

Health Impact of Caring for Elderly Disabled Spouse: Multiple Mediation Model

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Abstract: This study aimed to examine the health impact of caring on caregivers who take care of old disabled spouse in the context of aging population and increasing empty-nest families. With the data of China Health and Retirement Longitudinal Study in 2015 and 2018, linear regression and logistic regression were used to testify the relationship between care provision and physical health of the spouse carers, and a multiple mediation model was employed to explore its formation mechanism. The results verified that caring for elderly disabled spouses is negatively associated with the physical health of the caregivers, and life pattern and mental health had significant mediating effects in this relationship. This article argued that appropriate supports and health promotion plans for the spouse caregivers of disabled elderly were needed in communities to improve their physical and mental health.

1 INTRODUCTION

Family is the first liable person who is responsible for the care for the elderly, which is also the main nursing resource in the face of challenges of aging. While family caregivers make contributions to their families and society, they suffer various pressures caused by care provision, which has raised concern of more and more scholars. Faced with burdensome care tasks, heavy economic burdens and relatively isolated living environments, many caregivers are exhausted and exposed to the risk of declining health. Studies have shown that caregivers are more likely to self-report poorer health status than non-caregivers. (Vitaliano, 2003; Chan, 2013; Berglund, 2015) Because caring requires a lot of physical labor, it is easy to cause physical pain in caregivers and affect their quality of life. (Hughes, 1999; Ho, 2009) In terms of objective physical indicators, the stress response system, immune system and cardiovascular system status of caregivers are also inferior to those of non-caregivers. (Vitaliano, 2003; Lovell, 2011; Känel, 2008) Accumulated high intensity care stress also increases the probability of visiting a doctor or taking medicine. (Vitaliano, 2003) In order to further explain the health effect of care activity, Vitaliano constructed a theoretical model of care stress and physical health based on

stress-coping theory and psychosomatic diseases theory. It was believed that the burden of care activities caused physical reactions by changing the psychological distress and life pattern of the caregivers, thereby affecting the rate of illness and even mortality. (Vitaliano, 2003; Vitaliano, 2004)

In China, the tradition of raising children to prevent aging is facing challenge with the changes of family structure and family functions. Fewer children, empty nests and the growing pressure of work and life on adult children have weakened the role of adult children in parental care and therefore spouses play an increasingly important role in care for disabled elderly. According to the data from China Longitudinal Healthy Longevity Survey (CLHLS), in the ten years from 2005 to 2014, the proportion of disabled elderly who were taken care of mainly by their spouses increased from 7.5% to 15.7%. However, research on health effects of care provision in China still focuses on child caregivers. Studies showed that married women who care for their parents were more likely to report poorer health outcomes in both urban and rural China. (GU, 2016; CHEN, 2016; SONG, 2021) However, the authors hadn't found studies examining the impact of care activities on health of spouse carers using nation-wide sample. In fact, the impact of care provision on health of older spouse caregivers is probably much greater than that of child caregivers,

mainly for two reasons: Firstly, spouse caregivers tend to provide longer term care and the burden of care is much heavier; secondly, spouses of the elderly tend to be older and have fewer resources for coping with stress, thus, their ability to alleviate the negative impact of the care burden on health is relatively weak. (Pinqart, 2003) A study completed by Schulz and Beach in the last century has received much attention, because they found that spouse caregivers who reported care stress had a 63% higher mortality rate than non-caregivers at four-year follow-up. (Schulz, 1999)

In view of this, in China, where traditional endowment culture and endowment pattern have been impacted, it is necessary to pay attention to spouse caregivers of elderly. It shows a concern for the individual well-being of this group as well as provides a dimension to evaluate the sustainability of this significant caring resource. Therefore, selecting the spouse caregivers of the disabled elderly as the research object and using national micro data, this study would explore the relationship between care provision and health of caregivers and analyze the possible generating mechanism of this relationship.

2 DATA AND METHODS

2.1 Data and Sample

This paper used data provided by the China Health and Retirement Longitudinal Study (CHARLS), which adopted multiple stage sampling to ensure unbiased and representative samples, with PPS sampling method used at the level of county and village and randomly selection method at the level of household and individual. The sample covered 450 communities in 150 counties and 28 provinces (autonomous regions and municipalities) across the country. By 2015, the samples were consisted of 23,000 respondents in 12,400 households.

This study selected the sample from the 2015 survey data according to the following procedures: First of all, the research compared caregiver and non-caregiver in elderly families, so we selected families with at least one person who is not less than 60 years old, and retained the individual sample in these families; Secondly, the non-caregivers mentioned in this paper do not include the care recipients, so the care recipient samples in the elderly family were excluded; Finally, the missing values of the control variables were cleaned up.

Then 11,059 valid samples were retained, of which 1,635 were caregivers.

2.2 Variables

2.2.1 Explained Variable: Health

Health was measured by three indicators: self-rated health, whether you have visited a doctor or taken medicine due to illness in the past month and whether your body is in pain. Self-reported health was the respondent's subjective evaluation of their own physical health, including five options: "very good", "good", "average", "not good" and "very bad", which were coded from 1 to 5 respectively in CHARLS data. For easily explaining and understanding, the variable was coded in reverse order in this study, so that the higher the score meant the better health status. At the same time, this paper selected the symptoms of whether the body felt pain and the fact of whether he or she had visited a doctor or taken medicine due to illness in the past month to reflect the objective evaluation of physical health status.

In addition to the health status of the respondents in the current period, this study was also concerned about the changes in the health status of the respondents in the follow-up survey. In 2018 interview, respondents were asked that "compared to the last visit, do you feel your health has improved, about the same, or worse". The case responding "worse" was assigned the value of 1, the one with "about the same" or "better" was assigned the value of 0.

2.2.2 Main Explanatory Variable: Caring for Disabled Spouses

Caring for disabled spouses includes two meanings: first, the elderly in the family have physical dysfunction; second, the spouse is the main caregiver of the disabled spouse. In the CHARLS questionnaire, the ADL and IADL scales were used to collect the relevant information of the respondents' physical dysfunction, including six basic activities and five instrumental activities of daily life. All respondents who reported difficulty or inability to complete one or more of them were defined as physical dysfunction in this study. The CHARLS questionnaire further asked, "Who help you the most in the above difficulties?" The respondents who answered "spouse" were considered to be disabled elderly cared for by their spouses. And their spouses were identified by their

family ID, thereby forming a sample of spouse caregivers caring for disabled elderly who were assigned a value of 1 to the care-giving variable. Excluding the disabled elderly being cared for, the care-giving variable of all other samples was set to be 0.

2.2.3 Mediating Variable: Life Pattern and Mental Health

Life pattern was mainly considered in two aspects of sleeping time and social activity participation in this study. The CHARLS survey included an item: "Have you done any of these activities in the last month? Interacted with friends; Played chess, Played cards or went to the community club; Provided help to others who do not live with you or did not pay you for help; Went to a sport, social or other kinds of club; Took part in a community-related organization; Done voluntary or charity work; Attended an educational or training course; Other." The number of categories selected by respondents was the value of social activities variable.

This paper used the self-rating depression scale to measure the mental health of respondents. The CHARLS questionnaire employed 10 items of depressive symptoms and asked respondents how often these symptoms occurred in the last week. The items of "little or no (<1 day)", "not too much (1-2 days)", "sometimes or some half of the time (3-4 days)", "most of the time (5-7 days)" were respectively marked as 0, 1, 2, 3 points in turn. 10 item scores were summed up as a depression assessment score with two positive emotion items scored in reverse. The higher the score represented the greater the likelihood of depression.

2.2.4 Control Variables

According to health production model proposed by Grossman (Grossman, 1972), this paper selected control variables from four aspects: basic demographic characteristics, health care services and health habits and health foundation. In terms of basic demographic characteristics, this study controlled gender, age, education level and working status. In terms of health care services, two variables, whether they have medical insurance and whether they have had routine physical examinations in the past year, were controlled. Explanatory variables for healthy habits included smoking and drinking. Following the previous literature (Chan, 2013; CHEN, 2016), this study

used the presence of chronic diseases to control the health base of the sample.

2.3 Methods

First of all, this study established a general linear model to analyze the relationship between caregiving of disabled elderly and the self-assessed health of spouse caregivers, and binary logistic regression analysis was used to verify the relationship between caring for disabled spouses and the likelihood of sickness, bodily pain, and worsened health in the next period of caregivers.

Then multiple mediator models was used to further discuss the path of the impact of care activities on physical health, and bootstrap method was employed to test the mediating role of mental health and life pattern, which were done by the SPSS plug-in provided by Preacher and Hayes.

3 RESULTS

3.1 Descriptive Statistic and Health Difference Between Caregivers and Non-Caregivers

Generally speaking, descriptive statistic in table 1 showed that the health condition of spouse caregivers were worse than non-caregivers. From the perspective of subjective indicator, caregivers ($M=2.95$, $SD=0.98$) were apt to report poorer health than non-caregivers ($M=3.12$, $SD=0.95$), which was a significant difference testified by independent sample T test ($t(10483) = -6.697$, $p < 0.001$). The proportion of caregivers who assessed their health condition as "bad" and "very bad" was 5.6% ($F(1, 10483) = 18.978$, $P < 0.001$) and 2.3% ($F(1, 10483) = 29.193$, $p < 0.001$) higher than that of non-caregivers respectively. Moreover, 59.5% of the caregivers reported that their health got worsen, and the proportion was significantly higher than that of non-caregivers ($F(1, 9573) = 44.819$, $p < 0.001$). In terms of objective indicator, compared with non-caregivers, more caregivers saw a doctor or took medicine for an illness in a month prior to the visit ($F(1, 11046) = 28.256$, $p < 0.001$). And the rate of caregivers who felt bodily pain was higher than that of non-caregivers ($F(1, 10482) = 62.397$, $p < 0.001$).

Table 1: Descriptive statistics.

variables	N	Caregivers (1) N=1635		non-caregivers (2) N=9424		difference (1)- (2)
		N(M)	%(SD)	N(M)	%(SD)	
self-reported health	10485	2.95	0.98	3.12	0.95	-0.17***
5-very good		157	9.9%	1034	11.6%	-1.7%*
4-good		152	9.6%	1174	13.2%	-3.6%***
3-average		824	51.9%	4855	54.6%	-2.7%
2-not good		355	22.4%	1492	16.8%	5.6%***
1-very bad		99	6.2%	343	3.9%	2.3%***
sick	11048	1099	67.2%	5675	60.3%	6.9%***
pain	10484	591	37.2%	2445	27.5%	9.7%***
health worsen	9575	858	59.5%	4067	50.5%	9.0%***
depression	9490	9.50	6.92	7.53	6.18	1.97***
sleeping time	11059	6.22	2.05	6.36	1.95	-0.14**
social activities	11059	0.65	0.93	0.82	1.03	-0.17***
male	11059	905	55.4%	4343	46.1%	7.4%***
age	11059	66.72	8.02	64.87	9.66	1.85***
education	11059					
primary and below		1267	80.2%	6650	70.6%	9.6%***
junior		249	13.5%	1739	18.5%	-5.0%**
high and above		119	6.3%	813	10.1%	-3.8%***
work	11059	985	60.2%	5516	58.5%	1.4%
insurance	11059	1487	90.9%	8420	89.3%	1.6%
examination	11059	753	46.1%	4024	42.7%	3.4%*
smoke	11059	854	52.2%	4039	42.9%	9.3%***
drink	11059	464	28.4%	2355	25.0%	2.6%**
chronic disease	11059	1297	79.3%	6841	72.6%	6.7%***

Note: *** p ≤ 0.001; ** p ≤ 0.01; * p ≤ 0.05. Independent sample T test was used to verify the difference of self-reported health, depression, sleeping time, types of social activity and age between caregivers and non-caregivers, and one-way ANOVA was for other variables.

3.2 Health Effect of Care-Giving Based on Regression Results

Table2 presented the results of regression of health variables when basic demographic variables, health care service conditions, health habits and health base of sample were controlled. Care-giving was a

significantly negative predictor for self-reported health ($\beta = -0.126$, $t = -5.095$, $p < 0.001$). Compared with non-caregivers, odds of sick, pain and worsened health for caregivers respectively increased by 25.4% ($=e^{0.226}-1$), 51.8% ($=e^{0.417}-1$), 39.0% ($=e^{0.059}-1$).

Table 2: Regression results of health variables.

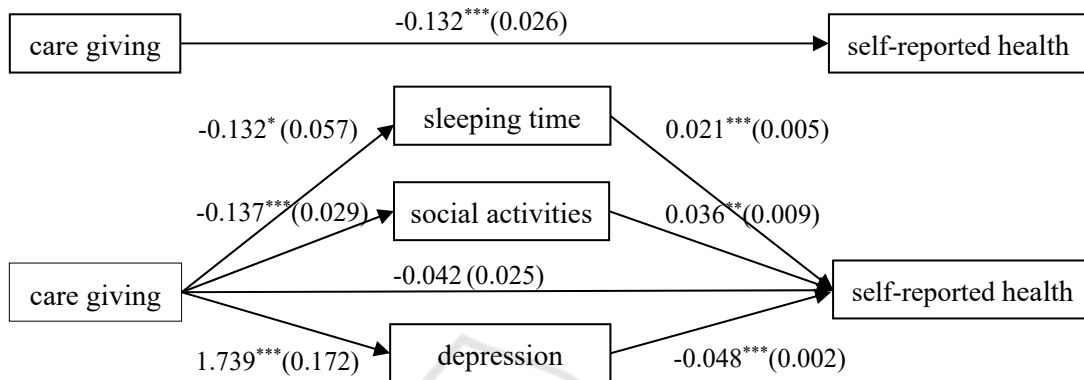
	self-reported health	sick	pain	health worsen
care-giving	-0.126***(0.025)	0.226***(0.059)	0.417***(0.060)	0.330***(0.059)
male	0.038(0.027)	-0.217**(0.063)	-0.647***(0.070)	-0.143*(0.064)
age	-0.001(0.001)	0.006*(0.002)	0.006*(0.003)	0.015***(0.003)
primary and below	-0.203***(0.030)	-0.034(0.071)	0.860***(0.093)	0.253***(0.073)
junior	-0.113***(0.034)	0.060(0.08)	0.385***(0.105)	0.139(0.082)
work	0.097****(0.020)	-0.118*(0.047)	0.051(0.050)	0.077(0.047)
insurance	0.022(0.029)	0.219***(0.067)	-0.046(0.074)	-0.116(0.071)
examination	0.014(0.018)	0.262****(0.042)	-0.102*(0.047)	-0.114***(0.043)
smoke	-0.019(0.026)	0.145*(0.060)	0.144***(0.067)	0.029(0.061)
drink	0.168****(0.022)	-0.105*(0.052)	-0.229****(0.061)	-0.066(0.053)
chronic disease	-0.644****(0.020)	1.217****(0.046)	1.233****(0.063)	0.529****(0.048)
constant	3.700****(0.081)	-1.020****(0.185)	-2.696****(0.221)	-1.379****(0.192)
-2Log Likelihood		13765.339	11620.364	12985.136
R ²	0.117			
N	11485	11048	10484	9575

Note: Estimated coefficient and standard error were reported. *** p ≤ 0.001; ** p ≤ 0.01; * p ≤ 0.05.

3.3 Mediating Effect of Lifestyle and Mental Health Based on Multiple Mediating Model

As the estimation results in Figure 1 showed, when controlling for basic demographic variables, health care service conditions, health habits and health base of sample, care provision had a negative

influence on spouse caregivers' health ($\beta = -0.132, t = -5.083, p < 0.001$), while care-giving was not significantly related to self-reported health after mediating variables of sleeping time, social activities, depression were added in the model ($\beta = -0.042, t = -1.685, p > 0.05$). Thus, it was a complete mediating model with significant total mediating effect.



Note: N=9487, adjusted R²=0.212. ***p ≤ 0.001; **p ≤ 0.01; *p ≤ 0.05.

Figure 1: Regression results of each path of mediation model.

Among the mediators of life pattern, caregivers had shorter sleeping time ($\beta = -0.132, t = -2.329, p < 0.05$) and less social activity types ($\beta = -0.137, t = -4.773, p < 0.001$). Meanwhile, sleeping time ($\beta = 0.021, t = 4.528, p < 0.001$) and social activity types ($\beta = 0.036, t = 4.049, p < 0.01$) were both positively associated with self-reported health. Bootstrapping test showed the mediating effects of sleeping time and social activity participation were both significant with the 95% confidence interval, as showed in table 3.

In term of mental health, caregivers got higher score in depression test ($\beta = 1.739, t = 10.087, p < 0.001$) than non-caregivers, which represented more severe depression symptoms and led to poorer self-reported health ($\beta = -0.048, t = -31.751, p < 0.001$). Thus, depression was a significant mediator between the relationship of care-giving and health, which was verified by bootstrapping test with 95% confidence interval.

Table 3: Mediating effect of life pattern and mental health and its bootstrapping test.

variables	estimated coefficient (standard error)	bootstrapping					
		percentile 95% CI		BC 95% CI		BC a 95% CI	
		lower	upper	lower	upper	lower	upper
sleeping time	-0.0027 (0.0014)	-0.0060	-0.0004	-0.0062	-0.0006	-0.0062	-0.0006
social activities	-0.0049 (0.0016)	-0.0081	-0.0022	-0.0083	-0.0023	-0.0083	-0.0023
depression	-0.0831 (0.0093)	-0.1018	-0.0659	-0.1022	-0.0659	-0.1022	-0.0659
total	-0.0907 (0.0098)	-0.1098	-0.0726	-0.1095	-0.0724	-0.1095	-0.0724

Note: BC, bias corrected; BC a, bias corrected and accelerated. 1000 bootstrap samples.

4 RESEARCH CONCLUSIONS AND POLICY IMPLICATIONS

4.1 Conclusion

This paper used the data of China Health and Retirement Longitudinal Study in 2015 and 2018 to study the relationship between care provision and health of spouse caregiver for disabled elderly, and demonstrated the impacting path. The results of independent samples t test and one-way ANOVA showed that there was a significant difference in the health status between caregivers and non-caregivers, and the spousal caregivers of the disabled elderly were in a relatively disadvantaged state. Further general linear regression and logistic regression analysis showed that the spouse caregivers of the disabled elderly were more likely to report poorer health status than other elderly people without physical dysfunction, and they were also more likely to experience pain in the body and got medical help due to illness in the past month. Using tracking data in 2018, it was found that those who cared for disabled spouses were also more likely to report worse health status in the next period than that of non-caregivers. The results of multiple mediation model analysis supported the theoretical model of care stress and physical health proposed by Vitaliano. Mental health and life pattern had significant mediating effects between caring for a disabled spouse and the physical health of caregivers. Spouse caregivers of the disabled elderly had shorter sleeping time, less social activities and higher scores in depression test, which all significantly associated with lower levels of self-rated health.

4.2 Policy Implications

This paper examined the impact of elderly care on health of spouse caregivers in the context of aging, empty nesting, and declining of traditional elderly care culture in China. And it demonstrated a hidden cost that caregivers beard while creating value for their families and society. The health of caregivers is not only a reflection of their own well-being, but also an important resource for care provision. When the health of caregivers is seriously overstretched, family care may be in the risk of quality reduction and even early termination. Therefore, appropriate support from society and community is needed.

In western countries, as the focus of endowment policies has shifted from institutions to

communities, the support policies for family caregivers in developed countries have gradually developed and improved, such as care allowances, respite services, individual consultation, mutual aid groups, work support, statutory caring vacation, which provide salutary experience for us to learn from, combining with China's national condition. By these supporting policies and services to ensure necessary rest time as well as social interaction time and to relieve psychological stress for caregivers of the disabled elderly, care burden will be appropriately reduced and family care will be better and sustainable. In the process of policy implementation, priority should be given to the spouse caregivers of disabled elderly who are having heavier caring tasks but fewer resources.

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