REVIEW ARTICLE

Nursing performance management under the reform of health insurance payment in China: A Biblio-metric and Visual Analysis Based on CiteSpace

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Keywords: Health insurance payment; Nursing performance; Nursing management; CiteSpace; visual analysis

ABSTRACT

Introduction: China's medical insurance payment reform has shifted to DRG/DIP in recent years. Nursing performance and management under the reform have been research hotspots. This article focuses on analyzing the research trends to help advance research in these fields.

Methods: Using CiteSpace, the literature on nursing performance management under the medical insurance payment reform was visualized and analyzed. Through analyses of annual publication volume, co-occurrence of authors, institutions, and keywords—as well as clustering and burst detection—trend charts of publication volume, collaborative co-occurrence maps, and keyword clustering visualizations were generated. Further exploration of research hotspots and trends followed.

Results: The results indicated that research hotspots focused on public hospitals, nursing, and nursing pathways, with future research trends moving toward cost management.

Discussion: There is still a need for enhanced research on nursing performance and nursing management under the medical payment reform.

Conclusion: Although researchers have focused on keywords related to nursing performance management during the medical insurance payment reform, more in-depth studies are still needed.

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What do we already know about this topic?
Through CiteSpace's visual analysis, the study clearly identifies and delineates the core research hotspots and evolutionary trends in this field in recent years, such as the specific impact of DRG/DIP payment methods on nursing resource allocation, cost accounting, quality monitoring, and nurse performance appraisal.
What is the main contribution to Evidence-Based Practice from this article?
By identifying hotspots and trends, the research highlights which nursing management practices and performance improvement measures have received significant attention and (potential) validation of effectiveness in the current reform context, guiding clinical institutions in prioritizing the adoption and implementation of evidence-based nursing management models.
What are this research's implications towards health policy?
The identified hotspots, such as linking nursing performance evaluation to payment and the role of nursing management in cost control and quality improvement, emphasize that future economic policies need to more precisely account for the unique value and economic contribution of nursing services, promoting their effective integration into overall healthcare value assessment and reimbursement systems.
Authors' Contributions Statement:
XDY: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Software, Visualization, Writing-Original Draft, Writing-Review & Editing; HXS: Conceptualization, Funding Acquisition, Resources, Supervision, Validation, Writing-Original Draft, Writing-Review & Editing.

In recent years, China's medical insurance payment reform has shifted from "project-based payment" to composite payment modes such as Diagnosis-Related-Group/Big Data Diagnosis-Intervention Pocket (DRG/DIP) payment and total prepayment, aiming to control medical costs and improve service efficiency (SUN Hua, 2025; SHEN Hao-nan, 2024). Nursing, as the core process of medical services, has its performance management directly affecting the quality of nursing and the effectiveness of medical insurance fund utilization (TAI Ping & CHEN Xiang feng, 2024). At present, the reform of medical insurance payment modes has posed new requirements for nursing staffing, service processes, cost control, etc. (Development Plan for National Nursing (2021-2025), 2022). Furthermore, its profound impact extends to the fields of nursing services and performance management, becoming an important direction for nursing research (SHEN Chen et al., 2023). However, the problems of single evaluation indicators and insufficient connection with medical insurance policies in traditional nursing performance management urgently need to be solved.

Documentometrics is a discipline that studies literature or related media using mathematical and statistical methods to explore quantitative relationships and patterns in literature and its working systems, while investigating the dynamic characteristics of science and technology (WEI Xin et al., 2024). CiteSpace, a scientific visualization tool for bibliometric analysis, is widely used for literature analysis and knowledge graph construction. It primarily reveals trends and hotspots in research fields by analyzing co-occurrence relationships among authors, institutions, and keywords in documents (SONG Dongyu et al., 2023). This study utilized CiteSpace 6.3 to conduct visual mapping analysis of annual publication volumes, authors, collaborating institutions, and keywords from Chinese and English literature on nursing performance management and DRG/DIP. The analysis dissected the developmental trajectory and core achievements in nursing performance management and its integration process research, identified research gaps, and

provided directional guidance for future studies.

Data sources and analysis methods

1.1 Data source

Research data were obtained from China National Knowledge Infrastructure (CNKI), Wanfang, VIP, and China Biomedical Database. The keywords included healthcare insurance payment reform, nursing performance management, DRG/DIP payment, total prepayment, and performance system optimization.

The literature search was conducted up to July 12, 2025, yielding a total of 511 articles. As shown in Figure 1, the retrieved literature underwent three screening stages: (1) Initial screening: excluding duplicate articles; (2) Secondary screening: excluding conference notices, news reports, book reviews, and other non-research materials; (3) Evaluation: assessing the relevance of article themes to research content and their reference value. Ultimately, 288 research papers meeting inclusion criteria were exported in Refworks format.

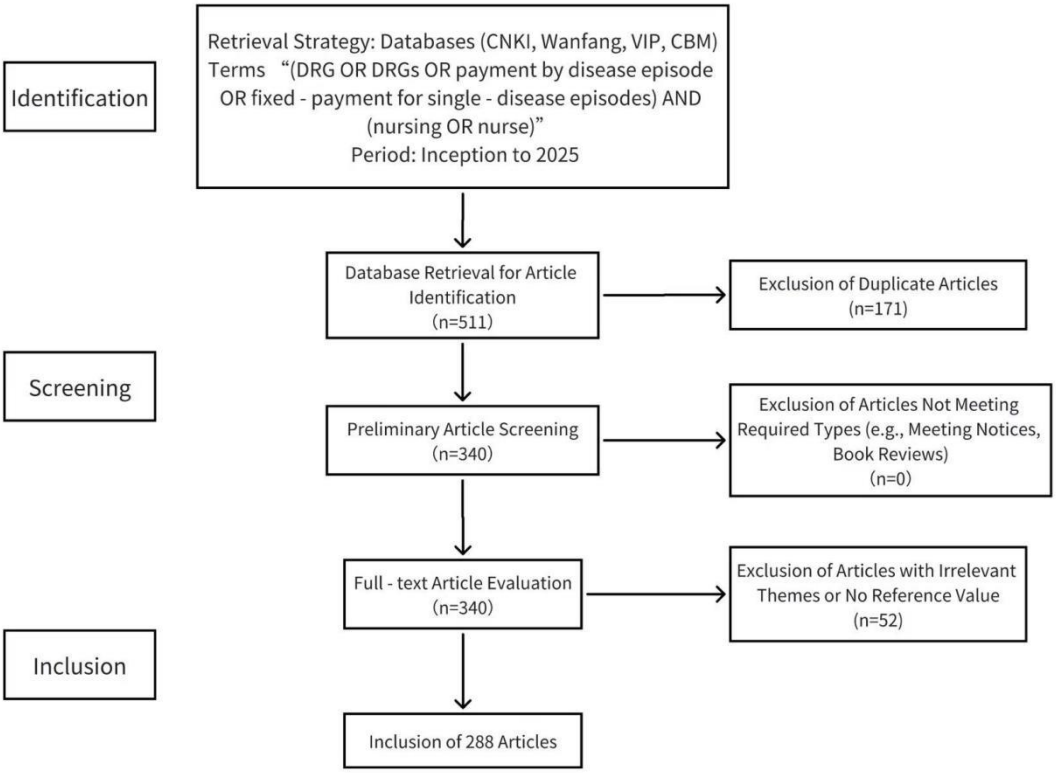

Figure 1: *Flow chart of literature screening on the nursing Nursing performance management under the reform of medical insurance payment in China*

1.2 Data analysis

This study conducted bibliometric analysis using CiteSpace 6.4.R1 software, with a 1-year time slice (Slice Length=1). The parameters used were the g-index (k=25), LRF=2.5, LIN=10, LBY=5, and e=1.0. Through screening the literature using these parameters, a keyword co-occurrence network was constructed to explore research hotspots in nursing performance management and related fields from a bibliometric perspective. The analysis in this study provides data support for

analyzing nursing performance management under China's medical insurance payment reform and helps ensure the credibility of the results.

Results and analysis

As shown in Figure 2, nursing, performance management, and public hospitals are the core nodes. The cluster "nursing management" reflects research on nursing personnel, performance, and management system, which is adapted to the trend of medical insurance payment. Against the backdrop of the evolution of medical insurance payment reform towards refinement and intelligence, lies the deep application of digital performance management (LI Miaomiao et al., 2025; YU Ting & YAN Bo, 2022). The cluster "cost and pathway" reflects the correlation between clinical pathways, cost accounting, and performance management under medical insurance cost control, such as the constructing of a correlation model. The cluster "hospital reform" highlights the driving force of medical insurance payment reform for the management reform of public hospitals, with nursing performance management being a key link, and numerous pilot projects exploring collaborative models.

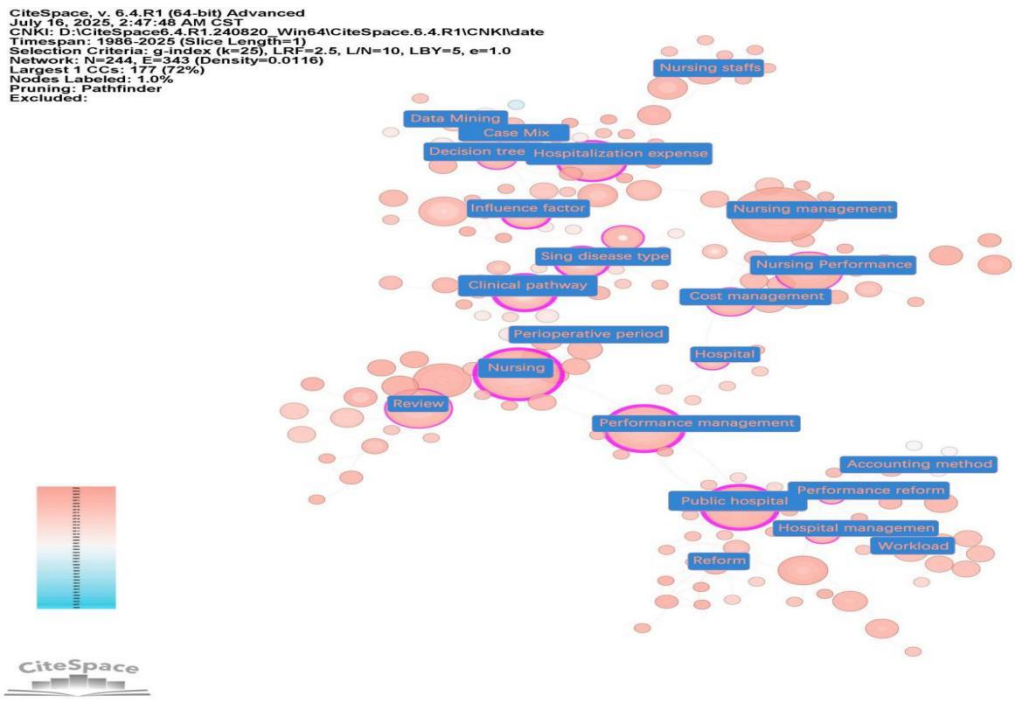

***Figure 2**: Keyword co-occurrence*

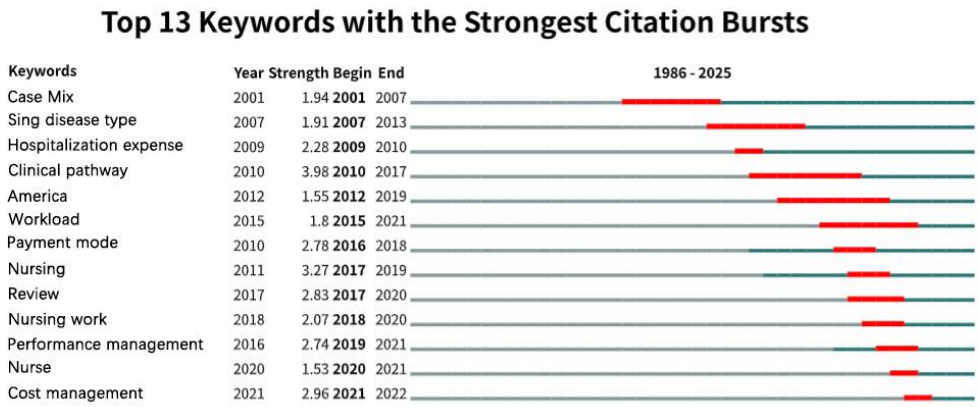

***Figure 3**: Keyword Highlighting*

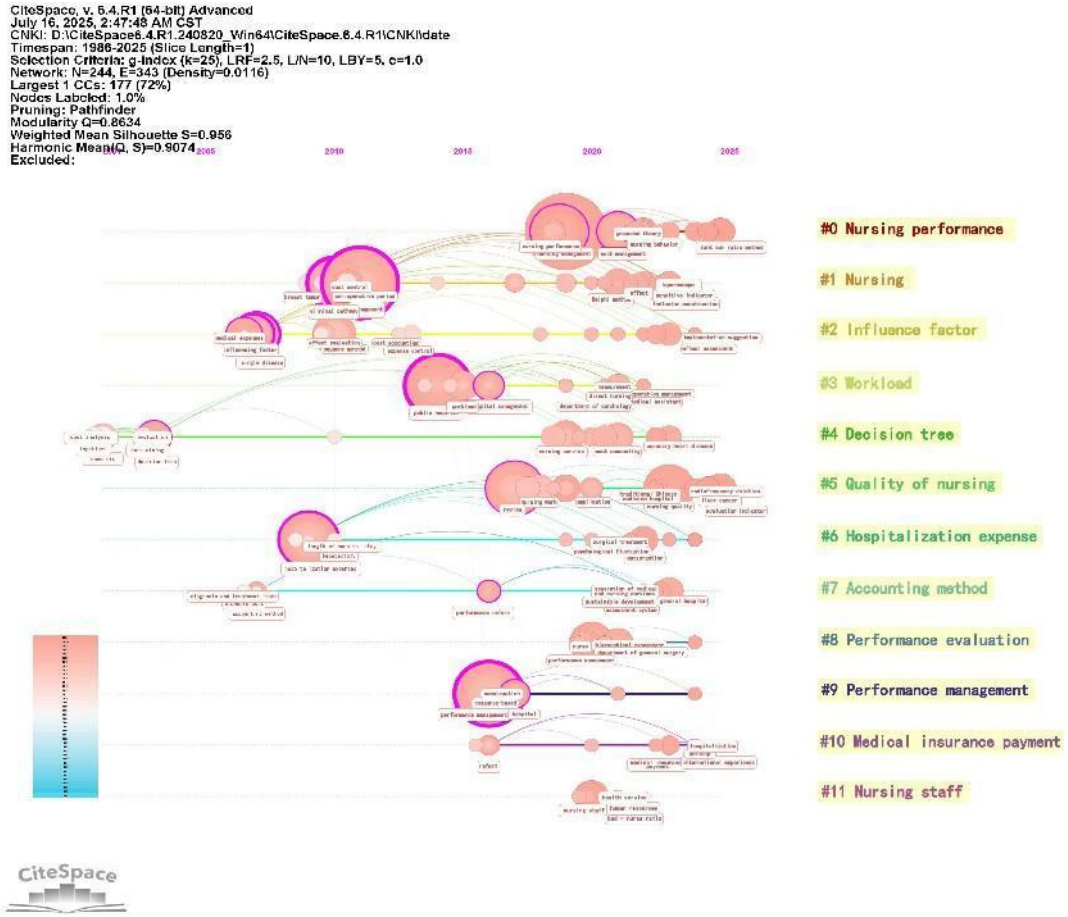

***Figure 4**: Timelines*

***Table1**: Keyword clustering*

Selected	ClusterID	Size	Silhouette	Mean (Year)	Label(LSI)	Label(LLR)	Label(MI)
FALSE	0	22	2022		(15.61) Rank sum ratio method; (15.61) Cost management; (15.43) Nursing performance; (12.29) Nursing Management: (12.15) Grounded Theory	Nursing performance (30.29,1.004); Cost management (16.6,1.004); Rank sum ratio method (13.23, 0.001); Grounded theory (9.89, 0.005); Nursing behavior (9.89,0.005)	Point calculation (0.68); Comprehensive evaluation (0.68); Workload assessment (0.68); Model construction (0.68)
FALSE	1	21	2017	0.992	(14.1) Perioperative period: (12.15) Sensitive indicators: (12.15) Laparoscopy: (12.15) Indicator construction; (12.15) Total hysterectomy	Nursing (40.41,1.004); Perioperative period (15.76, 1.004); Sensitive indicators (11.77, 0.001); Laparoscopy (11.77,0.001); Indicator construction (11.77,0.001)	cnki(0.45); Effect (0.45); Breast tumor (0.45); Human resource allocation (0.45)
FALSE	2	20	2016	0.891	(12.15) Medical expenses; (11.1) Influencing factors; (11.1) Payment method; (9.57) Single disease category; (9.35) Impact	Influencing factors (15.35,1.004); Medical expenses (15.06, 0.001); Payment method (15.06, 0.001); Single disease (15.06, 0.001); Human Resources (9.98,0.005)	Reform of medical insurance payment methods (0.22); Implementation suggestion (0.22); Rehabilitation (0.22); Cost control (0.2)
FALSE	3	17	2018	0.984	(12.15) Disease diagnosis related group: (12.15) Direct nursing: (12.15) Indirect nursing: (12.15) Cardiology: (12.15) Nursing time	Workload (17.04, 1.0004); Disease diagnosis related (12.72, 0.001); Direct nursing (12.72, 0.001); Nursing Human Resources (12.72,0001); Indirect nursing (12.72,0.001)	Medical Assistant (0.37); Disease performance (0.37); Medical insurance payment method (0.37); Balanced Scorecard (0.37)
FALSE	4	17	2011	0.957	(14.1) Decision tree: (12.29) Case combination; (9.4) Data mining; (9.4) Cost analysis; (9.4) Respiratory Medicine	Decision tree (20.73,1.0004); Case combination (15.45,1.0004); Data Mining (10.24,0.005); Cost analysis (10.24, 0.005); Respiratory Medicine (10.24,0.005)	Nursing services (0.21); Coronary heart disease (0.21); Cost accounting (0.21); Statistical classification (0.21)
FALSE	5	16	2021	0.979	(15.61) Nursing quality; (12.15) Evaluation indicators; (12.15) Radiofrequency ablation: (9.57) Liver cancer; (9.4) Nursing performance allocation	Nursing quality (22.56,1.0004); Liver (13.4,0.001); Evaluation index (13.4,0.001); Radiofrequency ablation (13.4,0.001); Nursing performance allocation (8.89,0.005)	Pay by service unit (0.32); Service sector (0.32); Overview (0.32); Europe (0.32)
FALSE	6	16	2018	0.854	(13.27) Hospitalization expenses; (10.8) Hospitalization; (10.28) Cost: (4.7) Purulent appendicitis; (4.7) DRG comprehensive management	Hospitalization expenses (26.33,1.004); Purulent appendicitis (5.15,0.05); DRG Comprehensive Management (5.15,0.05): Hospitalization Date (5.15,0.05): Gynecological Tumors (5.15,0.05)	Purulent appendicitis (0.2); DRG comprehensive management (0.2); Hospitalization date (0.2); Gynecological tumors (0.2)
FALSE	7	11	2016	0.979	9.4) Accounting method; (4.7) Separation of medical and nursing care: (4.7) Diagnosis and treatment items: (4.7) Continuous development; (4.7) Standard cost	Accounting method (15.06,0.001); Medical separation (7.42,0.01); Cost (7.42,0.01); Diagnosis and treatment items (7.42,0.01); Sustainable Development (7.42,0.01)	Separate medical care (0.05); Cost (0.05); Diagnosis and treatment items (0.05); Sustainable development (0.05)
FALSE	8	10	2020	0.993	(12.15) Performance evaluation criteria system to deter (12.15); (9.4) Nursing unit; (6.23)rbrvs; (4.7) Hierarchical management	Performance evaluation (18.94,1.0004); Indicator system (18.94,1.0004); Nursing unit (12.51,0.001); Hierarchical management (6.2,0.05); Clinical Department (6.2,0.05)	Hierarchical management (0.1); Clinical department (0.1); Goal management (0.1); Nurse (0.1); General Surgery (0.1)
FALSE	9	10	2018	1	(12.29) Performance management; (7.14) Hospital: (6.79) Management; (6.23)rbrvs; (4.7) Performance Integration	Performance management (20.74,1.0E-4); Hospital (17.08,1.0E-4); Performance integration (5.61,0.05); Construction (5.61,0.05); Informationization (5.61,0.05)	Performance integration (0.15); Construction (0.15); Informationization (0.15); DRG payment (0.15)
FALSE	10	9	2020	0.961	(5.4) Hospitalization; (4.7) United States; (4.7) Germany; (4.7) International experience; (4.7) Long term hospitalization	Medical insurance payment (8.18, 0.005); United States (8.18.0.005); Germany (8.18,0.005); International Economics (8.18, 0.005); Reform (8.18, 0.005)	Medical insurance payment (0.03); United States (0.03); Germany (0.03): International experience (0.03); Reform (0.03)
FALSE	11	8	2020	0.938	(9.4) Nursing staff; (7.4) Allocation of nursing human resources; (6.23) Nursing human resources; (6.23) Human resource allocation; (5.1) Nursing	Nursing staff (13.91,0.001); Nursing human resource allocation (8.48, 0.005); Human resource system (6.87,0.01); Capacity (6.87,0.01); Modern healthcare (6.87,0.01)	Human resource system (0.06); Capacity (0.06); Modern healthcare (0.06); Minimum standard (0.06)

With the continuous deepening of China's medical insurance payment reform as the background, relevant research hotspots have been clearly presented through the analysis of burst words, among which the content closely related to nursing performance management is particularly noteworthy. As shown in Figure 3, payment modes , as the core issue of medical insurance payment reform, showed a burst strength of 2.78% from 2016 to 2018, reflecting the academic attention to how new payment modes such as DRG and DIP affect nursing management; The "clinical pathway" became a research focus from 2010 to 2017 with a burst strength of 3.98. The implementation of refined nursing cost accounting and budget management is a key path to connect DRG/DIP payment standards and improve the efficiency of nursing resource allocation (LAI Feng-guo et al., 2023). The construction of its standardized process provided an important basis for nursing performance management. “Nursing” and “nursing work” became burst words in 2017-2019 and 2018-2020, respectively, with peak strengths of 3.27 and 2.07. Their emergence reflects the increasing importance of nursing work in the medical system and lies the foundation for the development of nursing performance management. As an important factor to consider in nursing performance management, “workload” has shown a burst strength of 1.8 from 2015 to 2021, providing quantitative references for performance evaluation. The burst of "performance management" itself in 2019-2021 (strength 2.74) directly indicates the warming of research in this field. In addition, the burst of “cost management” in 2021-2022 (strength 2.96) also suggests that under the reform of medical insurance payment, nursing performance management needs to balance costs and benefits. These burst words together outline the development trajectory of nursing performance management research from basic construction to practical exploration under the background of medical insurance payment reform.

The CiteSpace timeline map (Figure 4) presents the development trajectory of nursing performance management and related fields from 1988 to 2025, resonating with the reform of medical insurance payment. Its development can be divided into three stages according to “origin, differentiation, integration”. From 1988 to 2010, as the basic exploration period, nursing performance was the core, which was in line with the sprouting of medical insurance payment reform, focusing on the correlation between nursing 's basic attributes and performance and laying the foundation for the subsequent period. From 2011 to 2020, was a period of differentiation and expansion, with clusters expanding horizontally. Driven by reforms such as cost control in medical insurance payment, clusters such as "nursing quality" developed. The focus of nursing research shifted from isolated management to integration with medical insurance logic. Tools such as decision trees emerged. The period from 2021 to 2025 onward is a stage of deepening integration, with an increase in clustering edge density and the entry of medical insurance payment into the value-based medical stage. Medical insurance payment is deeply integrated with multiple clusters, focusing on nursing performance matching payment standards, and coordinating with the Healthy China strategy.

Interdisciplinary tools are used to assist in the analysis of the entire chain. In the future, to respond to comprehensive needs, attention can be paid to new integration points between the refinement of medical insurance payment reform and nursing performance management, as well as the deepening application of tools. From the clustering network density analysis of

CiteSpace (Table 1), it can be seen that the correlation strength between “medical expenses and payment methods” (including keywords related to medical insurance payment mode reform) and “nursing performance evaluation and indicator system” is only 0.09, far lower than the field average of 0.31, indicating a significant research gap between the two. Exploring the pricing of medical insurance based on the value of nursing services is a key measure to break through the current bottleneck of nursing performance-based incentives and demonstrates the independence of nursing professionals (LI Ziwei et al., 2025). Existing research either focuses on the impact of medical insurance payment reform on medical expenses, or on the independent construction of nursing performance indicators, but rarely explores the linkage design of "payment-performance". Therefore, in the future, research can focus on exploring the dynamic adjustment mechanism of nursing performance evaluation indicators under the background of medical insurance payment reform. Under this background, the innovation of performance-based allocation mechanism is a key breakthrough in stimulating the endogenous motivation of nursing staff (LI Fen et al., 2021), among which the pilot model of “medical insurance fund surplus sharing” has important practical significance. This is not only a structural gap revealed by quantitative data, but also a practical need to improve the value of nursing services and the efficiency of medical insurance fund utilization.

Summary

Using CiteSpace software, we conducted a visual analysis of articles published in China National Knowledge Infrastructure (CNKI) and Web of Science over the past 40 years regarding nursing performance management under China's reform of medical insurance payment. The analysis focused on five dimensions: annual publication volume, authors, institutions, keyword co-occurrence, keyword clustering, and keyword bursts. By integrating diagrams, line graphs, and tables to present data clearly, we identified research trends and burst hotspots in the field of nursing management under the reform of DRG/DIP.

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