

Factors Associated with Life Satisfaction among Migrant Grandparent Caregivers in Sichuan Province, China

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Abstract

This study aimed to (1) assess the level of life satisfaction among migrant grandparent caregivers in Sichuan Province, China; (2) examine the associations of policy implementation effectiveness, age-friendly community governance effectiveness, digital public service inclusiveness, and intergenerational relationship quality with life satisfaction. Data were collected from 385 migrant grandparent caregivers using a structured questionnaire with five-point Likert-scale measures. Descriptive statistics, Pearson correlation analysis, and multiple linear regression were used for data analysis.

The results showed that migrant grandparent caregivers reported moderate life satisfaction. All four contextual factors were significantly and positively associated with life satisfaction. The regression model explained 28.0% of the variance in life satisfaction. Among the predictors, age-friendly community governance effectiveness had the strongest standardized association with life satisfaction, followed by digital public service inclusiveness, intergenerational relationship quality, and policy implementation effectiveness.

Theoretically, these findings empirically validate the integrated framework of Ecological Systems Theory and Person-Environment Fit in the context of late-life migration, demonstrating that life satisfaction is shaped by the interplay among multiple nested environmental systems (community, digital, family, and policy) rather than by family conditions alone. In practice, the results suggest that targeted interventions should prioritize enhancing age-friendly community governance and bridging the digital divide for older adults, as these proximal environmental factors show the strongest associations with their life satisfaction. Furthermore, fostering the quality of intergenerational relationships remains a crucial family-level support mechanism.

Keywords: migrant grandparent caregivers; life satisfaction; age-friendly community governance; digital public service inclusiveness; intergenerational relationship quality

Introduction

Amid rapid globalization and social transformation, grandparental childcare has become an increasingly common family arrangement. However, assuming caregiving responsibilities may expose grandparents to greater physical and psychological stress, reduced personal autonomy, and other challenges that affect their subjective well-being (Hung et al., 2021; Zanasi et al., 2023). Life satisfaction, a key indicator of older adults' well-being, is closely linked to physical health and social participation (Diener et al., 1985). Understanding the life satisfaction of grandparent caregivers is therefore important for both intergenerational family research and the promotion of active aging.

Grandparental childcare varies considerably across countries. In the United States, grandparents often assume custodial care in response to family crises, such as parental substance abuse or incarceration (Ratnakaran et al., 2024). In Europe, caregiving patterns vary across welfare regimes: Nordic countries generally provide supplementary care due to extensive public childcare services, whereas Southern European grandparents undertake more intensive caregiving due to familialist traditions and limited public support (Hank & Buber, 2009; Zanasi et al., 2023; Eldén et al., 2024).

In China, grandparental childcare is more widespread due to rapid urbanization, insufficient public childcare services, family planning policies, and strong cultural expectations for intergenerational support. More than half of middle-aged and older adults participate in grandchild care (Gong et al., 2022). Limited childcare provision for children under three, together with the implementation of the two-child and three-child policies, has further increased families' reliance on grandparents (Lei, 2024; Liu et al., 2025).

Among various caregiving arrangements, migrant grandparent caregivers face distinct challenges stemming from both caregiving responsibilities and relocation. Moving to unfamiliar cities may disrupt established social networks and reduce access to familiar sources of social support, thereby increasing the risk of social isolation and difficulties with adaptation (Zhao & Huang, 2021; Guo et al., 2024). At the family level, intensive childcare responsibilities and differences in parenting practices between grandparents and adult children may also contribute to physical strain, emotional stress, and intergenerational tension (Chan et al., 2023; Chen & Liu, 2012). These studies provide

important evidence on the personal and family circumstances associated with grandparent caregivers' well-being.

However, the living conditions of migrant grandparent caregivers extend beyond the family domain. Their everyday experiences are also embedded in community environments, access to public services, digital administrative systems, and local policy implementation. Existing studies have separately demonstrated the relevance of neighborhood environments to older adults' quality of life (Flores et al., 2019; Lee & Park, 2022), of digital access and literacy to older adults' well-being and service utilization (Kainiemi et al., 2023; Jung et al., 2025), of intergenerational relationships to psychological and life satisfaction outcomes (Xu et al., 2019; Trinh et al., 2022), and of perceived government performance to citizens' life satisfaction (Li & He, 2025). Nevertheless, these contextual domains are often examined separately, making it difficult to determine their relative importance when considered together among migrant grandparent caregivers.

Accordingly, an important empirical gap remains in understanding how multiple contextual conditions relate to the life satisfaction of migrant grandparent caregivers within a single analytical framework. This gap is especially relevant in the context of late-life migration, where older caregivers must adapt to new community environments, increasingly digitalized public services, local institutional arrangements, and evolving intergenerational family relationships. To address this gap, the present study examines how policy implementation effectiveness, age-friendly community governance effectiveness, digital public service inclusiveness, and intergenerational relationship quality are associated with life satisfaction among migrant grandparent caregivers in Sichuan Province, China.

By integrating these contextual domains into a single framework, this study advances understanding of the ecological conditions associated with late-life migrant caregiving and provides evidence for more targeted community and public-service support.

Research Objectives

1. To assess the level of life satisfaction among migrant grandparent caregivers in Sichuan Province, China.
2. To identify and explain the factors impacting the life satisfaction of migrant grandparent caregivers.

Scope of Research

Content of the Study: Guided by Ecological Systems Theory and Person–Environment Fit, this study examines associations between four perceived contextual domains—policy implementation effectiveness, age–friendly community governance effectiveness, digital public service inclusiveness, and intergenerational relationship quality—and life satisfaction among migrant grandparent caregivers.

Population and Sample: The target population consisted of migrant grandparent caregivers who had relocated to Sichuan Province, China, to provide childcare for their grandchildren. A sample of 385 participants was recruited using purposive non–probability sampling. Limitations of this non–probability sampling strategy are acknowledged; communities were purposively selected to capture diverse urban–suburban socioeconomic and migrant–resident profiles, thereby reducing potential sampling bias.

Area: The study was conducted in urban and suburban communities in Chengdu, Sichuan Province, China. Chengdu was chosen as the research site owing to its status as a megacity in southwestern China, characterized by large–scale inter– and intra–provincial population mobility and a rapidly growing group of migrant grandparents engaged in grandchild care. This provides a relevant regional context for examining intergenerational caregiving amid urbanization and transitions in family support. Findings are bounded by Chengdu’s unique social, cultural, community–level, and policy environments and cannot be generalized to all migrant grandparent caregivers across China.

Time: All questionnaire data were systematically collected from January to June 2026.

Literature Review

Theoretical Framework

The life satisfaction of migrant grandparent caregivers cannot be explained by individual characteristics or caregiving responsibilities alone. Their well–being develops within a complex environment in which migration, grandchild caregiving, access to public services, community adaptation, digitalization, and family relationships operate simultaneously. Accordingly, this study integrates Person–Environment Fit (P–E Fit) Theory and Ecological Systems Theory (EST) to explain how institutional, community, technological, and family environments shape the life satisfaction of migrant grandparent caregivers. P–E Fit Theory is based on the proposition that human outcomes result from interactions between individuals and their environments rather than from either

component acting independently (Lewin, 1951). More specifically, the theory proposes that adaptation and well-being depend on the congruence between individuals' needs and capabilities and the demands and resources supplied by their environments (Edwards, 1996; Edwards et al., 1998; Kristof-Brown et al., 2005). Thus, when environmental resources adequately meet individual needs, greater satisfaction and psychological well-being can be expected; conversely, environmental mismatch may generate stress and adaptation difficulties.

While P-E Fit Theory explains the mechanism of fit, Ecological Systems Theory explains where that fit occurs. Bronfenbrenner (1979) conceptualized human development and well-being as embedded in interconnected environmental systems, ranging from immediate interpersonal relationships to broader institutional and societal structures. Applied to migrant grandparent caregivers, this perspective is particularly relevant because migration relocates older adults from familiar social environments into new institutional, community, technological, and family contexts. Their life satisfaction should therefore be understood as the cumulative outcome of adaptation across multiple environmental levels rather than as the result of a single condition. In the present framework, the institutional environment is represented by policy implementation effectiveness, the community environment by age-friendly community governance effectiveness, the digital-service environment by digital public service inclusiveness, and the immediate family environment by intergenerational relationship quality. Together, these four dimensions provide a multilevel explanation of the environmental conditions surrounding migrant grandparent caregivers.

At the institutional level, policy implementation effectiveness (PIE) reflects the extent to which formal policies translate into accessible, consistent, fair, and reliable support in older adults' everyday lives. Policy implementation research emphasizes that policy outcomes depend not only on formal policy design but also on implementation capacity, coordination, and the processes by which services reach target populations (Pressman & Wildavsky, 1984; Hill & Hupe, 2021). This distinction is especially important for migrant grandparent caregivers, who may interact with healthcare, eldercare, Social Security, education, and community-service systems simultaneously. From the P-E Fit perspective, effective implementation improves the needs-supplies fit by aligning institutional resources more closely with older adults' practical needs. From the ecological perspective, policy implementation is a macro-level institutional condition whose effects are transmitted through administrative and community structures. Previous studies similarly suggest that implementation consistency, service integration, accessibility, fairness, and institutional trust are associated with

citizens' well-being (Nicholson-Crotty & Carley, 2016; Ravensbergen et al., 2022; Kumar et al., 2024).

At the community level, age-friendly community governance effectiveness (ACGE) captures the capacity of local governance systems to translate institutional resources into supportive living conditions. Collaborative governance emphasizes coordination among government, community organizations, residents, and other actors in addressing complex public needs (Newman et al., 2004; Ansell & Gash, 2008). For migrant older adults whose original social networks may have been disrupted by relocation, the community is particularly important as a means of obtaining information, accessing services, participating socially, and developing new support networks. Effective community governance can therefore strengthen person-environment fit by reducing barriers between older adults' needs and locally available resources. Evidence reviewed in the study indicates that responsive services, supportive infrastructure, community cohesion, and age-friendly environments are positively related to older adults' subjective well-being and life satisfaction (Flores et al., 2019; Zhang et al., 2021; Li & He, 2024; Yang et al., 2025).

A third and increasingly important dimension is digital public service inclusiveness (DPSI). Digitalization has transformed access to healthcare, social security, transportation, and community services; consequently, exclusion from digital systems may also mean exclusion from public resources. Digital inclusion should therefore not be treated solely as an individual digital-skills issue. Rather, it reflects whether public institutions design services that accommodate differences in age, ability, accessibility, and technological competence (Morte-Nadal & Esteban-Navarro, 2022). From a P-E Fit perspective, inclusive digital services reduce abilities-demands mismatch by simplifying procedures, improving comprehensibility, providing assistance, and maintaining alternative service channels. From an ecological perspective, digital public services constitute a cross-cutting institutional environment whose effects reach older adults through community organizations and family support. Studies cited in the reviewed literature indicate that inclusive digital services can improve service accessibility, social participation, and subjective well-being, whereas inadequate inclusiveness may intensify digital exclusion and inequality (Kainiemi et al., 2023; Kim, 2024; Trischler & Westman Trischler, 2022).

At the microsystem level, intergenerational relationship quality (IRQ) represents the immediate social and emotional environment in which migrant grandparents perform their caregiving roles. Intergenerational solidarity emphasizes emotional closeness, interaction, and reciprocal support

between generations (Bengtson & Roberts, 1991). For migrant grandparent caregivers, relationships with adult children and grandchildren are especially consequential because family members provide not only emotional attachment but also practical assistance, recognition of roles, and support for adapting to the destination environment. In P-E Fit terms, harmonious intergenerational relationships improve the fit between older adults' socio-emotional needs—such as respect, recognition, belonging, and support—and resources available within the family. Within EST, these relationships constitute the microsystem most immediately connected to daily well-being. Empirical evidence suggests that stronger intergenerational relationships and family support are associated with better psychological health and life satisfaction, whereas conflict and weak family relationships may undermine well-being (Lowenstein, 2007; Shamsikhani et al., 2022; Trinh et al., 2022; Jiang et al., 2024).

Life satisfaction, the dependent variable in this study, reflects the overall cognitive evaluation individuals make of the quality and circumstances of their lives (Andrews & Withey, 1976). For migrant grandparent caregivers, this evaluation is particularly multidimensional because they must simultaneously adapt to relocation and ongoing caregiving responsibilities. Their assessment of life therefore reflects physical and psychological functioning, emotional experiences related to caregiving, social integration, family support, and perceived stability in the destination environment. From an integrated theoretical perspective, life satisfaction can be conceptualized as an outcome of person-environment fit across multiple ecological levels: the better institutional policies, community governance, digital public services, and family relationships align with older adults' needs and capacities, the more favorable their overall evaluation of life is expected to be.

This theoretical synthesis provides a coherent rationale for the study's conceptual framework. Ecological Systems Theory specifies the multilevel structure of environmental influence, whereas P-E Fit Theory explains the mechanism by which those environments affect well-being. Policy implementation effectiveness reflects institutional support; age-friendly community governance effectiveness reflects meso-level governance responsiveness; digital public service inclusiveness reflects the fit between technological service environments and older adults' capacities; and intergenerational relationship quality reflects the emotional and supportive fit within the family microsystem. Life satisfaction is therefore conceptualized not as the product of a single determinant, but as the subjective outcome of older adults' cumulative experience of fit across these interconnected environments. This integrated reasoning supports the proposed relationships of PIE

→ Life Satisfaction (H1), ACGE → Life Satisfaction (H2), DPSI → Life Satisfaction (H3), and IRQ → Life Satisfaction (H4).

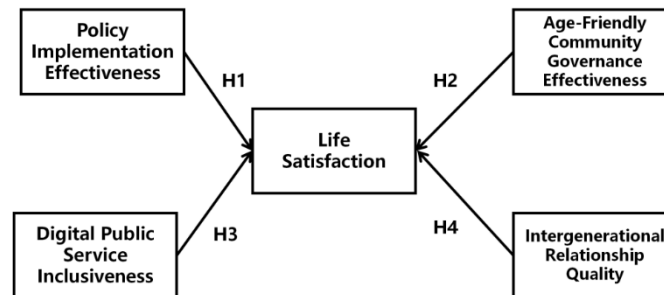


Figure 1 Conceptual Research Framework

Research Methodology

Research Design and Participants

This study employed a quantitative cross-sectional survey design. The target population comprised migrant grandparent caregivers residing in Sichuan Province, China. A target sample size of approximately 385 was estimated using Daniel's formula for planning purposes (Pourhoseingholi et al., 2013). Because no province-wide sampling frame of eligible migrant grandparent caregivers was available, participants were recruited through nonprobability purposive intercept sampling in selected urban and suburban communities. Eligible participants were approached at selected community service sites and public activity areas, and eligibility was screened against predefined inclusion criteria before the questionnaire was administered. Therefore, the sample should not be considered statistically representative of the entire population.

Participants were eligible if they: (1) were 50 years or older; (2) regularly provided childcare for grandchildren; (3) had migrated to the current city to support intergenerational childcare; and (4) had lived locally and provided continuous care for at least six months. A total of 385 valid questionnaires were included in the analysis.

Before participating, all respondents were informed of the study's purpose and procedures via a consent form. Participation was voluntary, and respondents were informed that they could

withdraw at any time without consequences. No personally identifiable information was collected, and all data were used solely for research purposes. Informed consent was obtained from all participants before completing the questionnaire.

Research Instruments

Data were collected using a structured, self-administered questionnaire. All construct items were measured on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire included four contextual constructs: Policy Implementation Effectiveness (4 items), Age-Friendly Community Governance Effectiveness (4 items), Digital Public Service Inclusiveness (5 items), and Intergenerational Relationship Quality (5 items). The items for these four contextual constructs were developed by the researchers through adaptation and contextual modification of relevant existing measures and theoretical frameworks to align with the experiences of migrant grandparent caregivers in China (Mazmanian & Sabatier, 1983; World Health Organization, 2007; Lawton & Nahemow, 1973; Silverstein & Bengtson, 1997). Life satisfaction was assessed with 12 items adapted from the Life Satisfaction Index for the Third Age-Short Form (LSITA-SF12; Barrett & Murk, 2009). The response format was adapted to a five-point Likert scale to ensure consistency with the other study measures.

A pilot test with 30 respondents was conducted to assess item clarity and reliability. Cronbach's alpha coefficients for the five constructs were .894, .897, .901, .901, and .962, respectively, indicating satisfactory internal consistency.

To assess the construct validity of the measurement instrument, an exploratory principal component analysis (PCA) was conducted on the 30 measurement items. The Kaiser - Meyer - Olkin (KMO) measure of sampling adequacy was .941, indicating excellent suitability for factor analysis. Bartlett's test of sphericity was statistically significant, $\chi^2(435) = 8423.744$, $p < .001$, further confirming that the correlation matrix was appropriate for factor extraction. Five components were extracted, together accounting for 73.019% of the total variance. The items corresponding to the five study constructs showed their strongest loadings on distinct components, with absolute primary loadings ranging from .581 to .814. Specifically, the primary loadings ranged from .698 to .738 for Policy Implementation Effectiveness, from .622 to .643 for Age-Friendly Community Governance Effectiveness, from .581 to .663 for Digital Public Service Inclusiveness, from .614 to .667 for Intergenerational Relationship Quality, and from .778 to .814 for Life Satisfaction. Overall,

the five-component solution was consistent with the proposed measurement structure and provided evidence supporting the questionnaire's construct validity.

Data Analysis

Descriptive statistics summarized participants' characteristics and study variables. Pearson correlation analysis examined bivariate associations, and multiple linear regression assessed the predictive associations of the four contextual factors with life satisfaction. Before regression analysis, the assumptions of normality, linearity, homoscedasticity, residual independence, and multicollinearity were assessed using appropriate diagnostic procedures, including the Durbin-Watson statistic, tolerance values, and variance inflation factors (VIF).

Research Results

Descriptive Statistics

The sample included 385 caregivers. Women accounted for 64.68% of respondents. Most respondents were 50–65 years old. About 65.19% had a junior high school education or lower. Most respondents lived with adult children and grandchildren. Table 1 presents the full demographic profile.

Table 1. Demographic information of participants

Characteristics		Number (n=385)	Percentage
Gender	Male	136	35.32
	Female	249	64.68
Age	50–55 years old	122	31.69
	56–60 years old	113	29.35
	61–65 years old	74	19.22
	66–70 years old	55	14.29
	> 70 years old	21	5.45
Marital Status	Married	295	76.62
	Divorced	56	14.55
	Widowed	34	8.83
Education	Primary school or below	141	36.62
	Junior high school	110	28.57
	Senior high school / Technical secondary school	83	21.56
	College or above	51	13.25
Characteristics		Number (n=385)	Percentage

Source of Income	Pension	81	21.04
	Financial support from children	68	17.66
	Employment or self-employment	66	17.14
	Other	81	21.04
	No stable income	89	23.12
Time lived in Sichuan	6 months-2 years	125	32.47
	2-6 years	123	31.95
	More than 6 years	137	35.58
Living Arrangement	Living with adult children and grandchildren	273	70.91
	Living with grandchildren only	41	10.65
	Living alone	33	8.57
	Other	38	9.87

Descriptive Statistics and Correlation Analysis

Participants reported moderate life satisfaction ($M = 3.564$, $SD = 0.958$). The four contextual variables also had moderate means: Policy Implementation Effectiveness ($M = 3.513$, $SD = 1.024$), Age-Friendly Community Governance Effectiveness ($M = 3.552$, $SD = 1.050$), Digital Public Service Inclusiveness ($M = 3.511$, $SD = 0.970$), and Intergenerational Relationship Quality ($M = 3.512$, $SD = 0.987$). All four contextual variables were positively correlated with life satisfaction ($r = .246-.369$, $p < .01$). Intercorrelations among the predictors were low ($r < .23$), indicating limited overlap among the four constructs. Detailed results are presented in Table 2.

Table 2 Pearson correlation

Variables	Mean	SD	LS	PIE	ACGE	DPSI	IRQ
Life Satisfaction (LS)	3.564	0.958	1				
Policy Implementation Effectiveness (PIE)	3.513	1.024	.246**	1			
Age-Friendly Community Governance Effectiveness (ACGE)	3.552	1.050	.369**	.180**	1		
Digital Public Service Inclusiveness (DPSI)	3.511	0.970	.363**	.140**	.214**	1	
Intergenerational Relationship Quality (IRQ)	3.512	0.987	.320**	.147**	.177**	.229**	1

* $P < .05$, ** $P < .01$

Objective 2 was addressed using multiple regression analysis to examine the associations. In addition, the standardized coefficients were examined to describe the relative magnitude of these associations.

Multiple Regression Analysis

Regression diagnostic plots were inspected to assess the core assumptions of ordinary least squares. Residual histograms and normal P-P plots indicated approximate normality of error terms. The scatterplot of standardized residuals versus standardized predicted values showed randomly distributed points with no curvilinear trend, supporting the linearity assumption. No funnel-shaped pattern was observed, supporting the assumption of homoscedasticity (see Figure 2).

The regression model was statistically significant, $F(4, 380) = 37.003$, $p < .001$, and explained 28.0% of the variance in life satisfaction ($R^2 = .280$, adjusted $R^2 = .273$).

The tolerance values for each variable were 0.947, 0.918, 0.910, and 0.921, respectively, with corresponding VIF values of 1.056, 1.089, 1.099, and 1.086, all within acceptable ranges. This indicates no serious multicollinearity among the independent variables, and the regression model estimates are reliable.

The Durbin-Watson value was 2.046, close to 2, suggesting that the residual sequences were independent and that the model exhibited no autocorrelation, indicating a well-specified model.

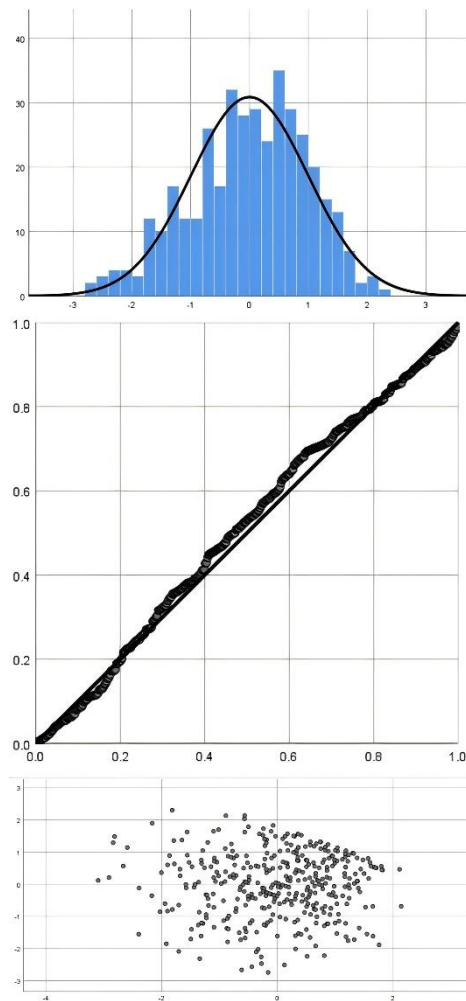


Figure 2 Regression Diagnostic Plots for Normality, Linearity, and Homoscedasticity

All four contextual variables showed significant positive predictive associations with life satisfaction. Age-Friendly Community Governance Effectiveness had the largest standardized coefficient ($\beta = .257$, $p < .001$), followed by Digital Public Service Inclusiveness ($\beta = .243$, $p < .001$), Intergenerational Relationship Quality ($\beta = .199$, $p < .001$), and Policy Implementation Effectiveness ($\beta = .137$, $p = .002$). Thus, the observed rank order of the standardized coefficients was ACGE > DPSI > IRQ > PIE.

Table 3 The results of multiple linear regression analysis

	Unstandardized		Standardized	t	P	Collinearity	
	Coefficients		Coefficients			Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	0.761	0.239		3.189	0.002		
Policy Implementation Effectiveness	0.128	0.042	0.137	3.060	0.002	0.947	1.056
Age-Friendly Community Governance Effectiveness	0.234	0.041	0.257	5.654	< .001	0.918	1.089
Digital Public Service Inclusiveness	0.240	0.045	0.243	5.334	< .001	0.910	1.099
Intergenerational Relationship Quality	0.193	0.044	0.199	4.384	< .001	0.921	1.086

$R^2 = 0.28$, Adjusted $R^2 = 0.273$, D-W = 2.046, F = 37.003

The unstandardized regression equation was calculated as:

$$y = 0.761 + 0.128x_1 + 0.234x_2 + 0.240x_3 + 0.193x_4.$$

All four hypotheses were supported by the observed positive and statistically significant associations. Detailed regression estimates are presented in Table 3, and the model results are shown in Figure 3.

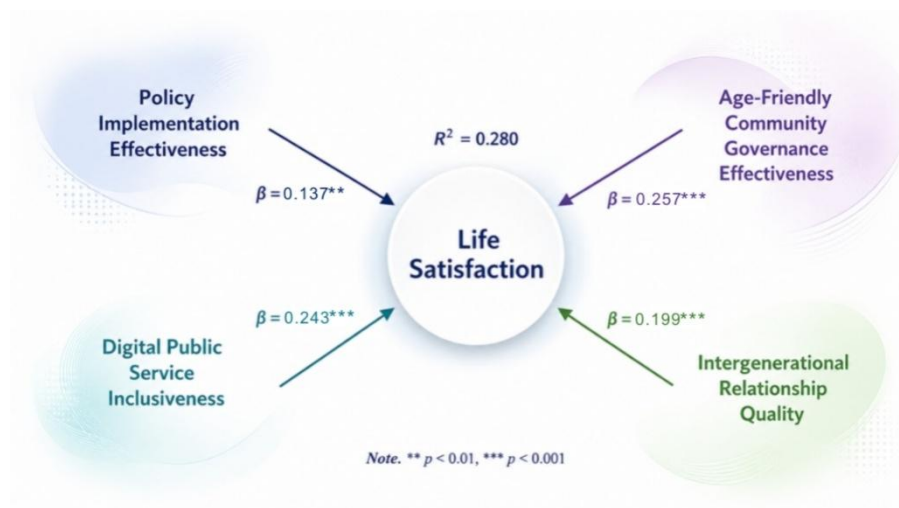


Figure 3 Results of the Multiple Linear Regression Model

Discussion

This study examined how policy implementation effectiveness, age-friendly community governance effectiveness, digital public service inclusiveness, and intergenerational relationship quality are associated with life satisfaction among migrant grandparent caregivers in Sichuan Province. All four factors were significantly positively associated with life satisfaction, though their standardized coefficients differed in magnitude. Age-friendly community governance showed the strongest association, followed by digital public service inclusiveness, intergenerational relationship quality, and policy implementation effectiveness.

The stronger association between age-friendly community governance and Ecological Systems Theory aligns with the theory's emphasis on individuals' immediate living environments (Bronfenbrenner, 1979). For migrant grandparent caregivers, relocation may disrupt familiar social networks and increase dependence on local community resources. Accessible facilities, opportunities for social participation, and responsive community services may therefore be especially relevant to their everyday life satisfaction. This interpretation aligns with previous studies linking supportive neighborhood environments to older adults' quality of life and social engagement (Flores et al., 2019; Lee & Park, 2022; Stephens & Bakhshandeh Bavarsad, 2025).

Digital public service inclusiveness also showed a relatively strong association with life satisfaction. As healthcare, welfare, transportation, and administrative services increasingly rely on digital systems, older migrants may struggle to access essential services. From a Person-Environment Fit perspective, more accessible digital services and practical assistance may reduce the mismatch between service requirements and older adults' digital capabilities. This finding aligns with studies showing positive relationships among digital accessibility, service use, and older adults' well-being (Kainiemi et al., 2023; Jung et al., 2025).

Intergenerational relationship quality remained significantly associated with life satisfaction, underscoring the importance of communication, respect, and reciprocal family support (Xu et al., 2019; Trinh et al., 2022). However, its standardized coefficient was smaller than those for community governance and digital inclusion. One possible interpretation is that, after migration, everyday community and service environments become especially salient alongside family relationships. Policy implementation showed the smallest, though still significant, coefficient. This may reflect the relatively distal nature of policy compared with directly experienced community and service conditions; however, the present study did not test any indirect or mediating mechanisms.

Overall, the findings support an integrated ecological interpretation in which life satisfaction is linked to multiple contextual domains rather than family conditions alone. The model explained 28.0% of the variance in life satisfaction, indicating that other factors, such as health, financial security, caregiving intensity, and social support, may also be relevant. Because the study was cross-sectional, used nonprobability sampling, and was restricted to Sichuan Province, causal inference and national generalization should be interpreted with caution. In addition, all contextual factors were measured through individual perceptions; therefore, the findings should not be interpreted as evidence of statistically tested multilevel interactions. Demographic variables such as age, education, income source, and living arrangement were not included as covariates because the present study focused on assessing the relative predictive strength of four theoretically specified contextual factors. This may leave some residual confounding unaccounted for. Future research should incorporate these demographic characteristics through hierarchical or stratified analyses to assess the robustness of the observed associations.

Conclusion

Life satisfaction among migrant grandparent caregivers was significantly associated with the effectiveness of policy implementation, age-friendly community governance, the inclusiveness of digital public services, and the quality of intergenerational relationships. Among these factors, community governance and digital inclusiveness showed stronger associations, highlighting the importance of accessible and supportive everyday environments after late-life migration. Overall, the findings suggest that the life satisfaction of migrant grandparent caregivers should be understood within an integrated ecological context in which institutional, community, service-access, and family conditions are jointly relevant. Given the cross-sectional design and non-probability sampling, these findings should be interpreted as predictive associations rather than causal effects.

Suggestions

At the policy level, local governments should strengthen coordination among migration-related, aging-support, and family-care policies, and ensure migrant grandparents' access to basic public services through both digital and offline channels. At the community level, age-friendly infrastructure, social participation programs, and targeted digital skills support should be developed to mitigate barriers to service access and reduce social isolation. At the family level,

adult children are encouraged to negotiate explicit caregiving plans, foster mutual respect, and maintain effective intergenerational communication.

For future research, longitudinal panel designs and cross-regional investigations, combined with mixed-methods frameworks, are recommended to strengthen causal inference. Additional work could explore physical health, financial security, caregiving intensity, and social support as potential mediators or moderators.

New Knowledge

This study offers an integrated examination of four contextual domains linked to life satisfaction among migrant grandparent caregivers. The findings indicate that age-friendly community governance and digital public service inclusiveness had stronger standardized associations with life satisfaction than intergenerational relationship quality and policy implementation effectiveness. This pattern suggests that directly experienced community and service environments may be particularly salient in the context of late-life migration.

The study therefore contributes by integrating institutional, community, digital, and family conditions into a single analytical framework and by examining the relative magnitude of their associations with life satisfaction. Figure 4 summarizes this empirically informed ecological interpretation rather than representing a statistically tested multilevel or causal mechanism.

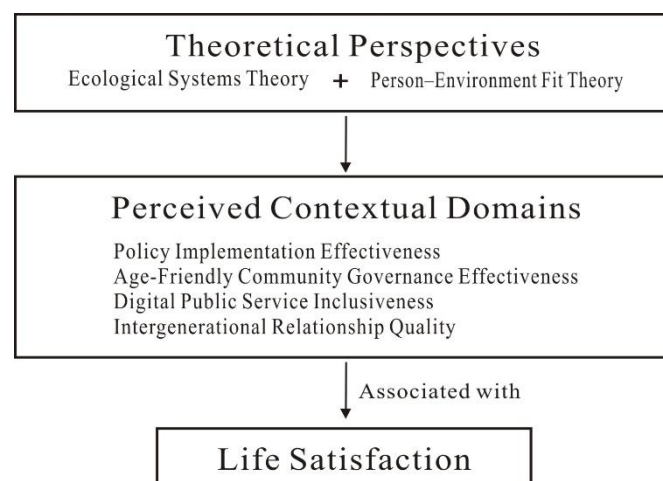


Figure 4 Integrated Ecological Framework of Life Satisfaction among Migrant Grandparent Caregivers

Note. The framework summarizes the observed associations and does not represent a tested causal or multilevel mechanism.

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