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Care-giving burden and life satisfaction among family care-givers of disabled older adults in China: the moderator role of care-giver wisdom

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Abstract

Care-giving to older adults with disabilities could lead to relatively high levels of care-giving burden and low levels of life satisfaction among their family care-givers. However, there is a lack of research examining the role of care-giver wisdom in the above stress process model. This study examined the moderator role of wisdom in the relationship between care-giver burden and life satisfaction among family care-givers of disabled older adults in urban China. A multi-stage quota sampling method was used to recruit 789 disabled older adult–family care-giver dyads in Shanghai in 2013. The average age of older adults and their family care-givers was 84 and 63 years old, respectively. Multiple-group path analysis was conducted to examine the proposed hypotheses. The results showed that care-giver wisdom played a moderator role in the association between care-giver burden and life satisfaction. Care-giver burden was found to only negatively affect life satisfaction among care-givers with relatively low wisdom levels. The findings highlight the influences of care-giver wisdom on the relationship between burden and life satisfaction in Chinese contexts. The concept of wisdom should be used in needs assessment among family care-givers of older adults with disabilities. Future social interventions should focus on promoting care-givers' capacities of reflective thinking, their understandings of reality and their feelings of compassion.

Keywords: wisdom; care-giver burden; life satisfaction; family care-givers

Introduction

The number of disabled adults aged 60 or older with at least one limitation in their activities of daily living (ADLs) has increased drastically in China. This figure reached 43.75 million in 2020 and is estimated to increase to around 91.4 million by 2050 (Zhang and Fang, 2019). The rapidly increasing long-term care needs of

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this older population are mainly fulfilled by their family members (typically spouses and adult children), especially considering the underdeveloped long-term care systems in China (Lu *et al.*, 2015; Shum *et al.*, 2015). The average family size in China declined from 4.33 in 1958 to 3.44 in 2001 and 3.00 in 2018 (National Bureau of Statistics of China, 2019). Meanwhile, rural-to-urban internal migration, modernisation and urbanisation not only widened intergenerational geographic distances, but also led to significant transitions in traditional filial culture and multigenerational household living arrangements (Cheung and Kwan, 2009; Cong and Silverstein, 2011). Under such circumstances, family care-giving tasks for disabled older adults are generally chronic in nature and can generate relatively high levels of burden in daily lives (Bastawrous, 2013). The literature has shown that care-giver burden has adverse impacts on mental health outcomes among the care-giver population, including life satisfaction (Pearlin *et al.*, 1990; Pearlin and Bierman, 2013; Lu *et al.*, 2015; Penning and Wu, 2015).

Life satisfaction refers to cognitive appraisals of important life domains (Nygqvist *et al.*, 2012). It is considered to be an important indicator of positive mental health. Poor mental health outcomes among care-givers were found to have negative care-giving consequences, such as poor quality of care-giving, premature institutionalisation and elder maltreatment (Carretero *et al.*, 2009). Therefore, it is important to have a deeper understanding of the mechanism linking care-giver burden to mental health, especially in terms of modifiable protective factors.

In general, the literature suggests that care-giver burden is a significant determinant of life satisfaction among care-givers. For example, the negative association between care-giver burden and life satisfaction was found to be statistically significant among care-givers of stroke patients (Bergstrom *et al.*, 2011). Care-giver burden was also found to be negatively associated with life satisfaction among family care-givers of frail older adults with musculoskeletal conditions (Lu *et al.*, 2015). However, the literature identified some non-significant findings. For example, care-giver burden was not significantly associated with life satisfaction among family care-givers of dementia patients in African American families (Haley *et al.*, 1995). Care-giver burden was also found to be negatively associated with self-rated mental health among women but not men in a nationally representative adult sample in Canada (Penning and Wu, 2015). The inconsistency might partially result from potential moderators and mediators in this association. Although previous studies focused on the role of coping strategies and social support in the family care-giving process (Pearlin *et al.*, 1990; Pearlin and Bierman, 2013; Lu *et al.*, 2017), there is a lack of research on the potential influence of care-giver wisdom in this association.

Defining wisdom

Wisdom is recognised as positive personality traits that generate positive ageing outcomes. Although declining rates of physical health and cognition often accelerate with age, wisdom tends to remain functional and generate opportunities to grow in later life (Ardelt, 2003; Ardelt and Edwards, 2015). Wisdom is a multi-dimensional concept that includes not only expert knowledge and competence in important life domains, but also affective and reflective dimensions (Ardelt,

2003; Ardel and Jeste, 2016). In this study, we conceptualised wisdom as modifiable personality traits that can be enhanced through interventions and policies. The most common assessment tool is the three-dimensional wisdom scale, which measures wisdom as having cognitive, affective and reflective dimensions (Clayton and Birren, 1980; Ardel, 2003; Bangen *et al.*, 2013). In short, the cognitive dimension of wisdom (CDW) refers to individuals' capacity to have a clear understanding of social reality. The affective dimension of wisdom (ADW) is about being compassionate towards other people. The reflective dimension of wisdom (RDW) is the foundation of the previous two components and greatly emphasises capacities of self-reflective thinking and examining social issues from multiple perspectives (Ardelt, 2000). Wisdom could be particularly important for family care-givers of disabled older adults, because their care-giving tasks tend to be stressful and chronic in nature. Wise individuals are more likely to be resilient, maintain ego integrity and grow psychologically when they encounter stressful life events (Ardelt, 2003).

Role of wisdom in the care-giving process

In this research, we used the stress process model as the theoretical framework for understanding the family care-giving process and its consequences for life satisfaction among family care-givers (Pearlin *et al.*, 1990). In this model, ADL disabilities, cognitive impairments and behavioural problems among disabled older adults are considered primary objective stressors in the care-giving process and often lead to prolonged and intensive care demands for family care-givers (Pearlin *et al.*, 1990; Pearlin and Bierman, 2013). Care-giver burden, which refers to subjective appraisals of the balance between available resources and long-term care needs, might occur in multiple life domains, including but not limited to social role conflicts, physical health decline and emotional distress. Subjective appraisals of care-giver burden could have adverse influences on self-efficacy, meaning in life, self-esteem, and positive and negative affect, which could further influence care-givers' subjective evaluation of their life situations (Yates *et al.*, 1999; Bastawrous, 2013).

Care-giver wisdom could play an important role in the family care-giving process. Empirical studies found that wisdom, an important indicator of an individual's psychological and social development, plays a more salient role in maintaining mental health in older age than other objective indicators such as socio-economic status and physical health (Ardelt, 1997, 2000, 2003; Bangen *et al.*, 2013; Cheung and Chow, 2020). Although a few studies have examined the influence of wisdom on wellbeing in older age, research on the role of wisdom in family care-giving is lacking. One recent study suggested that positive psychological constructs such as purpose in life and being optimistic about the future are associated with higher levels of subjective wellbeing among informal care-givers in Europe (Maguire *et al.*, 2019). A recent meta-analysis showed that a sense of coherence was associated with lower levels of care-giver burden, depressive symptoms and anxiety symptoms (del-Pino-Casado *et al.*, 2019). Furthermore, a systematic review suggested that care-giver personality traits and competence are important social determinants of care-giver burden and mental health outcomes (Der Lee *et al.*, 2014). Care-givers who found meaning and gains in their care-

giving activities and had access to more social resources reported higher levels of life satisfaction among spousal care-givers of hospice patients (Haley *et al.*, 2003).

We argue that care-giver wisdom not only has a direct influence on care-giving burden and mental health outcomes, but also moderates the relationship between burden and mental health. Wisdom was found to have a moderation effect on the negative relationship between stressful life events and subjective wellbeing (Ardelt and Edwards, 2015; Ardel and Jeste, 2016). In particular, wisdom had larger impacts on positive affect, rather than negative affect (Etezadi and Pushkar, 2013). In the context of family care-giving, wise care-givers might still feel stressed or burdened when they encounter high levels of care-giving tasks due to common stressors. However, they tend to handle the care-giving burden more efficiently because of their capacity to have a comprehensive understanding of social reality and events, and use social resources and adaptive coping strategies. This would lead to better mental health outcomes. Finally, the construct of wisdom is culturally sensitive. However, few studies have examined the impacts of care-giver wisdom on mental health outcomes and the stress process model (*i.e.* mechanisms from stressors, burden, to life satisfaction) in Chinese cultural contexts.

Based on the previous literature and theoretical framework of the stress process model, we hypothesised that care-giver wisdom would have a significant moderation effect on the relationship between care-giver burden and life satisfaction among family care-givers of older adults with disabilities in China.

Methods

Sampling

This secondary data analysis was based on data derived from a longitudinal study, 'Longitudinal Study on Family Caregivers for Frail Older Adults Aged 75 or Above in Shanghai', which was jointly conducted by the University of Hong Kong and East China Normal University. Ethics approval was obtained from the Ethics Committee of the University of Hong Kong. The three waves of the survey were conducted in 2010, 2013 and 2016. Given that wisdom was only assessed in the second wave, the present study was based on the 2013 wave. Shanghai is recognised as one of the most economically developed cities in China. The proportion of the local population aged 60 or older is nearly two times higher than the national average (33.2% *versus* 17.3%, respectively, in 2017). Local older residents with disabilities are mainly cared for by their family members (Lu *et al.*, 2015).

A quota sampling method was used to recruit respondents. Six street offices were selected randomly from Shanghai's urban districts. A total of 120 older adult-care-giver dyads were recruited from each selected street. The gender ratio of the sample was controlled to ensure consistency with a local representative sample from the 'Shanghai Elderly Population Status and Desire' survey collected in 2008 (60% women and 40% men). The inclusion criteria of sample selection were as follows: respondents needed to (a) be aged 75 or older; (b) live in one of six selected areas and have local household registration status; (c) have ADL scores equal to or greater than 10, which means that the respondents had difficulty performing at least one ADL task or equivalent (with assistance; ADL score range: 0–100) (Mahoney and Barthel, 1965); and (d) receive care from a primary family care-giver aged 18 or

older. Proxies were arranged to answer the survey questions on behalf of the older adults with cognitive impairments. In this research, a primary care-giver is defined as the individual who holds the main care-giving responsibility for the older recipient with disabilities. Their care-giving activities should be unpaid work. The older adults were asked to point out their primary care-giver.

A total of 720, 823 and 733 older adult–care-giver dyads participated in the 2010, 2013 and 2016 waves, respectively. New respondents were recruited in each wave to ensure that the gender ratio was consistent with that of the local representative sample. We included respondents who were cared for by their spouses and adult children, and excluded those with missing values on key variables (*i.e.* age, ADLs and wisdom), generating a final analytic sample of 789 older adult–care-giver dyads. Our research mainly focused on care-givers' burden, wisdom and life satisfaction, while controlling for stressors based on their care recipients' conditions.

Measurement

Dependent variable

Life satisfaction among family care-givers was assessed by a Chinese version of the Satisfaction with Life Scale (Diener *et al.*, 1985; Cheng *et al.*, 2008). This five-item scale asked respondents whether they had gained the most important things in life and were satisfied with their lives (*e.g.* 'The conditions of my life are excellent'; 'So far, I have gotten the important things I want in life'). The responses were measured on a five-point scale (1 = strongly disagree; 3 = neutral; 5 = strongly agree). Scores were summed to represent overall satisfaction level (range = 5–25; Cronbach's $\alpha = 0.911$).

Burden variable

Care-giver burden was assessed by the Chinese Caregiver Burden Inventory (Novak and Guest, 1989; Chou *et al.*, 2002). This 24-item scale includes physical burden (*e.g.* 'My physical health was affected by care-giving'), social burden (*e.g.* 'I did not get along with other family members as we used to'), time dependence (*e.g.* 'The care recipient needed my assistance in many daily activities'), emotional burden (*e.g.* 'I felt embarrassed by some behaviours of the care recipient') and developmental burden (*e.g.* 'I lost many opportunities for job promotion and travel due to care-giving'). Respondents were asked how frequently they had these experiences during their care-giving activities. The responses were measured on a five-point scale (0 = never, 2 = occasionally, 4 = always). Scores were summed to represent the overall level of care-giver burden (range = 0–96; Cronbach's $\alpha = 0.931$).

Stressor

In this study, stressors refer to ADL disabilities, behavioural problems and cognitive impairments among care recipients. ADL disability was assessed by the ten-item Barthel Index (Mahoney and Barthel, 1965). Care recipients were asked whether they had difficulties in performing ten ADLs (*e.g.* bathing, toileting, walking; 10 = have great difficulty; 5 = have some difficulty and need assistance; 0 = can complete the task independently). Summed scores were calculated to represent ADL dependence (range = 0–100; Cronbach's $\alpha = 0.887$). Higher scores indicate higher

dependence levels in ADLs. Cognitive impairments were measured by the Short Portable Mental Status Questionnaire (range = 0–10; Cronbach's $\alpha = 0.783$) (Pfeiffer, 1975; Chi and Boey, 1993). The validity and reliability of this measure have been well established among Chinese populations (Chi and Boey, 1993; Han *et al.*, 2017; Ge *et al.*, 2020). The care recipients were asked about their age, home address, current date, date of the mid-autumn festival (a famous Chinese festival), serial subtraction of 3 from 20 and some questions about the history of the People's Republic of China. Responses were measured by binary variables (0 = correct, 1 = incorrect). Summed scores were calculated. Higher scores indicate higher levels of cognitive impairment. Finally, care-givers were asked how frequently their care recipient had behavioural problems in the past 3 months (range = 0–20; Cronbach's $\alpha = 0.727$) (Lou *et al.*, 2009). The five-item scale includes shouting or cursing, wandering, delusion, act of violence and other types of antisocial behaviours. Answers were assessed on a five-point scale (0 = never, 2 = occasionally, 4 = always).

Moderator

We used items from the Three-Dimensional Wisdom Scale to assess CDW, ADW and RDW (Ardelt, 2003). The original scale has 39 items. The questionnaire included the 24 items in the section that queries: 'How much are the following statements true of yourself?' In this section, six items measured CDW, eight items measured ADW and ten items measured RDW.

We conducted reliability tests of the three subscales, and the internal consistency of the scales of CDW and ADW was satisfactory (Cronbach's $\alpha = 0.784$ and 0.703 , respectively). However, the Cronbach's α estimate of the ten-item RDW scale was lower than 0.60 . We ran an additional analysis and found that the ten items formed two subdimensions: five items were about their capacity to examine problems from different perspectives and feelings of resentment when looking back at their life, whereas the other five items were about whether they would be patient and consider other people's perspectives when they were upset at or critical of someone. We choose the former five items to represent RDW (Cronbach's $\alpha = 0.863$; details of sensitivity analysis are shown in the Results section).

In conclusion, in this study, six statements were about their comprehensive understanding of social reality (*i.e.* CDW; *e.g.* 'Simply knowing the answers to a problem without understanding the reasons is fine with me'); eight statements were about feelings of compassion toward others and willingness to provide support when necessary (*i.e.* ADW; *e.g.* 'I often feel a real compassion for everyone; I try my best to help people who need help one way or another'); and five statements were about their capacity to view problems from multiple perspectives and feeling resentment when looking back at their life (*i.e.* RDW; *e.g.* 'Sometimes I have difficulty in viewing things from other people's point of view'). The responses were assessed on a five-point Likert scale (0 = never, 1 = rarely, 2 = occasionally, 3 = sometimes, 4 = always). Among the 19 items, two items were positively worded and 17 were negatively worded (*i.e.* assessment of absence of wisdom). We conducted reverse coding for the latter items. Mean scores were used to represent the level of each wisdom dimension (Cronbach's $\alpha = 0.784$ for CDW, 0.863 for RDW and 0.703 for ADW). Higher scores indicated higher levels of wisdom.

Finally, the average scores of CDW, ADW and RDW were calculated to represent the level of wisdom (Cronbach's $\alpha = 0.809$) (Ardelt, 2004). The median score of the wisdom scale was 2.92. To ensure that the ratio of two groups' number was lower than 3, wisdom variables were further recoded as binary variables using a cutoff point of 3 (0 = low, 1 = high). In other words, respondents who scored lower than 3 were categorised as the relatively low wisdom group, whereas those who scored 3 or 4 were categorised as the relatively high wisdom group. Details of sensitivity analysis are shown in the Data analysis section.

Covariates

Care recipients' age and gender and care-givers' age, gender, marital status, educational attainment, living arrangements, care-giving time per week and income were treated as covariates in the final model. Age was measured in years. Gender, marital status, educational attainment and living arrangements were recoded as binary variables (1 = woman, 0 = man; 1 = married, 0 = other marital status; 1 = secondary school education level or higher, 0 = primary school education or lower; 1 = lived with care recipient, 0 = did not live with care recipient). The respondents were also asked about their average monthly income and the average hours that they spent on providing care to their care recipient per day in the last week (0 = less than 1 hour, 1 = 1–3 hours, 2 = 4–6 hours, 3 = 7–9 hours, 4 = 10 hours or higher).

Data analysis

We used multiple-group path analysis to test the proposed model. This model allowed us to not only test multiple paths in one statistical model, but also examine the moderator role of wisdom in each path of the mediation model (Muthén and Muthén, 2012; Hayes, 2015). The analytic procedures involved two main steps. In the first step, we conducted a path analysis to examine the associations among three primary objective stressors (ADL disabilities, cognitive impairment and behavioural problems), care-giver burden and life satisfaction, after nine covariates were entered in the model. We used the following fit indexes to assess whether the model fit the data: the chi-square test statistic, Standardised Root Mean Square Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) (Kline, 2011). Non-significant chi-square estimates and CFI and TLI values greater than 0.95 and SRMR and RMSEA values less than 0.05 indicate good model fit (Bentler, 1990; Kline, 2011).

In the second step, a multiple-group path analysis model was applied to examine the moderating role of wisdom in the relationship between care-giver burden and life satisfaction. The moderator was wisdom, which was treated as two groups for each dimension of wisdom. The analytic procedures were as follows. First, the regression coefficients of the path analysis model were freely estimated between the two wisdom groups. Second, the coefficients were held equal between the two groups. A robust nested chi-square difference test was conducted to test whether holding the regression coefficients equal worsened the model fit significantly. Significant difference test results indicated significant moderating effects of wisdom on the path. In other words, this model tested the moderation effects

of wisdom on a path when holding other paths equal across groups. Mplus 7.0 (was used to conduct the statistical models (Muthén and Muthén, 2012).

Results

Sample characteristics

We present the socio-demographic characteristics of the respondents in Table 1. The mean age of care recipients and their family care-givers was 84 and 63 years, respectively. Nearly two-thirds of the care recipients and more than half of the care-givers were women. Two-thirds of care recipients received care from their adult children, whereas the others were cared for by their spouses. Most care recipients (90%) had adequate cognitive function (assessed by the Short Portable Mental Status Questionnaire) and did not have any behavioural problems in the past 3 months at the time of the survey. On average, moderate levels of care-giving burden were reported among family care-givers. Around one-third of care recipients had ADL scores of 25 or higher. On average, around half of the respondents spent 1–3 hours per day on caring for their care recipients. More than 40 per cent spent 4–6 hours or more per day on their care-giving activities. Using the cutoff point of 3, 44 per cent of the care-givers fell into the high wisdom group. The bivariate associations among stressors, burden, wisdom and life satisfaction are presented in Table 2. The three stressors were positively associated with each other. The stressors were also positively associated with care-giver burden. Care-giver burden and care recipients' ADL were negatively associated with care-givers' life satisfaction. Care-giver wisdom was negatively associated with care-giver burden.

Path analysis

A path analysis model was built to test the relationship among three stressors, care-giver burden and life satisfaction. Fit index estimates showed a good model fit: $\chi^2(4) = 4.451$, $p = 0.3483$, RMSEA = 0.012, CFI = 0.998, TLI = 0.986, SRMR = 0.005. The results show that care recipients' ADL and living arrangement and care-givers' gender, marital status and household income were significantly associated with life satisfaction (ADL: $b = -0.019$ (standard deviation (SD) = 0.008), $\beta = -0.098$ (SD = 0.044), $p < 0.05$; living arrangement: $b = 0.775$ (SD = 0.313), $\beta = 0.098$ (SD = 0.040), $p < 0.05$; gender: $b = 0.590$ (SD = 0.264), $\beta = 0.082$ (SD = 0.037), $p < 0.05$; marital status: $b = 1.275$ (SD = 0.360), $\beta = 0.130$ (SD = 0.036), $p < 0.001$; income: $b = 0.291$ (SD = 0.078), $\beta = 0.136$ (SD = 0.036), $p < 0.001$). Care recipients' ADL and behavioural problems and care-givers' income and care-giving time were significantly associated with care-giver burden (ADL: $b = 0.143$ (SD = 0.032), $\beta = 0.180$ (SD = 0.040), $p < 0.001$; behavioural problems: $b = 1.885$ (SD = 0.323), $\beta = 0.197$ (SD = 0.033), $p < 0.001$; income: $b = -0.657$ (SD = 0.297), $\beta = -0.074$ (SD = 0.033), $p < 0.05$; care-giving time: $b = 2.732$ (SD = 0.504), $\beta = 0.191$ (SD = 0.035), $p < 0.001$). The relationship between care-giver burden and life satisfaction was statistically non-significant when controlling other covariates ($b = -0.010$ (SD = 0.009), $\beta = -0.043$ (SD = 0.039), $p > 0.05$).

Table 1. Sample characteristics

	N (%)	Mean (SD)
Care recipient:		
Age		84.0 (5.1)
Gender:		
Women	475 (60.2)	
Men	314 (39.8)	
No behavioural problems	694 (88.0)	
No cognitive impairment	692 (87.7)	
ADL disabilities		76.4 (18.5)
Care-giver:		
Age:		63.0 (11.8)
≤59	390 (49.4)	
60–69	176 (22.3)	
≥70	223 (28.3)	
Gender:		
Women	418 (53.0)	
Men	369 (46.8)	
Married	661 (83.8)	
Relationship with care recipient:		
Spouse	232 (29.4)	
Child	557 (70.6)	
Lived with care recipient	562 (71.2)	
Education:		
Primary school or lower	107 (13.6)	
Secondary school education or higher	681 (86.3)	
Monthly income:		
≤3,000 RMB	594 (75.3)	
≥3,001 RMB	191 (24.2)	
Care-giver burden		24.0 (14.8)
Life satisfaction		15.6 (3.6)

Notes: N = 789. SD: standard deviation. ADL: activity of daily living. 100 RMB = US \$15.7.

Multiple-group path analysis

First, an unconstrained path analysis model was built across the two wisdom groups. The fit index estimates showed a good model fit: $\chi^2(8) = 6.529$, $p = 0.5882$, RMSEA = 0.000, CFI = 1.000, TLI = 1.042, SRMR = 0.007. Second,

Table 2. Bivariate correlations between stressors, burden and life satisfaction variables

Indicator	Mean	SD	1	2	3	4	5	6
1. LS	15.6	3.6	1.000					
2. ADLs	23.6	18.5	-0.103**	1.000				
3. CI	2.9	2.1	-0.065	0.503***	1.000			
4. BP	0.5	1.6	-0.054	0.248***	0.251***	1.000		
5. Burden	24.0	14.8	-0.101**	0.315***	0.222***	0.277***	1.000	
6. Wisdom ¹	2.9	0.5	0.011	-0.019	-0.166***	-0.076*	-0.272***	1.000

Notes: N = 789. SD: standard deviation. LS: life satisfaction. ADLs: activities of daily living. CI: cognitive impairment. BP: behavioural problems. 1. Reported and tested in the form of a continuous variable (rather than a binary variable).

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed).

Table 3. Multiple-group path analysis for life satisfaction between wisdom groups

	Low wisdom			High wisdom		
	<i>b</i>	SE	β	<i>b</i>	SE	β
Care-giver:						
Age	0.007	0.013	0.025	0.007	0.013	0.022
Female gender	0.517	0.254	0.081*	0.517	0.254	0.064*
Married	1.173	0.345	0.137**	1.173	0.345	0.103**
Income	0.284	0.075	0.152***	0.284	0.075	0.116***
Education	-0.124	0.424	-0.013	-0.124	0.424	-0.011
Care-giving time	-0.112	0.132	-0.037	-0.112	0.132	-0.028
Living together	0.674	0.300	0.097*	0.674	0.300	0.075*
Burden	-0.031	0.011	-0.134**	0.006	0.015	0.021
Care recipient:						
Age	0.009	0.025	0.015	0.009	0.025	0.012
Female gender	-0.174	0.264	-0.027	-0.174	0.264	-0.021
ADLs	-0.017	0.008	-0.093*	-0.017	0.008	-0.083*
CI	-0.008	0.072	-0.005	-0.008	0.072	-0.005
BP	0.009	0.081	0.005	0.009	0.081	0.003

Notes: SE: standard error. ADLs: activities of daily living. CI: cognitive impairment. BP: behavioural problems. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

the parameters of the path analysis model were held equal across the two groups. The model fit did not worsen significantly after we constrained the parameters of all six paths from stressors to care-giver burden and life satisfaction to be equal. However, holding the parameter of the path from burden to life satisfaction to be equal across the two wisdom groups significantly worsened the model fit ($\Delta\chi^2 = 5.242$, degrees of freedom (df) = 1, $p < 0.05$).

Third, we established a final multiple-group path analysis that allowed the path from burden to life satisfaction to vary and held all other parameters (*i.e.* from stressors to life satisfaction and from stressors to burden) to be equal across the wisdom groups. In the final model, we also held the parameters of the path from the covariates to care-giver burden and life satisfaction to be equal. The model fit was good: $\chi^2(24) = 27.243$, $p = 0.2933$, RMSEA = 0.019, CFI = 0.985, TLI = 0.969, SRMR = 0.019. The results showed that the association between care-giver burden and life satisfaction was statistically significant for the low wisdom group ($b = -0.031$ (SD = 0.011), $\beta = -0.134$ (SD = 0.049), $p < 0.01$), but non-significant for the high wisdom group ($b = 0.006$ (SD = 0.015), $\beta = 0.021$ (SD = 0.058), $p = 0.711$). A moderation effect was identified (Wald test: $\chi^2(1) = 4.089$, $p < 0.05$; see Tables 3 and 4 and Figure 1). Regarding covariates, care recipients' ADL and care-givers' gender, marital status, living arrangement

Table 4. Multiple-group path analysis for care-giver burden between wisdom groups

	Low wisdom			High wisdom		
	<i>b</i>	SE	β	<i>b</i>	SE	β
Care-giver:						
Age	0.053	0.051	0.043	0.053	0.051	0.042
Female gender	-0.161	0.991	-0.006	-0.161	0.991	-0.005
Married	-2.010	1.348	-0.053	-2.010	1.348	-0.046
Income	-0.682	0.290	-0.083*	-0.682	0.290	-0.073*
Education	1.118	1.646	0.026	1.118	1.646	0.026
Care-giving time	3.030	0.502	0.230***	3.030	0.502	0.200***
Living together	-2.462	1.167	-0.081*	-2.462	1.167	-0.072*
Care recipient:						
Age	0.207	0.097	0.075*	0.207	0.097	0.070*
Female gender	0.263	1.027	0.009	0.263	1.027	0.008
ADLs	0.161	0.031	0.204***	0.161	0.031	0.208***
CI	-0.277	0.277	-0.037	-0.277	0.277	-0.041
BP	1.879	0.311	0.223***	1.879	0.311	0.172***

Notes: SE: standard error. ADLs: activities of daily living. CI: cognitive impairment. BP: behavioural problems. Significance levels: * $p < 0.05$, *** $p < 0.001$.

and income were significantly associated with life satisfaction in both wisdom groups.

Sensitivity analysis

We conducted regression models by regressing life satisfaction on care-giver burden and wisdom (treated as continuous variable); care recipients' ADL, cognitive impairment and behavioural problem; covariates; and interaction terms (*i.e.* care-giver burden and wisdom). The results identified a significant moderation effect of wisdom on the relationship between care-giver burden and life satisfaction (interaction term: $b = 0.049$ ($SD = 0.014$), $\beta = 0.573$, $p < 0.001$). The results were consistent with those from the multiple-group path analysis.

We also conducted additional sensitivity analysis to examine whether using different cutoff points (*e.g.* 2.5 and 3.5) for wisdom variables changed the results. The results were similar. Furthermore, we tested the moderation effect of CDW, ADW and RDW on the relationship between care-giver burden and life satisfaction. Finally, we used the other five items to represent RDW (details shown in the Measurement section) and reran the models. All models identified a significant moderation effect of wisdom on the association between care-giver burden and life satisfaction, and the estimates of Wald tests were statistically significant (all $p < 0.05$).

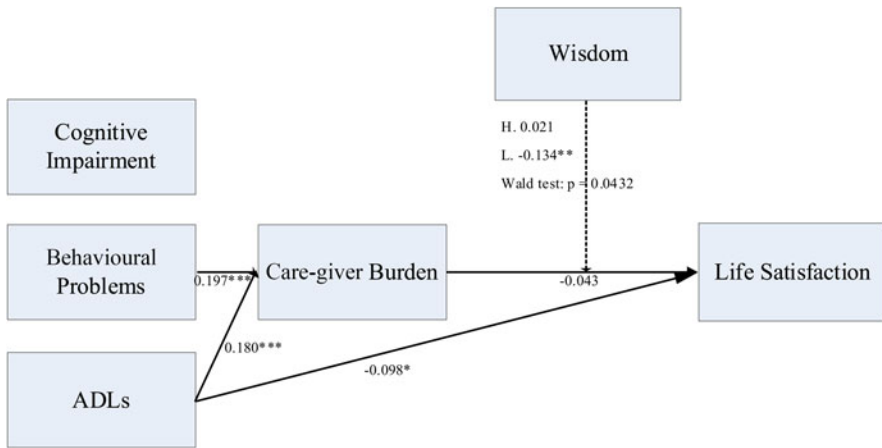


Figure 1. Final model of the role of wisdom in the association between care-giver burden and life satisfaction.

Notes: Standardised coefficients are reported. The dashed line indicates a moderating effect. The coefficients from the paths in the stress process model (i.e. the path from behavioural problems and activities of daily living (ADLs) to care-giver burden, the path from care-giver burden to life satisfaction, and the path from ADLs to life satisfaction) were calculated based on the whole sample. Care-givers' age, gender (1 = female), marital status (1 = married), income, educational level (1 = secondary school education level or higher), living arrangement (1 = lived with care recipient), care-giving time, and older adults' age and gender (1 = female) were controlled in the final model. Covariates except care-giving time are not shown for the reason of simplicity. H.: high wisdom. L.: low wisdom. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed).

Discussion

This study is one of the first attempts to examine the moderator role of wisdom in the relationship between care-giving burden and life satisfaction among family care-givers of older adults with disabilities in an urban Chinese context. The findings suggest that care-giver wisdom moderates the relationship between care-giver burden and life satisfaction. The findings provide new empirical evidence by emphasising the important role of care-giver wisdom in the family care-giving process. Such knowledge has important implications for long-term care policy and intervention development, especially in urban Chinese communities and other countries and regions with similar demographic characteristics and social, cultural and economic backgrounds.

Previous studies on the relationship between care-giver burden and life satisfaction have generated both significant and non-significant results (Haley *et al.*, 1995; Bergstrom *et al.*, 2011; Lu *et al.*, 2015; Penning and Wu, 2015). In this study, the relationship between care-giver burden and life satisfaction was statistically non-significant in urban Chinese contexts, even after controlling for socio-demographic characteristics, socio-economic status, and care recipients' ADLs, cognitive impairments and behavioural problems. Moreover, the findings showed that the association between care-giver wisdom and life satisfaction was statistically non-significant among Chinese family care-givers. We conducted further analysis, which showed that ADW was positively associated with life satisfaction and CDW was negatively associated with life satisfaction. The association between RDW and

life satisfaction was statistically non-significant. Furthermore, although previous studies found that purpose in life, being optimistic, a sense of coherence and competence were significant determinants of care-giver burden, life satisfaction and other mental health outcomes (Haley *et al.*, 2003; Der Lee *et al.*, 2014; del-Pino-Casado *et al.*, 2019; Maguire *et al.*, 2019), this study made new contributions and found that care-giver burden was negatively associated with life satisfaction among care-givers with relatively lower levels of wisdom in urban Chinese contexts. The negative impact of burden on life satisfaction was non-significant among those with relatively higher levels of wisdom.

We argue that wise adults might be more resilient when they encounter chronic stress and hardship. In other words, having relatively high levels of wisdom plays an important role in reducing the adverse influences of care-giver burden on life satisfaction. Specifically, care-givers with relatively high wisdom could have a clear and comprehensive interpretation of social reality, their care-giver roles, and the impacts of their care-giving activities on themselves, care recipients, families and communities. These factors could enable care-givers to have higher self-efficacy and confidence when they cope with stressors in their lives and make better judgments in stressful situations. Feelings of compassion for other people could not only play an important role in care-givers' subjective appraisals of their relationship with their care recipients, but also generate a positive and meaningful purpose in life. These factors could further contribute to improvements in life satisfaction. Given that wisdom is regarded as a global concept with validated measurements in other countries and cultures (Clayton and Birren, 1980; Ardel, 2003; Bangen *et al.*, 2013), the role of wisdom in family care-giving examined in the present study could have implications for socio-cultural contexts that are similar to the Chinese context. Future studies should be conducted to replicate this research in other social contexts.

The findings have the following policy and intervention implications. First, the wisdom construct should be applied as a crucial component of needs assessment among family care-givers, especially for those with low socio-economic status or lacking access to public services. Second, future interventions should focus on developing care-givers' capacity to analyse social issues from different perspectives, enhancing their understanding of reality and promoting feelings of compassion for others. Furthermore, it is important to note that the processes of self-reflection and examining adversities from various perspectives are difficult. However, they often lead to enhanced coping strategies, better emotional regulation and more comprehensive understanding of important life domains, which could further mitigate the negative impacts of care-giver burden on their subjective appraisal of their life situations. Given the important role of RDW in enhancing other wisdom subdimensions (Ardel, 2000), training and practice focused on reflective thinking should be included as a core component in social interventions addressing the welfare of family care-givers, especially in terms of how to use their life lessons to cope better with stressors. Finally, community-based education programmes for family care-givers should include training components such as positive reappraisal and both active and meaning-focused coping strategies (Nowlan *et al.*, 2015).

This study has the following limitations. First, the longitudinal survey focused on older adults with disabilities aged 75 years old or older. Due to the transition of

family care-givers and relatively large mortality rates during the survey period from 2010 to 2016 (23% in 2013 and 58% in 2016), we conducted the multiple-group path analysis based on the 2013 wave. This allowed us to conduct such analysis based on a relatively large sample size. Future longitudinal studies with large sample sizes are required to examine further the important role of care-giver wisdom in the family care-giving process across cultures and populations. Second, all data were self-reported, which might lead to inaccuracy and misclassification bias. Third, in this Shanghai-based study, the respondents' educational attainment and household income levels were higher than the national average. Hence, empirical generalisation of the findings should be limited to those with similar social and cultural backgrounds. Fourth, future scale validation studies are needed to examine the validity and reliability of the RDW scale among Chinese care-givers of older adults with disabilities. Furthermore, most wisdom items used in this research were negatively worded, mainly assessing the absence of wisdom and possibly leading to information inaccuracy. Finally, future studies should examine the role of wisdom in life satisfaction across lifestyles, particularly in terms of both positive and negative effects of wisdom in the care-giving process.

Conclusion

The results of this study confirm that care-giver wisdom can buffer the negative impacts of care-giver burden on life satisfaction. Wisdom is useful for care-givers to handle chronic care-giving stress by facilitating the integration of knowledge and life lessons, flexible coping strategies, utilisation of social resources, sense of purpose in life, mastery, personal control and positive affect. These factors are useful to handle burden, reduce negative thoughts, and enhance a sense of value and achievement. The construct of wisdom should be applied in both needs assessment and social interventions focused on family care-givers of older adults with disabilities.

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