

Grandparent-Parent Co-parenting Conflict and Grandparents' Depression: The Mediating Role of Sense of Control and the Moderating Role of Sense of Value as an Elder (Postprint)

Authors: Meng Huilin, Guo Fei, Chen Zhiyan

Date: 2022-09-06T00:00:00+00:00

Abstract

Background: In China, 80% of grandparents are involved in caring for their grandchildren. Research has found that caring for grandchildren may increase grandparents' risk of depression, thereby seriously affecting their quality of life. Previous studies have shown that co-parenting conflict, sense of value as an elder, and sense of control are all influencing factors of depression, but the underlying mechanisms remain to be elucidated.

Objective: To examine the influence mechanism of grandparent-parent co-parenting conflict on grandparents' depression, and to explore the mediating and moderating roles of sense of control and sense of value as an elder.

Methods: A total of 6,269 grandparents involved in raising their grandchildren were surveyed using the Grandparent-Parent Co-parenting Questionnaire, Sense of Control Questionnaire, Grandparent Meaning Questionnaire, and the Chinese short version of the Center for Epidemiological Studies Depression Scale. The SPSS 24.0 PROCESS macro was used to test the mediating effect of sense of control and the moderating effect of sense of value as an elder.

Results: The proportion of grandparents at risk for depression in this study was 11.98%. Grandparents' depression (5.36 ± 4.14) was significantly positively correlated with grandparent-mother co-parenting conflict (9.87 ± 3.08) ($r = 0.28, P < 0.001$), significantly positively correlated with grandparent-father co-parenting conflict (7.34 ± 3.25) ($r = 0.35, P < 0.001$), significantly negatively correlated with grandparent-sense of control (84.13 ± 8.58) ($r = -0.25, P < 0.001$), and significantly negatively correlated with sense of value as an elder (84.13 ± 8.58) ($r = -0.21, P < 0.001$). Grandparents' sense of control partially mediated the relationship between grandparent-mother co-parenting conflict and depression (mediating effect value = 0.05, accounting for 17.24% of the total effect, $P < 0.05$); it also significantly moderated the relationship between grandparent-father co-parenting conflict and depression (simple slope = -0.07, $P < 0.01$). Simple slope

test showed that for individuals with lower sense of value as an elder, co-parenting conflict had a greater impact on their depression.

Conclusion: Grandparent-parent co-parenting conflict, whether occurring with the grandchild's mother or father, is an important factor affecting grandparents' depression. Grandparents' sense of control plays a mediating role, and sense of value as an elder has a moderating effect. In families where grandparents are involved in child-rearing, intervention programs targeting grandparents' mental health should consider incorporating factors such as reducing co-parenting conflict and increasing grandparents' sense of control and value.

Full Text

The Influence of Grandparent-Parent Coparenting Conflict on Grandparents' Depression: The Mediating Effect of Sense of Mastery and Moderating Effect of Self-Perceived Valued Elder

MENG Huilin^{1, 2, 3}, GUO Fei^{1, 2*}, CHEN Zhiyan^{1, 2}

Funding: National Social Science Fund Project (18BSH117) -Study on the Influence of Father Involvement and Cooperative Parenting in Different Family Structures on Children's Socio-Emotional Behavior

Affiliation: Department of Psychology, University of Chinese Academy of Sciences, Beijing 100049, China

Corresponding Author: GUO Fei, Assistant Researcher; Email: guo@psych.ac.cn

Ethics Review: Ethics Committee of Institute of Psychology, Chinese Academy of Sciences; Approval No.: H21096

Abstract

Background: In China, 80% of grandparents participate in caring for grandchildren. Research indicates that grandparental childcare may increase depression risk, seriously affecting quality of life. Existing studies show that coparenting conflict, sense of mastery, and self-perceived valued elder status are all influencing factors for depression, but the underlying mechanisms remain to be elucidated.

Objective: To examine the influence mechanism of grandparent-parent coparenting conflict on grandparents' depression, exploring the mediating role of sense of mastery and moderating role of self-perceived valued elder status.

Methods: A total of 6,269 grandparents participating in grandchild care were surveyed using the Grandparent-Parent Coparenting Questionnaire, Mastery

Scale, Grandparent Meaning Scale, and the Chinese short version of the Center for Epidemiological Studies Depression Scale (CES-D). SPSS 24.0 with PROCESS macro was used to test the mediating effect of mastery and moderating effect of valued elder status.

Results: The proportion of grandparents at risk for depression in this study was 11.98%. Grandparental depression (5.36 ± 4.14) was significantly positively correlated with grandparent–mother coparenting conflict (9.87 ± 3.08) ($r = 0.28, P < 0.001$) and grandparent–father coparenting conflict (7.34 ± 3.25) ($r = 0.35, P < 0.001$), and significantly negatively correlated with sense of mastery (84.13 ± 8.58) ($r = -0.25, P < 0.001$) and self-perceived valued elder status (84.13 ± 8.58) ($r = -0.21, P < 0.001$). Sense of mastery partially mediated the relationship between grandparent–mother coparenting conflict and depression (indirect effect = 0.05, accounting for 17.24% of the total effect, $P < 0.05$) and between grandparent–father coparenting conflict and depression (indirect effect = 0.07, $P < 0.01$).

Conclusion: Grandparent–parent coparenting conflict is an important risk factor for grandparents' depression, with sense of mastery playing a mediating role and self-perceived valued elder status exerting a moderating effect. For families with grandparental involvement in childcare, intervention programs targeting grandparents' mental health should consider reducing coparenting conflicts and enhancing related factors such as sense of mastery and valued elder status.

Keywords: Grandparents; Coparenting Conflict; Sense of Mastery; Valued Elder; Depression

Introduction

Depression is a common mental health problem characterized by loss of interest, low mood, impaired concentration, and insomnia, which seriously affects individuals' physical and mental health and quality of life. With socioeconomic development and advances in technology, increased human longevity and reduced child mortality have significantly expanded the population of older adults who become grandparents. Meanwhile, the prevalence of dual-income families has made grandparental involvement in childcare more common, with surveys indicating that up to 80% of grandparents participate in caregiving. Consequently, multigenerational coparenting has become a prominent feature of modern Chinese families.

Coparenting refers to the coordination and cooperation between two or more caregivers in raising children. Conflicts often arise during this process due to differences in values and parenting philosophies between generations, serving as stressors that trigger emotional distress and increase vulnerability to depression. Research suggests that grandparental childcare may elevate depression risk. Family Systems Theory posits that the family is an integrated system in which members are interdependent, and their interactions shape the family system while profoundly influencing individual members. As a crucial form of

intergenerational interaction, coparenting quality significantly impacts grandparents' mental health, with conflicts between grandparents and adult children being significantly associated with grandparents' psychological well-being. However, most of these findings come from Western contexts, which is incongruent with the exceptionally high rates of grandparental involvement in childcare in China. Domestic research on this topic remains scarce, particularly regarding how coparenting affects grandparents' mental health and the potential mechanisms involved.

Previous research has identified sense of mastery as an important factor influencing mental health. Low mastery tends to trigger negative emotions, and perceiving a lack of control over events increases depression risk. According to the Stress Process Model, the negative impact of stressors on individuals is mediated by variables related to coping resources and stress management. Studies demonstrate that sense of mastery serves as a crucial individual resource that reduces depression risk among caregiving individuals. For grandparents involved in childcare, might their sense of mastery be compromised by coparenting conflicts, thereby increasing their depression risk? This study examines whether sense of mastery mediates the relationship between coparenting conflict and grandparents' depression.

Understanding the specific conditions under which coparenting conflict influences depression—that is, identifying moderating factors—can inform targeted interventions. According to the Cognitive-Motivational-Relational Theory of emotion, emotions result from person-environment interactions, with different appraisals of environmental events leading to different emotional outcomes. Individual cognitive differences lead to varied interpretations of coparenting conflicts and consequently different outcomes. Self-perceived valued elder status refers to individuals' perception of themselves as wise and respected grandparents, representing an indicator of grandparental role meaning. Individuals with high valued elder status tend to pay less attention to self-relevant negative information during conflicts and experience fewer negative emotions, suggesting that valued elder status may buffer the negative impact of conflict on mental health. Therefore, this study simultaneously examines the moderating effect of valued elder status in the relationship between coparenting conflict and grandparents' depression.

Existing research on intergenerational coparenting conflicts has focused primarily on conflicts between grandparents and the child's mother. However, with societal development, the importance of father involvement in parenting has gained increasing recognition, with unique influences on children's social development and mental health. Growing evidence confirms that fathers are core members of the coparenting system. Consequently, this study includes both grandparent-mother and grandparent-father conflicts to comprehensively examine the impact of grandparent-parent coparenting in families.

In summary, this study investigates the influencing factors and mechanisms of grandparents' depression within the context of coparenting, providing a basis

for interventions related to older adult and family health.

Methods

Participants and Procedure

Data were collected from August to November 2021 through both online distribution via Wenjuanxing and face-to-face interviews. The online survey covered Beijing, Tianjin, Hubei, Zhejiang, and other regions, while offline data collection was conducted primarily in Beijing. A total of 631 questionnaires were collected.

Inclusion criteria: (1) Caring for grandchildren together with adult children; (2) Clear consciousness and ability to understand questionnaire content; (3) Aged 50 years or older.

Exclusion criteria: (1) History of severe mental illness.

The final sample comprised 626 valid participants, yielding a response rate of 99.21%.

Measures

Sociodemographic Characteristics: Designed by the research team through group discussion, including age, gender, role (paternal vs. maternal grandparent), education level, marital status, employment status, income, and residence (defined as living in the locality for at least six months).

Coparenting Conflict: Measured using the Grandparent-Parent Coparenting Questionnaire, adapted from the Coparenting Relationship Scale (CRS). The questionnaire comprises four dimensions, with this study utilizing the “coparenting conflict” subscale, which includes direct and indirect conflict dimensions. Confirmatory factor analysis revealed that two items (“consistency in rule-making” and “child being closer to oneself”) had factor loadings below 0.3, so these were excluded, leaving four items measuring coparenting conflict. Items were rated on a 5-point scale from “never” to “always.” Cronbach’ s α was 0.81 in this study.

Sense of Mastery: Assessed using the 5-item version of the Pearlin and Schooler Mastery Scale. Items were rated on a 5-point Likert scale from 1 (“strongly agree”) to 5 (“strongly disagree”), with higher scores indicating lower sense of mastery. Cronbach’ s α was 0.85.

Self-Perceived Valued Elder Status: Measured using the Valued Elder subscale from Kivnick’ s Grandparent Meaning Scale. The subscale contains 14 items rated on a 7-point Likert scale from 1 (“strongly disagree”) to 7 (“strongly agree”). Cronbach’ s α was 0.88.

Depression: Assessed using the Chinese short version of the Center for Epidemiological Studies Depression Scale (CES-D). Scores of 17 or above indicated

high risk for severe depression. Cronbach' s α was 0.86.

Statistical Analysis

Data were analyzed using SPSS 24.0. Pearson correlation analysis examined relationships among variables. The PROCESS macro in SPSS was used to test mediating and moderating effects via bias-corrected nonparametric percentile bootstrap method with 5,000 resamples. Mediation and moderation effects were considered significant if the 95% confidence interval did not include zero, with $P < 0.05$ indicating statistical significance.

Results

Common Method Bias Control

To control common method bias, data were collected anonymously and attention-check items were included. Harman' s single-factor test was conducted, revealing seven factors with eigenvalues greater than 1. The first factor explained 23.53% of variance, below the 40% critical threshold, indicating no significant common method bias.

Depression Prevalence and Demographic Differences

Using the cutoff score of 10 or above to identify depression risk, 11.98% (75/629) of grandparents showed depressive tendencies. Significant differences in depression scores were found across education levels and marital status ($P < 0.001$). Detailed demographic characteristics and depression score comparisons are presented in Table 1 .

Descriptive Statistics and Correlations

Grandparent-mother coparenting conflict averaged 9.87 ± 3.08 , *grandparent – father coparenting conflict* 7.34 ± 3.25 , *sense of mastery* 12.61 ± 5.48 , *valued elder status* 84.13 ± 8.58 , and *depression* 10.12 ± 3.15 . Correlation analysis revealed that both grandparent-mother and grandparent-father coparenting conflicts were significantly positively correlated with depression and negatively correlated with sense of mastery. Sense of mastery and valued elder status were both significantly negatively correlated with depression (see Table 2).

Mediating Effect of Sense of Mastery

Grandparent role and employment status are unordered categorical variables that can introduce bias when entered directly into models. Creating dummy variables improves model accuracy. For analysis, these variables were converted to binary dummy variables coded as 0 and 1. Using paternal grandmother as the reference group, dummy variables were created for paternal grandfather (1,0,0), maternal grandfather (0,1,0), and maternal grandmother (0,0,1). For

employment status, using full-time/part-time employment as reference, dummy variables were created for retired (1,0) and unemployed (0,1). These dummy variables were included as controls along with other sociodemographic characteristics.

Regression analysis using PROCESS with 5,000 bootstrap samples examined mediation. For grandparent-mother coparenting conflict as the independent variable, the total effect was 0.29, with direct effect on depression of 0.24. The indirect effect through sense of mastery was 0.05 (17.24% of total effect), with 95% CI [0.03,0.08], indicating significant mediation. Unemployment, residence, education, and marital status significantly predicted depression ($P < 0.05$), while residence and maternal grandmother role predicted sense of mastery in the grandparent-mother conflict model ($P < 0.05$) (see Table 3).

Using the same procedure with grandparent-father coparenting conflict as the independent variable, the total effect was 0.36, direct effect 0.31, and indirect effect through sense of mastery 0.05 (13.89% of total effect), with 95% CI [0.03,0.07], confirming significant mediation. Unemployment, residence, education, and marital status predicted depression ($P < 0.05$), while marital status and residence predicted sense of mastery in the grandparent-father conflict model ($P < 0.05$) (see Table 4).

Moderating Effect of Valued Elder Status

With sociodemographic variables as controls, hierarchical linear regression tested moderation. The interaction term between grandparent-mother coparenting conflict and valued elder status significantly predicted depression ($\beta = -0.06$, $P < 0.05$), indicating a moderating effect. The same analysis with grandparent-father coparenting conflict revealed a significant interaction term ($\beta = -0.07$, $P < 0.01$), confirming that valued elder status also moderates this relationship. Marital status and education significantly predicted depression ($P < 0.05$) (see Tables 5 and 6).

Following established procedures, all variables were standardized and simple slope tests were conducted at $\pm 1SD$ of valued elder status. For individual high in valued elder status, grandparent-mother coparenting conflict significantly predicted depression ($\beta = 0.24$, $P < 0.001$). For those low in valued elder status, the conflict-depression relationship was stronger ($\beta = 0.35$, $P < 0.001$) (see Figure 1 [Figure 1: see original paper]). Similarly, for grandparent-father coparenting conflict, the effect was weaker at high valued elder status ($\beta = 0.27$, $P < 0.001$) and stronger at low valued elder status ($\beta = 0.41$, $P < 0.001$) (see Figure 2 [Figure 2: see original paper]).

Discussion

This study found that 11.98% of participating grandparents showed depressive tendencies, lower than the 26.80% detection rate in a Zhengzhou study. This discrepancy may be attributable to the older age (over 60) of participants in the Zhengzhou study, consistent with research showing higher depression rates in

older age groups. Education level and marital status emerged as important protective factors, aligning with previous research. Urban residence was associated with lower depression than rural residence, possibly reflecting better access to resources. Unemployed grandparents showed lower depression than those working full-time or part-time, likely because employed grandparents face dual pressures of work and childcare.

Urban residence also influenced sense of mastery, as different living environments may affect perceived control. Maternal grandmothers reported higher sense of mastery than paternal grandmothers when facing conflicts with mothers, possibly because paternal grandmothers lack blood ties and may feel more control loss during conflicts.

Both grandparent-mother and grandparent-father coparenting conflicts showed significant direct effects on depression. Intergenerational conflict has long been recognized as detrimental to mental health. In the Chinese context, Confucian traditions emphasize filial piety and parental authority, so coparenting conflicts may particularly wound grandparents' sense of authority, triggering negative emotions. Sense of mastery significantly mediated both relationships, highlighting its importance. When grandparents' parenting suggestions are rejected by adult children, they may experience helplessness; alternatively, they may adopt conflict-avoidant strategies by withholding opinions. Both responses reduce sense of mastery, making grandparents feel less control over their lives and less confident in managing conflicts, thereby increasing depression risk.

A crucial finding is that the impact of coparenting conflict on depression is conditional. When valued elder status is low, coparenting conflict exerts stronger effects on depression. High valued elder status may buffer the damage to self-worth from parenting disagreements, as these individuals have higher self-esteem and are less likely to attribute conflicts to personal failings. Conversely, according to the risk-enhancing model, the co-occurrence of multiple risk factors produces worse outcomes than their simple sum. Coparenting conflict already places grandparents under stress; when combined with low valued elder status, the inability to buffer this stress substantially increases depression risk.

In conclusion, this study elucidates the factors and mechanisms influencing depression among grandparents involved in childcare. Both mother and father coparenting conflicts increase depression risk, with sense of mastery mediating and valued elder status moderating these relationships. Research demonstrates that sense of mastery and valued elder status can be enhanced through interventions. For instance, internet-based self-help interventions for depression have effectively improved mastery, thereby alleviating depressive symptoms. According to symbolic interaction theory, self-perceptions like valued elder status are shaped through interactions with others, and group interventions have been shown to enhance self-esteem.

These findings suggest that community health centers should regularly conduct health education to raise awareness and facilitate early screening. Developing

educational programs to enhance grandparents' sense of mastery and valued elder status is recommended. For example, training grandparents as family health educators who transmit knowledge to family members and receive regular positive feedback could be beneficial. Collaborating with tertiary hospitals to provide continuous group therapy sessions may also enhance valued elder status.

Limitations: This study did not account for the impact of migration, and the associated social capital loss may significantly affect mental health, warranting future investigation. Additionally, other major life events related to coparenting were not considered. Most importantly, this cross-sectional design precludes causal inferences; longitudinal follow-up studies are needed to establish causality.

Despite these limitations, this study, grounded in Family Systems Theory, examines how intergenerational parenting conflicts affect grandparents' mental health and integrates crucial psychological variables (sense of mastery and valued elder status) to provide new perspectives for intervention development. Future mental health interventions for this population should incorporate strategies to enhance sense of mastery and valued elder status, which may prove significant for preventing depression and promoting psychological well-being.

Author Contributions

MENG Huilin: Study design and implementation, data collection and analysis, manuscript writing. GUO Fei: Study design and implementation, project evaluation, funding acquisition, quality control, manuscript writing and revision. CHEN Zhiyan: Study design, project evaluation, quality control, manuscript revision.

Conflict of Interest

The authors declare no conflict of interest.

References

- [1] Liu Q, He H, Yang J, et al. Changes in the global burden of depression from 1990 to 2017: Findings from the Global Burden of Disease study [J]. *Journal of psychiatric research*, 2020, 126: 134-140.
- [2] Shou J, Du Z, Wang H, et al. Quality of life and its contributing factors in an elderly community-dwelling population in Shanghai, China [J]. *Psychogeriatrics*, 2018, 18(2): 89-97.
- [3] Chen F, Liu G. The health implications of grandparents caring for grandchildren in China [J]. *The journals of gerontology Series B, Psychological sciences and social sciences*, 2012, 67(1): 99-112.
- [4] Silverstein M, Zuo D. Grandparents caring for grandchildren in rural China: consequences for emotional and cognitive health in later life [J]. *Aging mental*

health, 2020: 1-11.

[5] State Council Information Office. National Health and Family Planning Commission Press Conference on Universal Two-Child Policy Progress. <http://www.scio.gov.cn/xwfbh/gbwxwfbh/xwfbh/wsb/Document/1541106/1541106.ht>, 2017-01-22.

[6] Guo Y, Li X. The interaction between grandparent-parent coparenting relationships and toddler temperament [J]. Chinese Journal of Clinical Psychology, 2021, 29(4): 783-788.

[7] Wen M, Teng S, Feng X, et al. The effect of mother-child attachment on problem behaviors in preschoolers under grandparental coparenting: The mediating role of grandparent-grandchild attachment [J]. Studies of Psychology and Behavior, 2020, 18(02): 208-213.

[8] Hongwei X. Physical and mental health of Chinese grandparents caring for grandchildren and great-grandparents [J]. Social science & medicine, 2018: 106-116.

[9] Hansen A C, Brown R, Keller P, et al. Sources of stress and strength: Contextualizing the experience of grandparents rearing grandchildren in Appalachia [J]. Journal of Intergenerational Relationships, 2020: 1-21.

[10] Leder S, Grinstead L N, Torres E. Grandparents raising grandchildren: stressors, social support, and health outcomes [J]. Journal of family nursing, 2007, 13(3): 333-352.

[11] Brunello G, Rocco L. Grandparents in the blues. The effect of childcare on grandparents' depression [J]. Review of Economics of the Household, 2019, 17(2): 587-613.

[12] Rosenbusch K, Cseh M. The cross-cultural adjustment process of expatriate families in a multinational organization: A family system theory perspective [J]. Human Resource Development International, 2012, 15(1): 61-77.

[13] Jang H, Rautkis M E, Tang F. The quality of relationships with adult children and depressive symptoms among grandparents [J]. Aging mental health, 2021: 1-9.

[14] Goodman C C, Tan P P, Ernandes P, et al. The Health of Grandmothers Raising Grandchildren: Does the Quality of Family Relationships Matter? [J]. Families Systems & Health, 2008, 26(4): 417-430.

[15] Ang S, Malhotra R. Association of received social support with depressive symptoms among older males and females in Singapore: Is personal mastery an inconsistent mediator? [J]. Social science medicine, 2016, 153: 165-173.

[16] Zhao Y, Zhang Y, Wang P, et al. The mediating effect of sense of mastery in the relationship between depression and self-perceived aging among rural elderly [J]. Modern Preventive Medicine, 2021, 48(16).

- [17] Yu X, Fan G. Direct and indirect relationship between locus of control and depression [J]. *Journal of health psychology*, 2016, 21(7).
- [18] Van Egeren L A, Hawkins D P. Coming to terms with coparenting: Implications of definition and measurement [J]. *Journal of Adult Development*, 2004, 11(3): 165-178.
- [19] Chan E-Y, Glass G, Chua K-C, et al. Relationship between Mastery and Caregiving Competence in Protecting against Burden, Anxiety and Depression among Caregivers of Frail Older Adults [J]. *The journal of nutrition, health & aging mental health*, 2018, 22(10): 1238-1245.
- [20] Lazarus R S. Progress on a cognitive-motivational-relational theory of emotion [J]. *The American psychologist*, 1991, 46(8): 819-834.
- [21] Kivnick H Q. Grandparenthood: An Overview of Meaning and Mental Health [J]. *Gerontologist*, 1982, 22(1): 59-66.
- [22] Bechtoldt M N, De Dreu C K, Nijstad B A, et al. Self-concept clarity and the management of social conflict [J]. *Journal of Personality*, 2010, 78(2): 539-574.
- [23] Li D, Wang Z, Zhu X, et al. Community intervention study on grandparent-parent coparenting in urban Beijing [J]. *Chinese Journal of Child Health Care*, 2016, 24(06): 642-645.
- [24] Derlan C L, Umaña-Taylor A J, Updegraff K A, et al. Mother-Grandmother and Mother-Father Coparenting Across Time Among Mexican-Origin Adolescent Mothers and Their Families [J]. *Journal of Marriage Family*, 2018, 80(2): 349-366.
- [25] Li X, Wei X. Father involvement and its relationship with children's social competence: The mediating role of maternal parenting efficacy [J]. *Journal of Beijing Normal University (Social Sciences)*, 2017, (05): 49-58.
- [26] Zhao F, Cheng B, Li Y, et al. The effect of father coparenting on adolescent depression in nuclear families: The mediating roles of father-child and mother-child attachment [J]. *Psychological Development and Education*, 2022, (01): 109-117.
- [27] Chen C, Guo F, Chen Z. The effect of father coparenting on adolescent depression: The multiple mediating roles of maternal psychological control and adolescent grit [J]. *Chinese Journal of Clinical Psychology*, 2021, 29(04): 734-738.
- [28] Backe I F, Patil G G, Nes R B, et al. The relationship between physical functional limitations, and psychological distress: Considering a possible mediating role of pain, social support and sense of mastery [J]. *SSM Popul Health*, 2018, 4: 153-163.
- [29] Kivnick H Q. Dimensions of grandparenthood meaning: Deductive conceptualization and empirical derivation [J]. *Journal of Personality Social Psychology*, 1983, 44(5): 1056.

- [30] He J, Chen Z, Guo F, et al. Development of the Chinese short version of the Center for Epidemiological Studies Depression Scale [J]. Chinese Journal of Behavioral Medicine and Brain Science, 2013, 22(12): 1133-1136.
- [31] Zhou H, Long L. Statistical tests and control methods for common method bias [J]. Advances in Psychological Science, 2004, (06): 942-950.
- [32] Cao Y. Analysis and implementation of dummy variable regression in SPSS [J]. Statistics Decision, 2018, 34(10): 66-69.
- [33] Liang Y, Zhang Y. Correct application and expression of multiple linear regression [J]. Chinese Journal of Child Health Care, 2020, 28(02): 230-232.
- [34] Aiken L S, West S G, Reno R R. Multiple regression: Testing and interpreting interactions [M]. sage, 1991.
- [35] Gu C, Zhang R, Wang M, et al. The effect of social health on depression among grandparents providing intergenerational care [J]. Chinese Journal of Gerontology, 2020, 40(14): 3114-3116.
- [36] Yang Z, Chen R, Hu X, et al. Analysis of depressive symptoms and influencing factors among urban and rural elderly in China [J]. Chinese Journal of Epidemiology, 2017, 38(08): 1088-1093.
- [37] Cockerham W C. Health lifestyle theory and the convergence of agency and structure [J]. Journal of Health and Social Behavior, 2005, 46(1): 51-67.
- [38] Li J, Peng S, Huang P, et al. Detection rate and influencing factors of depressive symptoms among urban elderly in Ya' an six years after Lushan earthquake [J]. Sichuan Mental Health, 2021, 34(06).
- [39] Tao N, Yin P. Urban-rural differences in depression prevalence and risk factors among middle-aged and elderly populations in China [J]. Chinese Journal of Social Medicine, 2017, 34(01): 22-25.
- [40] Sobol S, Ben-Shlomo S. Stress-related mental health and growth among first-time grandparents: The moderating role of family support [J]. Stress Health, 2019, 35(4): 503-515.
- [41] Yang H, Shao J, Zhang Q, et al. Fear of aging and susceptibility to fraud among older adults: The mediating role of security and sense of mastery [J]. Chinese Journal of Clinical Psychology, 2019, 27(05).
- [42] Ge Y. Discussion on modern mother-in-law and daughter-in-law relationship from an ethical perspective [J]. Journal of Henan Polytechnic University (Social Sciences), 2016, 17(04): 421-426.
- [43] Yoo J, Russell D W. Caring for grandchildren and grandparents' physical and mental health changes [J]. Journal of Child Family Studies, 2020, 29(3): 845-854.
- [44] Kim J H, Silverstein M. Are filial piety and ethnic community engagement associated with psychological wellbeing among older chinese american immi-

grants? A cultural resource perspective [J]. *Research on Aging*, 2021, 43(2): 63-73.

[45] Low S S, Goh E C. Granny as Nanny: Positive Outcomes for Grandparents providing Childcare for Dual-Income Families. Fact or Myth? [J]. *Journal of intergenerational relationships*, 2015, 13(4): 302-319.

[46] Tangchonlatip K, Ingersoll-Dayton B, Punpuing S. Conflict in skipped generation households in Thailand [J]. *The International Journal of Aging Human Development*, 2021, 92(1): 3-21.

[47] Xu N, Chen X, Yang T, et al. Research progress on sense of mastery in breast cancer patients [J]. *Journal of Nursing Science*, 2019, 34(02): 105-108.

[48] Wang Y, Zhang W, Li D, et al. Adolescent temperament and substance use: Testing interaction effects [J]. *Psychological Development and Education*, 2012, 28(03): 292-300.

[49] Mehrotra S, Sudhir P, Rao G, et al. Development and pilot testing of an internet-based self-help intervention for depression for Indian users [J]. *Behavioral Sciences*, 2018, 8(4): 36.

[50] Xu Q, Li S, Yang L. Perceived social support and mental health for college students in mainland China: the mediating effects of self-concept [J]. *Psychology, health medicine*, 2019, 24(5): 595-604.

[51] Jalali A, Behrouzi M K, Salari N, et al. The effectiveness of group spiritual intervention on self-esteem and happiness among men undergoing methadone maintenance treatment [J]. *Current Drug Research Reviews Formerly: Current Drug Abuse Reviews*, 2019, 11(1): 67-72.

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv – Machine translation. Verify with original.