

Gender Differences in the Determinants of Mental Health of Co-residential Caregivers



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Contents

Background

- (1) Caregivers' burden and mental health
- (2) Causal relationship among caregivers' burden, mental health and physical health
- (3) Time spent on caregiving

Objectives

*I explore the complex interactions of caregivers' physical health and mental health. → **Objects of this study: Caregivers with work***

Data / Methodology

Results

Policy implications

Due to the time constraint, the study of ***the probability of continuation of caregiving*** is not presented today.

Background mental health

Caregivers' burden and mental health

Previous studies showed that the intensity of the caregiving is much greater for co-residential caregiving compared to extra-residential caregiving, and that those providing **high-intensity caregiving** (20 hours or more per week) were at twice the risk of psychological distress as non-caregivers.

Beach *et al.* (2000)

Hirst (2005) BHPS 1991–2000

OECD (2011)

Background physical health

Caregivers' physical health

Vitaliano *et al.* (2003, 2004) suggested two possible explanations for the relationships of illness to chronic stressors and bereavement. “First, chronic stress and psychosocial distress lead to elevated stress hormones,...Secondly, distress may trigger risky health behaviors such as poor diet,...”

The physical consequences of caregiving have received less attention than psychiatric outcomes.

Previous studies examined the relationships between caregivers' burden and mental health or physical health separately.

Chang *et al.* (2010)

Archives of Gerontology and Geriatrics 50

Background complex interactions

Caregivers' mental health had a stronger effect on physical health than did burden. The hours per day of caregiving and use of physical support were predictors of burden (Chang *et al.*, 2010).

Little is known about **the complex causal relationships among caregivers' burden, mental health status and physical health status**, including the causal path from the poor mental health to the poor physical health.

The objective burden of informal caregiving refers to the amount of time spent on caregiving. → *Next slide*

Background objective burden

Time spent on caregiving

Objective burden needs consideration independent of **subjective burden**, since the caregivers' mental state can alter their perception of personal burden and the patients' abilities to care for themselves, independent of their actual burden (Crocco and Eisdorfer, 2014).

The greater the intensity of caregiving, the greater the magnitude of the health effects due to chronic stress (Houser and Gibson, 2008).

Mentzakis et al. (2009) showed that co-residential informal care competes with other time-demanding activities, such as childcare and employment.

Female caregivers with work

Female caregivers with work are still **the main caregivers** of informal care in Japan.

In 2010, 41% of co-residential females in their fifties or sixties were the main caregivers.

The 2010 Comprehensive Survey of Living Conditions

The total number of minutes per day spent on caregiving, housework and market work of **co-residential female caregivers with work** was 506, which was greater compared to the other caregivers without work.

The 2011 Survey on Time Use and Leisure Activities

Objectives

[1] To examine the causal path **from caregivers' burden to mental health**, I analyze both the determinants of the hours spent on caregiving and the effect of the hours per week of caregiving on the mental health of caregivers.

[2] Taking into account both the causal path that **the poor physical health status such as having difficulty in daily life activities** has a positive effect on caregivers' own poor mental health and the reverse causal path, I explore **the complex interactions of caregivers' physical health and mental health**.

Feelings of distress and depression associated with caregiving also negatively affect the caregiver's physical health (Schulz and Sherwood, 2008).

Data

The 5-year longitudinal data (2005–2009) used in the present study were taken from the Longitudinal Survey of Middle-aged and Elderly Persons (LSMEP) conducted by the Japanese Ministry of Health, Labor and Welfare.

The respondents were 50–59 years old in 2005. The respondents filled out the questionnaires of the MHLW.

The LSMEP collects information about family situation, health status, and employment status on an annual basis. The number of subjects who returned the questionnaires at the 2nd survey was 32,285.

Limitations

The LSMEP did not provide information about **the severity of the care recipient**, thus we cannot investigate the initiation of informal caregiving or living arrangement.

Data *cont.*

Caregivers by labor force status and age

Caregivers with work > Caregivers without work

68.7% 9357 / (4259+9357)

Caregivers with work

Females under 61 years old (0.505) > Males under 61 years old (0.390)

Most Japanese companies have a mandatory retirement system and allow employees to work until age 60 at the time of the 2005 survey. The official employable age has been raised from 60 to 65 by 2013.

Data cont.

Individuals who responded the sum of hours spent on both caregiving and market work was beyond 168 hours per week were excluded.

The extent of missing income data was relatively large (39.8%, or 55,925/140,569 individual respondents).

However, Kumagai and Ogura (2013) confirmed that the missing income data were not systematically related to health variables; all of the correlation coefficients between the missing income data and health variables are very small (see Kumagai and Ogura 2013, Table 2).

Kumagai, N., Ogura, S. 2013. Persistence of physical activity in middle age: A nonlinear dynamic panel approach. *The European Journal of Health Economics* (DOI: 10.1007/s10198-013-0518-8).

Key variables

The respondents scored each item of **K6 variables** on a 5-point scale from 0 (never) to 4 (always true), with a high score indicating a severe psychosocial impairment.

Caregivers often make adjustments in employment status to facilitate caregiving, such as reducing or quitting work (Guberman *et al.*, 1992).

Caregiving with work seems to increase stress of female caregivers due to time pressure.

Thus I create *the priority of caregiving* as a dummy variable, which takes on the value of one if hours spent on caregiving exceed work hours.

Co-residential caregivers versus Non-residential caregivers

Variables	Co-residential caregivers (N=8473)						Non-residential caregivers (N=2085)					
	Females			Males			Females			Males		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Mental health	4335	4.56	4.52	3694	3.72	4.21	1161	4.26	4.58	790	3.69	4.30
Dummy for difficulty in daily life activities	4381	0.12	0.33	3785	0.08	0.27	1190	0.10	0.31	811	0.10	0.31
Hours spent on caregiving per week	4152	16.04	25.93	3418	12.30	22.70	1083	12.74	19.28	704	10.68	20.31
Dummy for high-intensity caregiving (below 40 h)	4572	0.14	0.34	3901	0.09	0.29	1240	0.12	0.33	845	0.09	0.28
Dummy for ultra-high-intensity caregiving (40 h or more)	4572	0.09	0.28	3901	0.06	0.24	1240	0.06	0.23	845	0.04	0.21
Dummy for hypertension	3886	0.23	0.42	3443	0.28	0.45	1000	0.25	0.43	721	0.34	0.47
Dummy for regular physical activity	4572	0.42	0.49	3901	0.39	0.49	1240	0.49	0.50	845	0.46	0.50
Work hours	4349	33.17	15.66	3786	45.14	13.87	1162	31.22	15.73	811	43.63	14.62
Real income (10 thousands yen per month at the time of the survey)	3758	20.18	65.99	3222	48.17	111.34	997	16.86	20.51	654	44.70	68.58
Dummy for the priority of caregiving	4572	0.22	0.41	3901	0.18	0.38	1240	0.22	0.42	845	0.19	0.39

Sources: Longitudinal Survey of Middle-aged and Elderly Persons 2005, 2006, 2007, 2008 and 2009.

Co-residential female caregivers

Mental health (4.56), Having difficulty in daily life activities (0.12),
Hours spent on caregiving per week (16.04)

Methods

An **instrumental variables (IV) estimation** of panel data is employed to examine the determinants of the hours spent on caregiving, because female caregivers with work appeared to adjust their work hours due to caregiving.

I use the lagged values of hours worked and income per month as instrumental variables when estimating the regression function of the hours per week of caregiving by the females.

I use **the dynamic random-effects probit model** to reveal the determinants of having difficulty in daily life activities of female caregivers.

$$y_{it}^* = \rho' y_{i,t-1} + \beta' x_{it} + \alpha_0 + \alpha_1' y_{i0} + \alpha_2' \bar{x}_i + \varepsilon_i + u_{it}$$

- Wooldridge proposed *a conditional maximum likelihood estimator* that considers the distribution conditional on the initial period observations and exogenous covariates.

Estimation function by females

Logged hours spent on caregiving

Instrumented variables are logged work hours and logged work hours squared.

Independent variables are lagged caregiving (priority, intensity of caregiving), demographic variables (age, co-residential,...), income, difficulty in daily life activities, chronic diseases and medical care use (diabetes, heart disease,...), house and care recipients, occupational status and work (part-time worker,..., managerial work,...), and lifestyle (drinking, regular physical activity, smoking).

Mental health

Instrumented variables are logged hours of caregiving and difficulty in daily life activities.

Independent variables are demographic variables (age, co-residential,...), income, chronic diseases and medical care use (diabetes, heart disease,...), house and care recipients, occupational status and work (part-time worker,..., managerial work,...), and lifestyle (regular physical activity).

Instrumental variables were **not** statistically significant in males.

Results Selected variables

Female caregivers

objective burden → poor mental health status ← poor physical health status

Table 3. Hours spent on caregiving by females (natural log)

Independent variables	Fixed-effects	
	OLS	IV
<i>Instrumented variables (IV regression)</i>		
Work hours (natural log)	0.0227 (0.286)	2.212** (1.014)
Work hours squared (natural log)	0.00419 (0.0524)	-0.313 (0.206)
Co-residential	0.0102 (0.110)	-0.00235 (0.125)
High-intensity caregiving (-1)	-0.364*** (0.0799)	-0.449*** (0.0899)
Ultra-high-intensity caregiving (-1)	-0.343*** (0.112)	-0.456*** (0.131)
Spouse's mother	0.444*** (0.112)	0.498*** (0.124)

Table 5. Mental health of caregivers

Independent variables	Females		Males	
	Random-effects		Fixed-effects	
	GLS	IV	OLS	IV
<i>An instrumented variable (IV regression)</i>				
Difficulty in daily life activities	2.458*** (0.237)	12.40*** (3.353)	0.597 (0.396)	-0.152 (0.576)
Hours of caregiving (natural log)	0.320*** (0.0754)	1.471** (0.610)	0.182* (0.108)	0.0709 (0.495)
Co-residential	0.276 (0.206)	-0.338 (0.377)	0.0557 (0.368)	-0.274 (0.579)
Age	-0.164*** (0.0377)	-0.182*** (0.0657)	0.0168 (0.101)	-0.0381 (0.152)
Heart disease	1.235** (0.510)	1.016 (0.910)	1.400** (0.591)	2.225*** (0.814)
Medication or doctor's consultation	-0.553** (0.269)	-0.347 (0.463)	0.845** (0.380)	0.690 (0.597)

Longer work hours than 12.6 hours per week had negative effects on the hours spent on caregiving.

Results

Hours spent on caregiving

Females

Determinants of the hours spent on caregiving

+	Ln (work hours)
-(13%)	Ln (work hours) squared
-	High intensity caregiving (-1)
-	Ultra high intensity caregiving (-1)
+	Spouse's mother
+	Having cancer
+(7%)	Having hypertension

Instruments

Ln (hours of caregiving) (-1)
Ln (hours of caregiving) (-1) squared
Ln (income per month) (-1)

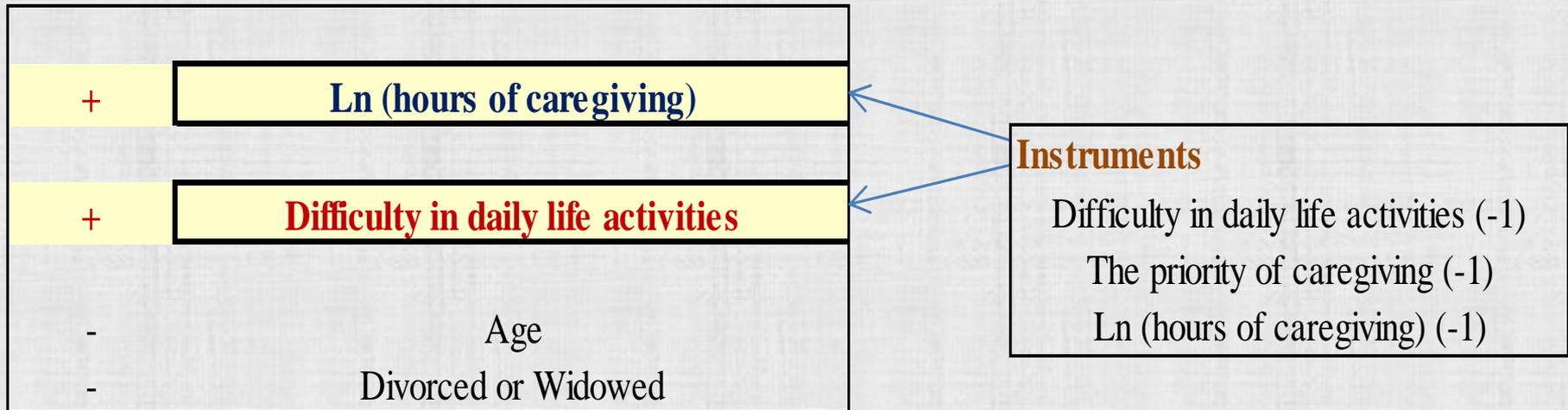
The estimation result of the fixed-effects IV model in females showed that the number of hours spent on caregiving was greater when the recipient was the spouse's mother.

In contrast, the number was lower when high-intensity caregiving was provided in the previous period.

Results Mental health

Females

Determinants of mental health



The random-effects IV model taking the reverse causality into account suggested that having difficulty in daily life activities had a positive effect on the poor mental health of female caregivers.

Results *Mental health cont.*

Males



Instrumental variables were **not** statistically significant in males.

Male caregivers having heart disease tended to be in poor mental health.

It was **not** a determinant of the mental health of caregivers to live together with care recipients in the home.

Policy implications

There were gender differences in the main determinants of the mental health of the caregivers.

The longer hours of caregiving caused a higher prevalence of mental health problems among female caregivers.

From the viewpoint of the effect of time allocation on health, the priority of caregiving is an important factor of informal caregiving.

Improving female caregivers' mental health by maintaining the priority of caregiving and reducing the hours per week of caregiving is a very important health policy.