

LONDON  
SCHOOL of  
HYGIENE  
& TROPICAL  
MEDICINE



LSHTM Research Online

Grundy, EM; Albala, C; Allen, E; Dangour, AD; Elbourne, D; Uauy, R; (2012) Grandparenting and psychosocial health among older Chileans: A longitudinal analysis. *Aging & mental health*. ISSN 1360-7863 DOI: <https://doi.org/10.1080/13607863.2012.692766>

Downloaded from: <http://researchonline.lshtm.ac.uk/21123/>

DOI: <https://doi.org/10.1080/13607863.2012.692766>

**Usage Guidelines:**

Please refer to usage guidelines at <https://researchonline.lshtm.ac.uk/policies.html> or alternatively contact [researchonline@lshtm.ac.uk](mailto:researchonline@lshtm.ac.uk).

Available under license: <http://creativecommons.org/licenses/by-nc-nd/2.5/>

<https://researchonline.lshtm.ac.uk>



## Grandparenting and psychosocial health among older Chileans: A longitudinal analysis

Emily M. Grundy<sup>a\*</sup>, Cecilia Albala<sup>b</sup>, Elizabeth Allen<sup>a</sup>, Alan D. Dangour<sup>a</sup>, Diana Elbourne<sup>a</sup>  
and Ricardo Uauy<sup>a</sup>

<sup>a</sup>*Faculty of Epidemiology and Population Health, London School of Hygiene & Tropical Medicine, London, UK;*

<sup>b</sup>*Instituto de Nutrición y Tecnología de los Alimentos, University of Chile, Santiago, Chile*

(Received 14 January 2012; final version received 5 May 2012)

**Objectives:** To investigate factors associated with Chilean grandparents' provision of help to grandchildren and associations between provision of such help and grandparents' mental well-being two years later.

**Methods:** Data are drawn from a representative sample of 2000 people aged 66–68 resident in low- or middle-income areas of Santiago who were surveyed in 2005 and re-interviewed two years later. Multivariable analyses were used to investigate factors associated with provision of help to grandchildren at baseline and associations between providing such help and life satisfaction, SF36-Mental Component Summary scores, and depression two years later.

**Results:** 41% of grandparents lived with one or more grandchildren and over half provided four or more hours per week of help to grandchildren. Models controlling for baseline mental health, grandchild characteristics, marital and household characteristics, socio-economic status and functional health showed that grandfathers who provided four or more hours per week of help to grandchildren had better life satisfaction two years later and that those providing material help had higher SF36 MCS scores at follow-up. Grandmothers providing four or more hours of help a week had lower risks of depression.

**Conclusion:** Older Chileans make important contributions to their families through the provision of help to grandchildren and these appear to have some benefits for their own psychosocial health. Gender differences in the pattern of associations may reflect differences in overall family responsibilities and merit further investigation.

**Keywords:** depression; quality of life/wellbeing; mental health

### Introduction

The Chilean population is rapidly ageing due to a process of fast demographic transition in the second half of the twentieth century (Palloni, McEniry, Wong, & Pelaez, 2006). Further understanding of possible influences on health in later life, including mental health, is therefore important particularly as the prevalence of depression among older people in Chile is high in comparison with other Latin American countries (Albala et al., 2005; Zunzunegui, Alvarado, Beland, & Visandjee, 2009). In this study, we investigate Chilean grandparents' help to grandchildren and associations between providing such help and grandparents' subsequent mental well-being.

Numerous studies have documented the contributions that grandparents make to the support of younger family members, including providing assistance with the care of grandchildren. The benefits of this support for the recipients, and for society as a whole, are well recognised (Hank & Buber, 2009; Ruiz & Silverstein, 2007) but evidence on implications for grandparents is mixed. Altruistic behaviours and balanced intergenerational exchanges are hypothesised to have mental health benefits (Fujiwara & Lee, 2008; Hayslip & Kaminiski, 2005) but caring for children can be stressful and may limit opportunities for other forms of activity, social engagement and self-care with

consequent negative health implications (Jendrek, 1993; Minkler, 1999; Szinovacz, DeViney, & Atkinson, 1999).

Much previous research on grandparenting and mental health has been based on studies from the US and has focussed on grandparents providing custodial or intensive care for grandchildren. In general, these studies have reported poorer mental (and physical) health for grandparents in 'skipped generation' households with primary responsibility for grandchildren, and for grandparents living with grandchildren in three generation households (Hayslip & Kaminiski, 2005; Minkler, 1999; Minkler & Fuller-Thomson, 2001; Musil & Ahmad, 2002) although some longitudinal studies suggest that negative effects reduce over time (Blustein, Chan, & Guanais, 2004; Szinovacz et al., 1999).

However, it is unclear to what extent these findings may reflect prior characteristics and experiences of the grandparents involved (Strawbridge, Wallhagen, Shema, & Kaplan, 1997), especially as custodial grandparenting in the US is often precipitated by mental health or addiction problems of the child's mother (Minkler, 1999), or whether similar associations apply to grandparents providing lesser amounts of help. Hughes, Waite, LaPierre, and Luo (2007) found that grandparent carers had poorer mental

\*Corresponding author. Email: Emily.grundy@lshtm.ac.uk

health than other grandparents even before assuming care for a grandchild and some indications that grandmothers providing less intensive help to grandchildren had reduced risks of depression. Similarly, Fujiwara and Lee (2008) in analyses of another US longitudinal study in which baseline mental health characteristics were controlled, found that providing moderate amounts of help to grandchildren was protective against depression two–three years later for grandfathers, although not for grandmothers. Some other studies have also reported gender differences in associations between grandparenting and mental health. Analyses of the US National Survey of Families and Households undertaken by Minkler, Fuller-Thomson, Miller and Driver (1997), for example, found more depression among caregiving grandmothers than equivalent grandfathers.

The applicability of results from studies of grandparenting in the US or other high-income Western countries to low- or mid-income societies with different patterns of family and household organisation is also questionable. In Latin America, three generation households are much more prevalent than in North America or Europe (De Vos, 1990; United Nations, 2005) and involvement in extended family life may be beneficial for older people's mental health. Previous longitudinal studies of grandparenthood and mental health are lacking but results from cross sectional analyses suggest that for older Cubans, for example, social networks centred on children and the extended family are associated with a low frequency of depressive symptoms (Sicotte, Alvarado, Leon, & Zunzunegui, 2008). Results from China also show a different pattern of associations from those reported in the US. One cross sectional study of a rural Chinese population found that older parents living in three-generation households or with grandchildren in skipped-generation households had better psychological well-being than those living in single-generation households, a finding attributed in part to the cultural value attached to multi-generational co-residence (Silverstein, Cong, & Li, 2006).

In this article, we use longitudinal data on a representative sample of older people resident in the Greater Santiago area of Chile to investigate the relationship between providing help to grandchildren and mental health. To our knowledge, this is the first longitudinal investigation of the implications of providing grandchild care for the mental health of grandparents in a Latin American population.

### **Aims and hypotheses**

The first aim of the research reported here was to analyse factors associated with the provision of help to grandchildren in a sample of Chilean grandparents. On the basis of previous studies, we expected that women would be more involved in providing care for grandchildren than men but that grandfathers might provide

more material assistance. We also expected that factors related either to potential demand for grandparent help (number of grandchildren, age of youngest grandchild and grandchild in the household) or ability of grandparents to provide it (health status and competing activities) would be associated with differentials in provision.

The second aim of the study was to investigate associations between provision of this help and mental health outcomes two years later. As summarised in the introduction, previous research and theory provide conflicting evidence on the possible direction of any such association in the older Chilean population. Studies from the US suggest that coresidential or custodial grandparenting, but possibly not provision of lesser amounts of help, has negative effects on mental health. In Latin American societies, three generational family connections, including co-residence, may be more 'normative' and possibly beneficial for older people's mental health. On the other hand, the poorer economic and physical health status (Zunzunegui et al., 2009) of older Chileans compared with North Americans may increase vulnerability to stresses attendant on providing care for grandchildren.

### **Data**

We used data collected in 2005 from a sample of people aged 66–68 resident in low or middle income areas of the Santiago Metropolitan area of Chile. The sample comprised participants in a cluster randomised controlled trial primarily designed to investigate the cost effectiveness of a nutritional supplement and/or exercise programme on pneumonia incidence, walking capacity and body mass index. The restricted age range was chosen in order to include respondents just below the threshold age for automatically receiving the nutritional supplement the effectiveness of which the trial aimed to evaluate. Full details of the trial methodology and primary findings have been reported elsewhere (Dangour et al., 2007, 2011). In brief, the sampling strategy involved recruiting from age-eligible people registered with 20 health centres in low- or middle-income areas of Santiago. Exclusion criteria were inability to walk unaided; having sought medical advice for unplanned weight loss in the past three months; already consuming the nutritional supplements the trial was designed to evaluate; planning to move house within the next three months or poor cognitive function (Mini Mental State Examination short form test score of <13 and Pfeffer score of 6 or more). This sampling strategy resulted in identification of 2649 eligible participants of whom 2002 were recruited to the trial, a response rate of 76%. All participants gave signed informed consent and the trial was approved by the Institutional Review Board at INTA, University of Chile and the London School of Hygiene & Tropical Medicine Ethics Committee.

Participants were interviewed at baseline in their local community centre or at home if unable to visit the community centre. Information was collected on physical and mental health status; on socio-economic and demographic characteristics, including level of education, family and household structure and number of grandchildren, and on participation in various activities. These included provision of help to grandchildren, participation in community organisations, and paid and unpaid work. At the end of the trial, 24 months after enrolment, respondents were re-interviewed when the baseline questionnaire (with a few minor amendments) was re-administered. By the time of this follow up, 28 respondents had died; 1669 of the remainder (85%) were successfully interviewed. Most loss to follow-up was due to inability to locate respondents at their previous address, despite several attempts. Additionally, small proportions were known to have moved out of the study area or refused re-interview.

## Measures

### *Grandchildren, help to grandchildren and family and household characteristics*

Respondents were asked how many grandchildren they had and for the ages of the youngest and oldest. A social definition of grandchildren was chosen as being most appropriate to the study population with interpretation of who constituted a grandchild left to respondents. An additional question asked about 'other children you consider to be like grandchildren' who were included with grandchildren. Respondents were asked whether they 'regularly helped' grandchildren (including children considered to be like grandchildren) and approximate hours per week spent helping (none; less than 2; 2–4 or 4 or more). They were also asked if they regularly provided help with money or material goods that grandchildren needed. Information collected on all household members and their relationship to the respondent was used to derive a three-category household type variable distinguishing those living alone or just with a spouse/partner; those living with other relatives (whether or not they also lived with a partner) not including a grandchild, and those living with other relatives (with or without a partner) including one or more grandchildren. Information on marital or partnership status was dichotomised into married or living with a partner versus unmarried/unpartnered.

### *Mental health and well-being outcomes*

Life satisfaction was measured using an indicator derived from responses to four items from Neugarten's life satisfaction scale (Neugarten, Havighurst, & Tobin, 1961): 'As I grow older things seem better than I thought they would be'; 'These are the best years of my life'; 'I feel my age but it doesn't worry me' and

'These are the worst years of my life'. Respondents were asked whether they agreed, disagreed or neither agreed nor disagreed with these statements and a score was derived distinguishing those with positive attitudes (yes to the first three items and no to the fourth); those with negative attitudes (no to the first three items and yes to the fourth) and an intermediate group, termed neutral, with other mixtures of responses. The second indicator of mental health was score on the Mental Component Summary (MCS) of the SF-36 scored using an algorithm derived for Chilean older people (Lera, Fuentes, Sanchez, & Albala, 2009). This was included as a continuous variable. Depression was measured using the 15 item Geriatric Depression Scale (GDS) (Sheikh & Yesavage, 1986) with those with scores of 5 or more considered as having depressive symptoms.

### *Other co-variables*

Other covariates were selected on the basis of the research questions and the previous literature on factors associated either with provision of help to grandchildren and/or with mental health outcomes. Indicators of socio-economic status and resources included years of education (grouped 0–5 or not known, 6–8, 9+) and household income per household member which was used in analyses of variations in transfers of money or material goods to grandchildren. Physical health status was measured using an indicator of functional health based on responses to 15 questions about limitations in specific areas of function or mobility including reaching; lifting; bending; stair climbing; walking; running and also bathing and dressing. On the basis of the observed distribution, we distinguished three groups: those with 0–2 limitations (low); those with 3–4 limitations (mid) and those with five or more limitations (high).

Variables based on questions about paid and unpaid work and participation in community organisations were included as participation in these activities might compete with the provision of help to grandchildren and are known to be associated with mental health (Menec, 2003; Sirven & Debrand, 2008). In Chile competing demands from work are likely to be particularly relevant, and to vary by level of education, even though those included in this study were older than the legal retirement ages of 65 for men and 60 for women. This is because the part privatised system introduced in the early 1980s worked reasonably well for workers with regular jobs, but not for the many Chileans, particularly the less well educated and women, who rely on part-time, seasonal or informal work and so have limited opportunities for acquiring the 20 years of contributions required for even the minimum pension (Williamson, 2005). For those lacking contributory pensions the only other state provision available at the time this study was conducted was rationed access to low-level 'assistance'

pensions (Williamson, 2005). We defined paid work as being employed, working in a family business (whether paid or unpaid), or undertaking various self-employed activities. Community work was defined as voluntary work for a community, charitable, educational or similar body or participation in a community group, club or other organisation. For most variables considered, item non-response and consequent missing data was trivial. The exception was information on household income which was missing for 6.7% of the baseline sample of grandparents.

### Analysis

The analysis was restricted to the 608 men (94%) and 1352 women (also 94%) who reported having at least one grandchild. We first investigated factors associated with the provision of help to grandchildren at baseline. Hours of help provided (time help) was analysed using ordinal logistic regression with three outcome categories; no help given (reference); less than four hours per week, and four or more hours per week. Models were specified in accordance with the previous literature and study research questions. Model 1 includes variables related to demand or need for help, namely grandchild characteristics and family and household situation (number of grandchildren; age of youngest grandchild; household type and marital status). Number of grandchildren was included as a continuous variable; age of youngest grandchild was included as a categorical variable distinguishing four groups (0–4, 5–10, 11+, age not known). Model 2 additionally includes potential confounding variables and variables related to ability to provide help and possible competing demands (educational status, functional health limitations, paid work and involvement in voluntary or community activities). We also used logistic regression to analyse the dichotomous outcome provision of help with money or material goods, including equivalised household income as an additional co-variate, but report only briefly on results of this here due to limitations of space.

In the second stage of the analysis, we analysed differences in the three mental health outcomes at follow-up (life satisfaction; SF-36 MCS score and depression score). Life satisfaction and depression were dichotomised into outcomes representing positive life satisfaction versus neutral or negative and GDS score of 0–4 (reference) versus 5 or more (indicative of depressive symptoms). These were analysed using logistic regression. Linear regression was used to analyse the continuous SF-36 MCS score after preliminary checks that the distribution met assumptions required. Three models were fitted in these analyses. In addition to the main variable of interest (help to grandchildren), Models 1 and 2 were as specified in the first part of the analysis and included grandchild and family and household variables (Model 1) and additionally variables relating to education, physical health

and work and community activities (Model 2). Model 3 also included the baseline value of the mental health outcome being investigated. In the interests of brevity, we show here only results from Models 1 and 3 and comment briefly on differences between Model 2 and the final Model 3; full results are available from the authors on request. We dichotomised the follow-up outcome measures of life satisfaction and depression in the interests of model parsimony but retained more information in the equivalent baseline co-variate and used a trichotomous indicator distinguishing positive, neutral and negative life satisfaction scores and GDS scores of 0–4, 5–9 and 10+ respectively.

Random-effect models were used to account for clustering (by health centre) in all regression analysis. All analyses were undertaken using STATA version 11 or 12 and results presented are for those with available data for all variables included in the relevant series of models.

### Results

#### *Descriptive results*

Table 1 presents descriptive information about the sample at baseline. Grandfathers had an average of 6.9 grandchildren and 55% had one or more grandchildren aged under 5. Grandmothers had on average slightly more grandchildren (8.2) and slightly older grandchildren, reflecting women's generally earlier age at parenthood and so grandparenthood. Co-residence with one or more grandchildren was slightly more usual among grandmothers (43%) than grandfathers (38%). Three quarters of the sample provided some time help to grandchildren; the proportion providing four or more hours per week was higher among grandmothers (55%) than grandfathers (48%). However, grandmothers were slightly less likely than grandfathers to provide help to grandchildren with money or material goods (54% versus 59%). Few grandparents provided only help with material goods and overall 70% of those providing time help, also provided help with money. There were large gender differences in other characteristics of sample members. Compared to women, men had higher levels of education, were much more likely to be married or partnered and to have paid work, although a higher proportion of women than men were involved in community organisations. Women's functional health was much worse than that of men; 54% had five or more functional limitations compared with 29% of men.

Table 2 shows the life satisfaction, SF-36 MCS and depression scores at baseline and follow-up for those included in the follow-up; comparable information for the whole baseline sample is also presented as a guide to possible bias resulting from differential inclusion in the follow-up by baseline mental health status. 60% of women and 61% of men had had positive life satisfaction scores at baseline; by follow up these

Table 1. Characteristics of grandparents at baseline, 2005.

	Grandfathers		Grandmothers	
	(%)/Mean (SD)	<i>N</i>	(%)/Mean (SD)	<i>N</i>
Provision of help to grandchildren		608		1264
None	21.55		22.63	
Money/things they need only	3.78		3.88	
Time only: 0 > 4 hours per week	6.91		6.80	
Time only: 4+ hours per week	12.34		16.53	
Money + 0 > 4 hours help per week	19.41		11.63	
Money + 4+ hours help per week	36.02		38.53	
All providing help with money*	59.21		54.04	
All providing 0 > 4 hours help per week***	26.33		18.43	
All providing 4+ hours help per week**	48.36		55.06	
Grandchild characteristics		608		1264
Number of grandchildren***	6.92 (5.18)	605	8.15 (6.33)	1249
Age group of youngest***		608		1264
0-4	54.77		45.81	
5-10	26.48		30.62	
11+	7.57		11.87	
Not known	11.18		11.71	
Household type*		608		1264
Alone or with spouse only	29.77		24.84	
With other relatives (+/- partner), not including grandchild	32.73		32.52	
With other relatives (+/- partner), including grandchild	37.50		42.64	
Married/partner***	85.86		56.96	
Education (years)***		608		1264
<6 (incl. not known) (Low)	25.66		36.31	
6-8 (Mid)	41.45		39.72	
9+ (High)	32.89		23.97	
Other activities		608		1263
Has paid work***	51.81		27.16	
Has community work**	32.40		40.66	
Functional limitations***		608		1264
5 or more (High)	29.11		54.11	
2-4 (Mid)	22.70		24.53	
0-2 (Low)	48.19		21.36	

Notes: Difference between grandfathers and grandmothers.

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p > 0.05$ .

Table 2. Indicators of mental well-being at baseline (2005) and follow-up (2007).

	Grandfathers			Grandmothers		
	Baseline, whole sample	Baseline, those in follow-up	Follow-up	Baseline, whole sample	Baseline, those in follow-up	Follow-up
Life satisfaction score	( <i>N</i> = 607)	( <i>N</i> = 465)	( <i>N</i> = 465)	( <i>N</i> = 1263)	( <i>N</i> = 1081)	( <i>N</i> = 1081)
Negative (%)	10.54	9.89	12.69	12.98	13.04	16.74
Neutral (%)	30.31	28.17	30.54	27.08	27.10	29.88
Positive (%)	59.14	61.94	56.77	59.94	59.85	53.38
SF-36: mental component score	( <i>N</i> = 603)	( <i>N</i> = 464)	( <i>N</i> = 464)	( <i>N</i> = 1255)	( <i>N</i> = 1072)	( <i>N</i> = 1072)
Mean (SD)	52.84 (7.48)	53.29 (7.01)	53.21 (7.28)	48.62 (8.41)	48.83 (8.34)	48.67 (8.57)
GDS score	( <i>N</i> = 600)	( <i>N</i> = 461)	( <i>N</i> = 461)	1255	( <i>N</i> = 1073)	( <i>N</i> = 1073)
0-4 (%)	78.00	80.26	78.74	64.46	65.80	63.56
5-9 (%)	15.67	14.53	14.10	22.63	21.71	20.97
10+ (%)	6.33	5.21	7.16	12.91	12.49	15.47

Notes: Difference between grandfathers and grandmothers in follow-up sample.

Life satisfaction:  $p > 0.05$ ; SF-MCS:  $p < 0.001$ ; GDS score:  $p < 0.001$ .

Table 3. Results from mixed effects ordinal regression models of hours of help provided to grandchildren at baseline.

		Grandfathers						Grandmothers					
		Model 1			Model 2			Model 1			Model 2		
		$\beta$	95% CI		$\beta$	95% CI		$\beta$	95% CI		$\beta$	95% CI	
Number of grandchildren		-0.05**	-0.08	-0.01	-0.04**	-0.07	-0.01	-0.01	-0.03	0.01	-0.01	-0.03	0.01
Age youngest grandchild	5–10	-0.48*	-0.87	-0.08	-0.52**	-0.89	-0.14	-0.43**	-0.75	-0.11	-0.43**	-0.74	-0.12
	11+	-1.21***	-1.83	-0.59	-1.17***	-1.74	-0.60	-1.24***	-1.62	-0.85	-1.24***	-1.64	-0.85
	Not known	-1.09***	-1.50	-0.68	-1.14***	-1.54	-0.73	-0.64**	-1.08	-0.21	-0.66**	-1.09	-0.24
Household type	With others, not with grandchild	-0.16	-0.45	0.13	-0.14	-0.45	0.17	-0.09	-0.36	0.18	-0.10	-0.37	0.17
	With others, including grandchild	1.67***	1.31	2.04	1.70***	1.33	2.08	2.07***	1.74	2.41	2.07***	1.75	2.40
Marital status	Married	0.44	0.00	0.87	0.42	-0.03	0.87	0.38**	0.10	0.62	0.35*	0.08	0.63
Education	Mid				0.05	-0.27	0.38				0.10	-0.28	0.48
	High				0.27	-0.07	0.61				0.09	-0.21	0.39
Paid work	Yes				-0.37	-0.85	0.12				0.14	-0.03	0.31
Community work	Yes				0.11	-0.31	0.52				0.04	-0.30	0.38
Functional limitations	Mid				-0.05	-0.41	0.31				0.06	-0.19	0.30
	Low				0.17	-0.22	0.56				-0.26	-0.50	-0.02
<i>N</i>		605			605			1248			1248		

Notes: Reference categories: Youngest grandchild aged 0–4; lives alone or with spouse only; not married/partnered; low education (<6 years); no paid work; no community work; high functional limitation.

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p > 0.05$ .

proportions had decreased slightly to 53% and 57%, respectively. Mean SF36-MCS for the sample present at both rounds of the survey were also slightly lower (worse) at follow-up and lower for women than men. 21% of men and 36% of women had GDS scores of five or more (indicating depression) at follow-up compared with 20% and 32%, respectively at baseline. Slight differences in the baseline values of these variables for those included in the follow-up and the whole baseline sample are suggestive of some association between non-participation in the follow-up and worse initial mental health, but differences were not statistically significant.

### Provision of help to grandchildren at baseline

Table 3 shows results from ordinal logistic regression models of provision of time help to grandchildren at baseline. Results from all models show an inverse association between provision of more help to grandchildren and age of youngest grandchild and a positive association between provision of help and living in a household including at least one grandchild. Among grandfathers, there was a negative association between provision of help and number of grandchildren and among grandmothers provision of help was positively associated with being married or partnered. Educational level, functional health and engagement

in paid or community work were not significantly associated with provision of help among either grandfathers or grandmothers.

Results from logistic regression models of helping grandchildren with money or material goods (not shown) showed that provision of such help was positively associated with living with a grandchild for both grandfathers and grandmothers and that grandfathers who did not know the age of their youngest grandchild were less likely to provide material help. Among men, being married, having a higher equivalised household income and a high (worse) level of functional limitation were also positively associated with provision of material help. There was a negative association between involvement in community work and grandmothers' help to grandchildren with money or material goods.

### Provision of help to grandchildren and psychosocial health at follow-up

#### Life satisfaction

As shown in Table 4, providing help of four or more hours per week was positively associated with grandfathers' life satisfaction at follow-up in both Model 1 and, although slightly attenuated, also in the final fully adjusted Model. The effect of providing smaller amounts of help was not statistically significant

Table 4. Results from mixed effects logistic regression models of time help to grandchildren and life satisfaction at follow up.

Baseline variables		Grandfathers						Grandmothers					
		Model 1			Model 3			Model 1			Model 3		
		OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
Hours of help to grandchildren	0 > 4	1.36	0.81	2.29	1.21	0.69	2.13	0.70	0.48	1.02	0.73	0.48	1.09
	4+	1.99**	1.19	3.32	1.78*	1.02	3.13	0.78	0.56	1.08	0.81	0.56	1.17
Number of grandchildren		1.01	0.97	1.05	1.00	0.96	1.04	0.99	0.97	1.01	0.99	0.97	1.01
Age youngest grandchild	5–10	1.10	0.71	1.71	1.09	0.68	1.75	1.07	0.81	1.42	1.23	0.90	1.68
	11+	1.64	0.76	3.57	1.72	0.73	4.04	1.16	0.77	1.74	1.27	0.81	1.99
	Not known	1.67	0.83	3.33	1.63	0.77	3.46	1.05	0.67	1.63	1.15	0.70	1.88
Household composition	With others, not with grandchild	1.02	0.63	1.65	1.08	0.64	1.83	1.44*	1.04	2.01	1.71**	1.19	2.46
	With others, including grandchild	0.94	0.57	1.53	0.89	0.52	1.53	1.25	0.90	1.75	1.45*	1.01	2.10
Marital status	Married	1.17	0.65	2.08	1.23	0.71	2.12	10.7	0.84	1.38	1.00	0.76	1.32
Education	Mid				1.07	0.57	2.01				0.93	0.68	1.26
	High				1.08	0.64	1.80				0.75	0.52	1.07
Paid work	Has paid work				0.94	0.62	1.43				0.87	0.64	1.18
Community work	Has Community work				1.19	0.77	1.84				1.34*	1.02	1.76
Functional limitations	Mid				1.49	0.83	2.66				1.60**	1.16	2.21
	Low				1.46	0.90	2.38				2.38***	1.67	3.40
Life satisfaction	Neutral				2.58*	1.12	5.96				3.29***	1.95	5.54
	Positive				9.62**	4.32	21.43				10.40***	6.33	17.08
N						464			1068			1068	

Notes: Reference categories: Youngest grandchild aged 0–4; lives alone or with spouse only; not married/partnered; low education (<6 years); no paid work; no community work; high functional limitation; life satisfaction negative.

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p > 0.05$ .

although odds ratios were positive. As would be expected, there was a strong association between baseline and follow-up life satisfaction but no other baseline characteristics were associated with life satisfaction at follow-up in the models shown, although in Model 2 (which did not include baseline life satisfaction) there was a significant association between a low level of functional limitation and positive life satisfaction at follow-up (OR 1.97, 95% CI 1.25–3.08). There was no indication of a positive effect of helping grandchildren on grandmothers' life satisfaction and in fact, odds ratios were below 1, although not significantly so, in all models. In the fully adjusted model, living with relatives rather than alone or just with a spouse was positively associated with good life satisfaction, particularly for those living with relatives not including grandchildren. Participation in community activities and a low or mid, rather than high, level of functional limitations were also associated with good life satisfaction.

### SF36-MCS

Grandfathers providing some help, but less than four hours per week, to grandchildren had better follow-up MCS scores than other grandfathers when only family and household characteristics were taken into account (Model 1), but this association was attenuated and

ceased to be significant when baseline health and socioeconomic status was controlled (Model 2, not shown); in this model a low level of functional health limitation was positively associated with higher MCS score, but in the final model (Model 3) only the association between baseline and follow-up MCS was significant (Table 5). For grandmothers there was an inverse association between number of grandchildren and MCS in Model 1 (and Model 2) but in the final model the only co-variables significantly associated with higher follow-up MCS were baseline MCS and low or mid (rather than high) levels of functional limitation.

### Depression

For men, helping grandchildren was associated with lower odds of depression in Model 1, but in the final Model only baseline depression and better functional health were associated with lower odds of depressive symptoms at follow-up. For grandmothers helping grandchildren for four or more hours per week appeared protective against depression in the fully adjusted model (OR 0.65, 95% CI 0.44, 0.98); the odds ratio for those providing less help (rather than none) was similar but not significant (OR 0.66, 95% CI 0.42, 1.04). Similarly, to results for grandfathers, lower levels of functional limitation and fewer depressive



Table 5. Results from mixed effects linear regression models of time help to grandchildren and SF36-MCS at follow up.

		Grandfathers				Grandmothers				
		Model 1		Model 3		Model 1		Model 3		
		$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI	
Hours of help to grandchildren	0 > 4	2.40*	0.33 4.47	0.92	-0.56 2.41	-0.27	-2.08 1.54	0.59	-1.11 2.30	
	4+	2.03	-0.51 4.57	1.07	-0.46 2.60	-0.22	-2.17 1.72	0.34	-1.03 1.71	
Number of grandchildren		-0.06	-0.11 -0.29	-0.07	-0.22 0.10	-0.13**	-0.21 -0.05	-0.06	-0.13 0.01	
Age youngest grandchild	5-10	-0.58	-2.86 -1.69	-0.20	-1.67 1.28	0.37	-1.20 1.93	0.85	-0.18 1.88	
	11+	-0.32	-2.63 1.98	0.79	-0.75 2.33	-0.88	-2.46 0.69	-0.33	-1.50 0.84	
Household composition	Not known	1.28	-1.79 4.53	1.56	-0.82 3.93	0.29	-2.01 2.58	0.70	-1.42 2.83	
	With others, not with grandchild	0.60	-1.42 2.61	0.15	-1.36 1.66	1.03	-0.30 2.36	1.08	-0.07 2.23	
	With others, including grandchild	0.78	-1.28 2.84	0.32	-1.45 2.10	-0.02	-2.05 2.02	0.02	-1.19 1.24	
Marital status	Married	1.32	-0.91 3.54	1.15	-0.66 2.95	0.14	-1.00 1.29	-0.07	-1.00 0.85	
Education	Mid			0.28	-1.42 1.98			0.55	-0.61 1.71	
	High			1.05	-0.20 2.29			-0.11	-1.55 1.34	
Paid work				-0.55	-1.62 0.52			-0.28	-1.33 0.76	
Community work				0.74	-0.38 1.85			0.09	-0.92 1.10	
Functional limitations	Mid			0.20	-1.60 2.00			1.26**	0.53 2.00	
	Low			0.90	-0.35 2.14			3.06***	0.51 0.60	
MCS				0.59***	0.47 0.70			0.56***	0.51 0.60	
N		463			463			1059		

Notes: Reference categories: Youngest grandchild aged 0-4; lives alone or with spouse only; not married/partnered; low education (<6 years); no paid work; no community work; high functional limitation.

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p > 0.05$ .

symptoms at baseline were negatively associated with depression at follow-up (Table 6).

### Provision of material help and mental health

Results from similar analyses of associations between the provision of money or other material goods and indicators of mental health at follow-up are summarised in Table 7. Grandfathers who helped their grandchildren in this way had slightly better MCS scores at follow up. Provision of this type of help was also positively associated with good life satisfaction at follow-up in Model 2 but not significantly so when baseline life satisfaction was taken into account (Model 3). Among grandmothers helping grandchildren with money or material goods was negatively associated with good life satisfaction at follow up (OR 0.73, 95% C.I. 0.54, 0.97).

### Discussion

This analysis of data from a prospective study of 2000 older Chileans aged 66-68 firstly highlights the importance of the grandparental role and the contribution made by grandparents to their families.

Fertility in Chile has declined very rapidly since the 1970s but those included in this study had relatively large families (six children on average) and 94% of sample members had one or more grandchildren, grandfathers having on average seven grandchildren and grandmothers eight. Forty percent of grandparents lived with at least one grandchild, 75% provided some time help every week and 50% four or more hours of help per week. Our data were restricted to a specific narrow age range which makes it harder to make comparisons with other populations but the level of provision of help seems similar to results reported from reported from middle income Asian countries (Hermalin, Roan, & Perez, 1998) but higher than in North America or Europe. Hughes et al.'s (2007) analysis of data from the 1998 US HRS, for example, found that 7% of 50-80 year old grandparents lived with a grandchild and only 13% of grandmothers and 7% of grandfathers provided 200 hours or more of care to grandchildren a year. The 2004 data on 10 countries included in the Surveys of Health, Ageing and Retirement in Europe analysed by Hank and Buber (2007) showed that 28% of grandparents provided help to grandchildren at least weekly, although these proportions were higher in Southern European countries with, for example, 35% of Spanish

Table 6. Results from mixed effects logistic regression models of time help to grandchildren and depression at follow up.

		Grandfathers					Grandmothers						
		Model 1		Model 3			Model 1		Model 3				
		OR	95% CI	OR	95% CI		OR	95% CI	OR	95% CI			
Hours of help to grandchildren (ref. None)	0>4 4+	0.52* 0.53*	0.27 0.29	0.98 0.98	0.59 0.57	0.28 0.28	1.24 1.16	0.91 0.79	0.62 0.56	1.35 1.13	0.66 0.65*	0.42 0.44	1.04 0.98
Number of grandchildren		1.00	0.96	1.05	1.00	0.95	1.05	1.02*	1.01	1.05	1.01	0.98	1.03
Age youngest grandchild (ref.>5)	5-10 11+	1.20 1.29	0.71 0.54	2.03 3.09	1.08 1.24	0.58 0.44	2.01 3.50	0.84 0.81	0.62 0.52	1.13 1.24	0.66* 0.61	0.47 0.37	0.94 1.01
Household composition (ref. alone or just with spouse)	Not known With others, not with grandchild With others, including grandchild	0.54 1.06	0.21 0.58	1.41 1.94	0.41 1.28	0.14 0.63	1.22 2.61	0.77 0.83	0.48 0.59	1.25 1.18	0.58 0.78	0.33 0.52	1.01 1.17
Marital status	Married	0.68	0.35	1.33	0.68	0.31	1.50	0.83	0.64	1.08	0.81	0.60	1.10
Education (ref. Low)	Mid High				1.04 0.58	0.54 0.28	1.99 1.22				0.78 0.73	0.56 0.49	1.09 1.10
Paid work	Has paid work				0.83	0.48	1.43				1.23	0.88	1.72
Community work	Has community work				0.99	0.55	1.76				0.88	0.65	1.19
Functional limitations	Mid Low				0.51 0.37**	0.25 0.20	1.03 0.71				0.61** 0.33***	0.43 0.22	0.88 0.51
GDS score	5-9 10+				9.08*** 7.91***	4.77 2.85	17.28 22.00				4.09*** 15.99***	2.92 9.50	5.73 26.91
<i>N</i>		460			460								

Notes: Reference categories: Youngest grandchild aged 0-4; lives alone or with spouse only; not married/partnered; low education (<6 years); no paid work; no community work; high functional limitation; GDS score 0-4.

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p > 0.05$ .

Table 7. Associations between provision of help with money or material goods and mental health outcomes at follow-up: Results from mixed effects regression models.

		Grandfathers				Grandmothers			
		OR	95% CI		<i>N</i>	OR	95% CI	<i>N</i>	
Life satisfaction	Model 1	1.45	0.98	2.16	457	0.81	0.62	1.05	982
	Model 2	1.59*	1.05	2.39		0.80	0.61	1.05	
	Model 3	1.36	0.88	2.12		0.73*	0.54	0.97	
		$\beta$				$\beta$			
MCS	Model 1	1.12	-0.26	2.57	456	0.42	-0.52	1.36	973
	Model 2	1.40*	0.01	2.80		0.33	-0.60	1.25	
	Model 3	1.03*	0.20	2.05		0.52	-0.34	1.39	
		OR				OR			
GDS	Model 1	0.86	0.52	1.37	453	0.92	0.70	1.20	975
	Model 2	0.70	0.41	1.17		0.96	0.72	1.28	
	Model 3	0.69	0.39	1.23		0.98	0.71	1.36	

Notes: Model 1: Controlling for number of grandchildren; age of youngest grandchild; household composition, marital status. Model 2: Additionally controlling for educational status; functional health status, equivalised household income, paid work; community participation.

Model 3: Additionally controlling for baseline value of relevant mental health outcome.

\* $p > 0.05$ .

grandmothers providing at least weekly help. Results from our study are consistent with other sources on the extent of three generational living arrangements in Latin America (UN, 2005).

Despite the importance of the grandparent role in Latin American societies, very few previous studies have investigated either the provision of help by grandparents or implications of such provision for

the psychosocial health of grandparents. We found that the provision of help was associated with demographic factors indicative of need or demand for such help, such as living with a grandchild, having a grandchild aged under five and, for grandfathers, having a larger number of grandchildren. Little variation by grandparent characteristics, such as educational level, involvement in other activities or health status, was found, apart from an association between higher incomes and provision of material assistance by grandfathers. Overall, these findings are consistent with research on the salience of family links in Latin American societies and suggest that providing help to grandchildren is viewed as a normative response to family need rather than a matter of personal choice. Gender differences in the associations between providing help to grandchildren and aspects of mental health suggest that this may be particularly true for grandmothers. Thus, we found that for grandfathers providing help to grandchildren was associated with the positive indicators of mental health – better life satisfaction for those providing four or more hours per week of time help and higher scores on the mental health component of the quality of life measure for those providing material help. Among grandmothers, however, helping with money was *negatively* associated with good life satisfaction and the direction of association between providing time help also tended to be negative, although not significantly so. However, grandmothers who helped grandchildren for four or more hours per week had a lower risk of depression at follow-up. Other studies have also found gender differences in mental health effects of helping or looking after grandchildren and attributed these to men's more detached role in childrearing and care (Blustein et al., 2004; Szinovack et al., 1999). This may be particularly important in Latin American societies given strongly differentiated gender roles and responsibilities (Ramos & Wilmoth, 2003; Sicotte et al., 2008). For women helping grandchildren may represent an addition to other family responsibilities whereas for men helping may more often be matter of choice. Further investigation, including qualitative studies, might help to see whether the effects of helping grandchildren on different aspects of mental health depend on the extent to which this activity is viewed as 'fun' or 'duty' and how this varies by gender.

Our findings contrast with the results from some US and European studies, in general, indicating some positive effects of active grandparenting on mental health. This difference may reflect the fact that much previous research has focussed only on effects of intensive grandparenting but also the different context and different pathways to co-residence with grandchildren. If, as our results suggest, active grandparenthood has benefits for older Chileans' mental health it is important to assess whether possible future changes in family and household patterns may have adverse effects on older people, especially as co-residence

with grandchildren is currently both common and a strong influence on grandparental help. It would also seem important to examine whether associations are similar among grandparents older than those we consider as in Chile, as elsewhere, mental health problems are more prevalent among the older than the younger old (Albala et al., 2005).

This study is, to our knowledge, the first longitudinal investigation of grandparenting and mental health in Chile, a rapidly ageing population with a very high prevalence of late-life depression. The study does however have some limitations. The data relate to a narrow age range and our sample was drawn from low- and middle-income areas of the Santiago Metropolitan area. Chile is a predominantly urbanised society and 34% of the total population live in Santiago (United Nations, 2009), however, our results may not be applicable to those in rural areas, high income Chileans or to grandparents older or younger than those we consider. Response rates at baseline and follow-up were relatively good (76% and 85%, respectively) and there were no significant differences between the mental health of those retained in the study and those lost to follow-up but bias due to non response remains a possibility and confirmation and further investigation of our findings in other studies is warranted.

### Acknowledgements

The Cost-effectiveness Evaluation of a Nutrition supplementation and EXercise programme (CENEX) study was funded by The Wellcome Trust with support from the Ministry of Health, Chile. We are very grateful to all members of the CENEX study team involved in data collection and to all participants in the study.

### References

- Albala, C., Lebrao, M.L., Leon Diaz, E.M., Ham-Chande, R., Hennis, A.J., Palloni, A.,...Pratts, O. (2005). The health, well-being, and aging ("SABE") survey: Methodology applied and profile of the study population. *Revista Panamericana de la Salud Pública*, 17, 307–322.
- Blustein, J., Chan, S., & Guanais, F.C. (2004). Elevated depressive symptoms among caregiving grandparents. *Health Services Research*, 39, 1671–1689.
- Dangour, A., Albala, C., Aedo, C., Elbourne, E., Grundy, E., Walker, D., & Uauy, R. (2007). A factorial-design cluster randomised controlled trial investigating the cost-effectiveness of a nutrition supplement and an exercise programme on pneumonia incidence, walking capacity and body mass index in older people in Santiago, Chile: The CENEX study protocol. *BMC Nutrition Journal*, 6, 14.
- Dangour, A.D., Albala, C., Allen, E., Grundy, E., Walker, D.G., Aedo, C.,...Uauy, R. (2011). Effect of a nutrition supplement and physical activity program on pneumonia and walking capacity in Chilean older people: A factorial cluster randomized trial. *PLoS Medicine*, 8, e1001023.

- De Vos, S. (1990). Extended family living among older people in six Latin American countries. *Journal of Gerontology, 45*, S87–S94.
- Fujiwara, T., & Lee, C.K. (2008). The impact of altruistic behaviours for children and grandchildren on major depression among parents and grandparents in the United States: A prospective study. *Journal of Affective Disorders, 107*, 29–36.
- Hank, K., & Buber, I. (2009). Grandparents caring for their grandchildren: Findings from the 2004 Survey of Health and Retirement in Europe. *Journal of Family Issues, 30*, 53–73.
- Hayslip, B., & Kaminski, P.L. (2005). Grandparents raising their grandchildren: A review of the literature and suggestions for practice. *Gerontologist, 45*, 262–269.
- Hermalin, A., Roan, C., & Perez, A. (1998). *The emerging role of grandparents in Asia*. (Elderly in Asia Rep. No. 98-52). Michigan, MI: Population Studies Center, University of Michigan.
- Hughes, M.E., Waite, L.J., LaPierre, T.A., & Luo, Y. (2007). All in the family: The impact of caring for grandchildren on grandparents' health. *Journal of Gerontology: Social Sciences, 62*, S108–S119.
- Jendrek, M.P. (1993). Grandparents who parent their grandchildren – Effects on lifestyle. *Journal of Marriage and the Family, 55*, 609–621.
- Lera, I., Fuentes, A., Sanchez, H., & Albala, C. (2009). Accuracy and reliability of the short-form 36 health survey in Chilean elders: The Alexandros study. *Journal of Nutrition Health & Aging, 13*, S357.
- Menec, V.H. (2003). The relation between everyday activities and successful aging: A 6-year longitudinal study. *Journal of Gerontology: Social Sciences, 58B*, S74–S82.
- Minkler, M. (1999). Intergenerational households headed by grandparents: Contexts, realities, and implications for policy. *Journal of Aging Studies, 13*, 199–218.
- Minkler, M., & Fuller-Thomson, E. (2001). Physical and mental health status of American grandparents providing extensive child care to their grandchildren. *Journal of the American Medical Women's Association, 56*, 199–205.
- Minkler, M., Fuller-Thomson, E., Miller, D., & Driver, D. (1997). Depression in grandparents raising grandchildren: Results of a national longitudinal study. *Archives of Family Medicine, 6*, 445–452.
- Musil, C., & Ahmad, M. (2002). Health of grandmothers: A comparison by caregiver status. *Journal of Aging and Health, 14*, 96–121.
- Neugarten, B.L., Havighurst, R.J., & Tobin, S.S. (1961). The measurement of life satisfaction. *Journal of Gerontology, 16*, 134–143.
- Palloni, A., McEniry, M., Wong, R., & Pelaez, M. (2006). The tide to come – Elderly health in Latin America and the Caribbean. *Journal of Aging and Health, 18*, 180–206.
- Ramos, M., & Wilmoth, J. (2003). Social relationships and depressive symptoms among older adults in Southern Brazil. *Journal of Gerontology B Psychological & Social Sciences, 58*, S253–S261.
- Ruiz, S.A., & Silverstein, M. (2007). Relationships with grandparents and the emotional well-being of late adolescent and young adult grandchildren. *Journal of Social Issues, 63*, 793–808.
- Sheikh, J., & Yesavage, J. (1986). Geriatric depression scale: recent findings and development of a short version. In T. Brink (Ed.), *Clinical gerontology: A guide to assessment and intervention*. New York, NY: Howarth Press.
- Sicotte, M., Alvarado, B.E., Leon, E.M., & Zunzunegui, M.V. (2008). Social networks and depressive symptoms among elderly women and men in Havana, Cuba. *Aging & Mental Health, 12*, 193–201.
- Silverstein, M., Cong, Z., & Li, S. (2006). Intergenerational transfers and living arrangements of older people in rural China: Consequences for psychological well-being. *Journal of Gerontology B Psychological & Social Sciences, 61*, S256–S266.
- Sirven, N., & Debrand, T. (2008). Social participation and healthy ageing: An international comparison using SHARE data. *Social Science & Medicine, 67*, 2017–2026.
- Strawbridge, W.J., Wallhagen, M.I., Shema, S.J., & Kaplan, G.A. (1997). New burdens or more of the same? Comparing grandparent, spouse and adult-child caregivers. *Gerontologist, 37*, 505–510.
- Szinovacz, M.E., DeViney, S., & Atkinson, M.P. (1999). Effects of surrogate parenting on grandparents' well-being. *Journal of Gerontology, 54B*, S376–S388.
- United Nations (2005). *Living arrangements of older persons around the world*. New York, NY: United Nations, ST/ESA/SER.A/240.
- United Nations (2009). *World urbanisation prospects, the 2009 revision population database*. Retrieved from <http://esa.un.org/wup2009/unup/>
- Williamson, J.B. (2005). *An update on Chile's experience with partial privatization and individual accounts* (AARP Public Policy Institute Rep. No. 2005–19). Washington, DC.
- Zunzunegui, M.V., Alvaredo, E.B., Beland, F., & Visandjee, B. (2009). Explaining health differences between men and women in later life: A cross-city comparisons in Latin America and the Caribbean. *Social Science & Medicine, 68*, 235–242.