The impact of a new grandchild on grandparents' mental health: Evidence from CHARLS

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Abstract: Becoming a grandparent may be both a source of happiness and stress, particularly in China, where custodial grandparenting is common. This paper examines the impact of a new grandchild on grandparents' mental health in China. We use newly released longitudinal data from CHARLS, a study that follows individuals aged 45 years and older in China. We use individual fixed effect models to control for time-invariant confounding. Preliminary results suggest that a new grandchild leads to a modest reduction in depressive symptoms and a small improvement in cognitive function. However, these effects disappear after controlling for time-changing covariates. Results suggest that the experience of a new grandchild may have weak or no effects on the mental health and cognitive function of older parents.

Background

The aim of this paper is to examine the impact of having a new grandchild on the mental health of older grandparents in the context of major family policy transformation in China during the last decade. Examining the relationship between grandparenting and health outcomes in modern China is of special significance for several reasons. First, China has the largest population in the world, and it is ageing very quickly due to reduced fertility and mortality rates. According to the National Population Sample Survey in 2015, China has a total population of almost 1.4 billion people, 16.2% of which is aged 60 years or older (Guo, 2017). These demographic trends have occurred in the context of increasing rural-to-urban migration and female labour force participation among young parents, which has led to major increases in the demand for care by grandparents (Arpino et al., 2014). To date, however, there is limited understanding of how this increase in the participation of older parents in the caring of young grandchildren influences the health and wellbeing of older generations.

According to role theory, individuals are members of a social network and hold expectations about their own behavior and the behavior of others (Biddle, 1986). Therefore, the role of grandparents is defined by their particular function in the family (Lou et al., 2012). After the grandchild is born, the family structure may be transformed from a nuclear family to a multigenerational household, entailing new responsibilities for grandparents (Thang, 2012). In China, where family harmony is highly praised and its culture dictates grandparenting as almost a compulsory responsibility (Chen et al., 2011), grandparents may experience stress associated with this role, potentially leading to poorer mental health.

For many older people in China, the timing of grandparenthood occurs roughly around the period of retirement (Feng et al., 2018). Transition to grandparenthood generally adds to role load associated with retirement transitions, bringing extra pressure on those who also need to adjust themselves to post-retirement status, potentially giving rise to additional role strain. In addition, in urban China, a tension may arise for cohabiting grandparents with their adult children as a result of different views of inflicting disciplining and corporal punishment on grandchildren (Wang et al., 2018). Studies suggest that the relationship between daughters-in-law and mothers-in-law is often vulnerable to deterioration due to arguments about contrasting childrearing practices in rural China (Cong et al., 2012). So far, few studies have examined to what extent the arrival of a new grandchild affects grandparent's mental health in the context of China.

In this study, we examine the relationship between having a new grandchild and grandparents' mental health. Using nationally representative longitudinal data from China, we examine how a new grandchild affects grandparents' depressive symptoms and cognitive function.

Data and Method

Data

We use data from the China Health and Retirement Longitudinal Study (CHARLS), a nationally representative study with baseline data conducted in 2011. It covers 150 counties and 450 villages with a sample of about 10,000 households and 17,500 individuals aged 45 and above. Modelled after the US Health and Retirement Study, CHARLS collects comprehensive individual information about family background, personal education, employment history, financial well-being, and physical and mental health. Each respondent interviewed in 2011 is followed every two years. For the purpose of this thesis, 3 waves are used, i.e. 2011 baseline national wave, together with 2013 and 2015 follow-up waves. (The 2017 wave data will be released in due course and will be included in updated analysis).

Number of grandchildren

Table 1 offers an overview of the questions that have been asked in CHARLS to measure the number of grandchildren. By comparing the total number of grandchildren that grandparent had for each wave, we are able to identify new grandchildren in the family between waves.

Table 1. Measurement of number of grandchildren in CHARLS

wave	Question	description
2011	CB065	How many sons does CHILDn's NAME have?
	CB067	How many daughters does CHILDn's NAME have?
2013	CB065	How many children does CHILDn's NAME have?
2015	CB065	How many children does [child'sname] have?

Mental health

The dependent variables in this analysis are the depression level and the cognitive function of grandparents. For depressive symptoms, CHARLS contains the 10-item version of Center for Epidemiologic Studies-Depression (CES-D) scale. Items included in this scale are summarized in Table 2. The CES-D 10 scale has been proved to have high validity in China (Ren et al., 2014). Respondents were asked questions about their feeling during the previous week and for each question they had to select only one answer from four choices: (1) Rarely or none of the time (<1 day); (2) Some or a little of the time (1-2 days); (3) Occasionally or a moderate amount of the time (3-4 days); (4) Most or all of the time (5-7 days). In line with previous study (Andresen et al., 1994), a total score ranging from 0 to 30 is used, with higher score indicating worse performance. A cut-off point of 10 is used (Guo et al., 2017), with grandparents having 10 or more points recorded as having depressive symptoms, and those with less than 10 recorded as having no depressive symptoms.

Table 2. CES-D 10 scale in CHARLS 2011 questionnaire

Question	description
DC009	I was bothered by things that don't usually bother me.
DC010	I had trouble keeping my mind on what I was doing.

DC011	I felt depressed.
DC012	I felt everything I did was an effort.
DC013	I felt hopeful about the future.
DC014	I felt fearful.
DC015	My sleep was restless.
DC016	I was happy.
DC017	I felt lonely.
DC018	I could not get “going”.

Cognitive function is measured by episodic memory and mental status, as suggested by previous studies (Lei et al., 2014). Episodic memory is the average of immediate and delayed recall scores (respondent was asked to repeat instantly and four minutes later in any order ten Chinese nouns read to them). Items to assess mental status are also summarized in Table 3 with scores ranging from 0 to 12.

Table 3 measure of cognitive function in CHARLS 2011 questionnaire

measure	Question	description
Episodic memory	DC007	Please repeat the words you are able to recall.
	DC027	(4 min later) Please repeat the words you are able to recall.
Mental status	DC001s1	Please recall the year.
	DC001s2	Please recall the month.
	DC001s3	Please recall the day.
	DC002	Please recall the day of the week.
	DC003	Please recall the season.
	DC019	What does 100 minus 7 equal?
	DC020	And 7 from that?
	DC021	And 7 from that?
	DC022	And 7 from that?
	DC023	And 7 from that?
	DC024	Whether the respondent used paper and pencil or any other aid when completing the number substraction?
	DC025	Please draw that picture on this paper.

Socio-demographic variables

Family background information is also included in the analysis. Socio-demographic covariates assessed include age, gender, marital status, ‘Hukou’ status, educational level, financial well-being, physical health and other health behaviors at baseline (obesity, and smoking). These covariates are included because previous studies have reported that they might be important confounders of the association between grandparenting and health (Di Gessa et al., 2016; Liu et al., 2017).

Method

Typically, random effects (RE) models assume that the unobserved heterogeneity is uncorrelated with the independent variable; violations of this assumption can produce

biased estimates. Fixed effects (FE) models use only variation within individuals over time, with participations acting as their own control, effectively eliminating any time-invariant confounding. Therefore, we use fixed effects models to address confounding by unobserved permanent characteristics.

Results

The valid sample size included 3,352 individuals, 1464 (43.68%) of which reported a new grandchild over this 4-year period. Table 4 shows basic descriptive characteristics of the sample, which had a mean age of 59.6 years. Preliminary findings show that an additional grandchild reduces depressive symptom scores (Table 5). However, these effects are relatively small and become insignificant after controlling for time-varying covariates. A new grandchild also reduces mental health status scores, but these effects become non-significant after controlling for covariates. There is no significant effect of a new grandchild on memory.

Table 4 Socio-demographic characteristics of baseline sample (N = 3352)

variable	mean	SD	frequency	percentage
age	59.63	9.42		
Income	1252.34	2062.99		
Gender (male)			1736	51.79
Hukou (non-agricultural)			811	24.19
Marriage (not in marriage)			876	26.13
Education (above elementary)			1201	35.83

Reference group in parentheses

Table 5 impact of number of grandchildren on grandparents' depressive symptoms (FE)

Variable	Model 1	M2	M3
Number of grandchildren	-0.011*	-0.002	-0.002
age		-0.03***	-0.03***
gender		omitted	omitted
edu		omitted	omitted
hukou		-0.07***	-0.07***
marriage		-0.09**	-0.09*
income		-0.00***	-0.00***
Episodic memory			0.00
Mental status			-0.01*
F-test scores	5.73	20.16	15.73
Prob > F	0.0168	0.0000	0.0000

Coefficient is given; *p<0.5, **p<0.1, ***p<0.01

Table 6 impact of number of grandchildren on episodic memory of grandparents (FE)

Variable	Model 1	M2	M3

Number of grandchildren	0.009	0.027	0.027
age		-0.01	0.00
gender		omitted	omitted
edu		omitted	omitted
hukou		0.18***	0.16**
marriage		0.06	0.05
income		-0.00**	0.00*
Depression			0.00
Mental status			0.08***
F-test scores	0.38	7.17	17.03
Prob > F	0.5380	0.0000	0.0000

Coefficient is given; *p<0.5, **p<0.1, ***p<0.01

Table 7 impact of number of grandchildren on mental status of grandparents (FE)

Variable	Model 1	M2	M3
Number of grandchildren	-0.064**	-0.003	0.024
age		-0.08***	-0.09***
gender		omitted	omitted
edu		omitted	omitted
hukou		0.22**	0.18*
marriage		0.10	0.06
income		0.00***	0.00**
Depression			-0.15*
Episodic memory			0.16***
F-test scores	9.64	23.09	30.06
Prob > F	0.0019	0.0000	0.0000

Coefficient is given; *p<0.5, **p<0.1, ***p<0.01

Preliminary conclusion

A new grandchild might lead to small improvements in depressive symptoms and cognitive mental status. However, these effects are small and lose statistical significance after controlling for confounders. We will expand these results by looking at differences by gender, education and employment status; and we will explore the potential mechanisms that might link grandparenting to mental health and cognition.

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