Care2i* indicates whether child *i* participates in family-based childcare for grandchildren, taking a value of 1 if participating and 0 otherwise. *Xi* represents exogenous variables, including basic personal and family characteristics of middle-aged children, such as education level, health status (ability to self-care), age, gender, and place of residence. δi denotes the unobservable random variable that is time-invariant, while ϵi is the random error term that varies across individuals. If the explanations derived from the working hours model are consistent with those from the income model, it can be concluded that Model (1) has a certain explanatory power.

Generally speaking, family-based elderly care tends to reduce the working hours of middle-aged individuals or affect their work efficiency and quality. This view has also been corroborated by existing literature[21]. By the same token, we hypothesize that childcare for

grandchildren may similarly encroach upon the working hours of middle-aged individuals, thereby negatively influencing their work situations. Thus, for Models (1) and (2), we can initially propose the following hypotheses:

H1a: Family-based elderly care is negatively associated with the working hours of middle-aged individuals.

H1b: Family-based childcare is negatively associated with the working hours of middle-aged individuals.

H1c: Family-based elderly care is negatively associated with the employment income of middle-aged individuals.

H1d: Family-based childcare is negatively associated with the employment income of middle-aged individuals.

A substantial body of literature indicates that educational attainment is a significant determinant of employment outcomes. Originating in the 1960s, human capital theory has illuminated the role of education as an investment. Becker posited that education, on-the-job training, and healthcare are all forms of human capital investment. Moreover, individuals with greater innate ability tend to invest more in human capital, thereby exacerbating wage inequality to a greater extent than innate ability alone. This inequality compounds with age, and is particularly pronounced among workers in skill-intensive occupations.

Therefore, we hypothesize that the core variable of family care may moderate the effect of education—an important determinant of employment outcomes—on work situations. Controlling for other variables, compared to middle-aged individuals with the same level of education who do not participate in family care, those who do engage in family care may experience a reduction in average working hours. Thus, we formulate the following hypothesis:

H2a: Elderly care negatively moderates the effect of education on working hours.

H2b: Childcare negatively moderates the effect of education on working hours.

H2c: Elderly care negatively moderates the effect of education on employment income.

H2d: Childcare negatively moderates the effect of education on employment income.

4. Empirical Analysis and Results

4.1. Variable Selection

The relevant variables in this study are primarily selected from the sub-databases of individual and family basic information, employment and retirement status, and health conditions in the 2018 CHARLS dataset. After cleaning missing values and removing outliers, a final sample of 2,413 valid observations was obtained.

In the variable selection, the dependent variables in this study are the annual working hours and annual income of the employed individuals. In the CHARLS questionnaire, the relevant questions are: "How many days per week did you usually work in the past year?" and "How many hours per day did you usually work in the past year?" This study converts the weekly working hours into an annual basis and considers individuals with positive annual working hours as employed, while those with zero annual working hours are considered unemployed. Regarding annual income, the question in the CHARLS survey is: "Including bonuses and other income, how much money did you receive from your employer in the past year?"

The core explanatory variables in this study are whether the employed individual provides family-based elderly care for parents (in-laws) and family-based childcare for grandchildren. These are derived from the questionnaire items: "In the past year, did you or your spouse provide help to your parents (in-laws) in daily activities (or other activities), such as housework, cooking, laundry, going out, shopping, and financial management?" and "In the past year, did you or your spouse spend time taking care of your grandchildren or great-grandchildren?"

In the control variables, considering that employment participation of children may be influenced by individual and family characteristics (Chen et al., 2016b; Song, 2019), individual characteristics include gender, age, education level, place of residence, and marital status, while family characteristics include cohabitation with parents (in-laws) and the self-care ability of the elderly.

Table 1: Variable Names and Descriptive Statistics for the Full Sample

Variable Name	Definition	Mean	Standard Deviation	Minimum	Maximum
Annual Working Hours	Continuous variable	1637	1056	4	5376
Care for Elderly	1 = Yes; 0 = No	0.535	0.499	0	1
Care for Grandchildren	1 = Yes; 0 = No	0.364	0.481	0	1
Education Level	1 = Primary school and below; 2 = Junior high and vocational school; 3 = Senior high and technical secondary school; 4 = Junior college and above	1.814	0.923	1	4
Gender	1 = Male; 2 = Female	1.382	0.486	1	2
Birth Year	Continuous variable	1965.812	4.177223	1958	1977
Place of Residence	1 = Urban; 0 = Rural	0.326	0.469	0	1
Marital Status	1 = Married; 0 = Unmarried	0.872	0.334	0	1
Elderly Self-care Ability	1 = Yes; 0 = No	0.791	0.407	0	1
Number of Siblings	Continuous variable	3.154	1.851	0	9

4.2. Regression Analysis

Table 2 primarily employs multiple linear regression and sets up four models. Models 1 and 2 are multiple linear regression models with annual working hours as the dependent variable, while Models 3 and 4 are multiple linear models with annual income as the dependent variable. According to Table 2, Model 1 uses whether caring for the elderly (1 = Yes, 0 = No) and whether caring for grandchildren (1 = Yes, 0 = No) as the core explanatory variables, with education level (1 = Primary school and below, 2 = Junior high school, 3 = Senior high school and vocational school, 4 = Junior college and above) and place of residence (1 = Urban, 2 = Rural) as auxiliary explanatory variables for individual basic characteristics. The regression results show that in Model 1, caring for the elderly is negatively correlated with annual working hours and is significant at the $\alpha = 0.1$ significance level, thus Hypothesis 1a is supported. Additionally, the variable for caring for grandchildren is also negatively correlated with annual working hours ($\alpha = 0.01$), supporting Hypothesis 1b. Therefore, in Model 1, it can be concluded that family care has a significant impact on the working hours of middle-aged individuals. Moreover, education and place of residence also have important effects on the working hours of middle-aged

individuals. Combining Models 1 and 3, it is evident that urban residents and those with higher education levels generally have longer working hours and higher incomes.

Model 2 is a separate regression model for the dependent variable of family elderly care. Considering that the variable of caring for the elderly may be influenced by family characteristics [22], Model 2 includes additional control variables such as the number of siblings and marital status, in addition to elderly care. The results show that caring for the elderly is more significantly negatively correlated with annual working hours compared to Model 1, further confirming Hypothesis 1a. The number of siblings has no significant correlation with working hours but is negatively correlated with marital status ($\alpha = 0.1$), indicating that married respondents work relatively fewer hours than unmarried respondents, similar to those who care for the elderly. Both are family-related factors that reduce working hours.

Model 3 uses annual work income as the dependent variable, with the same independent variables as Model 1. The regression results of Model 3 show that income is positively correlated with education level ($\alpha = 0.001$), and males have higher employment income than females ($\alpha = 0.001$). Annual income is also significantly positively correlated with age ($\alpha = 0.001$). Notably, in Model 3, there is a significant negative correlation between annual income and childcare for grandchildren ($\alpha = 0.001$), supporting Hypothesis 2a. However, there is no significant correlation between income and elderly care, although a negative trend is observed. Model 4 includes the same independent variables as Model 2, further examining the impact of family characteristics on elderly care. However, no significant correlation was found, thus failing to confirm Hypothesis 2b. Nevertheless, since childcare for grandchildren and elderly care both fall within the scope of family care as defined in this study, combining the working hours model and the income model suggests that the employment situation of middle-aged individuals is influenced by family care responsibilities.

Table 2: The Impact of Family Care Participation on Employment Situations of Middle-Aged Individuals

Variables	Working Hours Model		Income Model	
	Model 1	Model 2	Model 3	Model 4
Care for Elderly (1=Yes, 0=No)	-112.800+	-657.125*	-0.076	0.625
	(57.671)	(290.999)	(0.058)	(0.384)
Care for Grandchildren (1=Yes, 0=No)	-178.128**		-0.313***	0.238
	(66.080)		(0.064)	(0.889)
Education Level (1=Primary or below, 2=Junior High, 3=Senior High or Vocational, 4=Junior College or above)	108.860**		0.338***	
	(33.149)		(0.034)	
Age	2.805		0.028***	
	(5.875)		(0.005)	

Place of Residence (1=Urban, 2=Rural)	205.063** (66.882)		- 0.451*** (0.067)	
Number of Siblings		54.974 (70.237)		-0.000 (0.095)
Marital Status (1=Married, 0=Unmarried)		-731.358+ (402.580)		-0.387 (0.528)
Constant (_cons)	-3931.051 (11528.682)	2809.778*** (560.247)	-44.483*** (10.345)	9.991*** (0.752)
N	1175	38	1490	48
R ²	0.046	0.229	0.250	0.078

Notes:***, **, * and + indicate significance at the 0.1%, 1%, 5%, and 10% levels, respectively, and the values in parentheses are the standard errors of the coefficients.

4.3. Heterogeneity Analysis

4.3.1. From the Perspective of Gender Differences

According to the neoclassical theory of household division of labor, women are more inclined to take on family caregiving responsibilities, especially elderly care, and they typically devote more time to the family than men. Numerous scholars have confirmed that family-based elderly care has a negative impact on women's employment. Research indicates that the negative impact of family elderly care on women's employment is the result of the "substitution effect" outweighing the "income effect" [23]. The "substitution effect" refers to the idea that, due to the scarcity of time, caregiving activities for the elderly replace work, thereby reducing labor participation rates. In contrast, the "income effect" suggests that caregiving for the elderly involves significant expenses, and to avoid the income loss associated with exiting the labor market, children may choose to continue working while caring for their elderly parents.

The empirical results of this study show that in China, the substitution effect dominates the impact of family elderly care on women's employment, leading to a negative influence on labor participation. In China, family-based elderly care has long been a deeply rooted traditional practice and a reflection of the objective reality. Surveys indicate that the majority of elderly individuals prefer to live independently or with their children in familiar communities, with family care remaining the mainstream choice. Meanwhile, the proportion of urban elderly willing to reside in nursing homes decreased from 18.6% in 2000 to 11.3% in 2010, while in rural areas, it dropped from 14.4% to 12.5% over the same period. Additionally, although alternatives to family care, such as nursing homes and retirement apartments, have emerged in recent years, their relatively high costs mean that the elderly's utilization of these services is very low, failing to meet the caregiving needs of most seniors[24].

However, previous studies have rarely examined male samples in depth. Therefore, this paper includes an analysis of the impact on middle-aged men in the heterogeneity test. The regression results show that family-based elderly care has a significant negative impact on the working hours and income of male children. Specifically, elderly care is negatively correlated with the working hours of middle-aged men at a significance level of 0.01, reducing their annual working hours by 247.908 hours. In contrast, the results indicate that family elderly care does not have a significant impact on the working hours of women. Regarding work income, the variable of family elderly care is significantly negatively correlated with the income of both men and women, with a more pronounced effect on men. These findings suggest that men may be taking

on more responsibilities in family elderly care and playing an equally important role. This conclusion is also consistent with existing domestic research[25][26].

Table 3: Gender Differences in the Impact of Family Elderly Care on Employment of Middle-Aged Individuals

Variables	Working Hours Model		Working Income Model	
	Male	Female	Male	Female
Family Elderly Care	-247.908** (-2.6783)	-98.988 (-1.8007)	-0.2807** (-1.8742)	-0.1781+ (-0.6564)
N	1040	749	1944	1249
Pseudo R ²	0.0460	0.0510	0.0210	0.0300

Notes:

Notes:***, **, * and + indicate significance at the 0.1%, 1%, 5%, and 10% levels, respectively, and the values in parentheses are the standard errors of the coefficients.

The variables also include age, education level, marital status, urban-rural residence, and health status, among others. This paper only displays the core explanatory variables. The same applies to the following tables.

4.3.2. Perspective of Urban-Rural Differences

During China's economic development, significant urban-rural disparities have emerged in many aspects. This study has preliminarily explored the relationship between urban residence and working hours and income models in Table 2. Following this, the study further investigates whether there are urban-rural differences in the impact of family elderly care on the employment situation of middle-aged individuals. The results show that such differences do exist between urban and rural areas: The regression results in Table 4 indicate that family elderly care has no significant impact on the working hours of children living in urban areas but reduces the working hours of those living in rural areas, which is significant at the $\alpha = 0.1$ level. It also decreases their annual work income, which is significant at the 5% level. This suggests that the negative impact of family elderly care on the working hours of children living in rural areas is more pronounced.

Table 4: Urban-Rural Differences in the Impact of Family Elderly Care on Children's Employment

Variables	Working Hours Model		Working Income Model	
	Urban	Rural	Urban	Rural
Family Elderly Care	-120.012 (-0.9038)	-227.76+ (-1.6920)	-0.0292 (-0.2435)	-0.3195** (-3.5823)
N	629	1097	996	2227

Pseudo R ²	0.098	/	0.141	0.069
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Notes:***, **, * and + indicate significance at the 0.1%, 1%, 5%, and 10% levels, respectively, and the values in parentheses are the standard errors of the coefficients.

4.3.3. The Perspective of Education as a Moderator

To more intuitively illustrate the heterogeneity of family care factors and educational levels, we have drawn regression line charts for the impact of family elderly care and family childcare on employment situations across different education levels (1 = Primary school or below, 2 = Junior high school, 3 = Senior high school or vocational school, 4 = Junior college or above) based on the four basic models in Table 1. The results are shown in Figures 1 to 4.

Figures 1 and 2 explore the moderating effect of education level on the impact of family care on annual working hours. Figure 1 shows that the slopes of all four regression lines are negative, indicating that regardless of educational level, the annual working hours of middle-aged individuals who need to care for their grandchildren decrease, thus supporting Hypothesis 2b. In Figure 2, only middle-aged individuals with primary school or below and junior high school education levels show a negative slope in annual working hours, suggesting that Hypothesis 2a is not fully supported.

Figures 3 and 4 examine the moderating effect of education level on the impact of family care on annual income. Figure 3 indicates that regardless of educational level, the slopes of the regression lines are negative. This suggests that, within the same educational background, middle-aged individuals who need to care for their grandchildren earn less than their peers who do not have such responsibilities, supporting Hypothesis 2c. In Figure 4, family elderly care has a negative impact on the income of middle-aged individuals with primary school or below and junior college or above education levels, while those with junior high school and senior high school or vocational school education levels show a positive slope in annual income. Thus, Hypothesis 2d is not fully supported.

The reasons for the incomplete support of Hypotheses 2b and 2d may stem from issues such as uneven sample group classification bases, model specification, or the "income effect" in certain groups. As previously mentioned, the "income effect" contrasts with the "substitution effect." The "substitution effect" refers to the idea that, due to the scarcity of time, caregiving activities for the elderly replace work, thereby reducing labor participation rates. In contrast, the "income effect" indicates that caregiving for the elderly involves significant expenses, and to avoid the income loss associated with exiting the labor market, children may choose to continue working while caring for their elderly parents.

Under the current trend of population aging, domestic research has predominantly focused on the impact of elderly care on the employment of the younger generation. However, with the implementation of the three-child policy, childcare has also become a significant factor influencing the employment situation of middle-aged individuals. Therefore, it can be argued that, in addition to family-based elderly care, childcare for grandchildren is also an important factor affecting the work situation of middle-aged groups. Although the hypotheses related to elderly care are not fully confirmed, the impact of childcare for grandchildren on the employment situation of middle-aged individuals with different levels of education can be verified.

Third, through heterogeneity analysis, the study further verified the impact of family elderly care on the employment of middle-aged children, considering differences in individual and family characteristics. From the perspective of gender differences, family elderly care has a significant negative impact on the working hours of middle-aged men at the 0.01 significance

level, reducing their annual working hours by 247.908 hours. However, family elderly care does not have a significant impact on the working hours of women. In terms of work income, family elderly care has a significant negative impact on the income of both men and women, with a more pronounced effect on men. These results suggest that men are more likely to take on greater responsibilities in family elderly care and play an important role in it.Regarding urban-rural differences, family elderly care has no significant impact on the working hours of children living in urban areas but reduces the working hours and annual work income of those living in rural areas. This indicates that the negative impact of family elderly care on the working hours of rural children is more significant. This result reflects the disparities in public elderly care resources between urban and rural areas, suggesting that the supply of public elderly care services in rural areas may be insufficient.From the perspective of education, compared to elderly care, childcare has a more significant impact on the employment situation of middle-aged individuals with the same educational background.

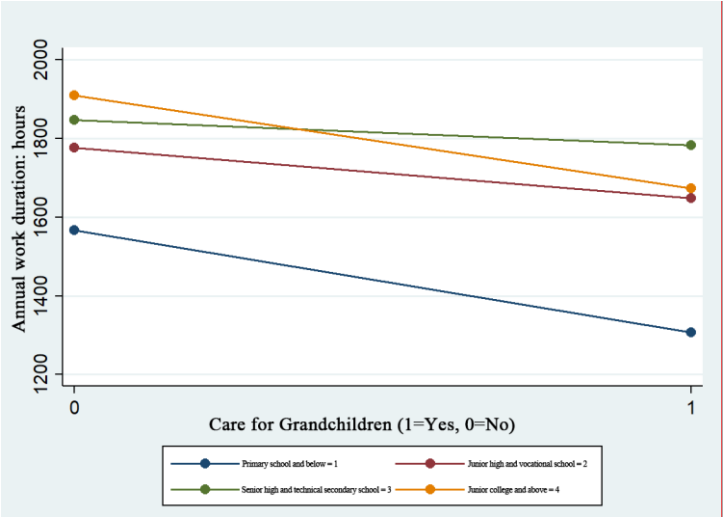


Figure 1

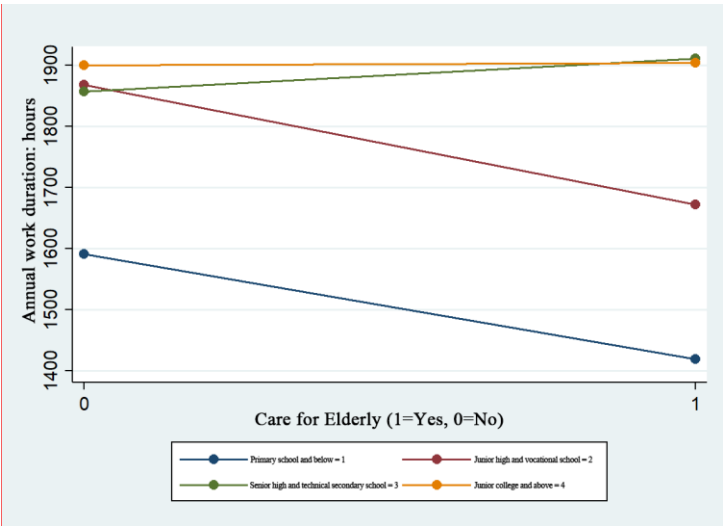


Figure 2

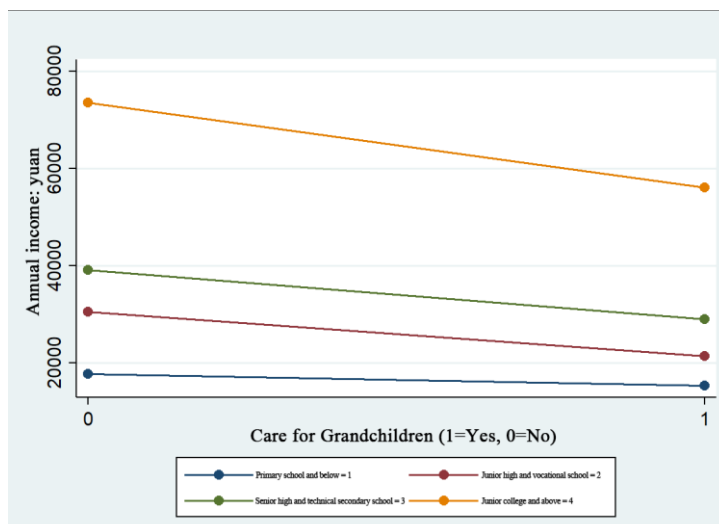


Figure 3

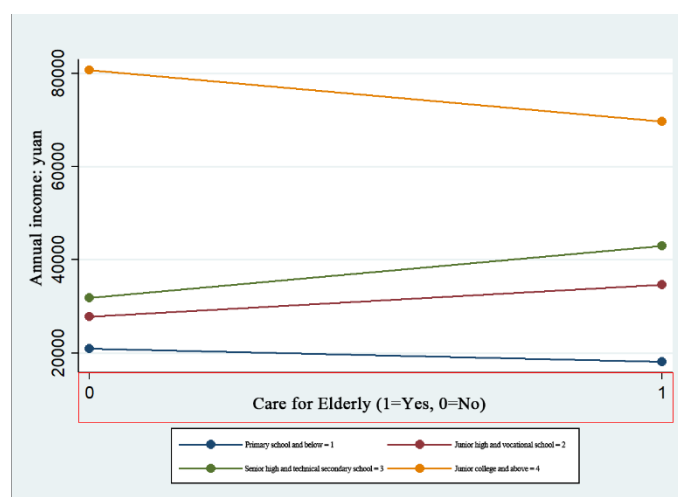


Figure 4

5. Conclusions and Policy Recommendations

5.1. Conclusions

This paper employs multiple regression analysis based on the 2018 data from the China Health and Retirement Longitudinal Study (CHARLS) to examine the impact of family elderly care on children's employment and further investigates the heterogeneous effects of gender, urban-rural differences, and education as moderators. The main findings of this study can be summarized as follows:

First, participation in family care (including care for the elderly and grandchildren) reduces the working hours of children. Holding other variables constant, engaging in family elderly care significantly decreases the working hours of middle-aged children at the 1% significance level. Meanwhile, caring for grandchildren is also negatively correlated with annual working hours ($\alpha = 0.01$). Therefore, this study concludes that family care has a significant impact on the working hours of middle-aged individuals. After controlling for sample selection bias, this negative impact increases, with elderly care showing a more significant negative effect on working hours ($\alpha = 0.05$). However, failing to account for endogeneity may underestimate the impact of family elderly care on children's labor participation rate. This result is consistent with studies both internationally (Carmichael et al., 2003; Bolin et al., 2007) and domestically (Jiang et al., 2009; Ma et al., 2014).

Second, participation in family childcare for grandchildren reduces children's work income. After controlling for sample selection bias, although family elderly care does not significantly affect the income of middle-aged individuals, the coefficient shows a potential negative correlation. The annual income variable is significantly negatively correlated with childcare for grandchildren ($\alpha = 0.001$). Since childcare for grandchildren and elderly care both fall within the scope of family care as defined in this study, combining the working hours model and the income model suggests that the employment situation of middle-aged individuals is influenced by family care responsibilities.

Third, through heterogeneity tests, the study further verified the impact of family elderly care on the employment of middle-aged children, considering differences in individual and family characteristics. From the perspective of gender differences, family elderly care has a significant negative impact on the working hours of middle-aged men at the 0.01 significance level, reducing their annual working hours by 247.908 hours. However, family elderly care does not have a significant impact on the working hours of women. In terms of work income, family elderly care has a significant negative impact on the income of both men and women, with a more pronounced effect on men. These results suggest that men are more likely to take on greater responsibilities in family elderly care and play an important role in it. Regarding urban-rural differences, family elderly care has no significant impact on the working hours of children living in urban areas but reduces the working hours and annual work income of those living in rural areas. This indicates that the negative impact of family elderly care on the working hours of rural children is more significant. This result reflects the disparities in public elderly care resources between urban and rural areas, suggesting that the supply of public elderly care services in rural areas may be insufficient. From the perspective of education, compared to elderly care, childcare has a more significant impact on the employment situation of middle-aged individuals with the same educational background.

5.2. Policy Recommendations

The research findings indicate that family-based elderly care has a negative impact on children's employment and that this impact is heterogeneous. Changes in modern family structures and other factors are driving the development of socialized elderly care, which can help share the burden of elderly care within individual families and promote the provision of elderly care services across society. As the leading institution, the government should improve relevant policies to safeguard the rights and interests of both caregivers and care recipients. This study proposes relevant policy recommendations in the following three areas:

Firstly, it is essential to actively improve the supply system for social elderly care and childcare services. While there are numerous childcare institutions in China, such as nurseries and kindergartens, the supply system for elderly care is still not well-developed. First, improve and promote respite care services. Respite care is a flexible care model that integrates home-based and institution-based day, night, and short-term services. It can both alleviate the long-term care burden on family caregivers and meet the needs of the elderly for home-based care. However, only a few cities in China have piloted respite care services. It is recommended to improve this service model as soon as possible and promote it nationwide. Second, leverage the positive role of community-based elderly care. Establish day care centers for the elderly in communities and equip them with professional caregivers to provide services such as daily care and rehabilitation treatment for the elderly. At the same time, implement the family doctor contract system. When the elderly have medical service needs, they can first get help from family doctors to provide convenient medical and health services for the elderly. In addition, following the idea of "the younger helping the older and the healthy assisting the disabled," organize a mutual assistance elderly care service team of younger elderly people to achieve mutual assistance within the elderly population. Third, develop a long-term care insurance

system. The establishment of a long-term care insurance system is in line with the concept of socialized elderly care. The government should take active measures to promote the implementation of long-term care insurance. Encourage families to provide informal family care services for the elderly and use cash payments. This can both enrich the supply of care services and save care service resources. Fourth, increase the allocation of elderly care service resources in rural areas to reduce urban-rural disparities. Support the public-private partnership model for rural nursing homes and encourage private capital to operate nursing homes to maximize their efficiency in providing rural elderly care services.

Secondly, it is necessary to increase the support for family caregivers. Children who provide care, especially those offering high-intensity care, often have to give up employment or reduce their working hours due to caregiving responsibilities. With the development of the economy and society, the opportunity cost of their caregiving is gradually increasing. Therefore, the government should provide appropriate material support for family caregivers. For example, caregiving allowances could be provided to children who take long-term care of the elderly or to families with multiple children, in order to alleviate their financial burden. For children caring for disabled or semi-disabled elderly individuals, regular free training in home caregiving skills could be offered to help them improve their caregiving abilities and service quality.

Lastly, it is essential to increase the policy inclination towards family elderly caregivers and employment support. On the one hand, it is necessary to facilitate flexible employment opportunities for family elderly caregivers. Consider arranging flexible employment positions for them or encouraging enterprises to implement flexible working hours, allowing employees to reasonably allocate time between family caregiving and work. This would enable them to earn income while fulfilling their caregiving responsibilities, thereby reducing their living pressure. On the other hand, the participation policy for flexible employment caregivers should be improved to increase their participation rate and safeguard their basic rights.

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