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Intergenerational Support from Adult Children on Cognitive Function in Chinese Older Adults: The Chain Mediating Role of Life Satisfaction and Depression

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ABSTRACT

Against China's rapid aging and cognitive decline concerns, this study explores intergenerational support's role in older adults' cognitive health. While family support is central to Chinese eldercare, whether life satisfaction and depressive symptoms mediate this link—especially across urban-rural areas—remains unclear. Data from the nationally representative CHARLS 2020 dataset (n=3,136, aged ≥60). Pearson correlations, PROCESS macro (5,000 bootstraps), and propensity score matching (PSM) was used to balance urban-rural covariates and test mediation heterogeneity. In this sample, intergenerational support correlated positively with cognitive function ($r=0.123$, $p<0.01$) and life satisfaction ($r=0.064$, $p<0.01$), and negatively with depressive symptoms ($r=-0.129$, $p<0.01$). Life satisfaction inversely linked to depression ($r=-0.275$), which associated with poorer cognition ($r=-0.275$, $p<0.01$). Regression showed direct effects of support on cognition ($\beta=0.166$, $p<0.001$), with stronger indirect effects through depressive symptoms ($\beta=0.021$) than life satisfaction ($\beta=0.015$). Serial mediation (support→satisfaction→depression→cognition) was significant ($\beta=0.013$). Depression-mediated effects were marginally stronger in rural subgroups ($\beta=0.082$) than urban subgroups ($\beta=0.076$). Intergenerational adult children's support can effectively promote cognitive health among older adults by enhancing life satisfaction and alleviating depression. Life satisfaction and depressive symptoms act as key mediators in this process.

Keywords: Intergenerational Support, Cognitive Function, Life Satisfaction, Depressive Symptoms, Older Adults

1. Introduction

The global trend of population aging has brought increasing attention to age-related cognitive decline as a major public health concern, particularly in societies with rapidly shifting demographic structures (World Health Organization, 2019). Cognitive impairment in later life often manifests as diminished memory capacity, slower information processing, and decreased attentional control, all of which compromise daily autonomy (Deary et al., 2009; Wilson et al., 2002). China faces one of the world's most rapid aging populations, with 296 million adults aged 60 years and older (21% of the population) as of 2022 (Development of Aging and Health; 2022). By 2050, this number is projected to exceed 400 million, which will further exacerbate challenges, given that about 15% of older adults already experience mild cognitive impairment, a sign of

cognitive decline. This protective effect may be amplified in rural contexts(Hou et al., 2023). Cognitive decline not only undermines older adults' ability to maintain daily functioning and independence but also contributes to increased caregiving demands, heavier familial burdens, and escalating healthcare expenditures (The Lancet Public Health, 2020). Although some cognitive changes are attributable to physiological aging, growing evidence highlights the critical role of psychosocial factors in shaping cognitive trajectories. Studies have consistently shown that older adults facing long-term depression, low satisfaction with life, or insufficient social support tend to experience a greater decline in cognitive function (Samtani et al., 2022; Zhang et al., 2024). As a result, researchers have increasingly focused on how the role of supportive relationships in slowing cognitive decline among older adults(Krzeczkowska et al., 2021). Due to the relatively underdeveloped institutional eldercare system in China, families—particularly the enduring intergenerational ties between older parents and their adult children—remain the primary providers of daily caregiving and emotional support. Support from adult children has been widely recognized as beneficial for preserving both mental well-being and cognitive health among older adults(Wu & Chiou, 2020; Silverstein et al., 2006). Previous studies suggest that financial and emotional support from adult children may enhance cognitive performance in older individuals(Krzeczkowska et al., 2021) .Those receiving dual forms of support outperform their unsupported counterparts in cognitive functioning (Wu & Chiou, 2020; Silverstein et al., 2006). Nevertheless, much of the extant literature focuses on the direct effects of intergenerational support, while relatively few studies explore the indirect mechanisms through which such support influences cognition—particularly via emotional pathways such as enhanced life satisfaction or alleviation of depressive symptoms (Yang et al., 2023; Feng et al., 2025; Shao et al., 2022). This lack of focus on mediating mechanisms leaves important gaps in understanding how intergenerational dynamics shape cognitive trajectories in later life.

2. Literature Review

In Chinese family settings, where traditional norms still emphasize filial responsibility, support exchanged between generations—including financial contributions, emotional companionship, and practical caregiving—remains a foundational element in elder care. Rather than viewing such support as merely instrumental, research has suggested it plays a key role in sustaining older adults ' emotional stability and daily functioning. Socioemotional Selectivity Theory (Carstensen and Löckenhoff, 2004) provides insight into these dynamics, suggesting that As individuals grow older and recognize that their remaining time is finite, they are more likely to focus on emotionally meaningful relationships (Carstensen et al., 1999). Within this context, children's involvement carries symbolic meaning beyond caregiving—it reinforces emotional bonds, familial identity, and a sense of being valued (Zhang, 2024; Wu & Chiou, 2020). These emotionally supportive interactions may protect against loneliness and marginalization, enhance personal continuity, and foster engagement—all of which are associated with slower cognitive decline (Samtani et al., 2022; Zhang et al., 2024). Findings from CHARLS lend further support, indicating that elders who receive regular emotional and instrumental support from their children tend to perform better on cognitive tasks such as memory recall and verbal processing (Hou & Zhang, 2023). A prior CHARLS analysis revealed that rural elders report 23% higher emotional dependency on children than urban counterparts. This protective effect may be amplified in rural contexts. At the same time, a prior CHARLS analysis revealed that rural elders report 23% higher emotional dependency on children than urban counterparts (Cong & Silverstein, 2008), and their cognitive performance is more strongly linked to children's visit frequency (β=0.18 vs. urban β=0.11) (Hou & Zhang, 2023; Hou et al., 2024). Based on this, the current study proposes the following hypothesis 1: Intergenerational support positively predicts cognitive functioning, with this effect being stronger among rural older adults due to their higher dependency on family care.

Life satisfaction—often understood as a person's subjective assessment of how well their life meets their expectations—has been a major topic of research in aging studies (Lee et al., 2020; Ko & Jun, 2021). Evidence suggests that various forms of support from adult children, including emotional encouragement and financial help, may significantly enhance this sense of fulfillment, especially among older individuals living in less developed communities or lacking access to social resources (Wu, 2022; Gan et al.2024). For instance, data from CHARLS show that elderly individuals with functional limitations tend to report higher well-being when they receive consistent help from their children (Zhou et al., 2023). This pattern appears to hold across cultural contexts. A regional review in South Asia emphasized the significance of intergenerational ties in shaping older adults' subjective well-being (Ko & Jun, 2021; Jahangir, 2025). Beyond its role in emotional health, life satisfaction has also been linked to cognitive outcomes. Some studies associate higher satisfaction with improved memory and information processing, while others highlight its long-term protective function against cognitive decline, especially among those with depressive risk. These findings support hypothesis 2: Intergenerational adult children's support enhances cognitive functioning in older adults by increasing their life satisfaction.

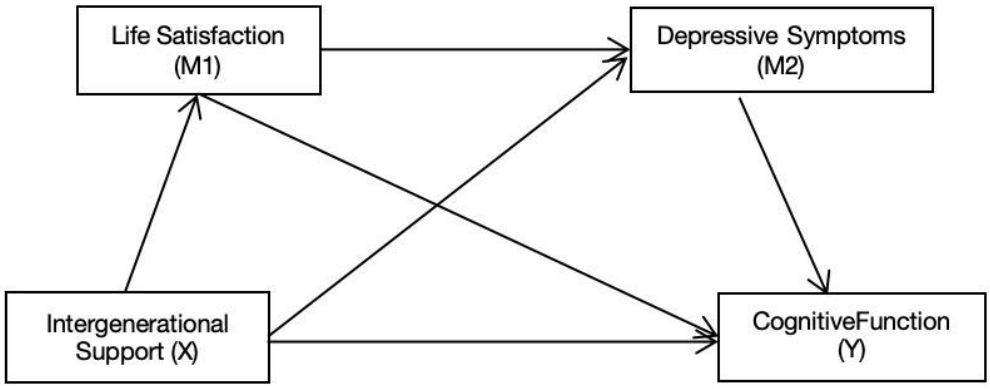
Depressive symptoms represent one of the most common psychological concerns in later adulthood, often characterized by prolonged sadness, low motivation, and emotional distress. These conditions frequently co-occur with sleep disturbances, attention deficits, and impaired executive functioning—factors that are frequently linked to cognitive decline (Deary et al., 2009). Longitudinal evidence has shown that older adults with chronic depression tend to perform worse in memory, focus, and information processing tasks, and are at elevated risk for developing mild cognitive impairment or dementia (Wilson et al., 2002). Individuals experiencing long-term depression tend to struggle with memory retention, focus, and information handling, and depression is increasingly recognized as a possible early indicator of conditions like mild cognitive impairment (MCI) or dementia (Lazarus & Folkman, 1984). From a psychosocial perspective, sustained emotional and instrumental support from family—particularly adult children—may buffer against such mental health risks. Based on the stress-buffering framework (Chou & Chi, 2003) supportive social relationships help individuals manage psychological pressure more effectively (Shen et al., 2022). Empirical studies further support this view: frequent and emotionally meaningful communication with family has been shown to reduce negative emotions and enhance the ability perceive happiness among older adults (Wu & Chiou, 2020; Tian, 2016; Huang & Fu, 2021; Liu & Bai, 2024). For example, feng found that cclose intergenerational ties were found to coincide with reduced depressive affect in chronically diseased older populations, partly through better self-rated health and enhanced emotional satisfaction (Feng et al., 2025). Based on this body of evidence, we propose hypothesis 3: Emotional support from adult children contributes to better cognitive health in later life by alleviating depressive symptoms.

Support from adult children—both financial and emotional—helps older adults maintain basic economic security and, more importantly, fosters a stronger sense of purpose and self-worth. These benefits together contribute to greater overall life satisfaction (Wu, 2022; Wang & Zhao, 2012; Carstensen, 1992). Socioemotional SelectivityTheory (Zhou, 2023) suggests that emotional quality and familial bonds become increasinglysalient in later life, and support from children reinforces older adults' positive evaluation of life (Gan et al., 2024; Wang et al., 2025). Concurrently, life satisfaction is widely recognized as a protectivefactor against depression. Enhancing emotional regulation and access to coping resources has been shown to help buffer against depressive symptoms (Hou & Zhang, 2023; Liao et al., 2024). Additionally, community-level support and personal agency may buffer against depression through improved life satisfaction (Lu, 2016; Tian & Chen, 2022; Ma et al., 2023). Longitudinal data from (Hou et al., 2024) further suggest that life satisfaction significantly predicts lower depressive symptoms six months later,

underscoring a delayed psychological effect. Urban-rural disparities in this pathway are plausible: rural older adults have higher depressive symptom rates (18.3% vs. 12.5%) , which may strengthen the support-cognition link through emotional distress. Urban seniors' life satisfaction, however, may be more influenced by community engagement (Larsen, 2025; Wu, 2022), weakening family support's mediating role.Given robust evidence linking depressive states to diminished cognitive performance (Wilson, et al., 2022; Zhao et al, 2014), this study advances hypothesis 4: life satisfaction and depression act as sequential mediators, and the mediating role of depressive symptoms is more pronounced in rural subgroups than urban subgroups.

Although prior research has explored the individual links between intergenerational support, emotional well-being, and cognitive outcomes, the pathways through which life satisfaction and depression may act as mediators—either alone or in sequence—have received limited attention. This piecemeal perspective hinders a deeper understanding of how these psychosocial factors operate together within an integrated framework. To bridge this gap, the current study tests a chain mediation model, proposing that life satisfaction and depression jointly explain how adult children's support may shape cognitive functioning in later life within Chinese society, guided by the values of filial piety (Figure 1).

Figure 1: Hypothesized relationships between Intergenerational Support, life satisfaction and Depression Symptoms, Cognitive Function



3. Materials and Methods

3.1. Data Source and Sample Composition

Our research utilized data from the 2020 wave of CHARLS, a peer-reviewed, nationally representative longitudinal survey conducted by Peking University. CHARLS uses a sampling scheme involving multiple stages and stratification across 29 provinces, stratified by urban-rural residency and socioeconomic status to represent adults who were at least 45 years old.

To focus on intergenerational support dynamics, the analysis included respondents aged 60 years and older with at least one living child aged 18 years or older. The initial sample included 19,396 participants. We first excluded 7,925 individuals below the age of 60 years. An additional 8,335 participants were excluded due to having no living children or missing data on child status. Finally, 2,000 cases with incomplete responses on core variables (cognitive function, depressive symptoms, or intergenerational support) were removed. The final analytical sample comprised 3,136 older adults (mean age = 68.2 years, SD = 7.5; 52% female), with 48% urban and 52% rural

representation. This selection process ensured focus on parent-child relationships while addressing data completeness and demographic representativeness.

3.2. Data Source and Sample Composition

3.2.1. Measurement Cognitive Function

The cognitive ability assessment of the research subjects was conducted using a composite index developed from CHARLS (Lei et al., 2014; Wu et al., 2024). We gauged cognitive function through a battery of validated assessment tests, which includes immediate recall, delayed recall, and serial subtraction tasks. Responses to these tasks were aggregated into a composite scores spanning 0 to 21, Cognitive function was assessed using a validated battery of tests, with higher scores indicating better cognitive performance (Cronbach's alpha = 0.82) aligning with previous research utilizing CHARLS data (Zhang et al., 2024; Bengtson & Robert, 1991).

3.2.2. Intergenerational Support

In this study, intergenerational support from children was measured using three CHARLS indicators, financial or in-kind assistance received in the past year, frequency of communication (via phone, messages, or online), and frequency of in-person contact. These reflect two key dimensions—material support and emotional connectedness—and were combined to capture overall support intensity.Children's support is widely regarded as a central element of family-based social capital (Cong, & Silverstein, 2011). Social exchange theory suggests such support reflects not only affection but reciprocal exchanges (Li, & Guo, 2022). In the Confucian context, filial piety encompasses both economic provision and emotional closeness. Therefore, combining economic and relational indicators provides a culturally appropriate and theoretically grounded measure.Empirical studies confirm that both financial transfers and interaction frequency independently predict older adults' well-being (Feng et al., 2025; Cong & Silverstein, 2008; Tian, 2016) In operational terms, each indicator was first standardized (Z-scores) to ensure comparability across different units and scales. Subsequently, the standardized scores of financial support, contact frequency, and meeting frequency were averaged to create a composite index of intergenerational support. This composite score reflects the overall intensity of material and emotional support received from adult children. Higher scores indicate stronger perceived intergenerational support.

3.2.3. Life satisfaction

The measurement of this variable use a single-item, self-administered questionnaire. Adopting a five-point Likert response format, respondents were prompted to evaluate their general contentment with life. The scale anchored 1 at "extremely dissatisfied" and 5 at "extremely satisfied," providing a unidimensional assessment of subjective well-being. This single-item measure captures a respondent's evaluative judgment of their life as a whole, rather than momentary emotions or context-specific experiences. It reflects a long-term cognitive assessment that integrates personal, social, and material domains. Prior validation studies have demonstrated the reliability and predictive utility of this approach in large-scale aging surveys, particularly within Chinese samples and broader cross-cultural research (Lei et al., 2014; Wu, 2022).

3.2.4. Depressive Symptoms

In this study, depressive symptoms were assessed adopting the 10-item (CES-D 10). This brief yet validated instrument, originally developed by Radloff later adapted for brevity, has demonstrated robust psychometric properties in community-based studies among older adults (Boey, 1999; Mohebbi et al., 2018). Participants rated the frequency of experiencing ten mood-related symptoms over the past week on a four-point scale (0 = "rarely or none of the time"; 3 = "most or all of the time"). The scale includes various depressive manifestations from anhedonia to worthlessness. Positively phrased items, such as "I believet the future is full of hope" were reverse scored to minimize response bias. Total scores ranged from 0 to 30, with higher scores indicating more severe depressive manifestations. In this dataset, the CES-D 10 demonstrated good internal consistency, with a Cronbach's alpha of 0.80, supporting its reliability in assessing depressive symptoms among older Chinese adults.

3.2.5. Covariance

To minimize potential confounding effects, the analysis controlled for various background factors and health indicators. These included age (60 to 89 years, mean-centered), gender (0 = female, 1 = male), residence (0 = urban, 1 = rural), and marital situation (0 = unmarried, including single, divorced, or widowed; 1 = married). In addition, self-assessed health was incorporated as a covariate. Participants rated their current overall health utilizing the five-point Likert scale. A higher score on this item was interpreted as indicating more favorable perceived physical well-being. Including this measure allows for better adjustment for individuals' subjective health conditions, which are known to influence both psychological and cognitive outcomes.

3.3. Data analysis

Data for this study were obtained through structured questionnaires and analyzed using SPSS version 26.0. A stepwise analytical approach was employed to investigate how intergenerational from adult children assistance influences the cognitive abilities of seniors, considering the intermediary roles of life satisfaction and depressive manifestations.

First, descriptive analyses summarized the sample's demographic and psychosocial characteristics. Pearson correlation matrices were then constructed to investigate how intergenerational support is related to life satisfaction, depression, and cognitive function. These preliminary results served as a foundation for subsequent model development. A chain mediation model was specified to test the hypothesized causal pathway (intergenerational support → life satisfaction → depression → cognitive function), with self-rated health, gender, and age statistically adjusted as covariates. Bootstrapping with 5,000 resamples was employed to estimate the indirect effects, yielding bias-corrected confidence intervals. To further account for selection bias across residential settings, propensity score matching (PSM) was employed to ensure comparability between urban and rural respondents. Finally, multi-group mediation models were run to assess whether structural relationships differed between subsamples.

4. Result

4.1. Descriptive Analysis

Table 1 summarizes the descriptive statistics of key study variables based on a sample of 3,136 older adults.A majority were male (59.0%), lived in rural areas (65.3%), and were currently

married (85.0%), indicating a high proportion of partnered individuals.Regarding intergenerational support, the average financial assistance received from children was 7,506.67 RMB (SD = 10,244.62). Notably, the frequency of face-to-face meetings (M = 3.63, SD = 1.57) was considerably lower than that of non-physical contact (e.g., phone or online communication; M = 6.30, SD = 1.92), reflecting modern patterns of long-distance familial interaction.Regarding intergenerational support, the average financial assistance received from children was 7,506.67 RMB (SD = 10,244.62). Notably, the frequency of face-to-face meetings was considerably lower than that of non-physical contact (e.g., phone or online communication), reflecting modern patterns of long-distance familial interaction.

4.2. Spearman's Rank Correlation Test

The Table 2 . presents the outcomes of the Spearman's rank correlation analysis indicated that greater levels of intergenerational support were moderately associated with enhanced life satisfaction ($r = 0.064$, $p < 0.01$) and better cognitive performance ($r = 0.123$, $p < 0.01$). Conversely, participants who received more support were inclined to report fewer negative depressive emotions ($r = -0.129$, $p < 0.01$). Moreover, life satisfaction demonstrated a moderate negative correlation with depressive symptoms ($r = -0.275$, $p < 0.01$), and it also had a slight positive correlation with cognitive ability ($r = 0.052$, $p < 0.01$). As anticipated, depressive symptoms showed a significant inverse relationship with cognitive performance ($r = -0.275$, $p < 0.01$).

Table 1: Basic variable description statistics.

Variables	Definition	Frequency	Mean	SD
Gender	Men	1,850	0.59	0.49
	Women	1,286		
Marital Status	Divorced or other	471	0.85	0.65
	Married	2665		
Intergenerational Support	financial support	3136	7506.67	10244.62
	Frequency of meetings	3136	3.63	1.57
	Contact frequency	3136	6.30	1.92
Life satisfaction	Continuous variable	3136	3.27	0.71
Dpressive Symptoms	cesd10	3136	8.92	6.41
cognitive Function	total cognition	3136	11.95	3.31
Age	Continuous variable	3136	68.56	5.79
Srh	Continuous variable	3136	2.97	0.98

Table 2: Correlation analysis results.

Variable	Intergenerational Support	Life Satisfaction	Depressive Symptoms	Cognitive Function
Intergenerational Support	1			
Life Satisfaction	0.064**	1		
Depressive Symptoms	-0.129**	-0.275**	1	
Cognitive Function	0.123**	0.052**	-0.275**	1

**$p < 0.01$.

4.3. Spearman's Rank Correlation Test

To examine the indirect effects through which intergenerational support may shape cognitive performance, we conducted a series of regression-based mediation analyses, incorporating life satisfaction and depressive symptoms as sequential mediators. Gender, age, marital status, and self-rated health were included as control variables.

The findings showed that individuals receiving higher levels economic and emotional support from their adult children could lead to report stronger cognitive outcomes (β = 0.166, p < 0.001) and greater life satisfaction (β = 0.090, p < 0.001), while also experiencing fewer depressive symptoms (β = –0.351, p < 0.001). In addition, life satisfaction was positively associated with cognitive scores (β = 0.183, p < 0.01) and negatively related to depressive symptoms (β = –1.084, p < 0.001). Consistent with expectations, depression was found to have a significant negative correlation with cognitive functioning (β = –0.141, p < 0.001). Complete coefficients are presented in Table 3.

Table 3: The mediating effect of life satisaction, depressive symptoms.

Variable	Intergenerational Support		Life Satisfaction		Depressive Symptoms		Cognitive Function	
	β	sx	β	sx	β	sx	β	sx
Gender	+0.685***	0.116	-0.120**	0.045	-1.912***	0.199	+0.685***	0.116
Srh	-0.275***	0.064	+0.248***	0.024	-1.441***	0.108	-0.275***	0.064
Marry	0.254***	0.068	0.118***	0.026	1.779***	0.114	0.254***	0.068
Age	-0.066***	0.010	+0.004	0.004	-0.008	0.017	-0.066***	0.010
Intergenerational Support	+0.166***	0.037	+0.090***	0.015	-0.351***	0.064	+0.042**	0.021
Life Satisfaction					-1.084***	0.078	0.183**	0.085
Depressive Symptoms							-0.141***	0.010
R2	0.063		0.067		0.280		0.116	
F	42.178***		44.897***		202.947***		58.707***	

***p < 0.001., **p < 0.0, Srh: Self-rated Health.

To assess the significance of the proposed serial mediation mechanism (support → life satisfaction → depression → cognition), we employed bootstrapping with 5,000 resamples. The estimated indirect effect across the full pathway reached statistical significance (β = 0.013, 95% CI [0.008, 0.019]), lending support to the hypothesized chain mediation structure. Full details are shown in Table 4 and Figure 2. Suggesting that adult children's support enhances life satisfaction, which reduces depressive symptoms and subsequently improves cognitive performance.Two single mediation paths were also significant. Through life satisfaction (0.015, 95% CI [0.003, 0.034]), intergenerational support indirectly promoted cognitive functioning by fostering psychological well-being. Through depressive symptoms (0.021, 95% CI [0.013, 0.030]), support reduced

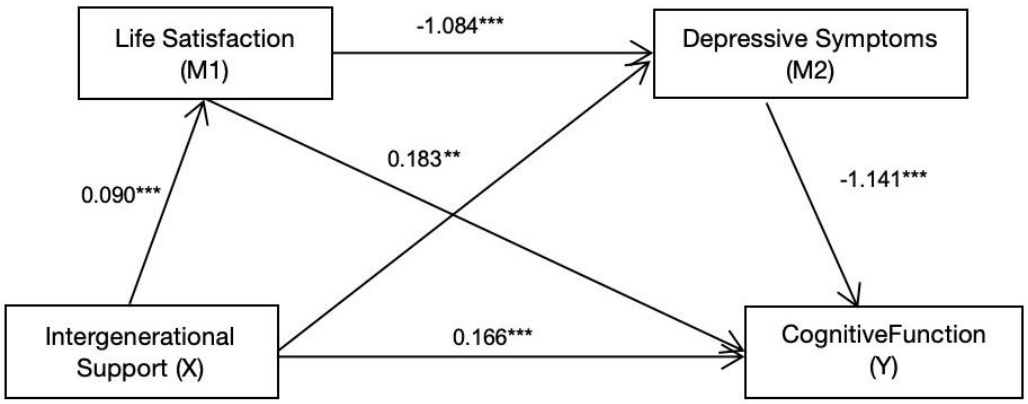
emotional distress, benefiting cognition.These results underscore the dual and sequential roles of life satisfaction and depression in explaining how intergenerational support contributes to cognitive health in later life.

Table 4: Bootstrap test results and effect decomposition of mediated effects.

Paths	Effect	SE	95%CI	β
Total effect				
Intergenerational Support→ Cognitive Function	0.215***	0.038	[0.134,0.283]	0.097
Direct effect				
Intergenerational Support→ Cognitive Function	0.166***	0.037	[0.092,0.239]	0.076
Indirect effects (total)	0.049***	0.010	[0.023,0.063]	0.019
Intergenerational Support→Life Satisfaction→Depressive Symptoms	0.013**	0.030	[0.008,0.019]	0.006
→Cognitive Function				
Intergenerational Support→Life Satisfaction→Cognitive Function	0.015*	0.002	[0.003, 0.034]	0.008
Intergenerational Support→Depressive Symptoms→Cognitive Function	0.021***	0.004	[0.013,0.030]	0.021

***p < 0.001., **p < 0.01

Figure 2: Path Diagram of the Chain Mediation Model.



4.4. Spearman's Rank Correlation Test

Examining differences in the pathway "intergenerational support → life satisfaction/depressive symptoms → cognitive function" across urban and rural settings, this study utilized Propensity Score Matching (PSM) to create matched groups for comparison. Using the urban group (N = 1090) as the reference, rural participants were matched on gender, age, education, self-rated health, marital status, and ADLs (caliper = 0.02), yielding two equal groups (N = 1090 each).In the rural sample, intergenerational support exerted a significant overall influence on cognitive function

(effect size = 0.439, $p < 0.001$, 95% CI [0.182, 0.697]), with a direct effect of 0.361 ($p < 0.01$). All three indirect pathways were also significant, indicating stable mediation effects.Table 5 shows the specific experimental result.

Table 5: Urban–Rural Heterogeneity in Mediation Effects.

Paths	**Rural**		**Urban**	
	effect	**bootCI**	**effect**	**bootCI**
Intergenerational Support→Cognitive Function(Total effect)	0.439***	[0.182, .697]	0.272*	[0.051, 0.049]
Intergenerational Support→Cognitive Function(Direct effect)	0.361**	[.1052, .6173]	0.178	[0.134, 0.490]
Intergenerational Support→Life Satisfaction→Depressive Symptoms→Cognitive Function	0.029**	[.0129, .0507]	0.019**	[0.006, 0.042]
Intergenerational Support→Life Satisfaction→Cognitive Function	0.021*	[0.005, 0.035]	0.015*	[0.002, 0.031]
Intergenerational Support→Depressive Symptoms→Cognitive Function	0.082**	[.0248, .1489]	0.076**	[0.013, 0.149]

***p < 0.001., **p < 0.01

5. Discussion

This study investigated how support received from adult children relates to older adults' cognitive functioning in China, particularly examining pathway through which life satisfaction and depressive indicators impact. The findings offer compelling support for the proposed sequential mediation model.

First, results indicated that individuals reporting greater intergenerational support tended to demonstrate better cognitive performance ($\beta = 0.166$, $p < 0.001$), lending support to Hypothesis H1. This aligns with previous research suggesting that adult children's involvement—whether through emotional presence, practical aid, or regular communication—can bolster mental health and enhance cognitive resilience in later life (Chen & Jand dan, 2018; Peng et al., 2018; Davey & Eggebeen, 1998; Zhang et al., 2024). Within the framework of China's family-oriented culture, these findings reflect the continued importance of filial engagement in successful aging, as also emphasized Li and Liu (Li et al., 2024; Liu & Bai, 2024). Intergenerational exchanges may buffer age-related cognitive decline by fostering emotional closeness, meaningful roles, and psychological reassurance during older adulthood (Hou et al., 2024; Lai et al., 2019).

Secondly, Support from adult children was also positively linked to greater life satisfaction ($\beta = 0.090$, $p < 0.001$) and fewer depressive feelings ($\beta = –0.351$, $p < 0.001$), supporting Hypotheses H2a and H2b. These outcomes are consistent with the stress-buffering hypothesis (Chou & Chi, 2003), which highlights the protective value of family-based emotional support in promoting psychological well-being. When older adults regularly experience supportive interactions with their children, they appear better equipped to maintain emotional balance and self-worth (Huang & Fu, 2021; Wu, 2022; Fukuzawa & Sugawara, 2023). Conversely, the absence or inconsistency

of such support may heighten risks of loneliness and emotional instability, potentially exacerbating depressive symptoms and reducing cognitive engagement (Hou & Zhang, 2023; Jahangir et al., 2025).

In the current analysis, both life satisfaction and depression showed meaningful links to cognitive outcomes ($\beta = 0.035$ and -0.141, $p < 0.001$), offering support for the proposed mediation effects. Interestingly, the indirect influence through depression ($\beta = 0.021$) was slightly stronger than that through life satisfaction ($\beta = 0.015$), suggesting that emotional distress may have a more direct impact on cognitive performance.. Additionally, the full chain mediation—intergenerational support → life satisfaction → depression → cognitive function—was also significant ($\beta = 0.013$). These findings offer additional empirical backing for Hypothesis 4. They suggest that both life satisfaction and emotional distress act as intermediary mechanisms through which family-based support influences cognitive functioning. Among these, depressive symptoms appear to play a more immediate and adverse role in cognitive decline, consistent with prior emotion–cognition interaction models (Shao et al., 2022; Lee et al., 2020; Ma et al., 2023). This is further substantiated by neuropsychological evidence highlighting the cognitive burden of prolonged emotional strain in older age (Deary et al., 2009; Wilson et al., 2002).

Subgroup comparisons indicated that depressive symptoms exerted a stronger mediating influence on cognitive outcomes among rural older adults. This pattern may be explained by limited access to institutional support systems in less urbanized communities, where families often become the primary source of emotional and instrumental care (Yang et al., 2023; Wu, 2022). These observations underscore the need for more localized mental health initiatives—particularly in rural areas—where service infrastructure is often lacking. In such settings, promoting family-based care strategies may be especially critical to preserving older adults' cognitive and emotional well-being (Wang & Li, 2008; Zhan et al., 2021).

Overall, the findings emphasize how family support contributes not only to emotional well-being but also to cognitive preservation in later life. Enhancing intergenerational engagement and addressing depression may be vital strategies for promoting healthy aging, particularly as China's population continues to age rapidly.

6. Conclusions

This study provides robust empirical evidence for a chain mediation model in which intergenerational adult children's support enhances cognitive functioning in older adults by enhancing overall well-being and decreasing depression levels. Specifically, intergenerational support was positively associated with cognitive health, and this relationship was partly explained by improvements in subjective well-being and emotional state. Notably, depressive symptoms had a stronger mediating effect than life satisfaction, and the full sequential pathway—intergenerational support → life satisfaction → depression → cognition—was also significant. Subgroup analysis further revealed that these pathways were more pronounced in rural settings, suggesting the heightened dependence of rural elders on family-based support systems. In this regard, emotional satisfaction drawn from children's success may serve as a long-term buffer against age-related emotional decline (Olawa & Idemudia, 2019), while broader neighborhood-level social cohesion and functional support have also been shown to foster cognitive resilience in later life (Zhou et al., 2023; Mogic et al., 2023). Future policies should therefore not only promote intergenerational involvement, but also consider multi-level interventions to enhance both family and community-based support systems(Müller et al, 2024; Shen et al, 2022).

Although this study offers insights into the psychological processes linking intergenerational support and cognitive health among the olderly , several methodological shortcomings need to be acknowledged. Firstly, given the cross-sectional design of the data, establishing a causal relationship is not feasible. It remains plausible, for instance, that individuals with stronger cognitive capacity are themselves better positioned to sustain regular and emotionally meaningful contact with their children. Second, reliance on self-reported data—especially regarding subjective experiences like life satisfaction and depressive symptoms—may be influenced by recall bias or personal interpretation.Incorporating clinician-rated assessments or biological markers in future studies would improve measurement validity. Moreover, although core demographic and health covariates were included, other important factors—such as education, personality traits, or neighborhood cohesion—were not accounted for and may moderate the observed pathways. Finally, although Propensity Score Matching improved comparability between urban and rural groups, residual confounding from unobserved structural or cultural variables cannot be entirely ruled out, which may still influence how intergenerational support is experienced and interpreted.

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