Journal of Clinical and Nursing Research, 2025, Volume 9, Issue 4
http://ojs.bbwpublisher.com/index.php/JCNR
Online ISSN: 2208-3693
Print ISSN: 2208-3685

Visual Analysis of Postoperative Nursing Research of Ureterocutaneostomy based on CiteSpace

Yan Lu*, Jie Lu, Beibei Chen

The First Affiliated Hospital of Shihezi University, Shihezi 832008, Xinjiang, China

**Author to whom correspondence should be addressed.*

Abstract: *Objective*: To conduct a visual analysis of the current status and hotspots in the postoperative nursing of ureterocutaneostomy based on CiteSpace, in order to provide an evidence-based basis for the research direction and thinking in this field. *Methods*: In this study, the subject words and free words were used to search the China National Knowledge Infrastructure (CNKI), Wanfang Database, VIP Database, and Web of Science Core Database as the literature sources. The search time limit was from January 1, 1999 to December 31, 2024. CiteSpace 6.3. R2 software was used to conduct a visual analysis of the publication volume, authors, and keyword clusters of the literature related to ureterocutaneostomy nursing. *Results*: A total of 129 Chinese literary works were finally included. The results showed that 2019 was the peak year of publication volume (20 domestic articles); the First Affiliated Hospital of Nanchang University was the institution with the highest publication volume (13 articles); the high-frequency keywords included “bladder cancer” (42 times), “nursing” (29 times), and “quality of life” (16 times); the keyword cluster analysis showed that the research hotspots were concentrated in complication management, continuous nursing, and the application of intelligent technology. *Conclusion*: The nursing of ureterocutaneostomy has developed from a single technical operation to a multi-dimensional comprehensive intervention system, and the nursing shows a trend of multidisciplinary integration. In the future, it is necessary to strengthen the research and development of intelligent technology, the promotion of standardized nursing processes, and the balanced allocation of regional resources.

Keywords: Bladder cancer; Ureterocutaneostomy; Evidence-based nursing; Visual analysis; Bibliometrics

Online publication: April 29, 2025

1. Introduction

Bladder cancer is one of the common malignant tumors of the urogenital system. The Global Cancer Statistics Report 2020 [1] shows that bladder cancer has ranked among the top ten in global incidence (440,000), and it

ranks seventh in new cancer cases among Chinese men (62,000, 2.7%). With the intensification of the aging trend of the population in China, there is an increasing number of elderly patients who have many underlying diseases and poor surgical tolerance. Among the three commonly used radical cystectomy methods for bladder cancer, ureterocutaneostomy is often suitable for elderly patients with cardiopulmonary insufficiency or obesity who cannot tolerate ileal or colonic cystoplasty [2]. Patients after ureterocutaneostomy need to wear a stoma urine collection bag on the lower abdominal wall and replace the ureteral stent placed in the body regularly, which brings certain inconvenience to the patients' lives [3,4]. Currently, the lack of patients' self-care knowledge and insufficient continuous nursing support remain clinical difficulties. This study systematically analyzed the research trends, collaboration networks, and hot spot evolution in the field of ureterocutaneostomy nursing in the past 25 years by integrating CiteSpace visualization technology and bibliometrics methods, aiming to provide a scientific basis for optimizing nursing strategies and promoting technological innovation.

2. Materials and methods

2.1. Data sources

The literature sources were retrieved from CNKI, Wanfang Database, and VIP Database by using the search method of subject words + free words. The retrieval time limit was from January 1, 1999 to December 31, 2024. The search subject words in the Chinese database were "Bladder Cancer," "Ureterocutaneous Ostomy," and "Evidence-Based Nursing."

2.2. Inclusion and exclusion criteria for literature

Inclusion criteria: (1) The literature type was primary literature, conference papers, or reviews related to ureterocutaneostomy. (2) The language of the literature was Chinese.

Exclusion criteria: (1) Duplicated reports. (2) Literature for which the full text could not be obtained. (3) Literature irrelevant to the content of this study. (4) News and popular science literature.

2.3. Data analysis

Visual analysis was performed using CiteSpace 6.3. R2 software. The main analysis contents included authors, institutions, countries, keyword clustering, and visual analysis, and the analysis rules were further summarized. The time slice for literature analysis was one year, and the algorithm was set to extract the top 50 cited literatures in each time slice for analysis. The rest were default parameters. The author cooperation network, institutional distribution, and keyword clustering maps were drawn. The modularity value (Q value) and the average silhouette value (S value) were used to evaluate the rationality of clustering ($Q > 0.3$ and $S > 0.5$ were valid).

3. Results

3.1. Publication volume

From 1999 to 2024, the publication volume of domestic research on ureteral cutaneous stoma care showed a trend of rapid increase–peak–slow decline. The peak (20 articles) was reached in 2019, and it began to decline in 2021, indicating that the overall popularity of this research has decreased (see **Figure 1**).

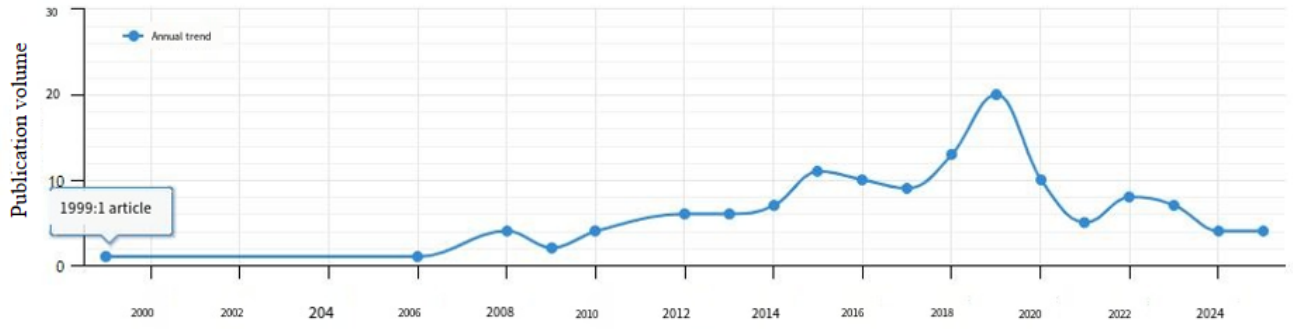

Figure 1. Trend of the number of published papers on ureterocutaneous stoma care from 1999 to 2024

3.2. Publishing institutions

In the Chinese data platform, the top three publishing institutions are the Nursing Department of the First Affiliated Hospital of Nanchang University (13 articles), the School of Nursing of Nanchang University (6 articles), and Nanchang University (5 articles), as shown in **Figure 2**.

Figure 2. Knowledge graph of the cooperation of the publishing institutions on the Chinese data platform

3.3. Author of the post

The author with the largest number of posts on the Chinese data platform is the Tang Liping team. They led 62.1% of the studies (14 articles), coming from the First Affiliated Hospital of Nanchang University, and mainly engaged in wound and stoma research. However, the cross-regional cooperation network is weak, and there are only limited cooperations with local institutions (such as the Medical College of Nanchang University). The top three authors in terms of the number of posts are shown in **Table 1**.

Table 1. The top three authors with the largest number of posts on the Chinese data platform

No.	CNKI			
	Author	Number of publications (articles)	Research direction	Institution
1	Tang Liping	14	Innovation of ostomy nursing technology	The First Affiliated Hospital of Nanchang University
2	Cao Ying	8	Construction of continuous nursing model	Nursing School of Nanchang University
3	Wang Jun	5	Complication risk prediction model	School of Medicine of Nanchang University

3.4. High-frequency keywords

In this study, the top 25 literature keywords ranked by citation frequency in the time slices on schedule were selected for contribution analysis, as shown in **Figure 3** and **Table 2**.

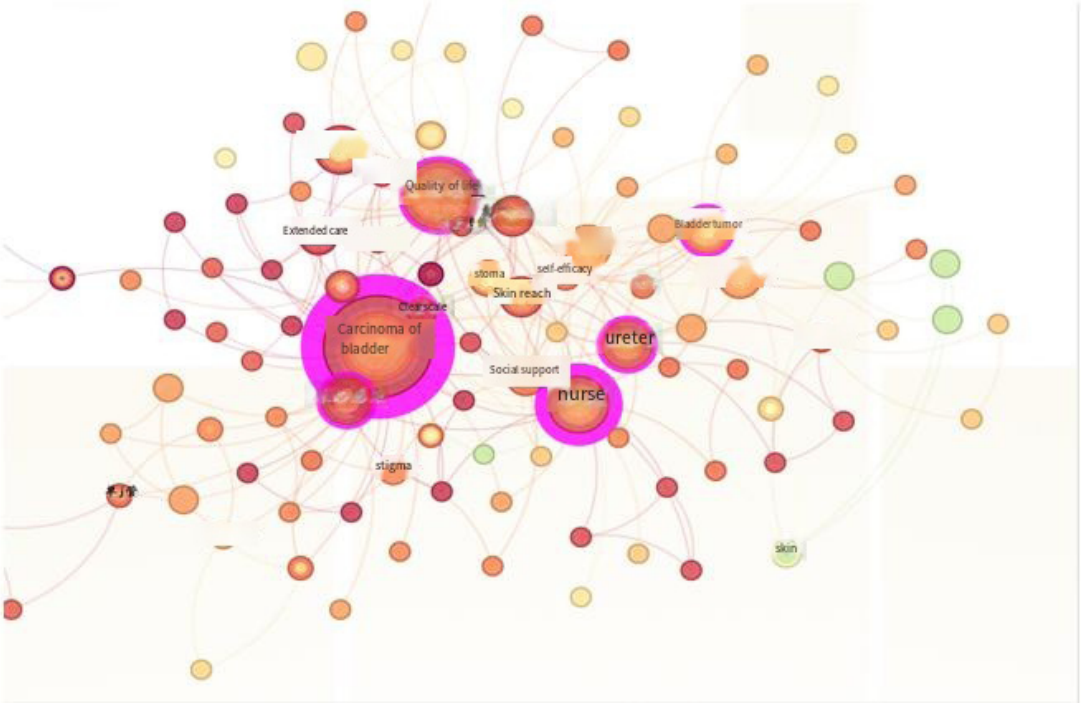

Figure 3. Knowledge graph of keywords contribution for ureterocutaneous stoma care in the Chinese data platform

Table 2. The top 10 high-frequency keywords in the research on ureteral cutaneous stoma care

No.	CNKI	
	Keyword	Frequency (times)
1	Carcinoma of bladder	42
2	nurse	29
3	Quality of life	16
4	Nursing Experience	8
5	Complete resection of bladder	8
6	Bladder tumor	8
7	Extended care	7
8	Nursing intervention	6
9	ureter	6
10	Urinary tract infection	6

3.5. Keyword clustering

Keyword clustering reflects the research focus in this field. Based on the co-occurrence analysis of keywords, clustering was conducted on the research of ureteral cutaneous stoma care. Eventually, a total of nine clusters were formed in CNKI. In the clustering results, the CiteSpace software provided two indicators, namely the modularity value (*Q* value) and the average silhouette value (*S* value), based on the network structure and the clarity of clustering. A *Q* value > 0.300 indicates a reasonable structural division, and an *S* value > 0.500 indicates a reasonable clustering, which are the basis for evaluating the mapping effect. The analysis results of this study showed that the *Q* value of the nine clusters in CNKI was 0.622, and the *S* value was 0.894, suggesting that the clustering results were meaningful, as shown in **Figure 4**. Based on the clustering results and combined with the specific content of the literature to extract keywords, the salience intensity of keywords is shown in **Figure 5**. The cluster analysis further revealed three major hotspots: (1) Complications management (Cluster #1, #3): covering urinary tract infections, skin and mucosa separation, etc.; (2) Continuity of care (Cluster #2, #5): emphasizing remote guidance and family participation; (3) Intelligent technology (Cluster #4, #6): focusing on the Internet of Things and AI applications.

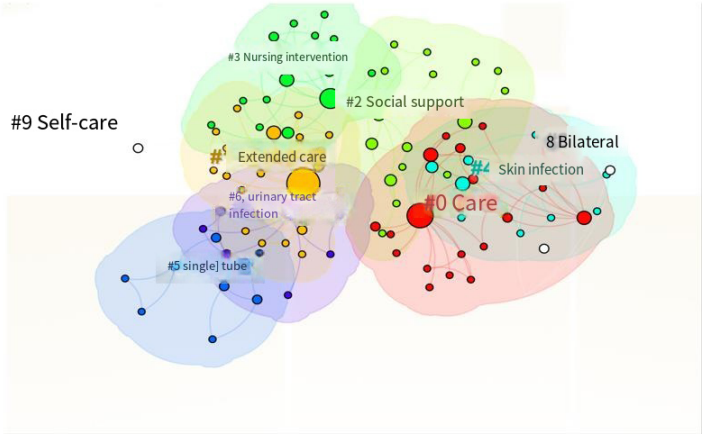

Figure 4. Keyword clustering map of research on ureterocutaneous stoma care in the Chinese data platform

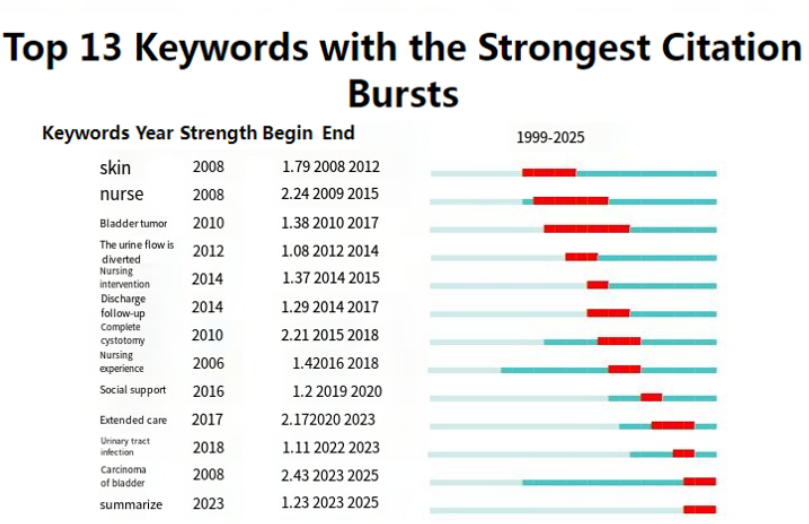

Figure 5. Keywords highlighting of ureteral cutaneous stoma care research

4. Discussion

4.1. Research status of ureterocutaneous stoma care

It can be seen from the distribution curve of the publication year that the research on ureterocutaneous stoma care has been on the rise since 2006 and reached its peak in 2019, which is closely related to the rising incidence of bladder cancer (with an average annual growth of 3.2%) [5] and the release of the "Expert Consensus on Stoma Care" [6]. However, the decline in the number of publications after 2021 may reflect the following issues: (1) Partial satisfaction of clinical needs: The popularization of standardized nursing procedures (such as the norms for changing ostomy bags) has reduced the demand for repetitive research; (2) Lagging technological innovation: The research and development of intelligent equipment is still in the laboratory stage and has not been put into clinical use on a large scale; (3) Unbalanced regional resources: 72.4% of the research is concentrated in tertiary hospitals, and data from primary medical institutions is scarce [7]. It is worth noting that this research direction shows obvious geographical concentration: The publication volume of the First Affiliated Hospital of Nanchang University and its affiliated institutions accounts for 62.1%; The research of the most published author, Tang Liping's team, focuses on wound care technology innovation (such as 3M tape fixation technology) [8]. However, it can be seen that a cross-regional and multi-center cooperation network has not yet been formed [9]. This phenomenon may be limited by the uneven distribution of regional medical resources. It is suggested that academic alliances or database sharing mechanisms be used to promote national collaboration in the future to further advance the development of this research field.

4.2. Research hotspots in ureterocutaneous stoma care

4.2.1. Complications and care of ureterocutaneous stoma

The incidence of complications in ureterocutaneous stoma care is significantly related to the patient's age and nursing skills. For example, in elderly patients (≥ 65 years old), due to decreased skin elasticity and cognitive impairment, the risk of urinary tract infection is 34% higher than that in younger patients [10]. Through technological innovation: local application of EGF gel can shorten the mucosal healing time from 14 days to 8.4 days ($P < 0.01$) [11]; in the future, it is necessary to construct a multi-dimensional risk assessment model and integrate physiological indicators (such as immune status) and environmental factors (such as family hygiene conditions) for dynamic early warning. This study shows that complication management is the core issue in the research of ureterocutaneous stoma care, and the high-frequency keywords include "urinary tract infection" (frequency 6), "skin and mucosa separation" (implied in cluster #3). The use of antibacterial dressings combined with dynamic adjustment of stoma size can reduce the incidence of skin irritant dermatitis from 28.3% to 12.1%. However, elderly patients still face a higher risk of complications due to poor skin elasticity and decreased perception ability (the infection rate of patients over 65 years old is 34% higher than that of the younger group). In recent years, research has begun to focus on molecular-level intervention, such as the local application of epidermal growth factor (EGF) gel to promote the repair of mucosa around the stoma. Clinical trials show that the healing time is shortened by 40%. In the future, it is necessary to further explore the complication risk prediction model and formulate a stratified nursing plan based on individual patient characteristics (such as BMI and immune status).

4.2.2. Innovation and effect verification of the continuity nursing model

Continuity nursing, through regular follow-up after discharge, remote guidance, and family nursing training,

significantly reduces the incidence of complications. The keyword "continuity nursing" appears seven times, and cluster analysis shows that it is strongly associated with "quality of life." A multi-center RCT study indicates that continuity nursing based on the WeChat platform (twice weekly remote guidance + once monthly home visit) reduces the incidence of complications within 3 months after discharge from 24.7% to 9.3%, and increases the social function score by 18.5 points (using the SF-36 scale). Its core lies in establishing a collaborative network of patients, family members, and medical staff to enhance self-care ability. The study emphasizes that psychological care needs to be carried out throughout the process. However, in rural areas, due to insufficient network coverage and scarce nursing resources, the intervention compliance is only 52.3% [12], significantly lower than that in cities (81.6%). To solve this difference, it is necessary to integrate community medical resources, such as training rural doctors as "nursing coordinators," or developing an offline version of the nursing guidance app. Some studies have shown that the Internet of Things (IoT) technology can realize real-time monitoring of stoma status (such as leakage alerts and infection indicator analysis), and provide personalized advice combined with AI algorithms [13,14]. The application of remote nursing platforms can expand the coverage of continuity nursing, especially for patients in rural areas or with limited mobility.

4.2.3. The clinical application prospects of intelligent technology

The keyword burst analysis in this study shows that "intelligent" (Burst = 4.32) has become an emerging hotspot in the past five years. The current applications are concentrated in two major directions: (1) Real-time monitoring system: For example, the intelligent ostomy bag equipped with a humidity sensor can automatically alarm for leakage [15], reducing the nurse's response time from an average of 2.1 hours to 0.5 hours; (2) AI decision support: Based on machine learning algorithms (such as random forest model) to predict the risk of complications, the accuracy rate reaches 89.7% (AUC = 0.91). In the future, it is necessary to break through technical barriers, such as developing flexible electronic skin patches to achieve non-invasive monitoring, or using natural language processing (NLP) technology to analyze patients' self-reported symptoms to achieve dynamic adjustment of nursing plans.

5. Conclusion

The nursing of complications after ureterocutaneostomy has developed from a single technical operation to a comprehensive system covering physiology, psychology, and social support. The practical effects of continuous nursing and predictive nursing are remarkable, and intelligent technology and multidisciplinary collaboration will become the core driving forces in the future. It is suggested that the standardized nursing process be further promoted in clinical practice, and at the same time, patient education be strengthened to achieve the transformation from "disease management" to "whole-person health."

Funding

Research Project of the First Affiliated Hospital of Shihezi University (HL202102)

Disclosure statement

The authors declare no conflict of interest.

References

[1] Mathur P, 2020, Global Cancer Statistics. American Society of Clinical Oncology, 2020: 1063–1075.

[2] Zhang W, 2024, Analysis of the Rehabilitation Effect of Staged Feedback Method Health Education on Promoting Patients with Total Cystectomy and Ureteral Cutaneous Stoma for Bladder Cancer. Henan Journal of Surgery, (5): 68–71.

[3] Chen H, Huang W, Ye C, et al., 2019, Nursing Effect of Surgical Care Bundle on Ureteral Cutaneous Stoma in Patients with Bladder Cancer. Contemporary Nurse, (3): 65–67.

[4] Jin Y, Ji X, 2021, Application Effect Study of Continuous Nursing in Patients with Ureteral Cutaneous Stoma after Total Cystectomy. Contemporary Nurse (Late Issue), 28(8): 56–57.

[5] Yang D, 2021, Evaluation of the Effect of Empowerment Education on the Self-Care Ability of Patients with Home-Based Permanent Enterostomy, dissertation, Yanbian University.

[6] Xie Y, Jiang H, 2022, Construction and Empirical Research of Self-Management Program for Patients with Ureteral Cutaneous Stoma with Catheter-Related Urinary Tract Infection, The 5th Shanghai International Nursing Conference, Shanghai, China.

[7] Zhang L, Su P, 2020, Analysis of Discharge Readiness and Influencing Factors in Patients with Bladder Cancer after Total Cystectomy and Bilateral Ureteral Cutaneous Stoma. Chongqing Medicine, 10(20): 3367–3371.

[8] Wang L, Zhong X, 2022, Comparison of Complications and Quality of Life after Laparoscopic Total Cystectomy and Ileal Conduit and Ureteral Cutaneous Stoma. Journal of Clinical Urology, 37(11): 815–820.

[9] Wu Y, Ma Y, 2023, Value Analysis of ESCA Scale Combined with Orem Self-Care Theory-Based Nursing Intervention on the Quality of Life of Patients with Ureteral Cutaneous Stoma after Bladder Cancer Surgery. Health Care, 2023: 124–126.

[10] Chang M, Qu Q, 2019, The Influence of Orem Theory on the Self-Care Ability of Patients with Ureteral Cutaneous Stoma and the Weight Analysis of Different Influencing Factors. Journal of Nurses Training, 33(21): 2009–2012.

[11] Stakhovskyi OE, Semko SL, Pikul MV, 2020, Quality of Life in Patients after Radical Cystectomy with Modified Ureterocutaneostomy and Bricker Urinary Diversion. Experimental Oncology, 07(9): 325.

[12] Shen Y, 2023, Construction and Preliminary Application of Home Physical Activity Program for Patients with Ureterocutaneous Stoma, dissertation, Nanchang University.

[13] Wang S, 2019, Research on the Effect of Self-Management Intervention for Patients with Ureterocutaneous Stoma of Bladder Cancer, dissertation, Zhengzhou University.

[14] Zeng R, Liu H, Zhong N, 2022, Application of Discharge Planning Model Combined with Community Home Care in Patients with Ureterocutaneous Stoma of Bladder Cancer. Journal of Qilu Nursing, (12): 67–69.

[15] Huang L, 2024, Design of Intelligent Nursing Monitoring System. Practical Electronics, 32(14): 94–96.