

Visualization Analysis of Research on Unaccompanied Wards in China Based on CiteSpace

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Abstract

Objective: Visualization analysis of domestic literature related to unaccompanied wards was performed by CiteSpace, so that the research status, core authors, high-yield institutions, research hotspots, and evolutionary trends in this field could be systematically elucidated, and evidence-based references could be provided for nursing management and clinical practice. **Methods:** CNKI, Wanfang, VIP, and CBM databases were searched from their inception to April 22, 2026. The exact search strategy for each database was as follows (Chinese original terms): (无人陪护病房 OR 零陪护病房 OR 无人陪护护理 OR 零陪护护理 OR 无陪护病房 OR 无陪护护理). Searches were conducted in the “topic” field (including title, abstract, and keywords), with no additional language or document type limits applied at the database level. Co-occurrence, clustering, and burst detection analyses of annual publications, authors, institutions, and keywords were conducted using CiteSpace 6.4.R1. **Results:** A total of 769 eligible articles were included. Literature screening was independently performed by two reviewers; disagreements were resolved through consensus discussion or consultation with a third reviewer. Core authors were identified as Xu Cuiping, Chu Liangliang, and others, among whom close intra-team collaboration was observed whereas cross-institutional cooperation was insufficient. High-yield institutions were mostly distributed in medical centers of Shandong Province. High-frequency keywords included unaccompanied nursing, nursing quality, elderly patients, and nosocomial infection, and 10 core research clusters were generated. Records from 2026 were partially indexed at retrieval, so the rapid growth stage (2020-2026) should be interpreted with caution, as the incomplete 2026 data may inflate the most recent trend. Research hotspots were gradually transformed from early nursing models and basic care to nursing satisfaction, care quality, and long-term inpatient care. **Conclusion:** Research on unaccompanied wards in China has

evolved from pilot exploration to large-scale promotion and quality-oriented improvement, with focuses on nursing management, care delivery models, and safety experience. Nevertheless, challenges including inadequate cross-regional collaboration and incomplete standard systems remain to be addressed. Future studies are expected to strengthen multi-center cooperation, refine care protocols, and deepen mechanism research, thereby facilitating high-quality development of the industry.

Keywords

CiteSpace, Unaccompanied Ward, Unaccompanied Nursing, Nursing Management, Visualization Analysis

1. Introduction

The process of population aging in China has been continuously accelerated, and family care functions have been gradually weakened. As a result, contradictions between the accompanying demands of inpatients and hospital infection control as well as ward management have become increasingly prominent [1]. For clarity, key terms are defined at first use: an unaccompanied ward refers to a ward where full-time professional nursing and care services replace family companionship; unaccompanied care denotes the overall care service model delivered in such wards; unaccompanied nursing specifically refers to professional nursing practices within the model. These three terms were treated as conceptually equivalent during database retrieval and keyword merging for consistency in analysis. As a novel ward management model in which full-time care is provided by professional nurses and medical caregivers instead of family members, unaccompanied wards have been demonstrated to be of great practical significance in optimizing medical resources, reducing nosocomial infections, improving nursing quality, and alleviating family burdens [2]. In recent years, a series of national policies concerning unaccompanied care and high-quality nursing services have been issued, which have strongly promoted the implementation of unaccompanied management models in hospitals at all levels. Unaccompanied wards have been gradually expanded from local pilots to various departments and types of hospitals nationwide, and the volume of relevant research literature has increased rapidly [3].

At present, domestic research on unaccompanied wards has involved nursing management, model construction, clinical application, effect evaluation, safety prevention and control, and other fields. However, relevant studies are relatively scattered, and systematic sorting and objective bibliometric analysis of the overall research situation, hot topics, cutting-edge trends, and cooperation patterns are still lacking [4] [5]. As a mainstream tool for literature visualization analysis, CiteSpace can clearly present the research context and development direction in a given field through co-occurrence, clustering, burst detection, and timeline analyses, thus providing a scientific basis for research decision-making [6].

In this context, visualization analysis of literature in the field of unaccompanied wards in China was carried out based on CiteSpace software. The research status, hotspot distribution, and evolutionary trends of unaccompanied wards were systematically revealed from the perspectives of annual publication volume, core authors, research institutions, keyword co-occurrence, clustering, and burst detection. The current strengths and weaknesses of existing research were clarified, so as to provide support for the subsequent optimization of nursing management, model innovation, policy implementation, and high-quality clinical research.

2. Materials and Methods

2.1. Data Sources

CNKI, Wanfang Data, VIP Database, and China Biomedical Literature Database (CBM) were searched from their inception to April 22, 2026. The exact database-specific search strategies (original Chinese terms) were: CNKI: (主题 = 无人陪护病房 OR 零陪护病房 OR 无人陪护护理 OR 零陪护护理 OR 无陪护病房 OR 无陪护护理); Wanfang: (主题: 无人陪护病房 OR 零陪护病房 OR 无人陪护护理 OR 零陪护护理 OR 无陪护病房 OR 无陪护护理); VIP: (题名或关键词或摘要 = 无人陪护病房 OR 零陪护病房 OR 无人陪护护理 OR 零陪护护理 OR 无陪护病房 OR 无陪护护理); CBM: (主题词 = 无人陪护病房 OR 零陪护病房 OR 无人陪护护理 OR 零陪护护理 OR 无陪护病房 OR 无陪护护理). Topic retrieval was adopted, and the search strategy was formulated as follows: (unaccompanied care OR zero accompanying care OR unaccompanied OR zero accompanying OR unaccompanied ward).

2.2. Inclusion and Exclusion Criteria

1) Inclusion criteria:

Studies focused on the construction, practice, effect evaluation, management strategies, and safety prevention and control of unaccompanied wards or unaccompanied nursing models;

Literature types include journal articles, clinical studies, reviews, and experience summaries.

2) Exclusion criteria:

Studies irrelevant to the theme of unaccompanied wards or with incomplete information;

Newspapers, popular science articles, patents, conference abstracts, and dissertations;

Repeatedly published articles (only the latest version was retained).

2.3. Data Processing and Analysis

Retrieved results were imported into Note Express software for deduplication and standardization. Institutional names were unified, and synonymous keywords were merged. Data were exported in RefWorks format and imported into

CiteSpace 6.4.R1. Detailed CiteSpace parameter settings were: time slice = 1 year; time range = 1995-2026; node types = author, institution, keyword; pruning method = pathfinder pruning (pruning sliced networks and pruning merged network); top N per slice = 50; link strength = cosine; clustering algorithm = log-likelihood ratio (LLR). Clustering analysis was performed using the log-likelihood ratio algorithm, and clustering quality was evaluated using the modularity index Q and silhouette index S [6]. Final clustering results yielded Q = 0.42 and S = 0.78, indicating a robust and reliable clustering structure. Core authors were determined according to Price's law [7]. Keyword co-occurrence, timeline, and burst detection analyses were conducted to identify research hotspots and evolutionary paths.

3. Results

3.1. Literature Screening

A total of 5,543 articles were initially retrieved, including 627 from CNKI, 3,706 from Wanfang, 448 from VIP, and 762 from CBM. After deduplication, manual screening, and standardization, 769 eligible articles were finally included.

3.2. Annual Publication Trend

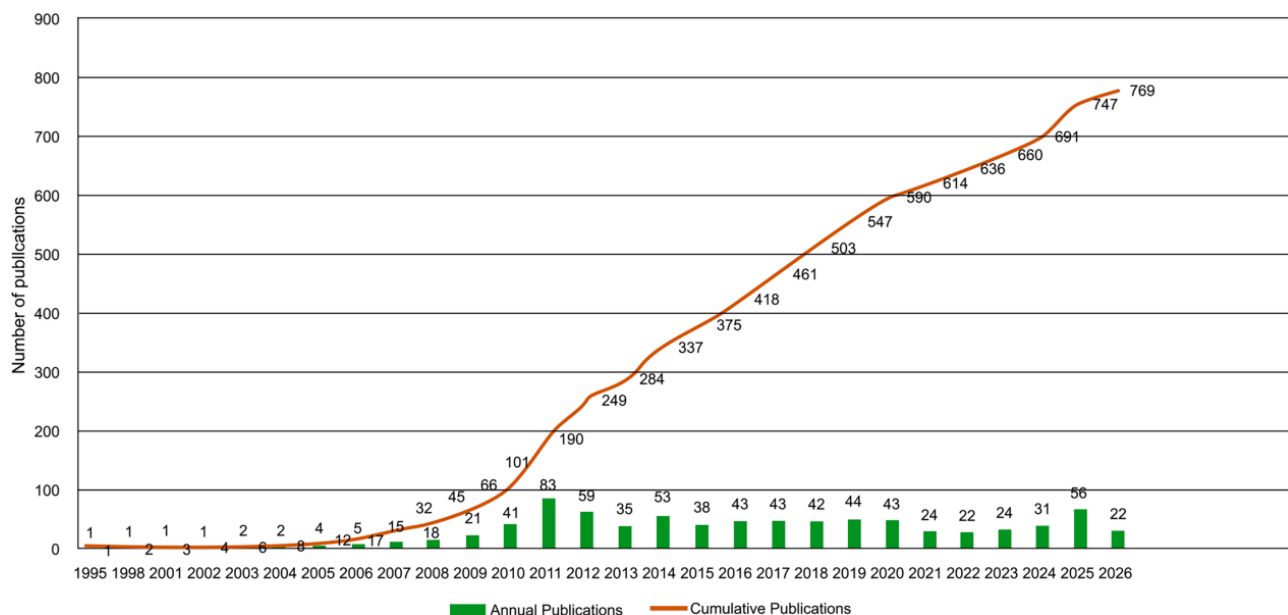


Figure 1. Annual and cumulative publication volumes of studies on unaccompanied wards in China (1995-2026).

From 1995 to 2026, the annual number of publications in the field of unaccompanied wards in China showed a continuous upward trend and could be divided into three stages (Figure 1). The three-stage division was defined based on visible inflection points in annual output and key national nursing policy milestones: (1) Initial stage (1995-2004): annual publications < 10; (2) Steady growth stage (2005-2019): annual publications rose from 10 to 50, aligned with the launch of the na-

tional high-quality nursing service program; (3) Rapid development stage (2020-2026): annual publications exceeded 50, driven by national unaccompanied care pilot policies.

- Initial stage (1995-2004): Publication volume was extremely low, with fewer than 10 articles per year on average, which was dominated by concept introduction and scattered pilot practices.
- Steady growth stage (2005-2019): Driven by the promotion of high-quality nursing services and the expansion of local pilots, publication volume increased fluctuantly, and the average annual output rose gradually.
- Rapid development stage (2020-2026): Boosted by national policies and clinical demands, publication volume increased substantially, indicating that unaccompanied wards had entered a period of comprehensive research and popularization [8].

3.3. Analysis of Author Contribution

The top three authors in the field of unaccompanied care research were Xu Cuiping (12 articles), Liu Kai (12 articles), and Chu Liangliang (11 articles). According to Price's formula: $M = 0.749 \times \sqrt{12} \approx 2.595$. Authors with ≥ 3 publications were defined as core authors. Finally, 24 core authors were identified, with a total of 111 articles published, accounting for 14.43% of all included literature (Table 1).

Table 1. Authors with ≥ 5 publications in the field of unaccompanied ward.

Number	Name	Number of Articles Published (Articles)
1	Cuiping Xu	12
2	Kai Liu	12
3	Liangliang Chu	11
4	Xueying Yang	11
5	Hongxia Ge	8
6	Yuanyuan Lin	6
7	Yuan Chen	6
8	Lin Wang	5
9	Rongguang Shi	5

Author mapping demonstrated that research teams with Xu Cuiping, Chu Liangliang, and Liu Kai as cores had been formed. Close intra-team cooperation was detected, while cross-team and cross-institutional connections were sparse, suggesting that the overall cooperation network was scattered and cross-regional academic collaboration needed to be enhanced (Figure 2).

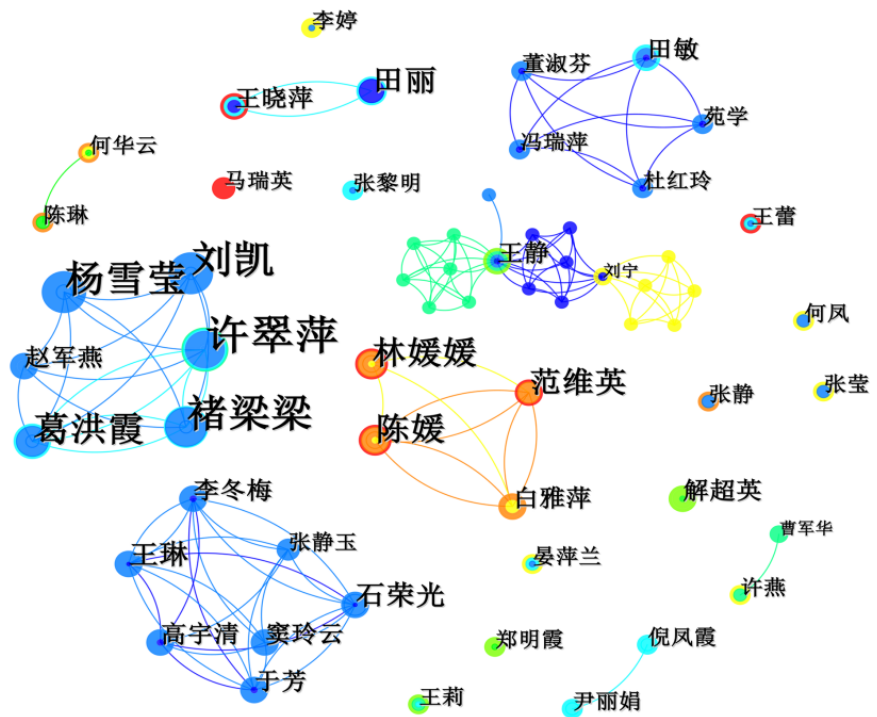


Figure 2. Visualization map of author collaboration network in unaccompanied ward re-search.

3.4. Analysis of Institutional Distribution

Institutions that published articles in the field of unaccompanied care were mainly hospitals and universities. The institution with the highest publication volume was Shandong Qianfo Mountain Hospital (10 articles), followed by Taishan Hospital (7 articles) and Shandong Cancer Hospital (7 articles) (Table 2). High-yield institutions were concentrated in Shandong Province, showing an obvious regional clustering characteristic. Sparse cooperative links among institutions were observed, most of which were independent studies, and a multi-center and cross-regional collaborative research network had not been established (Figure 3).

Table 2. Institutions with ≥ 4 publications.

Number	Issuing authority	Accumulated number of publications (articles)
1	Shandong Qianfo Hospital	10
2	Mount Taishan Hospital	7
3	Shandong Cancer Hospital	7
4	School of Nursing, Shandong University	6
5	Shandong University	5
6	Tangshan Second Hospital, Hebei Province	4
7	Xiamen University Affiliated Cardiovascular Hospital 4	4

Continued

8	Hunan Children's Hospital	4
9	Zhejiang Medical College Affiliated Children's Hospital	4



Figure 3. Visualization map of institutional collaboration network in unaccompanied ward research.

3.5. Keyword Analysis

3.5.1. Keyword Co-Occurrence

A co-occurrence network was constructed with keywords as nodes. Node size represented frequency, and lines indicated co-occurrence intensity. High-frequency keywords included unaccompanied care, nursing quality, caregivers, elderly patients, nosocomial infection, nursing intervention, ward management, humanistic care, schizophrenia, and neonatal ward, reflecting that research was concentrated on four dimensions: care model, nursing management, key populations, and safety control.

3.5.2. Keyword Clustering

Ten stable clusters were generated by clustering analysis, with $Q > 0.3$ and $S > 0.7$, indicating a reasonable and highly reliable clustering structure. Main clusters included #0 unaccompanied care, #1 long-term hospitalization, #2 accompanying demand, #3 unaccompanied nursing, #4 unaccompanied care, #5 unaccompanied ward, #6 caregivers, #7 unaccompanied care, #8 psychiatry, and #9 nursing staff. These clusters could be summarized into four themes (Figure 4):

Care models (unaccompanied care, unaccompanied nursing, unaccompanied care);

Service recipients (elderly patients, schizophrenia, neonates, long-term inpatients);

Management components (nursing quality, nursing staff, caregivers, safety management);

Implementation outcomes (nursing satisfaction, quality of life, nosocomial infection control).

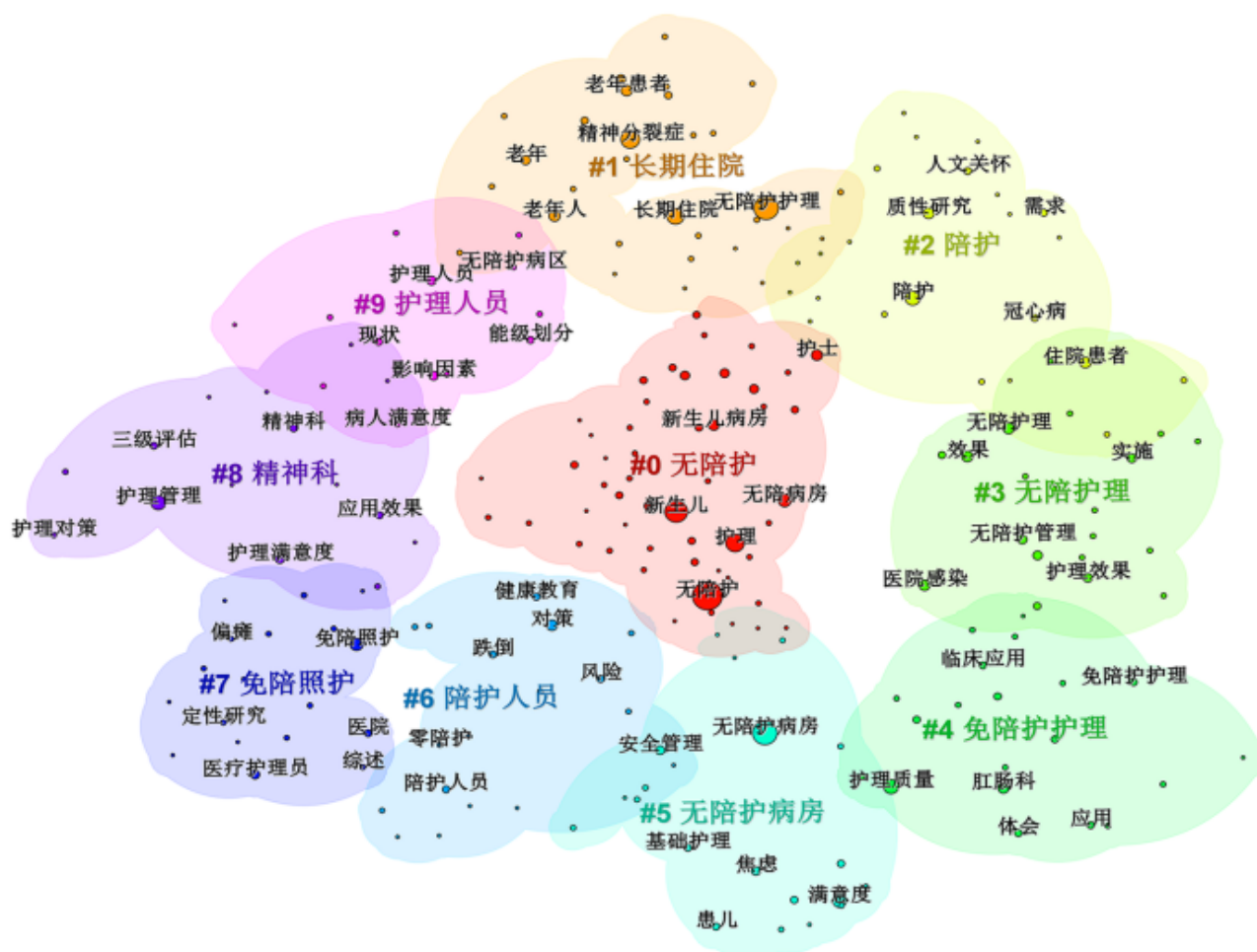


Figure 4. Keyword clustering map of unaccompanied ward research.

3.5.3. Keyword Timeline Analysis

The timeline map clearly displayed the evolutionary path of research (**Figure 5**):

- 2000-2004: Dominated by nursing models, accompanying care, and basic nursing, which was the stage of concept introduction and preliminary exploration.
- 2005-2009: Focused on unaccompanied nursing, nursing risks, countermeasures, nurses, and nosocomial infections, shifting toward management standardization and risk control.

- 2010-2014: Emphasized nursing intervention, ward management, humanistic care, and high-quality nursing, highlighting service quality and humanistic construction.
- 2015-2019: Concentrated on unaccompanied nursing, schizophrenia, long-term hospitalization, and neonates, expanding key populations and specialized scenarios.
- 2020-2026: Turned to nursing quality, caregivers, qualitative research, unaccompanied wards, and nursing satisfaction, moving toward standardized, professional, and high-quality development.

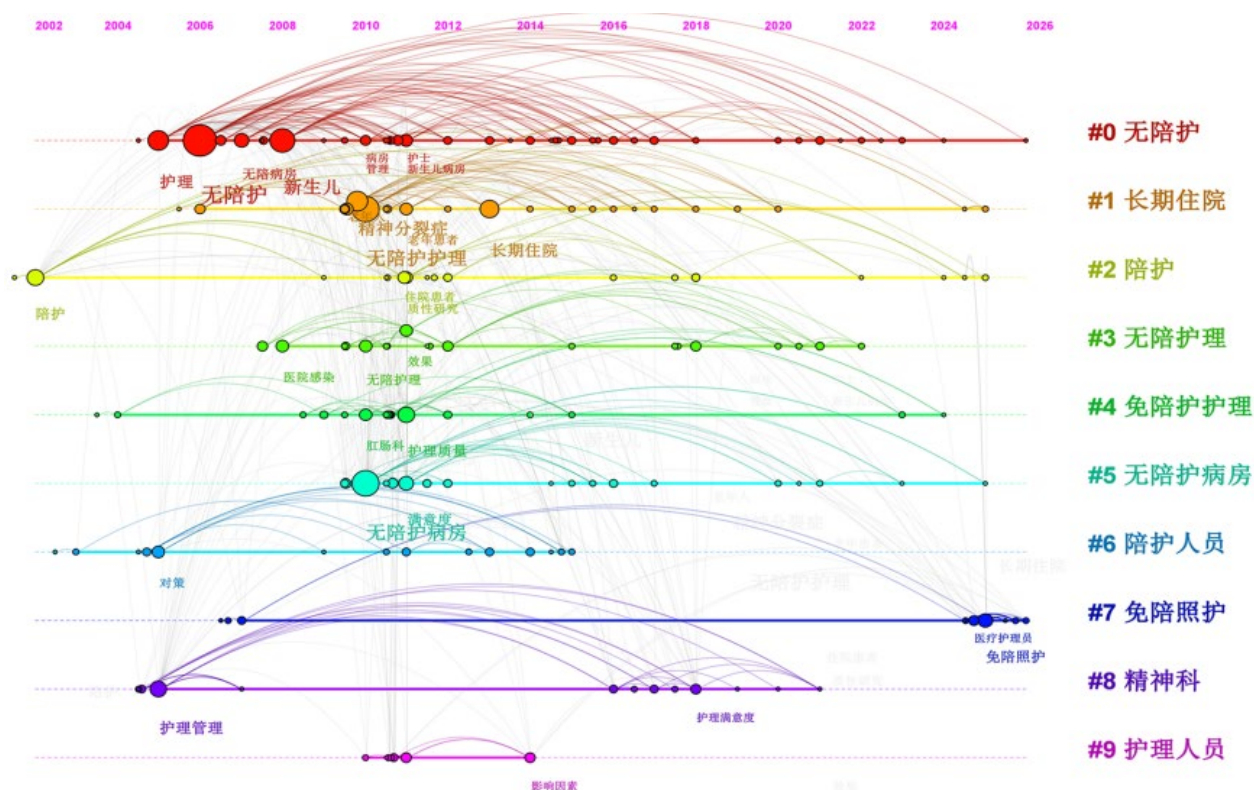


Figure 5. Keyword timeline map of evolutionary paths in unaccompanied ward research.

3.5.4. Keyword Burst Detection

The top 25 keywords with the strongest burst reflected the evolution of research frontiers (Figure 6):

- Early burst terms: nursing model, nursing, nursing risk, unaccompanied nursing, basic nursing (2005-2014);
- Middle burst terms: unaccompanied nursing, schizophrenia, long-term hospitalization, high-quality nursing, neonates (2015-2019);
- Recent burst terms: nursing satisfaction, quality of life, unaccompanied ward, nursing quality, caregiver, qualitative research, cardiology (2020-2026).

Among them, unaccompanied ward, nursing quality, and caregiver have remained burst to the present, representing core research directions at present and in the future.

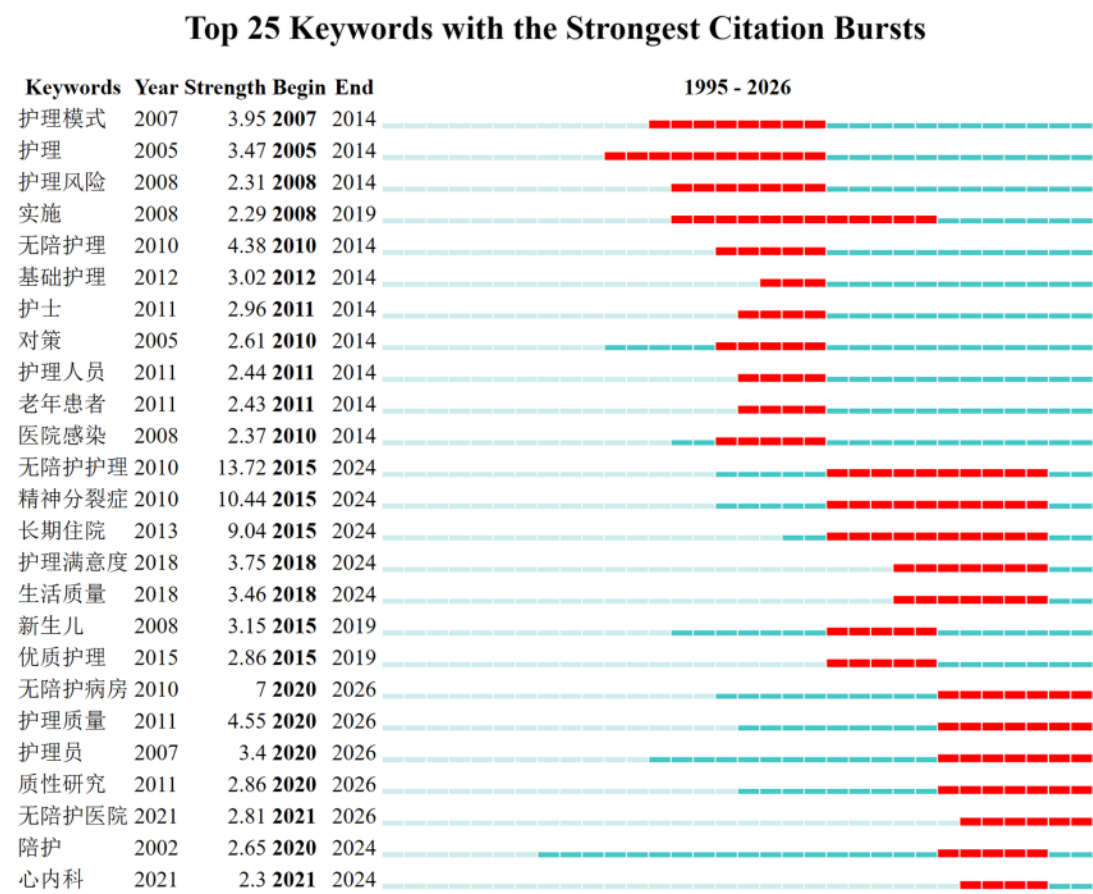


Figure 6. Top 25 keywords with the strongest citation bursts in unaccompanied ward research (1995-2026).

4. Discussion

In this study, visualization analysis of 769 eligible articles in the field of unaccompanied wards in China from 1995 to 2026 was conducted using CiteSpace 6.4.R1. The annual publication trend, distribution of core authors and institutions, clustering of research hotspots, and evolutionary context were systematically demonstrated. It was comprehensively indicated that research on unaccompanied wards in China had evolved from concept introduction and local pilots to large-scale promotion and high-quality construction. However, obvious deficiencies still existed in cooperation networks, research depth, standard systems, specialty coverage, and other aspects, which were discussed in detail as follows.

4.1. Research Situation: Sustained Growth, Policy-Driven Features, and Distinct Stages

From 1995 to 2026, the publication volume of literature related to unaccompanied wards in China maintained a rapid growth trend and could be divided into three stages: initial exploration, steady growth, and rapid development, which was highly consistent with the evolution of national nursing policies and hospital management needs [8] [9]. Before 2005, publication volume was extremely low, dominated by concept introduction and case practices. From 2005 to 2019, with

the advancement of the high-quality nursing service program and strengthened requirements for nosocomial infection control, publication volume increased steadily, and unaccompanied wards were extended from psychiatry and neonatology to comprehensive departments [10] [11]. Since 2020, driven by the national pilot policy of unaccompanied care services, publication volume has increased dramatically, marking that unaccompanied wards have become a key direction for high-quality development of public hospitals and transformation of nursing models [4].

Notably, the growth of publications in this field has mainly relied on the summary of clinical practice and the promotion of management experience. The proportion of basic research, mechanism research, and evidence-based research is relatively low, presenting an overall feature of “practice progressing faster than theory and application developing faster than research”, which may restrict the long-term development potential of this field.

4.2. Research Forces: Core Teams Established but Loose Collaboration and Regional Agglomeration

Author analysis revealed that a core author group represented by Xu Cuiping, Chu Liangliang, Liu Kai, Yang Xueying, and others had been formed in the field of unaccompanied wards in China, with high publication output and sustained research efforts, laying a foundation for the development of the field. Contrary to the initial claim, core authors contributed only 111 out of 769 papers (14.43%), far less than half; thus, the research force is dispersed rather than concentrated, and the formation of a stable, unified academic echelon remains limited. According to Price’s law, the total publications of core authors accounted for more than half, suggesting that research forces in this field were relatively concentrated and a stable academic echelon had been established [7].

Nevertheless, obvious defects were detected in the cooperation network:

1) Cooperation among authors was mainly limited to small internal teams, with sparse cross-team and cross-institutional links, and a national collaborative research network had not been formed [12];

2) Institutions were highly concentrated in Shandong Province. Regional superior clusters had been formed by Shandong Qianfo Mountain Hospital, Taishan Hospital, Shandong Cancer Hospital, School of Nursing of Shandong University, and other institutions, while the participation of high-level research institutions in other provinces was insufficient, showing a pattern of “local strength and overall dispersion” [13];

3) The linkage between universities and hospitals, clinical practice and scientific research was insufficient, and a gap between theoretical research and practical implementation was observed.

This decentralized pattern has restricted the conduct of multi-center, large-sample, and high-quality studies and has also affected the promotion and translation of research findings [5].

4.3. Research Hotspots: Clear Focus and Comprehensive Dimensions but Insufficient Depth and Standardization

Keyword co-occurrence, clustering, timeline, and burst detection analyses showed that four stable research directions had been formed in the research on unaccompanied wards in China, with a clear evolutionary context of hotspots and increasingly systematic research content.

1) Care model and management system as the core: From the early concepts of “unaccompanied” and “zero accompanying”, diversified models such as unaccompanied nursing, unaccompanied care, and mobile care have been gradually developed. Research focuses have been centered on staffing, level classification, process standardization, safety management, and risk prevention and control, reflecting the management logic of transformation from “canceling accompanying care” to “professional care” [14].

2) Expansion of key populations and specialized scenarios: Research subjects have been gradually extended from initial schizophrenic patients, neonates, and elderly long-term inpatients to patients with stroke, hemiplegia, orthopedic diseases, coronary heart disease, tumors, and other conditions, covering internal medicine, surgery, psychiatry, pediatrics, rehabilitation, and other specialties, indicating that unaccompanied wards have moved from specialized pilots to hospital-wide promotion [8].

3) Safety and quality as core concerns: High frequency and sustained burst of keywords such as nursing quality, caregivers, nosocomial infection, nursing risk, and adverse events have reflected high clinical attention to the safety bottom line and quality controllability under the unaccompanied model, and have also exposed practical problems such as inconsistent personnel qualifications, non-uniform processes, and difficult supervision [15].

4) Increasing emphasis on humanistic care and patient experience: The popularity of keywords such as nursing satisfaction, quality of life, humanistic care, and qualitative research has increased significantly in recent years, indicating that research has shifted from “management convenience” to “patient-centeredness”, with more attention paid to psychological support, emotional needs, and medical experience, which is in line with the developmental trend of modern nursing.

However, in-depth analysis revealed three major shortcomings in existing research:

1) Unified dialectical and evaluation standards are lacking: National unified norms for admission criteria, care levels, quality evaluation indicators, and charging standards of unaccompanied wards are absent, making it difficult to compare research results horizontally [15];

2) Mechanism research is weak: Most studies are limited to effect observation and experience summary, and insufficient exploration has been made on the underlying mechanisms by which the unaccompanied model affects patient rehabilitation, infection control, medical costs, and care outcomes;

3) Low level of evidence-based evidence: Most studies are retrospective analyses and single-center experiences, while large-sample randomized controlled tri-

als, health economic evaluations, and long-term follow-up studies are scarce, leading to insufficient high-level evidence.

4.4. Research Frontiers: Transition from Model Construction to Quality Improvement, with Specialization, Intelligence, and Standardization as Trends

Keyword burst detection and timeline analysis indicated that research hotspots of unaccompanied wards presented a distinct evolutionary path: early focus on nursing models, basic nursing, and accompanying management; middle shift to unaccompanied nursing, psychiatry, long-term hospitalization, and high-quality nursing; recent concentration on nursing quality, caregiver team building, nursing satisfaction, qualitative research, intelligent care, and other directions. Keywords such as “nursing quality”, “caregiver”, and “unaccompanied ward” have shown strong and sustained burst intensity, becoming core research frontiers at present and in the future.

This trend suggests that unaccompanied wards in China have passed the debate stage of “whether to build” and entered the deep-water zone of “how to build well, manage effectively, and improve quality”. Future research will be more focused on key issues such as training, assessment, and career development of caregivers, intelligent construction of unaccompanied wards, differentiated care plans for multiple specialties, precise prevention and control of nosocomial infections, construction of humanistic care systems, and health economic evaluation, so as to promote the transformation of unaccompanied wards from “scale expansion” to “connotation improvement” [16]-[18].

4.5. Limitations and Prospects

This study has systematically presented the overall research status in the field of unaccompanied wards in China, but several limitations should be acknowledged:

- 1) Only Chinese databases were searched, and English literature was not included, resulting in a lack of comparison between domestic and overseas research;
- 2) Subgroup analysis of unaccompanied wards in different specialties and hospital levels was not performed, and the pertinence needs to be improved;
- 3) Restricted by software functions, some deep-seated correlations and evolutionary laws could not be fully explored.

Combined with the current situation of the field, future research is expected to achieve breakthroughs in four aspects:

- 1) Establish a national collaborative research network: Break institutional and regional barriers, set up a multi-center and interdisciplinary research alliance, conduct large-sample, prospective, and long-term follow-up studies, and improve the level of evidence;
- 2) Improve the unified standard and norm system: Formulate industry guidelines covering construction criteria, personnel qualifications, care processes, quality evaluation, infection control, and charging standards for unaccompanied

wards, so as to promote homogenized development;

3) Deepen research in key fields: Focus on caregiver team construction, precision care for special populations, application of intelligent nursing technology, care mechanisms, and health economics, so as to make up for the shortcomings in basic and evidence-based research;

4) Promote model innovation and quality enhancement: Integrate information-based and intelligent equipment to build intelligent unaccompanied wards; strengthen humanistic care and psychological support to realize the integration of “professional care + humanistic services” and improve patients’ sense of gain and medical service efficiency.

5. Conclusions

CiteSpace-based visualization analysis demonstrated that the publication volume of research on unaccompanied wards in China from 1995 to 2026 had increased continuously, and four major research directions including care model, key populations, management safety, and patient experience had been formed. Core authors and institutions had made outstanding contributions, and research hotspots had shifted from basic management to quality improvement and humanistic care. However, problems such as insufficient cooperation, lack of unified standards, and limited research depth still exist.

In the future, collaborative innovation should be strengthened, standard systems should be improved, and mechanism research should be deepened to promote the high-quality development of unaccompanied wards toward standardization, specialization, intelligence, and humanization, so as to better meet patients’ medical needs and support the upgrading of hospital management.

Conflicts of Interest

The authors declare no conflicts of interest.

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