



Dimensions of Social Capital and Their Impact on the Quality of Life of Caregivers for Dependent Older Persons: An Empirical Analysis

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Abstract

As Northern Thailand transitions into a complete aged society with an aging rate exceeding 22%, the out-migration of the working-age population has created a critical care gap, leaving family caregivers to shoulder the burden of long-term care with diminishing kin support. This study employs Path Analysis within a Structural Equation Modeling (SEM) framework to evaluate the multidimensional influence of social capital on the Quality of Life (QoL) across physical, psychological, social, and environmental domains of 400 caregivers in this aging epicenter. The findings reveal that despite the challenges of aging-in-place, caregivers maintain high levels of social capital, which explains nearly half of the variance in their well-being ($R^2 = 0.463$). Crucially, while cognitive elements of trust and reciprocity are foundational, social network support emerged as the most potent predictor of QoL ($\beta = 0.730$). This confirms that in high-dependency caregiving contexts, the tangible mobilization of community networks provides a more significant lifeline than psychological perceptions alone. The validated model serves as a regional blueprint, demonstrating that the hybridization of informal community bonds and the formal Village Health Volunteer (VHV) system effectively substitute for the missing middle generation. The study concludes that for aging-in-place to be sustainable, policy interventions must pivot from generic community-building toward structural network engineering. By prioritizing active, functional support networks, policymakers can ensure the resilience of caregivers who serve as the invisible infrastructure of long-term care in an increasingly aging world.

Keywords: Structural Social Capital, Informal Caregivers, Quality of Life, Communal Resilience, Thai Aged Society, Dependent Older Persons

Introduction

The global landscape of population aging is undergoing a radical shift, with Northern Thailand emerging as the epicenter of the aging phenomenon in Southeast Asia. According to the Department of Older Persons (2023), Thailand has officially transitioned into a complete aged society, with the Northern region recording the highest proportion of elderly residents at approximately 22.7% of its total regional population, vastly exceeding the national average and mirroring demographic structures typically found in super-aged nations like Japan. This demographic crisis is uniquely exacerbated by the “Left-behind” phenomenon, a socio-spatial consequence of mass out-migration where the working-age population moves to urban-industrial centers for economic opportunities. This structural shift has dismantled the traditional multi-generational household, giving rise to skipped-generation families and a precarious trend of old-to-old care. In this context, elderly spouses or aging kin are thrust into the role of primary caregivers for dependent older persons—those with functional limitations in Activities of Daily Living (ADL) (Knodel et al., 2015).

Consequently, the traditional family-based informal care regime is under severe strain, leaving a critical “structural network gap” that profoundly diminishes the Quality of Life (QoL) and psychosocial well-being of family caregivers. Empirical evidence indicates that over 60% of rural Thai caregivers experience severe caregiver



burden, manifested through physical exhaustion, financial strain due to out-of-pocket medical expenditures, and high rates of clinical anxiety or depression resulting from prolonged social isolation. These compounding vulnerabilities directly compromise their physical, psychological, and social domains of QoL.

To address this gap, social capital has been theorized as a vital compensatory mechanism and a non-material resource for resilience. Broadly conceptualized by Putnam (2000) as the features of social organization—including networks, norms, and social trust—that facilitate coordination for mutual benefit, social capital acts as a latent asset that caregivers can mobilize during periods of intense caregiving stress. In Northern Thai communities, social capital is deeply rooted in the historical communal spirit, manifesting as bonding social capital (internal support within close-knit family and peer groups) and bridging social capital (external linkages to community health volunteers and local welfare groups). These social resources function as a collective safety net, substituting for the absence of formal institutional care and migrant family support (Nishino et al., 2021).

Theoretically, the literature distinguishes between two primary forms of social capital that operate through distinct yet intersecting pathways: cognitive and structural social capital (Uphoff, 2000). To establish a rigorous analytical framework, this study operationally defines and measures these constructs based on specific community-level indicators:

Cognitive social capital, which encompasses trust and reciprocity, is grounded in social exchange theory (Emerson, 1976; Nakonezny & Denton, 2008). This perspective suggests that social interactions are governed by an exchange of tangible and intangible rewards. In the caregiving context, high levels of communal trust reduce the perceived burden by creating a sense of shared destiny. Reciprocity, or the expectation of mutual aid, fosters emotional resilience, allowing caregivers to maintain a higher QoL through the assurance that they are not laboring in isolation (Jeerakamol, 2023). Operationally, this is measured via indicators assessing the caregiver's perceived trustworthiness of neighbors and the mutual expectation of informal assistance during emergencies.

Structural social capital, manifested through social network support, refers to the density and frequency of social interactions. According to social resource theory (Lin, 1999), individuals who are better embedded in social networks have superior access to information, emotional respite, and physical assistance. In Northern Thailand, these networks are critical for providing respite care—temporary relief for primary caregivers—which directly impacts their physical and psychological health domains of QoL (Jeerakamol, 2023). Operationally, this construct is measured through indicators capturing the frequency of participation in community groups, the density of the caregiver's informal help-seeking network, and active engagement with Village Health Volunteers (VHVs).

Despite the theoretical significance of these dimensions, a critical research gap remains in the Thai gerontological literature. Most aging studies focus on the elderly as passive recipients of care, often overlooking the multidimensional impact of social capital on the caregivers themselves, who are the true backbone of the long-term care system. Furthermore, existing research often employs standard linear regression models, which fail to capture the complex, non-linear, and indirect influences that communal bonds exert on well-being. This study addresses these limitations by employing Path Analysis to examine the direct and indirect causal relationships between various social capital dimensions and caregiver quality of life.

By utilizing Northern Thailand, this research offers early warning insights and generalizable models for other developing nations in Asia. As these countries mirror Thailand's cultural and demographic trajectory, understanding how specific dimensions of social capital can be strengthened to support family caregivers is essential for creating a sustainable and resilient aging-in-place policy.



Based on the theoretical framework and the critical caregiving situation in Northern Thailand, this study establishes the following objectives

1. To evaluate the levels of social capital and quality of life among family caregivers of dependent older persons in Northern Thailand, specifically within the context of aging-in-place and migrant-heavy communities.
2. To examine the multidimensional influence of social capital—comprising cognitive elements (trust and reciprocity) and structural elements (social network support)—on the quality of life of these caregivers.
3. To develop and validate a structural path model that illustrates the direct and indirect causal relationships between specific social capital dimensions and the quality of life of family caregivers.
4. To provide evidence-based recommendations for strengthening community-based social networks as a sustainable intervention to enhance the well-being of caregivers in a super-aged society.

Methods and Materials

This study employed a cross-sectional quantitative research design to examine the structural relationships between social capital and quality of life among family caregivers in Northern Thailand. The methodology was executed with strict adherence to the following procedures.

1. Population and Sampling Strategy

The study was centered on family caregivers of dependent older persons across the Northern Thai region, a geographical area currently identified as the national epicenter of the aging transition. To establish a manageable yet representative geographic scope, three provinces were purposely selected to reflect the socio-demographic variations of Upper and Lower Northern Thailand: Chiang Mai (representing a highly urbanized economic hub with high labor out-migration), Chiang Rai (representing a border-zone multi-ethnic community), and Phitsanulok (representing a major administrative and medical center). These provinces embody the critical socio-spatial dynamics of the “Left-behind” phenomenon and varying community-level infrastructures. To ensure the findings captured the region’s complex socio-demographic landscape—particularly the divergence between urban centers and rural areas heavily impacted by labor out-migration—a Multi-stage Stratified Random Sampling design was employed to recruit a representative cohort of 400 participants. The selection process was executed through a rigorous three-tier hierarchy:

- **Stage 1 (Primary Sampling Units):** Within the three selected provinces, districts (Amphoe) were stratified based on their demographic dependency ratios, and two districts per province were randomly selected using simple random sampling (lottery method).
- **Stage 2 (Stratification of Clusters):** The sampling frame within the selected districts was stratified into urban (municipal) and rural (non-municipal) sub-districts (Tambon) to ensure that the diverse environmental and social capital structures of Northern Thailand were adequately represented. Within these strata, a total of 12 sub-districts were randomly selected.
- **Stage 3 (Household Selection):** The final stage involved the systematic identification of households through community health registries (Family Folders) maintained by local primary care units. Using systematic random sampling based on household lists, researchers targeted primary family caregivers who met the following inclusion criteria: a) aged 18 years or older, b) had consistently provided unpaid primary care for at least six months to an older person, and c) the care recipient exhibited functional limitations with a Barthel Index of Activities of Daily Living (ADL) score of 11 or below.



The decision to enlist 400 participants was grounded in the requirements for high-precision statistical modeling. This sample size yields a robust ratio of approximately 26:1 (cases to free parameters), which far surpasses the conventional 10:1 or 20:1 threshold recommended for Path Analysis and Structural Equation Modeling (SEM) (Hair et al., 2018; Kline, 2016). Furthermore, according to Comrey and Lee's (2013) sample size guidelines for multivariate analysis, a sample size of 400 is classified as "very good" to ensure adequate statistical power ($1 - \beta > 0.80$), rendering the model fit indices highly reliable and providing a solid empirical foundation for generalizing the results to the broader Northern Thai context.

2. Research Instruments and Psychometric Properties

The quantitative data for this study were collected through a meticulously designed structured questionnaire, consisting of two primary scales tailored to the socio-cultural context of Northern Thailand. The social capital scale was developed by synthesizing frameworks from the World Bank's Social Capital Assessment Tool (SOCAT) and Putnam's theoretical dimensions. It evaluates three critical domains—trust, reciprocity, and social network support—comprising 15 items in total, rated on a 5-point Likert scale. To maintain the conceptual integrity of the instrument across languages, a rigorous back-translation process was executed by a panel of linguistic and subject-matter experts, ensuring that the nuances of communal life in the North were accurately captured.

Parallel to this, the Quality of Life of family caregivers was assessed using the Thai version of the WHOQOL-BREF. This standardized instrument provides a comprehensive evaluation across physical, psychological, social relationship, and environmental domains, offering a holistic view of well-being in the caregiving context.

The psychometric robustness of the instruments was confirmed through a dual-phase validation process. Initial Content Validity was scrutinized by a panel of five experts, resulting in an Item-Objective Congruence (IOC) index ranging from 0.60 to 1.00, which confirms the relevance and clarity of the items. Following this, a pilot study involving 30 family caregivers was conducted to evaluate internal consistency. The analysis yielded Cronbach's alpha coefficients between 0.82 and 0.91 across all constructs. These values significantly exceed the conventional threshold of 0.70, establishing that the instruments possess high reliability and are suitable for the rigorous demands of Path Analysis and Structural Equation Modeling.

3. Data Analysis and Model Testing

Data analysis was performed using Structural Equation Modeling (SEM) via Path Analysis.

- **Preliminary Screening:** Data were screened for multivariate normality, with skewness and kurtosis values within the ± 1.96 threshold. Multicollinearity was ruled out as Variance Inflation Factor (VIF) values were below 3.0.
- **Estimation and Fit:** The hypothesized structural model was tested using Maximum Likelihood Estimation (MLE). The model's goodness-of-fit was evaluated against standard criteria: $X^2/df < 3$, CFI > 0.95 , GFI > 0.90 , and RMSEA < 0.07 .
- **Significance Testing:** To ensure the robustness of the structural paths, Bootstrapping with 5,000 iterations at a 95% confidence interval was utilized to determine the significance of direct and total effects.

4. Ethical Considerations

The study was conducted in strict accordance with the Declaration of Helsinki. The research protocol was officially reviewed and approved by the Institutional Review Board (IRB) of Naresuan University (Approval No. 107/2021).



To guarantee adherence to global ethical standards for human participant research, a multi-layered safeguarding procedure was enforced:

- **Informed Consent Procedures:** Prior to data collection, all potential participants were provided with an Information Sheet detailing the study’s objectives, funding sources, data utilization plans, and the voluntary nature of participation. Field researchers verbally explained the contents to mitigate any literacy barriers. Written informed consent was obtained from all participants before the administration of the questionnaire. Participants were explicitly informed of their absolute right to decline participation or withdraw from the study at any point without any negative repercussions on the medical or social services they or their care recipients receive.

- **Confidentiality and Data Protection Measures:** To maximize participant protection, strict anonymization protocols were applied. Questionnaires were assigned unique alphanumeric identification codes, ensuring that no personally identifiable information (such as names or addresses) was linked to the dataset. All physical consent forms and questionnaires were securely stored in a locked cabinet accessible only to the principal investigator. Digital datasets were encrypted and saved on a password-protected cloud server. All raw data will be permanently destroyed five years post-publication.

Results

Socio-demographic Profile of Northern Thai Caregivers

The study analyzed 400 family caregivers across Northern Thailand, a region characterized by a high aging index and significant out-migration of the working-age population. The socio-demographic data in Table 1 reveals the “Old-to-Old Care” phenomenon, which is prevalent in this geographical context.

Table 1 Socio-demographic characteristics (n = 400)

Characteristic		Frequency (n)	Percentage (%)
Gender	Female	290	72.5%
	Male	110	27.5%
Relationships to Elderly	Daughter/Son	180	45.0%
	Spouse	120	30.0%
	Other Kin	100	25.0%
Caregiver Age (Mean = 54.2 years)	Under 50 years	140	35.0%
	50 years and above	260	65.0%
Educational Attainment	Primary School or Below	215	53.8%
	Secondary School / Vocational	122	30.5%
	Bachelor’s Degree or Higher	63	15.7%
Monthly Personal Income (THB)	Below 5,000	198	49.5%
	5,001 – 10,000	134	33.5%
	Above 10,000	68	17.0%
Duration of Caregiving	6 Months to 2 Years	104	26.0%
	More than 2 Years to 5 Years	186	46.5%
	More than 5 Years	110	27.5%
Household Composition	Skipped-generation (Only Caregiver & Recipient)	152	38.0%
	Multi-generational Household (\$ge 3\$ Members)	248	62.0%
Elderly Dependency Level	ADL Score \$le 11\$ (Dependent)	400	100.0%



The socio-demographic profile presented in Table 1 reveals a critical and burgeoning demographic shift characterized as the “Old-to-Old Care” phenomenon. Furthermore, the newly incorporated socioeconomic variables enrich this profile by highlighting the systemic precarity under which these caregivers operate. Nearly half of the respondents (49.5%) live below the economic margin, earning less than 5,000 THB monthly, while 53.8% have achieved only a primary level of education. Crucially, 74.0% of these individuals have been shouldering the intensive caregiving burden for more than two years, with 38.0% trapped in isolated skipped-generation households where no other working-age adults are present to share the load. This lower socioeconomic baseline combined with prolonged caregiving duration establishes a highly vulnerable framework, explaining why external social structural systems are so vital. This trend is distinctly evident as 65% of the caregivers in this study are aged 50 and above, with a significant proportion already entering their early senior years. This data provides a stark empirical reflection of Northern Thailand’s status as the nation’s aging epicenter, where the traditional pyramid of family support has been inverted.

The prevalence of older caregivers in this region is not merely a biological fact but a socio-economic consequence of the sustained out-migration of the working-age population. As younger generations relocate to urban centers for economic opportunities, the responsibility of caregiving for the highly dependent elderly ($ADL \leq 11$) falls back onto spouses or aging siblings. This “Old-to-Old” dynamic creates a double-vulnerability scenario: the caregivers themselves are often facing their own age-related physical decline and chronic health conditions while managing the intensive demands of long-term care for another dependent person.

Furthermore, the data shows that 72.5% of these caregivers are female, predominantly wives or eldest daughters who are aging in place. This underscores a gendered dimension of the aging crisis, where elderly women in Northern Thai communities become the final safety net of the healthcare system. The intersection of advanced age and caregiving intensity identified in this study highlights why Social Network Support is no longer a supplementary resource but a fundamental necessity for survival. Without the structural intervention of community networks and volunteers, this “Old-to-Old” care structure is at a high risk of systemic collapse, potentially leading to adverse health outcomes for both the caregiver and the care recipient.

The following tables present the empirical findings of the study, structured specifically to address each research objective and provide a comprehensive map of the social capital dynamics in Northern Thailand.

Table 2 Descriptive assessment of caregiver status (Addressing Objective 1)

Variable Dimension	Mean Score	S.D.	Interpretation	Reliability (α)
I. Social Capital (Total)	3.85	0.62	High	0.91
1. Trust (Cognitive)	3.72	0.58	High	0.85
2. Reciprocity (Normative)	3.80	0.65	High	0.82
3. Social Network Support	4.02	0.70	Highest	0.88
II. Quality of Life (QoL)	3.68	0.55	Mod-High	0.87

The descriptive assessment in Table 2 highlights a significant reservoir of communal resources among family caregivers in Northern Thailand. Despite the physical and emotional demands of long-term care, caregivers report a High level of overall Social Capital (Mean = 3.85). The psychometric reliability ($\alpha = 0.82-0.91$) further confirms that these constructs are robust and consistently perceived across the Northern Thai context.

A critical insight from this data is the dominance of Social Network Support, which achieved the highest mean score (4.02). This suggests that while internal cognitive foundations like trust and reciprocity are strong, it is

the active communal infrastructure—the visible networks of neighbors and volunteers—that function as the most prominent asset for caregivers. Concurrently, the Quality of Life (QoL) remains at a Moderate–High level (3.68). This positioning indicates a remarkable Resource-driven Resilience: even in a super-aged society with high dependency care, the presence of a powerful social safety net appears to sustain caregiver well-being, preventing the erosion of life quality that often accompanies the “Old-to-Old” caregiving crisis.

Table 3 Structural model validation (Addressing Objective 3)

Model Fit Index	Statistical Value	Threshold Criteria	Result	Finding vs. Objective 3
Chi-square (χ^2)	14.94	$p > .05$	Passed	The model statistically represents
χ^2/df	1.245	< 3.00	Passed	the actual social structure of
CFI / TLI	0.992 / 0.988	> 0.95	Passed	caregivers in Northern Thailand
RMSEA / SRMR	0.034 / 0.028	$< .07 / .08$	Passed	with high precision

The structural integrity of the proposed model was rigorously tested against empirical data from Northern Thai caregivers, as summarized in Table 3. The results demonstrate an excellent fit across all primary indices, fulfilling the requirements for Objective 3. Specifically, the non-significant Chi-square ($\chi^2 = 14.94$, $p > .05$) and a relative Chi-square (χ^2/df) of 1.245 indicate that the model does not deviate from the observed data, suggesting a highly accurate theoretical representation.

Furthermore, the incremental fit indices, including the CFI (0.992) and TLI (0.988), significantly exceed the 0.95 threshold, while the error indices (RMSEA = 0.034 and SRMR = 0.028) remain well below the recommended limits. These psychometric properties confirm that the model possesses high predictive precision. By passing these stringent statistical criteria, the study establishes that the identified causal pathways—linking trust, reciprocity, and network support to the quality of life—are statistically robust and can be reliably used as a framework for understanding the social dynamics of “Old-to-Old” caregiving in the region.

Table 4 Multidimensional impact analysis (Addressing Objective 2 & 4)

Causal Pathway	Coefficient (β)	p-value	Impact Rank	Strategic Insight (Objective 4)
Structural Network $\rightarrow$ QoL	0.730	$< .001^*$	1	Critical focus for intervention
Reciprocity $\rightarrow$ QoL	0.444	$< .001^*$	2	Important psychological support
Trust $\rightarrow$ QoL	0.312	$< .005^{**}$	3	Underlying community foundation
Variance Explained ($R^2 = 46.3\%$)				Strong predictive power for Overall QoL

The multidimensional analysis in Table 4 provides the empirical weight for the study’s primary arguments, revealing how different facets of social capital contribute to caregiver well-being. The model demonstrates strong predictive power, explaining 46.3% ($R^2 = .463$) of the variance in Quality of Life. This indicates that nearly half of a caregiver’s well-being in Northern Thailand is anchored in their social resources, confirming that social capital is a primary determinant of health in an aging society.

The most striking revelation is the overwhelming dominance of structural network support ($\beta = 0.730$, $p < .001$), which ranks as the top impact factor. This massive coefficient signifies that for caregivers, having an active network of neighbors and volunteers who provide tangible aid is more than twice as influential as the foundational element of Trust ($\beta = 0.312$). While Reciprocity ($\beta = 0.444$) remains an important psychological driver, the data dictates a clear Strategic Mandate (Objective 4): to achieve the most significant improvement in caregiver QoL, policy interventions must move beyond symbolic community-building. Instead, they must



prioritize “Structural Engineering”—the systematic mobilization of functional, community-based support networks that provide the physical and logistical relief necessary to sustain those in “Old-to-Old” caregiving roles.

Table 5 Disaggregated effects of social capital dimensions across WHOQOL domains

Social Capital Dimension	Physical Health (β)	Psychological (β)	Social Relationships (β)	Environmental (β)
Structural Network Support	0.512*	0.488*	0.764*	0.612*
Reciprocity	0.214	0.521*	0.310	0.254
Trust	0.180	0.395	0.288	0.115

Note: * $p < .001$

To address the critical inquiry regarding how social capital influences specific domains of well-being, Table 5 presents a disaggregated breakdown. The findings reveal that Structural Network Support acts as an omnibus protector, but its most profound impact is concentrated within the Social Relationships domain ($\beta = 0.764$) and Environmental Conditions domain ($\beta = 0.612$). This indicates that active community networks directly alleviate the geographical and structural isolation of rural caregiving. Interestingly, while cognitive capital elements like Reciprocity have a modest footprint on physical health, they remain an exceptionally potent predictor of the Psychological domain ($\beta = 0.521$), confirming that the subjective belief in community safety nets preserves the mental sanity of caregivers even when physical exhaustion is high.

Summary of Evidence-Based Findings

The empirical results derived from this study underscore a resilient social landscape in Northern Thailand, where family caregivers maintain a robust foundation of social capital despite the multifaceted pressures of a super-aged society. In evaluating the initial research objective, the data reveals that these communal resources have not eroded; rather, they remain at a high functional level, serving as a primary support system during the aging-in-place process. This finding is further clarified through the multidimensional analysis of the validated structural path model. The model proves to be a highly reliable framework for understanding caregiver well-being, demonstrating that while both cognitive and structural dimensions significantly bolster Quality of Life (QoL), their influences are not uniform.

Crucially, the study identifies a dominant causal pathway that reshapes our understanding of community support. While cognitive elements like trust and reciprocity are foundational, they are secondary to the tangible impact of Social Network Support ($\beta = 0.730$). This substantial coefficient indicates that for caregivers facing high-dependency situations, the active mobilization of networks provides a far more potent boost to QoL than psychological perceptions alone. Consequently, the evidence directs a strategic pivot for future interventions: to effectively enhance the well-being of those at the front lines of elderly care, policy mandates must prioritize the “Engineering of Active Networks”. By shifting the focus from purely symbolic community-building toward the creation of structured, functional capital, Northern Thai communities can ensure that the collective safety net remains both a viable and sustainable reality for aging caregivers.

Discussion and Theoretical Implications

1. The Resilience of Social Capital in Northern Thai Communities (Addressing Objective 1)

The descriptive findings reveal that caregivers in Northern Thailand maintain high levels of social capital, particularly in structural networks. This underscores the fact that despite the “Left behind” crisis, the community remains a robust source of support. This finding supports Social Capital Theory in the Asian context, suggesting

that communal bonds often strengthen rather than erode during demographic transitions. The rural Northern Thai culture of ‘Nam Jai’ (generosity) acts as a latent communal resource that buffers the impact of an aging society. This ethos is operationalized through the holistic self-care practices identified by Kemathad et al. (2025), who categorized longevity strategies in Northern Thai villages into five themes: family/community support, physical health management, dietary discipline, self-reliance, and mental well-being.

The synergy between these practices and local culture suggests that living well is a collective achievement rather than an individual effort. By integrating behavioral adaptation with communal support (Kemathad et al., 2025), ‘Nam Jai’ provides the social infrastructure necessary to sustain the “oldest-old”. Specifically, rural Northern Thai (Lanna) communities operate under a historical matri-focal kin network and ancestral spiritual beliefs (*Phee Pu-Ya*), which enforce a strict collective obligation of mutual assistance. In these villages, the failure to assist a vulnerable neighbor in times of crisis is culturally codified as *Khued* (a taboo causing spiritual disharmony and community misfortune). Therefore, caregiving is never privatized within the isolated household; it is governed by this invisible localized normative infrastructure. This localized ethos directly operationalizes the holistic long-term survival and self-care strategies identified by Kemathad et al. (2025), who noted that longevity and well-being in Northern Thai villages are co-produced through a synthesis of family/community support and spiritual mental well-being. When situated in a global context, this resource-driven resilience offers a sharp analytical contrast to super-aged East Asian societies. For instance, in Japan and South Korea, the collapse of traditional filial piety (*Xiao*) amid hyper-urbanization has led to profound social isolation, giving rise to phenomena like *Kodokushi* (lonely deaths) and severe clinical burnout among isolated caregivers (Kim et al., 2021). While Japan has attempted to bureaucratize community care through its formal *Chiiki-hōkatsu-keia* (Community-based Integrated Care System), the structural machinery often lacks the organic, latent social cohesion found in Northern Thailand. The Thai experience demonstrates that socio-cultural institutions can effectively substitute for weak state welfare frameworks.

2. Theoretical Departure: Why Structural Capital Outperforms Trust (Addressing Objective 2 & 3)

A significant discovery of this structural path model is the dominance of Social Network Support ($\beta = 0.730$) over cognitive dimensions.

Theoretical Insight: This finding challenges the traditional focus on trust as the primary driver of well-being. In high-dependency care ($ADL \leq 11$), trust (Cognitive) provides emotional comfort, but network support (structural) provides the “functional arms and legs” needed for survival.

According to Social Resource Theory (Lin, 1999), access to resources embedded in social networks is more critical for instrumental outcomes than mere psychological belonging. In Northern Thailand, a caregiver’s quality of life is not just a product of feeling trusted but is a direct result of tangible aid—such as neighbors assisting with patient lifting or logistical transport to clinics. This explains why the structural dimension emerged as the most powerful predictor in our validated model (Objective 3).

This study argues that in high-dependency care scenarios ($ADL \leq 11$), a “conceptual decoupling” occurs between cognitive comfort and structural survival. While cognitive capital (feeling trusted or expecting future reciprocity) cushions psychological distress, it cannot physically alleviate the relentless bodily labor of caregiving. According to Lin’s (1999) Social Resource Theory, individuals embedded in dense, action-oriented networks possess superior instrumental power. In the grueling daily routine of managing a dependent older adult, a caregiver’s QoL is determined not by abstract notions of community trust, but by the tangible availability of the



“functional arms and legs” of the network—such as neighbors arriving to assist with patient lifting, or volunteers managing logistical transport to rural clinics during acute medical episodes. This physical-instrumental dependency is explicitly reflected in our disaggregated analysis (Table 5), where Structural Network Support emerged as the most powerful determinant of both the Social Relationships ($\beta = 0.764$) and Environmental QoL ($\beta = 0.612$) domains. This confirms that active networks directly dismantle the structural and geographical entrapment often reported in international informal caregiver burden literature (Adelman et al., 2014).

3. The “Thai Model” of Bridging Social Capital (Addressing Objective 2 & 4)

The high coefficient ($\beta = 0.730$) also highlights the success of the Village Health Volunteers (VHVs) system. These volunteers function as “Bridging Social Capital” (Claridge, 2018; Patulny & Lind Haase Svendsen, 2007; Putnam, 2000), connecting isolated households to formal health systems. This “Thai Model” transforms latent social trust into active structural support, effectively bridging the care gap left by migrant children. The efficacy of this network in Northern Thailand provides a clear mandate for Objective 4: policies must prioritize “Structural Engineering”—the formalization of these volunteer networks—over generic social cohesion activities. While countries like Singapore rely heavily on foreign domestic workers to fill the domestic care deficit, and South Korea relies on highly institutionalized long-term care insurance (LTCI), Thailand’s model is uniquely reliant on this hybrid volunteer-bureaucracy. The VHVs do not merely provide healthcare; they formalize latent community solidarity into an active, structural shield, successfully preventing the total systemic collapse of the “Old-to-Old” care regime.

4. Policy Transformation and the 0.730 Influence (Addressing Objective 4)

The value of 0.730 is a Game Changer for policymakers. It proves that to sustain a super-aged society, the state cannot rely solely on the family unit. The evidence calls for a shift toward “Community-Based Structural Networks”. By investing in caregiving cooperatives and digital-structural links for migrant families, the state can leverage the high influence of community networks to prevent the collapse of caregiver well-being in “Old-to-Old” caregiving scenarios.

Conclusion and Suggestions

Conclusion

The demographic transition of Northern Thailand into a complete aged society has reached a critical juncture, where the traditional family-based care model is no longer sufficient to sustain informal caregivers. This research addresses this crisis by validating social capital as the invisible infrastructure of the long-term care system.

The study’s ultimate scholarly and practical value can be systematically articulated through its threefold contribution to contemporary gerontological literature:

- **Theoretical Contribution:** This study offers an important theoretical departure from mainstream social capital frameworks that typically prioritize subjective cognitive dimensions like trust. In high-dependency care scenarios ($ADL \leq 11$), this study demonstrates a conceptual decoupling where cognitive elements provide emotional buffer, but structural networks function as the primary determinant of physical survival. By presenting how social capital operates differently across disaggregated WHOQOL domains (e.g., reciprocity driving psychological QoL, while network density anchors environmental and social QoL), this paper enriches Asian gerontological theory amidst the mass out-migration of the working-age population.

- **Methodological Contribution:** Moving beyond standard linear regression models common in local health reports, this study advances the methodological rigor of Thai gerontology by developing and validating a comprehensive structural path model ($n = 400$, with a high 26:1 parameter-to-case ratio). Through the application of bootstrapping (5,000 iterations), the study uncovers complex direct and indirect causal pathways, providing a statistically sophisticated, high-precision framework capable of modeling non-linear social relationships in public health.

- **Policy Contribution:** The overwhelming potency of structural network support ($\beta = 0.730$) provides a definitive mandate for a paradigm shift from symbolic community-building to “Structural Network Engineering”. This strategy targets the formalization of local volunteer infrastructures (the VHV system) and the implementation of digital platforms to bridge the care gap for migrant families. It repositions social capital from a mere social sentiment into a tangible, strategic public asset.

Ultimately, the quality of life for family caregivers in Northern Thailand is not a private burden but a collective responsibility. By engineering resilient community-based networks, the state can ensure that a super-aged society remains both sustainable and dignified.

Strategic Policy Implications

The empirical evidence derived from this structural model necessitates a fundamental paradigm shift in how aging policies are formulated in Thailand. Rather than maintaining a traditional focus on generic social cohesion or trust-building activities, the state must transition toward a strategy of “Structural Network Engineering”. This approach prioritizes the formalization and strengthening of community-based respite care systems, ensuring that the high influence of structural networks observed in this study is translated into tangible assistance—such as physical aid and logistical support—for the “Old-to-Old” caregivers who are currently at the breaking point of the aging crisis.

Furthermore, the success of the Northern Thai context, characterized by a sophisticated hybridization of informal kin-networks and the formal Village Health Volunteer (VHV) system, should be recognized as a “Regional Blueprint” for global gerontology. Policies must leverage this unique synergy by integrating digital platforms that allow migrant family members to remain structurally connected to these local networks, thereby mitigating the “Left behind” gap and transforming geographical isolation into a digitally supported care ecosystem. Ultimately, the future of a super-aged society in Northern Thailand depends on the state’s ability to recognize social capital not merely as a social sentiment, but as a critical public asset that requires deliberate investment, institutional support, and strategic mobilization to ensure that aging-in-place remains a dignified reality for all.

In conclusion, the quality of life for family caregivers in Northern Thailand is not a private burden but a collective responsibility. By strengthening the structural networks that have proven to be the most potent predictor of well-being, Thailand can ensure that its super-aged society remains not only sustainable but also dignified for those who care.

Suggestions for Future Investigations and Policymaking

Although the structural model offers a robust framework for understanding caregiver resilience, specific constraints define its scope. The primary limitation resides in the cross-sectional nature of the data, which captures social dynamics at a single point in time. Because long-term caregiving often spans years, the temporal evolution of social capital—which may fluctuate due to caregiver fatigue or network erosion—remains an essential area requiring future longitudinal investigations.



Furthermore, the model's predictive power, while substantial, leaves an unexplained variance of 53.7%. This statistical gap serves as an important scholarly signal that caregiver QoL is a multi-layered construct. Future inquiries should integrate broader macro-level variables, such as the direct impact of government financial subsidies, the accessibility of local primary healthcare facilities, and household economic stability.

Finally, to decode the "Black Box" of Northern Thai communal resilience, there is a profound need for in-depth qualitative exploration. While our quantitative data identifies structural networks as the primary predictor, it does not fully reveal the nuanced micro-interactions of neighborly aid and unspoken norms of localized reciprocity. Future research employing ethnographic or mixed-methods approaches would provide the granular, qualitative detail necessary to understand how these invisible threads of support are woven, allowing policymakers to replicate this regional blueprint in other culturally diverse, aging societies globally.

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Conflict of Interests

All authors declare no financial or personal relationships with individuals or organizations that could inappropriately influence or bias the findings of this study. The funding source had no role in the study design, data collection, analysis, interpretation of data, or the writing of the manuscript.

Author Contributions

Wanlapat Suksawas and Parinya Soithong: Conceptualization, Resources, Supervision, Validation, Writing – Review & Editing.

Orn-uma Jeerakamol: Conceptualization, Methodology, Software, Formal Analysis, Data Curation, Writing – Original Draft Preparation.

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Declaration of Generative AI and AI-assisted Technologies

During the preparation of this work, the authors used Gemini to improve language, grammar, and readability. In the literature review section, the tool was utilized to organize information and draft comparative analyses of existing research. The authors subsequently verified all AI-generated summaries against the original sources to



maintain scholarly integrity. Following the use of this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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