Mapping Rural Aging-in-Place Research in China: Bibliometric Evidence from CNKI Core and CSSCI Journals, 2010–2025

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Abstract: Against the complex backdrop of accelerating population aging, the reversal of aging trends between urban and rural areas, and the ongoing weakening of family caregiving functions, aging in place in rural areas presents not only a practical challenge in the development of China's elderly care service system but also offers a context-specific empirical field for the international community to understand the institutional conditions, service boundaries, and governance logic of aging in place in rural regions. While existing research has yielded substantial findings on topics such as rural elderly care needs, home- and community-based care, integrated medical and elderly care, mutual aid-based care, and smart elderly care, there remains a lack of systematic bibliometric analysis regarding the knowledge production structure, shifts in research foci, and characteristics of collaborative networks within Chinese core academic literature on rural aging in place. This study uses a sample of 1,102 articles from Peking University Core and CSSCI journals indexed in the China National Knowledge Infrastructure (CNKI) database from 2010 to 2025. Based on clearly defined search scope, inclusion criteria, and data cleaning rules, and utilizing the CiteSpace 7.0 R1 tool, the study comprehensively employs methods such as publication volume statistics, author and institutional collaboration network analysis, keyword co-occurrence analysis, and keyword timeline mapping to examine the knowledge structure and evolutionary characteristics of research on rural in-place elderly care in China. The study found that academic attention in this field has generally undergone three phases: steady growth, rapid expansion, and fluctuating adjustment. Changes in publication volume show a relatively clear temporal correlation with the密集 issuance of national rural elderly care policies; although research actors have formed several relatively stable groups of authors and institutional nodes, cross-institutional and cross-regional collaboration remains limited; research hotspots center on high-frequency keywords such as "aging in place," "integration of medical and elderly care," "elderly care services," "the elderly," and "rural areas," forming core conceptual clusters. The research demonstrates an evolutionary trend, gradually expanding from discussions on family-based care, aging in place, and care needs to topics such as the integration of medical and elderly care, long-term care, care for the disabled elderly, and smart elderly care. The contribution of this paper lies in revealing, from.

a bibliometric perspective, the logic of knowledge evolution among policy agendas, service integration, and digital empowerment in research on rural aging in place in China, thereby providing a structured framework for subsequent theoretical construction, policy evaluation, and research on service integration mechanisms regarding rural aging in place...
Keywords: rural aging in place; aging in place; bibliometric analysis; CiteSpace; knowledge map; smart aging

Introduction

Global population aging is profoundly reshaping social policies, public services, and long-term care systems. As life expectancy increases, fertility rates decline, and the size of the elderly population expands, the risks of chronic diseases, multiple conditions, disability, and care dependency among older adults continue to mount. Consequently, traditional care models centered on institutional care are facing pressures such as rising costs, insufficient resources, and limited guarantees of quality of life. Against this backdrop, "aging in place" has gradually emerged as a key concept in international aging governance. Its core principle is not simply to keep older adults in their homes or communities, but rather to ensure that they can access necessary daily care, medical services, social support, and environmental adaptations within familiar living environments, social relationships, and local networks. From this perspective, the realization of aging at home or in one's community is not merely a matter of spatial choice, but a comprehensive issue involving family care, community services, primary healthcare, long-term care, public transportation, digital technology, and social participation. Particularly in rural areas, the combined effects of low population density, extensive service coverage areas, insufficient medical resources, the outflow of young and middle-aged adults, and the weakening of family care have made rural aging in place a critical test of public service capacity, the resilience of grassroots governance, and the equity of long-term care.

Aging in place in China's rural areas presents distinct local complexities within the global context of rural aging. Data from the Seventh National Population Census shows that in 2020, China's population aged 60 and over reached 264 million, accounting for 18.7% of the total population. The degree of aging in rural areas is significantly higher than in urban areas, resulting in a pronounced urban-rural inversion. Compared to community-based elderly care in urban areas, rural elderly care in China is not merely a matter of service provision in the conventional sense. Rather, it is a complex socio-policy issue shaped by the interplay of the urban-rural dual structure, continuous population mobility, the weakening of intergenerational family support, the transformation of village communities, the decentralization of basic public services, and the rural revitalization strategy. The intergenerational cohabitation, close-proximity care, and kinship support upon which traditional family-based elder care relies are being steadily eroded by population mobility. Rural elder care facilities are scattered, and the integration of healthcare and daily living support resources remains inadequate. Furthermore, the roles of grassroots organizations, village mutual aid networks, and community public services in the delivery of elder care have not yet been fully institutionalized. Therefore, in the Chinese context, rural aging in place cannot be simply equated with the concept of "aging in place" in Western literature, nor can it be reduced to home-based or community-based care in a general sense. Instead, it should be understood as an integrated care arrangement involving the joint participation of families, communities, grassroots governments, healthcare resources, social organizations, and digital platforms.

Over the past decade, the Chinese government has continuously issued policy documents regarding the development of rural elderly care service systems, propelling rural aging in place from a practical issue into the academic research arena. The integration of the basic old-age insurance systems for urban and rural residents, the launch of policies on the integration of medical care and elderly care, the "13th Five-Year Plan" for the Development of Aging-Related Undertakings and the Construction of the Elderly Care System, provisions regarding rural mutual-aid elderly care in the Rural Revitalization Strategy, and the national-level Guidelines on Rural Elderly Care Services jointly issued by the Ministry of Civil Affairs and 21 other departments in 2024 collectively constitute the significant policy backdrop for the expansion of research on rural elderly care. At the same time, the Chinese academic community has accumulated a substantial body of research on the care needs of rural older adults, service provision, home-based care, community-based care, mutual aid in aging, the integration of medical and elderly care, smart aging, and the development of elderly care service systems. Such

research has advanced the analysis of rural elderly care issues through empirical surveys, model comparisons, policy evaluations, and the construction of service systems, providing a crucial foundation for understanding the transformation of elderly care in rural China.

However, existing research still leaves room for further advancement: while academic studies on specific topics within rural elderly care continue to grow, there remains a lack of systematic examination of the knowledge production structure within this field itself. Most literature focuses on a specific region, policy, service model, or demographic group of older adults. While such studies offer in-depth empirical explanations, they struggle to demonstrate how research on rural in-place aging has developed thematic clusters over the long term, how research priorities have shifted in response to policy changes, how knowledge has diffused across disciplines, and whether networks of authors and institutions have formed a relatively mature academic community. Existing reviews have primarily relied on qualitative induction; while they offer detailed explanations, they are constrained by the scale of the sample literature, the scope of manual screening, and the subjective judgments of researchers. In contrast, bibliometric analysis can visualize the knowledge structure, thematic evolution, and collaborative relationships within large-scale literature through methods such as publication volume, co-occurrence networks, clustering structures, emerging terms, and timeline maps, thereby addressing the shortcomings of traditional reviews in depicting macro-level knowledge maps.

Based on this, this paper uses 1,102 articles from Peking University Core and CSSCI journals published between 2010 and 2025 and indexed in the China National Knowledge Infrastructure (CNKI) database as its analytical sample. Utilizing the CiteSpace 7.0 R1 bibliometric tool, the study comprehensively employs methods such as publication volume statistics, keyword co-occurrence analysis, keyword timeline mapping, and author and institutional collaboration network analysis to systematically examine the knowledge structure and evolutionary patterns of research on in-village elderly care in rural China. This paper focuses on addressing the following questions: How has the academic attention toward research on aging in place in rural China evolved between 2010 and 2025? What core concepts, hot topics, and knowledge connections have emerged in this field? How have research hotspots shifted in response to changes in policy agendas, demographic structures, and the transformation of elderly care service practices? To what extent do collaboration networks among authors and research institutions reflect the maturity and level of organization within this research field? The contribution of this paper lies in situating research on aging in place in rural China within the international contexts of aging in place, rural aging, long-term care, and community-based care. Furthermore, based on a knowledge map of core Chinese-language literature, it reveals the evolutionary logic of rural elderly care research—shifting from discussions of family-based and home-based care toward integrated medical and elderly care, supply-demand matching, long-term care, and smart empowerment—thereby providing a structured framework for subsequent policy evaluations, comparative studies, and research on integrated rural elderly care service mechanisms.

Data Sources and Research Methods

(1) Identification of Relevant Literature and Data Sources

To identify relevant literature in the field of aging in place in rural China, this study utilizes the China National Knowledge Infrastructure (CNKI) as its data source. The selection of the CNKI database is primarily based on the specificity of this study's research objectives: this study does not aim to map the overall knowledge landscape of global aging in place research, but rather focuses on the knowledge production structure, thematic evolution, and collaborative network characteristics formed by the Chinese core academic community regarding rural aging in place. Compared to international databases such as Web of Science and Scopus, CNKI more systematically collects Chinese-language research findings in the field of social sciences on topics including rural elderly care, home-based care, community-based care, integrated medical and elderly care, mutual aid-based care, long-term care, and smart elderly care. It is thus better positioned to present the Chinese academic community's research responses to rural elderly care service practices, policy changes, and governance logic in a concentrated manner. Therefore, CNKI exhibits a high degree of alignment with the research focus of this paper on the "knowledge structure of core Chinese-language literature on rural in-place elderly care in China."

This study employs thematic retrieval to identify relevant literature. The search timeframe is set from January 1, 2010, to December 31, 2025. The starting point of 2010 was chosen primarily because research on rural elderly care, home-based elderly care, and community-based elderly care gradually entered a relatively stable phase of academic discussion around that time; The end date was set at 2025 to incorporate, as much as possible, developments in emerging topics in recent years, such as rural revitalization, the integration of medical care and elderly care, long-term care, and smart elderly care. To ensure the academic quality and representativeness of the sample literature, this study limited the document type to academic journal articles and further restricted the source categories to journals listed in the Peking University Core Journal List and the Chinese Social Sciences Citation Index (CSSCI).

Regarding the design of search terms, this study constructs search formulas based on the thematic logic of "rural context—elderly population—elderly care services/care models." Core search terms include "rural elderly care," "rural aging," "rural elderly," "home-based elderly care," "local elderly care," and "community-based elderly care," which are used to define the research subjects and context; expansion search terms include "care needs," "elderly care needs," "family support," "parental support," "intergenerational support," "left-behind elderly," "elderly living alone," "community services," "home-based and community-based elderly care," "integration of medical and elderly care," and "long-term care," which are used to cover related themes such as elderly care needs, care relationships, service models, and policy practices. The specific search strategy is shown in the table below.

Table 1: Literature Search Strategy

Item	Content
Database	China National Knowledge Infrastructure (CNKI)
Search Field	Subject
Time Range	anuary 1, 2010 – December 31, 2025
Document Type	Academic Journal Articles
Journal Categories	Peking University Core Journals, CSSCI-Indexed Journals
Core Search Terms	"Rural Elderly Care" OR "Rural Aging" OR "Rural Elderly" OR "Home-Based Care" OR "Local Care" OR "Community-Based Care"
Extended Search Terms	"Care Needs" OR "Aging Needs" OR "Family Support" OR "Parental Support" OR "Intergenerational Support" OR "Left-Behind Elderly" OR "Elderly Living Alone" OR "Community Services" OR "Home-Based and Community-Based Elderly Care" OR "Integration of Medical and Elderly Care" OR "Long-Term Care"
Comprehensive Search Query	TS = ("rural elderly care" OR "rural aging" OR "rural elderly" OR "home-based care" OR "local care" OR "community-based care") AND ("care needs" OR "elderly care needs" OR "family support" OR "parental support" OR "intergenerational support" OR "left-behind elderly" OR "elderly living alone" OR "community services" OR "Home- and Community-Based Elderly Care" OR "Integrated Medical and Elderly Care" OR "Long-Term Care")

Item	Content
Initial Search Results	13,200 articles
Final Valid Samples	1,102 articles
Exported Content	Metadata including title, author, institution, abstract, keywords, source journal, publication year, etc.
Export Formats	Formats compatible with RefWorks / EndNote / CiteSpace

It should be noted that, since the field structure of the CNKI Advanced Search platform does not fully align with the Boolean search syntax used in international databases such as Web of Science and Scopus, this study employed combined searches of core and extended keywords based on the subject search rules supported by the CNKI system during the actual search process. Furthermore, the relevance of the literature to the study's theme was verified during a subsequent manual screening phase to minimize the interference of irrelevant literature on the quantitative results.

(2) Literature Screening and Sample Selection

To enhance the accuracy and reproducibility of the sample literature, this study established clear inclusion and exclusion criteria based on the initial search results. The inclusion criteria primarily include: literature topics covering rural areas, rural society, or elderly populations in rural areas, with content related to elderly care services, care needs, home-based care, community-based care, on-site care, in-place care, integrated medical and elderly care, long-term care, mutual aid-based care, or smart elderly care; the literature type must be academic journal articles; the source journals must be included in the Peking University Core Journal List or the CSSCI (China Social Sciences Citation Index); the publication date must fall between January 1, 2010, and December 31, 2025; and the literature must possess relatively complete basic metadata, including title, author, institution, abstract, keywords, publication year, and source journal.

Exclusion criteria primarily include: non-journal literature such as theses, conference papers, newspaper articles, yearbooks, book chapters, patents, and achievement announcements; non-research literature such as reviews, book reviews, conference notices, calls for papers, news reports, interviews, and reprinted policies; literature primarily focused on urban elderly care, urban community-based elderly care, or institutional elderly care, and not involving rural settings or rural elderly populations; literature that discusses only pension actuarial science, pension financing, or macro-level social security systems, with weak relevance to rural elderly care services, care practices, and the theme of aging in place; duplicate records, literature with severe metadata deficiencies, or literature with unidentifiable keyword information; Literature deemed insufficiently relevant to the theme of rural in-place aging after manual review of titles, abstracts, and keywords.

Based on the above criteria, this study first identified 13,200 initial documents in the CNKI database; subsequently, by limiting the document type to academic journal articles and excluding non-journal literature such as theses, conference papers, newspapers, yearbooks, books, patents, and research reports, 6,636 journal articles were obtained; Further restricting the source categories to Peking University Core Journals and CSSCI-indexed journals yielded 1,111 high-quality academic papers; finally, through manual verification of titles, abstracts, keywords, and document types—excluding reviews, book reviews, conference notices, calls for papers, news reports, duplicate records, documents with severely missing metadata, and those with insufficient thematic relevance—a final valid sample of 1,102 documents was obtained.

(3) Data Cleaning and Standardization

Prior to conducting the bibliometric analysis, the metadata of the exported CNKI documents was cleaned and standardized. First, duplicate records, documents with missing titles or keywords, and those with clearly incomplete institutional information or unrecognizable formats were identified and removed. Second, keywords were standardized by merging terms with identical meanings but different expressions. For example, "home-based and community-based elderly care services" and " community-based home care services" were unified under "home-based and community-based elderly care" expressions; "integration of medical and elderly care" and "integrated medical and elderly care services" were merged into "integrated medical and elderly care" expressions; and "smart elderly care" and "intelligent elderly care services" were consolidated under "smart elderly care" expressions. Furthermore, necessary adjustments were made to certain overly broad terms lacking substantive thematic identification functions to prevent them from introducing noise interference into the keyword co-occurrence network.

This approach draws on the thesaurus cleaning methodology commonly used in international bibliometric research, which involves standardizing synonyms, near-synonyms, singular/plural forms, spelling variations, or conceptual expressions prior to formal analysis to enhance the accuracy of keyword analysis. It should be noted that keyword cleaning does not alter the original content of the literature; rather, it standardizes expressions that could lead to duplicate counts or thematic shifts in the metaanalysis, while preserving the fundamental thematic information of the literature.

(4) Analytical Tools and Parameter Settings

This study employs CiteSpace 7.0 R1 as the primary tool for bibliometric and scientific knowledge graph analysis. CiteSpace is capable of revealing the knowledge structure, topic distribution, and dynamic evolution of a specific research field through methods such as co-occurrence analysis, emergence detection, and timeline views. In light of the research questions addressed in this study, the analysis primarily focuses on annual publication volume analysis, author publication volume and collaboration network analysis, institutional publication volume and collaboration network analysis, keyword co-occurrence analysis, and keyword timeline graph analysis.

(5) Data Analysis Methods

The data analysis in this study primarily consists of two categories: bibliometric analysis and scientific knowledge graph analysis. Bibliometric analysis is mainly used to identify the basic development trends of research on in-place elderly care in rural China. Specifically, this study tallies the annual publication volume of the sample literature from 2010 to 2025 and analyzes the phased changes in academic attention within the field based on these figures. Concurrently, it counts the publication volumes of high-output authors and major research institutions to present the distribution characteristics of knowledge producers in the field. Building on this, by integrating author collaboration networks and institutional collaboration networks, the study further examines the degree of organization within the research community and the level of cross-institutional collaboration. Scientific knowledge graph analysis is primarily used to reveal the structure and evolutionary pathways of research hotspots. Keyword co-occurrence analysis is employed to identify high-frequency keywords and the relationships between them. In the keyword co-occurrence network, nodes represent keywords, node size reflects keyword frequency, and links represent co-occurrence relationships between keywords, with link strength indicating the number of times two keywords appear together in the same literature. Through this analysis, concepts, issues, and research directions occupying central positions in research on rural in-place elderly care can be identified. The keyword timeline graph is used to visualize the emergence, persistence, and evolution of different keywords over time, thereby examining how research on rural in-place aging in China has gradually expanded from early studies on family-based care, home-based care, and care needs to topics such as integrated medical and elderly care, long-term care, mutual aid-based care, smart aging, and digital technology empowerment.

(6) Methodological Applicability and Research Boundaries

This study uses articles from CNKI Chinese Core Journals and CSSCI-indexed journals as its sample, enabling it to present, in a relatively concentrated manner, the knowledge structure and research agenda formed by the Chinese academic community regarding the issue of aging in place in rural areas. However, this also implies that the focus of this analysis is not the global literature on aging in place, but rather research on aging in place in rural areas within the specific academic context of China. Consequently, the conclusions drawn in this paper are primarily intended to explain the characteristics of knowledge production in this field within Chinese core journals and do not directly represent the overall development of research on "aging in place," "rural aging," "long-term care," or "community-based care" in international databases.

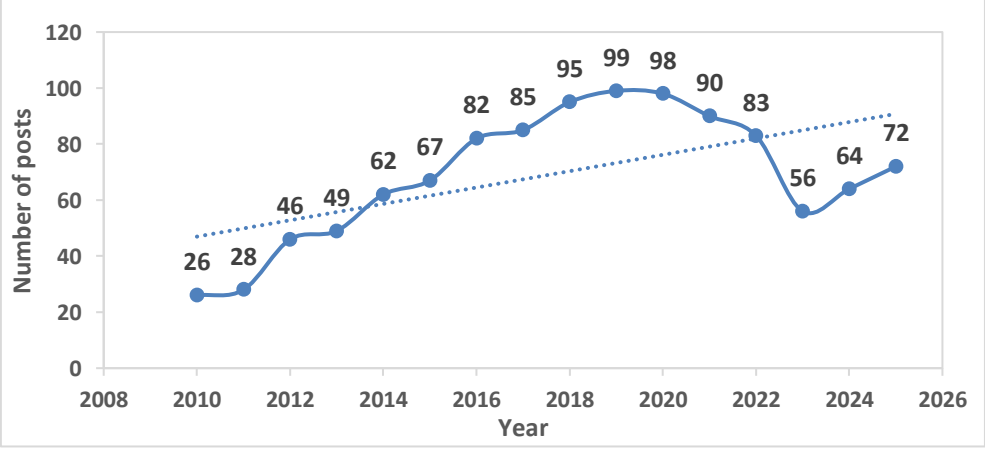
Furthermore, while bibliometric analysis is effective in revealing research hotspots, collaboration networks, thematic clusters, and evolutionary trends, its capacity for theoretical depth and causal explanation regarding the content of the literature is relatively limited. In particular, when analyzing the relationship between changes in publication volume and the introduction of national policies, this paper primarily employs terms such as "temporal correlation" and "policy responsiveness" rather than interpreting them directly as statistically tested causal relationships. Future research could build upon the knowledge map presented in this paper and further integrate systematic reviews, policy text analysis, content coding, case studies, or interview data to provide a more in-depth explanation of the theoretical evolution, policy mechanisms, and practical logic of research on rural aging in place in China.

Results of the Literature Analysis on In-Community Elderly Care in Rural China

(1) Distribution of Annual Publication Volumes

Annual publication volumes reflect changes in academic interest in a particular research field over different time periods. According to the statistical results of the CNKI sample literature, between 2010 and 2025, the annual publication volume for research on in-community elderly care in rural China generally followed a pattern of initial growth followed by fluctuations. As shown in Figure 1, the number of publications in the sample increased from 26 in 2010 to 99 in 2019, with 2019 marking the peak during the observation period. After 2020, the number of publications experienced a temporary decline, dropping to 56 in 2023, before rebounding to 64 and 72 in 2024 and 2025, respectively. Overall, although there were annual fluctuations in publication output in this field between 2010 and 2025, output in the later period remained at a relatively high level compared to the initial stage of the observation period, indicating that research on rural aging-in-place has garnered sustained academic attention.

Figure 1. Annual Distribution of Publications on Rural Aging-in-Place Research in China (2010–2025)



In terms of changes over different periods, the number of publications increased from 26 to 49 between 2010 and 2013, indicating a steady rise in research interest; from 2014 to 2019, the number of publications rose from 62 to 99, marking the period of most significant growth during the observation period; From 2020 to 2025, the number of publications fluctuated between 56 and 98, exhibiting a pattern of recovery following an adjustment. It should be noted that the results section of this paper presents only descriptive changes in annual publication volumes and does not provide trend forecasts for publication volumes beyond 2026. Since this paper does not establish a rigorous time-series forecasting model, nor does it report model fit, residual tests, or prediction intervals, it is inappropriate to extrapolate future publication volumes based on simple polynomial fits. The relationship between annual publication volume changes and the policy agenda will be further explained in the discussion section below in conjunction with the policy context.

Summary. Between 2010 and 2025, the volume of publications on rural in-place aging in China underwent a transition from low-level growth to high-level fluctuations, reaching a peak in 2019 and entering a state of fluctuating adjustment after 2020. These results indicate that rural in-place aging has become a research topic receiving sustained attention in Chinese core journals; however, its annual output does not follow a linear growth pattern but rather exhibits periodic fluctuations.

(2) Author Publication Volume Statistics

Author publication volume statistics are primarily used to examine the distribution of output among leading researchers in a field. This study analyzed the author information in the 1,102 sample articles to identify the top 10 authors by publication volume, as shown in Table 1. It should be noted that the analysis conducted here involves author publication volume statistics and author collaboration network analysis—that is, productivity analysis and collaboration network analysis—and does not constitute co-citation analysis. Author co-citation analysis is primarily used to examine knowledge connections among authors through citation relationships. Since this study does not treat it as a primary focus, the term "author co-citation" will not be used in the following discussion.

Table 1: Top 10 Researchers by Number of Publications on In-Community Aging in Rural China

No.	Author	Year of Publication	Number of Publications	Research Focus
1	Xing Fengmei	2016	10	Elderly people's demand for home-based care services and influencing factors; care for elderly people who remain at home; evaluation of the quality of integrated medical and elderly care services
2	Wang Fenglan	2016	8	Community-based elderly residents' willingness to age in place and influencing factors; relationship between demand for elderly care services and physical health status
3	Zhang Xiaoli	2016	8	Demand for home-based elderly care services; relationship between health status and demand for elderly care services; impact of different health statuses on demand for elderly care services
4	Feng Tieying	2010	7	Estimation of Funding Scale and Demand for the New Rural Pension Insurance, Demand-Oriented Optimization of the New Rural Pension Insurance System, Inclusive Development of Community-Based Home Care Services
5	王芳 Wang	2016	5	Functional Enhancement and Optimal Allocation of Community Healthcare Facilities, Community-Based

	Fang			Home Care Services from the Perspective of Integrated Medical and Elderly Care, Application of Smart Integrated Medical and Elderly Care Services
6	Ding Jianding	2013	5	Development of the Home-Based Elderly Care Service System; Evolution of Social Elderly Care Service Policies; Misconceptions Regarding Elderly Care Services and Strategies for Improvement
7	Zhang Jiankun	2014	4	Construction of the Community-Based Home Care Service System; Financial Balancing of Elderly Care Facilities; Networked Governance of Elderly Care Services
8	Wu Fangwei	2024	4	Impact of Rural Labor Migration and Intergenerational Residential Segregation on Elderly Care Demand; Transformation of Family-Based Elderly Care Functions in Rural Areas; Effects of Pilot Reforms in Home-Based and Community Elderly Care Services
9	Ni Chenxu	2022	4	The Impact of Integrated Medical and Elderly Care on the Physical and Mental Health of the Elderly, The Impact of Community Age-Friendly Renovations on Elderly Health, Integrated Medical and Elderly Care and Elderly Consumption
10	Ma Duoduo	2020	4	Accessibility of Community-Based Home Care Services and Its Influencing Factors, Equity in Community-Based Home Care Services, Inclusive Development of Community-Based Home Care Services

As shown in Table 1, the most prolific author in the sample literature is Xing Fengmei, who published a total of 10 relevant papers; Wang Fenglan and Zhang Xiaoli each published 8 papers; Feng Tieying published 7 papers; Wang Fang and Ding Jianding each published 5 papers; and the remaining authors in the top 10 published 4 papers each. In terms of research topics, high-output authors primarily focused on issues such as the demand for home-based elderly care services, the integration of medical and elderly care, community-based home care services, the accessibility of elderly care services, and changes in the role of rural families in elderly care. This indicates that research output at the author level mainly revolves around the identification of elderly care service needs, the optimization of service models, and the practice of integrating medical and elderly care.

To further identify the group of high-output authors, this paper uses Price's Law to calculate the core author threshold. The formula for Price's Law is:

$$M=0.749\times\sqrt{Nmax}$$

Here, Nmax represents the number of publications by the most prolific author in the sample literature. In this paper, the most prolific author has published 10 papers; therefore:

$$M=0.749\times10\approx 2.37$$

Following the rounding rule, authors with three or more publications are considered high-output authors in this field. According to our statistics, authors with three or more publications have published a total of 97 papers, accounting for 8.80% of the 1,102 papers in the sample. This result indicates that, within the scope of this study's sample, several researchers have consistently produced work on rural in-place aging; however, the proportion of papers contributed by high-output authors remains low, and the distribution of author output is relatively dispersed.

Summary. Statistics on author publication output show that research on rural in-place aging in China has attracted a small number of active researchers, but overall, it has not yet developed a highly concentrated author output structure. This study identifies high-output authors solely based on

publication volume and does not equate them directly with high-impact authors; to assess an author's academic influence, further analysis incorporating citation frequency, co-citation networks, or core literature analysis is required.

(3) Publication Output of Research Institutions and Collaboration Networks

The publication output of research institutions reflects the organizational distribution of knowledge production, while institutional collaboration networks further illustrate the collaborative relationships among different institutions. In this paper, using "Institution" as the node type, we conducted a statistical analysis of publication output and a collaboration network analysis on a sample of 1,102 documents, identifying the top 10 institutions by publication output, as shown in Table 2.

Table 2: Top 10 Research Institutions by Number of Publications on In-Community Elderly Care in Rural China

No.	Number of Publications	Institution Name	Type	Location Regiona	Attribute
1	15	School of Public Administration, Renmin University of China	Secondary School under a comprehensive university	Beijing	Eastern China/Municipality
2	14	School of Public Policy and Management, Xi'an Jiaotong University School	Secondary School under a comprehensive university	Xi'an, Shaanxi	Western China
3	9	School of Humanities and Law, Northeastern University	Secondary School under a comprehensive university	Shenyang, Liaoning	Northeast
4	8	School of Nursing and Rehabilitation, North China University of Science and Technology	School under a comprehensive university	Tangshan, Hebei	East
5	8	School of Labor and Human Resources, Renmin University of China	Secondary School under a comprehensive university	Beijing	Eastern China/Municipality
6	7	School of Health Economics and Management, Nanjing University of Chinese Medicine	Secondary School under a specialized university	Nanjing, Jiangsu	East
7	7	Center for Social Security Research, Wuhan University	Key Research Base for Humanities and Social Sciences under the Ministry of Education	Wuhan, Hubei	Central China

8	7	School of Public Economics and Management, Shanghai University of Finance and Economics	Secondary School of a Finance and Economics University	上海Shanghai	Eastern China/Municipality
9	6	School of Philosophy and Sociology, Jilin University	Secondary School under a comprehensive university	Changchun, Jilin	Northeast China
10	6	School of Sociology and Population Studies, Renmin University of China	Secondary School under a comprehensive university	Beijing	Eastern China/Municipality

As shown in Table 2, the institutions with the highest number of publications in the sample literature are primarily concentrated in secondary colleges and research bases within universities, covering disciplines such as public administration, social security, nursing, economics, sociology, and traditional Chinese medicine. Among these, the School of Public Administration at Renmin University of China had the highest number of publications, with 15; the School of Public Policy and Management at Xi'an Jiaotong University published 14 papers; institutions such as the School of Humanities and Law at Northeastern University, the School of Nursing and Rehabilitation at North China University of Science and Technology, and the School of Labor and Human Resources at Renmin University of China also demonstrated high output. The distribution of institutional types indicates that research on rural in-place elderly care is not dominated by a single disciplinary institution but rather exhibits characteristics of multidisciplinary collaboration involving public administration, social security, nursing and health, and sociology.

Regarding the institutional collaboration network, CiteSpace analysis reveals that the sample literature involves 366 publishing institutions, with 149 collaborative links formed between them, resulting in a network density of 0.0022. Network density is an indicator measuring the ratio of the actual number of links in a network to the theoretically maximum possible number of links. The value of 0.0022 indicates that, within the scope of this study's sample, collaborative relationships between institutions are relatively sparse, and the institutional collaboration network has not yet formed a highly dense connection structure. Since this study did not include other research fields as a control sample, this value is not directly judged as "extremely low" here, but is interpreted merely as follows: within the current sample of literature, the institutional collaboration network exhibits a relatively loose structural characteristic.

Further examination of institutional distribution reveals that among the top 10 institutions by publication volume, universities and research institutions in eastern regions such as Beijing, Shanghai, and Jiangsu hold a certain advantage. However, some institutions from central, western, and northeastern regions also rank among the top, including the School of Public Policy and Management at Xi'an Jiaotong University, the Center for Social Security Research at Wuhan University, the School of Humanities and Law at Northeastern University, and the School of Philosophy and Social Sciences at Jilin University. It should be noted that Table 2 presents publication frequency statistics at the institutional level. If a single paper involves multiple institutions, it may be counted separately in the statistics for each relevant institution. Therefore, the publication volumes of different schools within the same university should not be simply added together and interpreted as the university's total publication volume after deduplication. If an analysis of overall output at the university level is required, subsequent research should consolidate and deduplicate institutional names at the university level.

According to Price's Law, the minimum publication threshold for core institutions can also be calculated using the formula:

$M=0.749\times\sqrt{Nmax}$

Here, Nmax represents the number of publications by the most productive institution. In this paper, the most productive institution—the School of Public Administration at Renmin University of China—published 15 papers; therefore:

$M=0.749\times\sqrt{15}\approx 2.90$

Accordingly, institutions with three or more publications can be considered high-output institutions in the sample. Statistical results show that there are 50 institutions with three or more publications, accounting for 13.66% of the total 366 publishing institutions. This result indicates that research on rural in-place aging has formed a certain number of high-output institutional nodes; however, the publication output of most institutions remains low, and the distribution of institutional output exhibits a degree of dispersion.

Summary. Institutional analysis indicates that knowledge production in the field of rural in-place elderly care in China is primarily concentrated in universities and research institutions, with a relatively diverse disciplinary background; however, from the perspective of collaborative networks, connections between institutions are relatively sparse, and there remains significant room for expansion in cross-institutional collaboration structures. The results section of this paper presents only the basic structure of institutional output and collaborative networks; the underlying disciplinary organizational mechanisms and regional resource disparities will be further explored in the discussion section.

4. Analysis of Research Hotspots in Rural China's In-Place Elderly Care

(1) High-Frequency Keywords and Co-occurrence Networks

Keywords represent a highly condensed summary of a paper's thematic content. By conducting co-occurrence analysis on the keywords of the sample literature, one can identify the core concepts, major issues, and their interrelationships in research on rural in-place aging in China. This paper utilized CiteSpace to process the keywords of 1,102 sample documents, setting the node type to "Keyword," and combined this with Excel to organize the high-frequency keywords. Table 3 lists the top 20 keywords with the highest frequency of occurrence, along with their betweenness centrality and year of first appearance.

Table 3: Statistics on High-Frequency Keywords in Research on Aging in Place in China

No.	Keyword	Frequency	Intermediary Centrality	Year of First Appearance	No.	Keyword	Frequency	Intermediary Centrality	Year of First Appearance
1	Aging at Home	217	0.49	2010	11	Aging Needs	39	0.07	2010
2	Integration of Medical and Elderly Care	131	0.23	2015	12	Family-Based Elderly Care	39	0.1	2010
3	Elderly Care Services	90	0.11	2010	13	Long-Term Car	31	0.03	2014
4	Elderly	88	0.2	2011	14	Community	28	0.05	2010
5	Aging	55	0.1	2010	15	Rural Elderly Care	26	0.09	2012

6	Community Elderly Care	54	0.07	2010	16	Smart Elderly Care	23	0.04	2018
7	Influencing Factors	51	0.05	2010	17	Demand	23	0.02	2010
8	Elderly Care Models	47	0.05	2010	18	Functionally Impaired Elderly	19	0.03	2014
9	Rural Areas	45	0.14	2010	19	Willingness to Provide Elderly Care	16	0.01	2013
10	Institutional Elderly Care	45	0.04	2010	20	Service Demand	15	0	2014

In terms of keyword frequency, "home-based elderly care" appeared 217 times, making it the most frequently occurring keyword in the sample literature; "integrated medical and elderly care" appeared 131 times, ranking second; keywords such as "elderly care services," "the elderly," "aging," "community-based elderly care," and "influencing factors" all appeared more than 50 times. This indicates that, in the sample literature, home-based elderly care, integrated medical and elderly care, elderly care services, and the elderly population are the most frequently discussed themes in research on rural in-place elderly care.

In terms of betweenness centrality, "home-based elderly care" had the highest centrality at 0.49; "integrated medical and elderly care" had a centrality of 0.23; "elderly people" had a centrality of 0.20; "rural" at 0.14; and "elderly care services" at 0.11. Betweenness centrality reflects a keyword's role as a bridge connecting different thematic nodes. The aforementioned keywords not only appear frequently but also possess strong connecting functions within the keyword co-occurrence network. Among them, "home-based elderly care" has both the highest frequency and the highest centrality, indicating that it occupies a core position in the thematic structure of the sample literature; "integration of medical and elderly care" exhibits high frequency and centrality, indicating that the integration of healthcare and elderly care services is a significant cross-cutting theme in this field; the centrality of "rural" reaches 0.14, suggesting that the rural context is not merely a background qualifier but plays a mediating role in connecting themes such as elderly care services, needs, family support, and community care.

According to the keyword co-occurrence network generated by CiteSpace, the sample literature's keyword network comprises 416 nodes and 982 links, with a network density of 0.0114. This result indicates that relatively stable co-occurrence relationships have formed among keywords, but the overall network connections remain relatively dispersed. In other words, research on rural in-place aging has established several core keywords and thematic connections, yet a certain degree of differentiation still exists among different sub-topics.

The results of high-frequency keywords and the co-occurrence network show that keywords such as "home-based elderly care," "integration of medical and elderly care," "elderly care services," "the elderly," and "rural areas" constitute the core conceptual cluster of research on rural in-place elderly care in China. Among these, "home-based elderly care" occupies a prominent position in both frequency and centrality, indicating that it serves as a crucial hub connecting different research topics.

(2) Keyword Timeline Analysis

Keyword timeline maps illustrate the emergence, persistence, and evolution of different themes over time. According to the keyword timeline map generated by CiteSpace, some core themes in research on rural in-place aging had already emerged around 2010, such as "home-based care," "elderly

care services," "family-based care," "community-based care," and "care needs." These themes constituted the foundational issues in the early stages of the sample literature, primarily focusing on elderly care arrangements, service needs, and family support for rural older adults.

From around 2014 to 2019, the keyword timeline map featured a significant number of themes related to service integration, health care, and institutional provision, such as "integration of medical and elderly care," "long-term care," "elderly with disabilities," and "elderly care services." Among these, "integration of medical and elderly care" first appeared in 2015 and maintained high activity levels in subsequent years; "long-term care" and "elderly with disabilities" first appeared in 2014, indicating that health care and care for the disabled were gradually entering the core scope of research on rural in-place elderly care. At the same time, keywords such as "elderly care needs," "service needs," and "influencing factors" continued to appear, suggesting that needs identification remains an important analytical dimension in this field.

After 2018, "smart aging" began to appear in the keyword timeline map and persisted in subsequent years. Compared to the early themes dominated by family-based care, home-based care, and care needs, the emergence of "smart aging" indicates that digital technologies, information platforms, and intelligent services are gradually being incorporated into the research framework of rural in-place aging. However, in terms of frequency and centrality, although "smart aging" has become an emerging keyword, its frequency of 23 occurrences and betweenness centrality of 0.04 indicate that it remains in a developmental stage within the sample literature and has not yet attained the core hub status of "home-based care" and "integrated medical and elderly care."

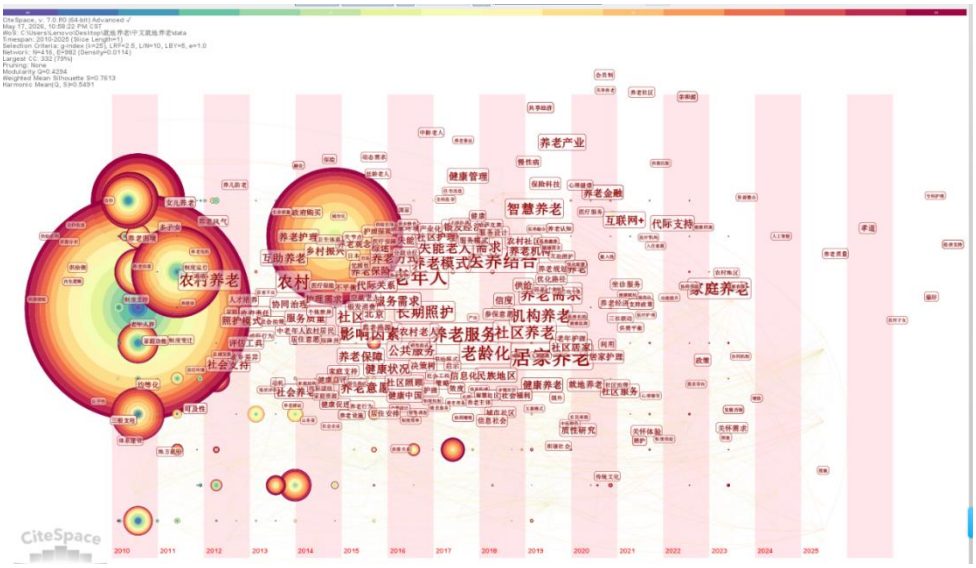


Figure 3: Timeline Map of Keywords in Research on In-Place Elderly Care in Rural China

The keyword timeline results show that the thematic evolution of research on aging in place in rural China generally follows this pattern: early-stage research focused on home-based care, family-based care, and care needs; mid-stage research expanded to include integrated medical and elderly care, long-term care, and care for the disabled elderly; and late-stage research introduced emerging topics such as smart aging, digital technologies, and service platforms.

Discussion

The bibliometric results indicate that research on aging in place in rural China exhibits distinct characteristics of policy-responsive knowledge growth. Changes in annual publication volume reveal that this field did not emerge solely from the natural accumulation of internal academic discourse, but rather gradually took shape under the impetus of policy agendas such as national aging governance, rural public service development, the promotion of integrated medical and elderly care, and the rural revitalization strategy. Between 2010 and 2019, related research grew steadily, reaching a peak in 2019. Although there have been fluctuations since 2020, the topic has maintained a high level of attention.

This indicates that rural in-place aging has evolved from an early-stage, relatively fragmented topic regarding care models into a significant research field of common concern for public policy, grassroots governance, and the development of elderly care service systems. It should be noted that bibliometric results can only reveal a temporal synchrony between policy agendas and academic interest; they cannot directly prove a strict causal relationship between policy changes and the growth in publication volume. A more prudent conclusion is that research on rural in-place aging in China exhibits characteristics of policy-responsive knowledge production, with knowledge growth emerging from the continuous interaction between real-world governance needs, institutional reform processes, and academic interpretive frameworks.

Keyword co-occurrence and timeline results further indicate that research on rural in-place aging in China is shifting from discussions of fragmented care models toward the construction of integrated service systems. Early literature primarily focused on comparing different models—such as family-based, home-based, community-based, and institutional care—examining their applicability, operational advantages, and practical challenges. As rural family structures have changed, population outflow has increased, and the risk of disability among the elderly has risen, a single care model has become increasingly inadequate to address the complex care needs of rural seniors. High-frequency keywords such as "home-based care," "integration of medical and elderly care," "elderly care services," " "elderly," "rural," and other high-frequency keywords occupy central positions in the co-occurrence network, indicating that research is coalescing around a comprehensive approach grounded in home-based living, supported by medical and health services, and connected through community and grassroots public services. Consequently, rural in-place aging should not be understood as a single, isolated model, but rather as a multi-stakeholder service arrangement involving the joint participation of families, communities, local governments, healthcare institutions, social organizations, village mutual aid networks, and digital platforms.

Timeline analysis also reveals that "smart aging" emerged relatively late as a key concept in research on aging in place in rural areas. Digital platforms, smart devices, remote health monitoring, online consultations, and data-driven service matching are viewed as crucial pathways to alleviating the shortage of elderly care services in rural areas. Theoretically, digital technology has the potential to overcome the constraints of rural areas—such as spatial dispersion, large service coverage areas, and a lack of professional resources—by enhancing service accessibility through information connectivity, resource allocation, and remote support. However, technological empowerment does not necessarily lead to improved service capacity. Rural older adults generally face issues such as insufficient digital literacy, difficulties in using devices, uneven internet access, limited payment capacity, and a lack of trust in platforms. Even if online platforms are established, without stable offline care providers, primary healthcare facilities, village-level service stations, emergency response mechanisms, and sustained financial support, digital platforms will struggle to translate into tangible, accessible, and sustainable elderly care services. Smart aging should therefore not be simplistically viewed as a replacement of traditional elderly care services with technological tools, but rather examined within the context of rural service system development. Its effectiveness depends on whether technology can be embedded within grassroots governance networks, healthcare systems, village mutual aid relationships, and family support structures.

The findings of this paper offer insights for both future research and policy practice. At the research level, the concept of aging in place in rural areas requires further theoretical integration, incorporating family care, community services, medical resources, grassroots governance, and digital platforms into a unified analytical framework, rather than remaining confined to discussions of a single elderly care model or individual policy tool. At the same time, future research should place greater emphasis on the subjective experiences of rural older adults, thoroughly examining their preferences regarding aging in place, care choices, service utilization experiences, the process of adopting digital technologies, and daily life practices. There is also room for further expansion in regional and cross-national comparisons. Given the significant differences among rural areas in terms of economic development, population mobility, grassroots organizational capacity, and elderly care practices, comparative studies can help reveal how local conditions influence the effectiveness of aging in place in rural areas. At the policy level, the development of rural in-place elderly care services should shift

from the implementation of scattered projects to the construction of an integrated service system. Through county-level coordination, township service platforms, village-level service stations, grassroots medical networks, and stable fiscal investment, a service chain should be formed that seamlessly connects family-based care, community services, integrated medical and elderly care, mutual aid, institutional support, and smart elderly care. Digital elderly care services should also adhere to the principle of embedding technology within services. Digital platforms cannot replace human care and community support but should instead serve to match resources, identify risks, coordinate services, and monitor processes. For rural seniors, what truly matters is not the complexity of platform features, but whether services are easily accessible, whether there is assistance in using them, and whether they can address real care needs.

Conclusion

This study uses a sample of 1,102 articles from Peking University Core and CSSCI journals indexed in the China National Knowledge Infrastructure (CNKI) database from 2010 to 2025. Utilizing the CiteSpace 7.0 R1 bibliometric tool, the study comprehensively employs methods such as publication volume statistics, analysis of author and institutional collaboration networks, keyword co-occurrence analysis, and the creation of keyword timeline maps to systematically examine the knowledge structure and evolutionary trajectory of research on in-place elderly care in rural China. The findings reveal that research on in-place elderly care in rural China has generally undergone three phases: steady growth, rapid expansion, and fluctuating adjustment. Annual publication volume fluctuations exhibit a relatively clear temporal correlation with the advancement of rural elderly care policies, the development of integrated medical and elderly care systems, the implementation of the rural revitalization strategy, and the construction of elderly care service systems, indicating that this field exhibits prominent characteristics of policy-responsive knowledge production. The author-institution collaboration network reveals that several active nodes have emerged in this research, yet high-output authors account for a relatively small proportion of the literature, and the density of the institutional collaboration network is low. This indicates that while the field has accumulated a certain research foundation, there remains significant room for improvement in cross-institutional, cross-regional, and interdisciplinary collaboration.

Keyword co-occurrence and timeline maps further reveal that “home-based elderly care,” “integration of medical and elderly care,” “elderly care services,” “rural areas,” and “the elderly” constitute the core conceptual cluster of research on in-place elderly care in rural China. The co-occurrence relationships among high-frequency keywords indicate that research in this field primarily revolves around the following areas: elderly care models, the integration of medical and elderly care with health services, elderly care demand and service supply, the macro-policy environment, and smart elderly care and technology-enabled solutions. In terms of its evolutionary trajectory, research priorities have evolved from studies on family-based care, home-based care, and care needs to a broader focus on integrated medical and elderly care, long-term care, care for the disabled elderly, and smart aging. This shift indicates that research on in-place aging in rural China is transitioning from discussions of single care models to the integration of diverse resources and the construction of service systems; its research focus has also shifted from “who will provide care” to “what support systems are needed to achieve sustainable aging.”

The contributions of this paper are primarily reflected in three aspects. First, it systematically presents the knowledge map of research on aging in place in rural China from a bibliometric perspective, addressing the shortcomings of existing qualitative reviews and thematic studies in depicting macro-level knowledge structures. Second, it interprets research on aging in place in rural China as a policy-responsive knowledge production field, revealing how academic focus is continuously generated and shifted amidst national policy agendas, demographic changes, and reforms of the rural elderly care service system. Third, by situating research on aging in place in rural China within the international discourse on aging in place, rural aging, community-based care, and long-term care, this study demonstrates that the Chinese rural experience holds not only local policy significance but also provides empirically valuable comparative material for international aging research.

This study has certain limitations. The sample was drawn exclusively from articles in Peking University Core and CSSCI journals within the CNKI database, which effectively reflects the research landscape of the Chinese core academic community but cannot fully present the development of related research in international databases. Bibliometric methods can reveal research hotspots, collaboration networks, and thematic evolution, but they struggle to provide a thorough theoretical deep dive into the content of the literature or offer mechanistic explanations. The analysis of the relationship between policy agendas and changes in publication volume in this paper is primarily based on temporal correlations and does not establish a rigorous causal testing model. Although keyword cleaning and thematic interpretation were corrected as much as possible based on CiteSpace results and the semantics of the original literature, they inevitably still involve the researcher's judgment.

Future research can be further deepened in four areas. First, integrate databases such as CNKI, Web of Science, and Scopus to conduct comparative bibliometric analyses of Chinese and international research on "aging in place." Second, building upon the knowledge map, further systematic reviews and content analyses should be conducted to provide a more detailed theoretical analysis of core concepts such as home-based care, integrated medical and elderly care, mutual aid-based care, and smart elderly care. Third, by combining questionnaire surveys, in-depth interviews, case studies, and long-term tracking data, the operational mechanisms of rural aging-in-place policies in local practice should be examined, along with their actual impacts on the quality of life, service accessibility, and care safety of rural older adults. Fourth, we will strengthen interdisciplinary and cross-regional collaboration to advance research on rural aging in place from the description of isolated experiences toward the construction of a systematic theoretical framework. Overall, the knowledge map presented in this paper is not the endpoint of research in this field, but rather a foundational reference for subsequent studies with greater theoretical depth, methodological diversity, and capacity for international dialogue.

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