



Palliative Care in Patients with Kidney Failure: Bibliometric Analysis

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ABSTRACT

Palliative care for patients with kidney failure is increasingly recognized as an important approach to improving quality of life through symptom control, psychosocial and spiritual support, and strengthening shared decision-making, yet the global knowledge landscape remains fragmented and incompletely mapped. Mapping publication performance, geographic distribution of country contributions, and the dynamics of research themes related to palliative care in kidney failure patients through bibliometric analysis. A bibliometric study was conducted using the Scopus database spanning the last 10 years. The search strategy combined the keywords palliative care and kidney failure. From 4,730 initial findings, a gradual narrowing was performed to obtain 2,397 documents meeting the criteria, consisting of 1,974 research articles and 423 review articles. Descriptive analysis was used for annual publication trends and country contributions, while VOSviewer version 1.6.18 was used to map keyword co-occurrence, overlay maps, and density maps. Keyword mapping places demographic and clinical terms as central nodes, with primary clusters reflecting acute conditions and severity indicators including acute kidney injury and respiratory infectious complications, chronic kidney disease and dialysis therapy clusters linked to themes of palliative care, terminal care, quality of life, psychology, and conservative care, and geriatric clusters and service outcomes such as hospitalization, comorbidities, risk factors, length of stay, and mortality. The overlay map demonstrates a shift in themes from patient support and quality of life to a stronger focus on clinical outcomes, comorbidities, and infectious and respiratory contexts in the more recent period, while the density map highlights the largest hotspots in the elderly population and the kidney disorder theme networked with hospitalization outcomes. Palliative care research in patients with kidney failure is dominated by clinical themes and service outcomes, while patient-centered themes such as quality of life, psychology, and terminal and conservative care emerge as important but relatively less prominent. Strengthening studies measuring meaningful outcomes for patients and caregivers, standardizing terminology and reporting, and multicenter collaboration across countries are needed to reduce contextual bias and enhance global relevance.

Keywords: chronic kidney; disease; dialysis; kidney failure; palliative care

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INTRODUCTION

Chronic kidney disease (CKD) is a growing global health problem and poses a significant challenge to healthcare systems in many countries (Cheung & Couchoud, 2022). This disease is progressive, incurable, and often accompanied by various physical, psychological, social, and spiritual complications that significantly impact patients' quality of life (Ng et al., 2022). Patients with kidney failure, especially in the advanced stages, face not only physical symptoms such as pain, fatigue, and shortness of breath, but also emotional burdens, anxiety, depression, and decreased social and family functioning (Merchant et al., 2022).

Palliative care is a crucial approach in the management of patients with kidney failure (Kennedy et al., 2024; Monzón et al., 2025). Palliative care focuses not solely on curative efforts, but also on symptom control, improving quality of life, psychosocial support, and meeting the spiritual needs of patients and their families (Praça et al., 2019). This approach can be provided from the early stages of the disease through the end of life and can be used alongside disease therapies such as dialysis or conservative treatment (Noronha et al., 2024). Therefore, palliative care for patients with kidney failure is seen as an integral part of patient-centered healthcare.

As awareness of the importance of palliative care for patients with kidney failure grows, research in this area has also grown significantly. Numerous studies have explored clinical aspects, ethics, decision-making, quality of life, the role of healthcare professionals, and family involvement in palliative care for patients with kidney failure (Kurella Tamura et al., 2022; Lin et al., 2023). However, these studies are scattered across various disciplines and journals, with varying focuses, methods, and contexts (Bonares et al., 2025). This makes it difficult for researchers and practitioners to obtain a comprehensive overview of the direction, trends, and structure of scientific development in the field of palliative care for patients with kidney failure (Kum et al., 2022).

To date, most available studies are narrative or systematic reviews focused on intervention effectiveness or the experiences of patients and healthcare professionals (Effendy et al., 2022; Engel et al., 2023). While important, these approaches fail to comprehensively map the global research landscape, including publication trends, collaborations between researchers and institutions, country contributions, and dominant and underexplored research themes (Vidanapathirana et al., 2025). The lack of a structured scientific map can hinder the development of advanced research and evidence-based decision-making in clinical practice and health policy (Gelfand et al., 2020). Bibliometric analysis is an appropriate approach to address these needs. This method allows for quantitative mapping of the development of scientific publications, identification of influential authors and institutions, research collaboration networks, and keyword analysis to uncover the focus and direction of research in a field (Bukar et al., 2023; Herrera-Franco et al., 2021). Using bibliometric analysis, researchers can obtain a systematic and objective overview of the dynamics of palliative care research in patients with kidney failure over time (Donthu et al., 2021). Therefore, this study aims to conduct a bibliometric analysis of scientific publications on palliative care for patients with kidney failure. The results are expected to make a significant contribution to the development of scientific knowledge, serve as a basis for future researchers in identifying research gaps, and support clinical practice and the formulation of more comprehensive health policies oriented toward improving the quality of life of patients with kidney failure.

METHOD

Research Design

This study uses bibliometric analysis to map the development and trends of research related to palliative care for patients with kidney failure. Bibliometric analysis is a quantitative approach used to evaluate scientific literature through the analysis of publication patterns, citations, author networks, and conceptual relationships based on keywords (Donthu et al., 2021). This approach allows the identification of knowledge structures, dominant research themes, and collaboration patterns among researchers, institutions, and countries, thus providing a comprehensive overview of research developments in the field of palliative care for patients with kidney failure.

Data Sources and Search Strategy

The literature search was conducted using the Scopus database (Elsevier) because it covers a wide range of international scientific journals and is compatible with bibliometric analysis software. The search covered the last 10 years to capture the latest research developments. The search strategy uses the following keyword combinations: ((TITLE-ABS-KEY ("palliative care") OR TITLE-ABS-KEY ("palliative treatment") OR TITLE-ABS-KEY ("supportive care") OR TITLE-ABS-KEY ("end-of-life care") OR TITLE-ABS-KEY ("terminal care") OR TITLE-ABS-KEY ("hospice care") OR TITLE-ABS-KEY (hospice*))) AND ((TITLE-ABS-KEY ("renal failure") OR TITLE-ABS-KEY ("kidney failure") OR TITLE-ABS-KEY ("chronic kidney disease") OR TITLE-ABS-KEY (CKD) OR TITLE-ABS-KEY ("end-stage kidney disease") OR TITLE-ABS-KEY ("end-stage renal disease") OR TITLE-ABS-KEY (ESRD))). The initial search yielded 4,730 publications. After limiting the search to publications from the last 10 years, the total number of articles was 2,845. Subsequently, publications were filtered by field of medicine and nursing,

resulting in 2,679 documents. After limiting the document types to research articles (1,974) and review articles (423), the final number of publications analyzed was 2,397 documents.

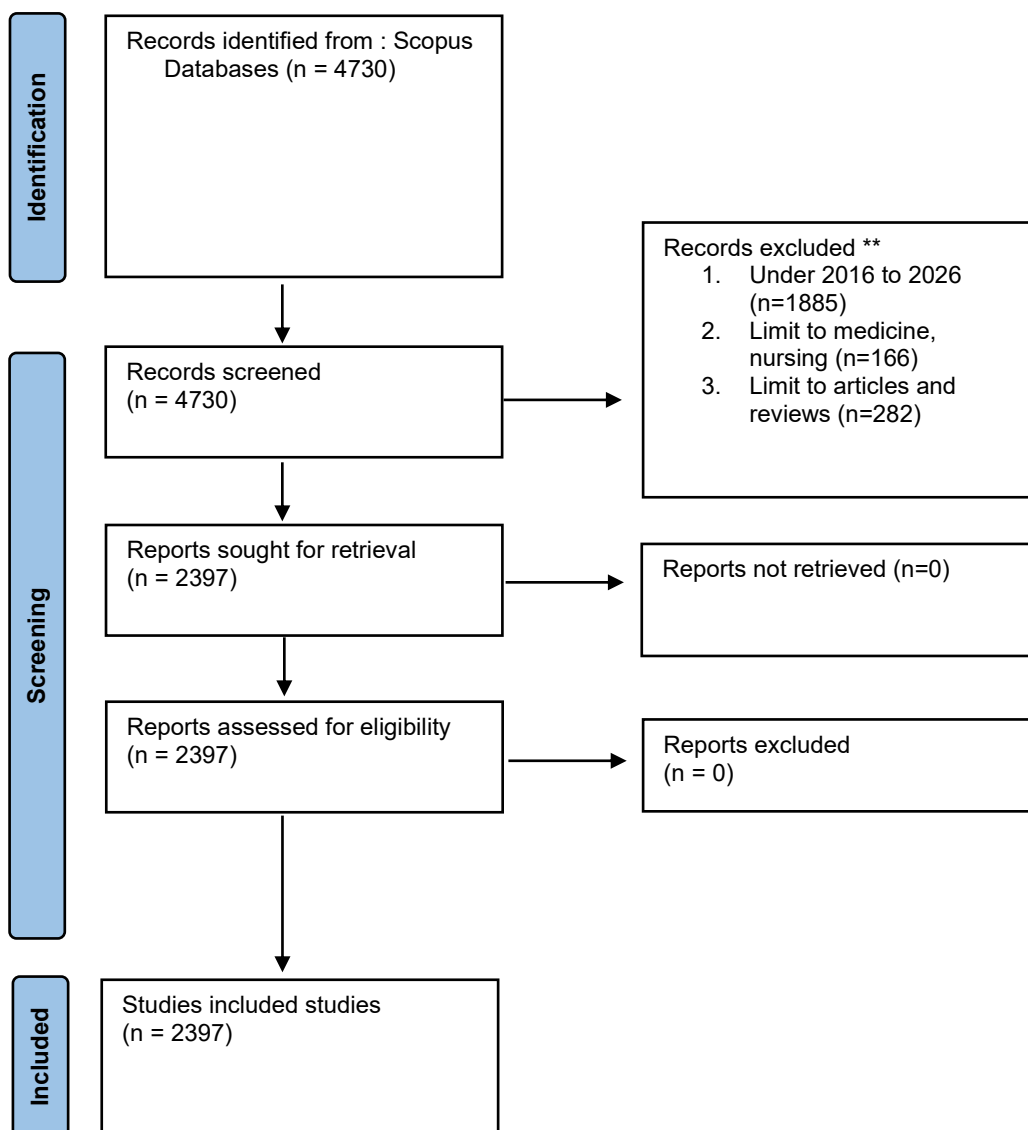


Figure 1. PRISMA Flow Diagram

Inclusion and Exclusion Criteria

Inclusion criteria were established using the Population, Concept, Context (PCC) framework as follows: Population: Patients with kidney failure, including chronic kidney disease (CKD) and end-stage renal disease (ESRD). Concept: Palliative care, including palliative care, supportive care, hospice care, end-of-life care, and terminal care. Context: Health services in various settings, such as hospitals, dialysis centers, hospices, and community-based care. Publications that were not relevant to the focus of palliative care in patients with kidney failure, were outside the fields of medicine and nursing, or were not research articles or reviews were excluded from the analysis.

Data Extraction and Coding

The extracted bibliographic data included article title, author name, year of publication, journal, institutional affiliation, country of origin, keywords, and number of citations. All data was exported directly from Scopus in a format compatible for bibliometric analysis. The data coding process was carried out systematically to ensure consistency and accuracy of the analyzed data.

Bibliometric and Network Analysis

Bibliometric analysis was conducted to identify annual publication trends, article growth, and research distribution based on the most productive authors, institutions, countries, and journals. Collaboration network analysis was conducted by mapping co-authorships between authors and institutions. Furthermore, keyword co-occurrence analysis was used to identify key research themes and emerging topics in palliative care research for patients with kidney failure. Bibliometric network visualization was performed using VOSviewer version 1.6.18 (Kokol & Blažun Vošner, 2019; Zupic & Čater, 2014).

Statistical Analysis

Statistical analysis is descriptive in nature and is used to summarize publication characteristics, including frequency, percentage, and publication trends during the analysis period.

Data Visualization

The analysis results are visualized as a map of annual publication trends, author and institutional collaboration networks, geographic distribution of research, and keyword co-occurrence clusters. This visualization aims to facilitate interpretation of the analysis results and provide a comprehensive overview of the direction and development of palliative care research in patients with kidney failure.

RESULT

Documents by year

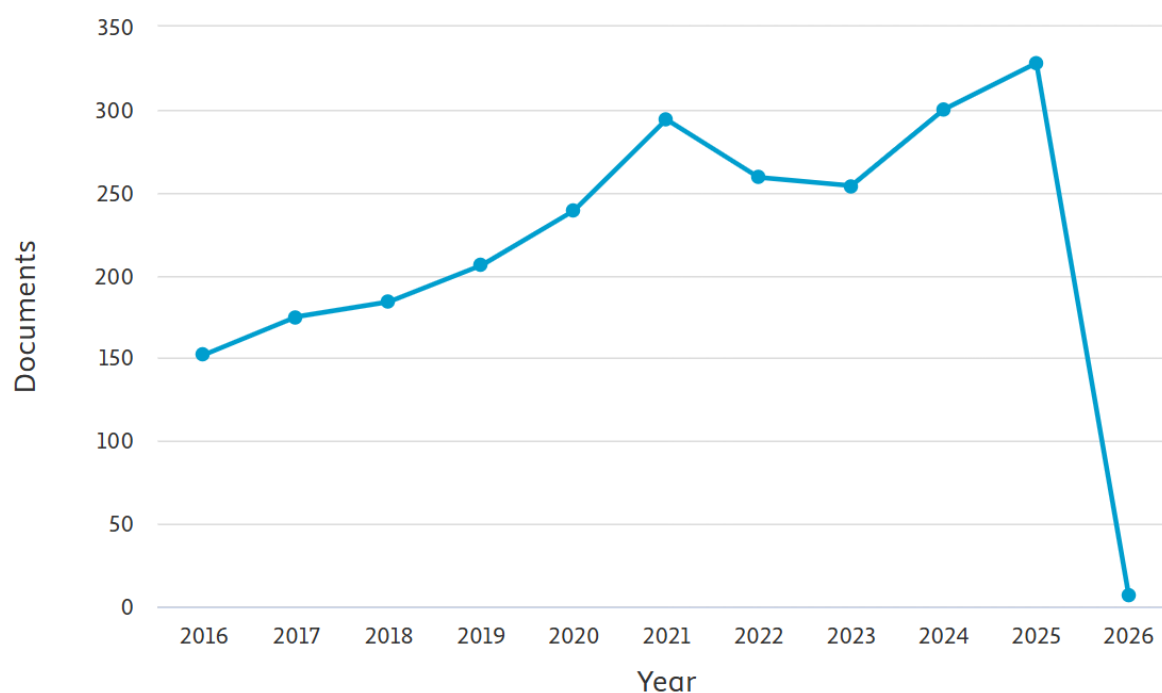


Figure 2. Documents by year (2016–2026)

Notes. Figure 2 displays the number of publications per year in the analyzed Scopus corpus for the period 2016–2026 (a total of 2,397 documents). In the initial period, the number of documents was relatively low, at 152 (2016), then increased to 175 (2017) and 184 (2018). The upward trend continued in 2019 (206) and 2020 (239), then reached a temporary peak in 2021 (294). After that, there was a decline in 2022 (259) and a slight decline/stabilization in 2023 (254). Publication production increased again in 2024 (300) and reached its highest value in 2025 (327). Meanwhile, only 7 documents were recorded in 2026, which is likely still temporary because the current year has not yet ended and the indexing/data updating process is not yet complete. Overall, the pattern

suggests strong growth through 2021, a brief decline in 2022–2023, and then a rebound in 2024–2025.

Table 1.
The 10 most cited publications in the Scopus corpus (sorted by highest citation)

No	Title	Author and Year	TC
1	2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure	(Ponikowski, Voors, & Anker, 2016)	11,334
2	2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC	(Ponikowski, Voors, Anker, et al., 2016)	5,746
3	Tisagenlecleucel in children and young adults with B cell lymphoblastic leukemia	(Maude, 2018)	4,602
4	2022 AHA ACC HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology American Heart Association Joint Committee on Clinical Practice Guidelines	(Heidenreich et al., 2022)	4,034
5	2022 ESC ERS Guidelines for the diagnosis and treatment of pulmonary hypertension	(Humbert et al., 2022)	2,870
6	KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease	(Stevens et al., 2024)	2,499
7	Factors associated with hospital admission and critical illness among 5279 people with coronavirus disease 2019 in New York City: Prospective cohort study	(Petrilli et al., 2020)	2,049
8	2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC), with the special contribution of the Heart Failure Association (HFA) of the ESC	(McDonagh et al., 2022)	1,749
9	Ramucirumab after sorafenib in patients with advanced hepatocellular carcinoma and increased α fetoprotein concentrations (REACH 2): a randomised, double blind, placebo controlled, phase 3 trial	(Zhu et al., 2019)	1,432
10	2022 ESC ERS Guidelines for the diagnosis and treatment of pulmonary hypertension	(Humbert et al., 2023)	1,342

TC = total citations in Scopus (according to the “Cited by highest” display in the search results).

Table 1 summarizes the 10 most highly cited publications in the dataset, showing that the most influential documents are dominated by clinical practice guidelines and international guidelines, particularly the 2016 ESC heart failure guidelines (Ponikowski et al., 2016a; Ponikowski et al., 2016b) and the 2022 AHA ACC HFSA heart failure guidelines (Heidenreich et al., 2022). Furthermore, the ESC ERS pulmonary hypertension guideline also occupies two highly cited positions in two different journal sources (Humbert et al., 2022; Humbert et al., 2023), and the 2024 KDIGO guideline for chronic kidney disease is a primary reference (Stevens et al., 2024). The list also includes high-impact research articles in broader clinical areas, such as the Tisagenlecleucel clinical trial in the *New England Journal of Medicine* (Maude et al., 2018), a prospective cohort study of COVID-19 in the *BMJ* (Petrilli et al., 2020), and the REACH 2 clinical trial in liver cancer in the *Lancet Oncology* (Zhu et al., 2019). These patterns suggest that the corpus' citation landscape is influenced not only by the specific palliative literature but also by guidelines and large clinical studies that are frequently referenced across disciplines in the care of chronic and complex patients, including those with kidney failure.

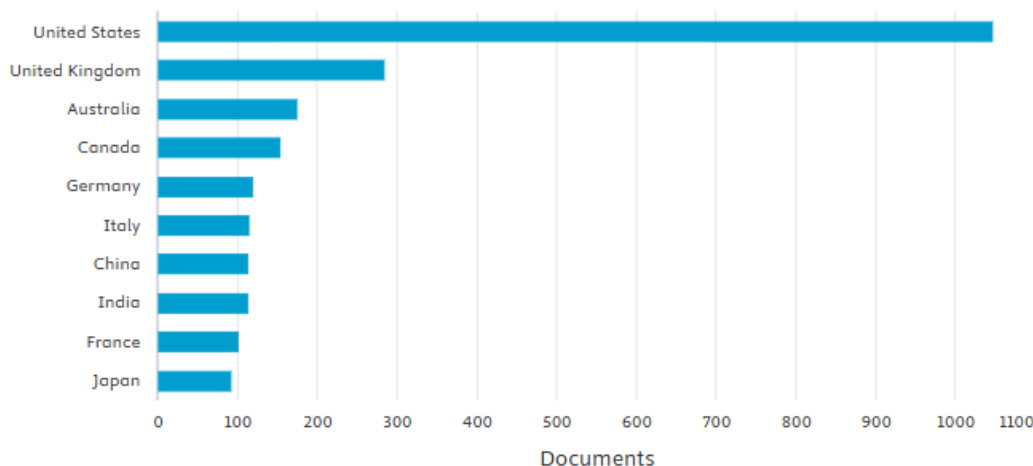


Figure 3. Documents by country or region

Figure 3 shows the distribution of publications by country/region in the analyzed Scopus corpus (a total of 2,397 documents). The United States dominates with 1,046 documents, far surpassing other countries. The United Kingdom (284) is next, followed by Australia (174) and Canada (153). European and Asian countries contribute at an intermediate level, namely Germany (118), Italy (114), China (113), and India (112). France contributes 100 documents, while Japan accounts for 92 documents. This pattern indicates a very strong concentration of publications in the United States, with the next largest contribution from the United Kingdom, followed by a relatively smaller but still significant group of other countries. Overall, these findings confirm that research in the corpus is cross-regional (North America, Europe, Asia, and Oceania), but publication productivity is still dominated by countries with established research ecosystems.

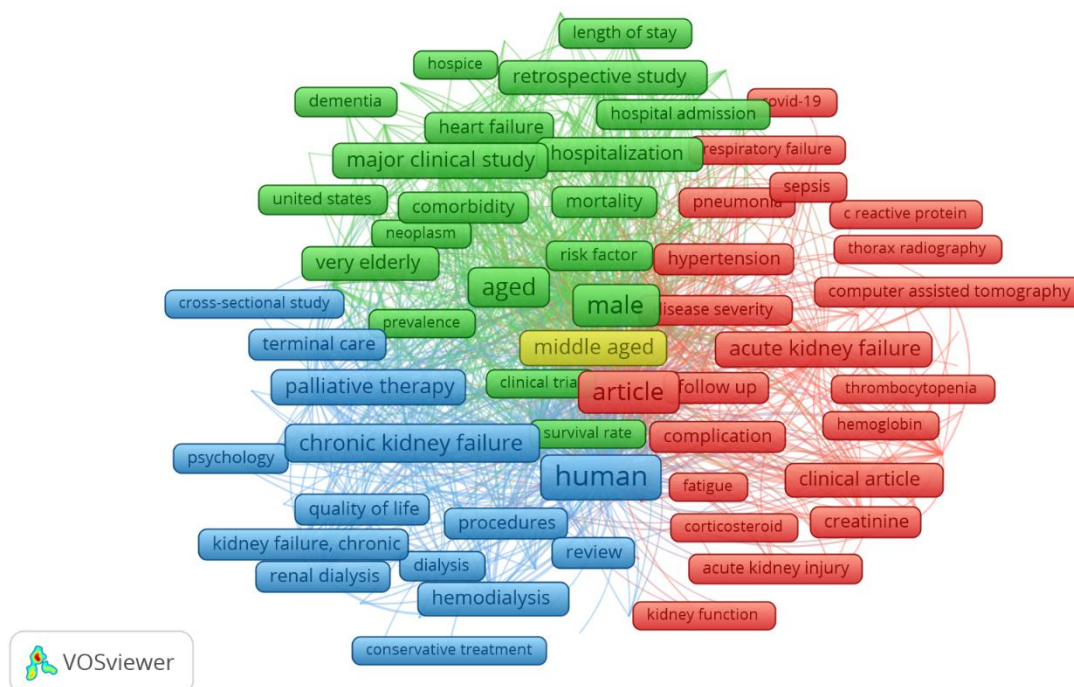


Figure 4. Keyword co-occurrence network (VOSviewer)

Figure 4 displays a map of the interrelationships between keywords in the analyzed corpus, with the most central nodes being general terms such as human, male, aged, middle aged, and articles linking various clinical topics. Several main clusters are visible: the red cluster focuses on acute conditions and severity indicators, such as acute kidney failure/acute kidney injury, creatinine, hypertension, and infectious and respiratory complications (sepsis, pneumonia, respiratory failure,

COVID-19) along with clinical support (e.g., C-reactive protein, thorax radiography, computer-assisted tomography). The blue cluster depicts the theme of chronic kidney disease and patient management/support, encompassing chronic kidney failure, hemodialysis/dialysis/renal dialysis, and aspects of patient care and outcomes such as palliative therapy, terminal care, quality of life, psychology, and conservative treatment. The green cluster represents the context of the geriatric population and clinical outcomes of healthcare, including heart failure, hospitalization/hospital admission, retrospective study, length of stay, comorbidity, risk factors, and mortality, with relevance to conditions such as dementia and the very elderly. The density of connecting lines between clusters indicates that the research in the corpus is integrated, linking elderly patient characteristics and comorbidities to hospitalization/mortality outcomes, and bridging the spectrum of chronic kidney disease and acute kidney injury in the context of infectious complications and disease severity.

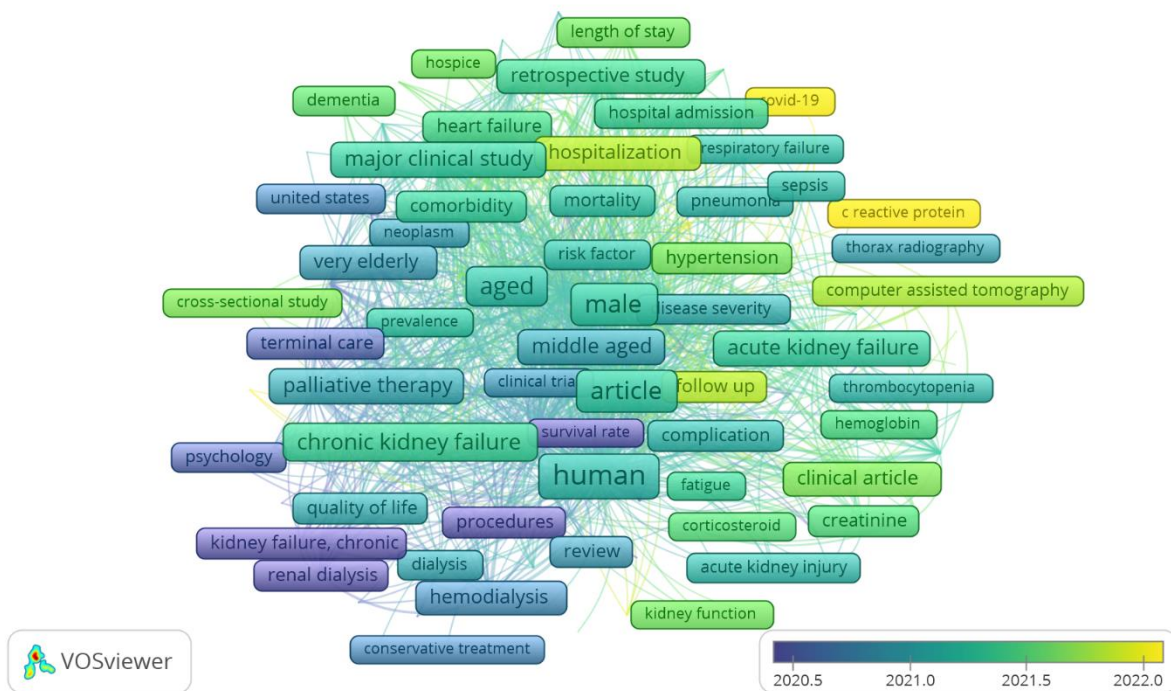


Figure 5. VOSviewer overlay map (Overlay Map)

Figure 5 shows the temporal development of keywords based on a color gradation from blue (earlier) to yellow (newer) on a scale of approximately 2020.5–2022.0. In the early phase (blue–purple), prominent themes centered on chronic kidney disease and patient management/support, such as chronic kidney failure, hemodialysis/dialysis/renal dialysis, kidney failure, chronic, as well as psychosocial outcomes and aspects such as quality of life, psychology, terminal care, and palliative therapy, including methodological terms such as cross-sectional study and review. Entering the middle phase (green–turquoise), the focus shifted to population characteristics and clinical outcomes of healthcare services, characterized by central keywords such as human, aged, male, middle aged, as well as topics such as comorbidity, risk factors, hospitalization, retrospective study, mortality, heart failure, hypertension, and acute kidney injury complications, which are closely linked to complications, survival rates, and clinical markers such as creatinine and hemoglobin. In the most recent phase (yellow-greenish), there is a strengthening of the infection/respiratory issue and the pandemic context, seen in the keywords COVID-19, C-reactive protein, and diagnostic support such as thorax radiography and computer-assisted tomography, which are networked with pneumonia, sepsis, and respiratory failure.

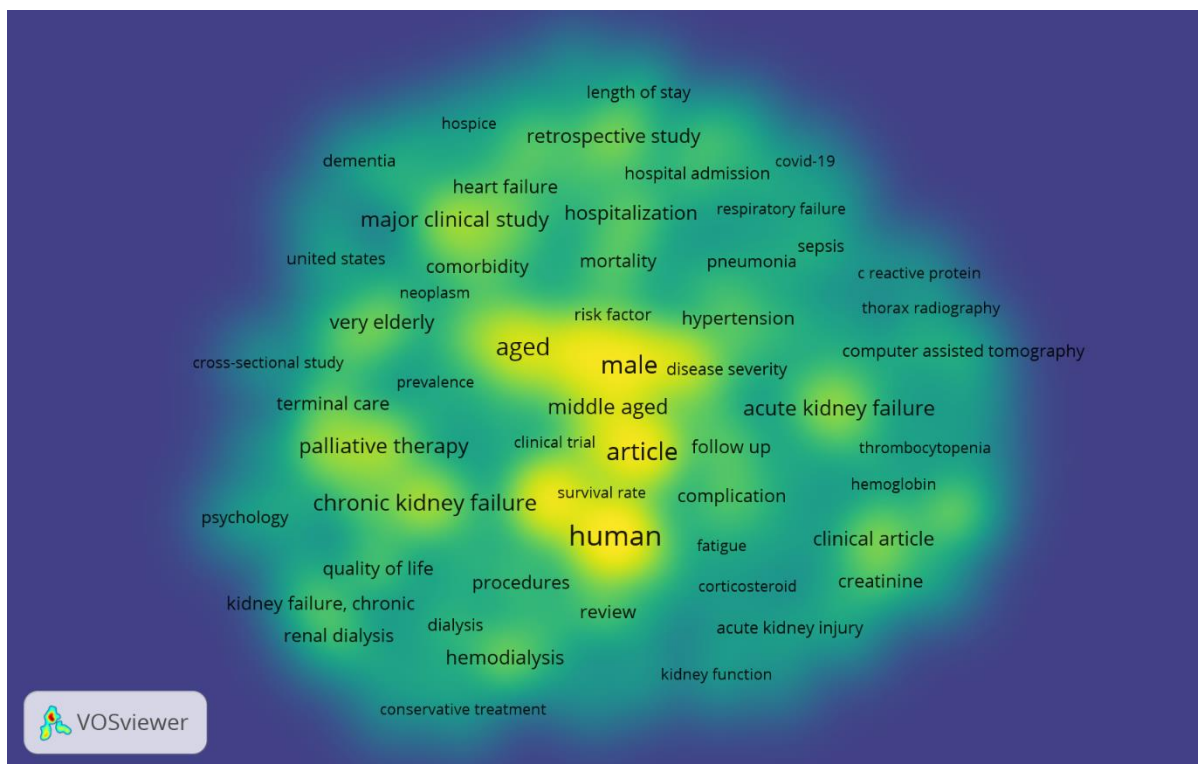


Figure 6. Visualization of keyword co-occurrence density

Figure 6 displays a density map from VOSviewer, where the bright yellow area indicates keywords with the highest frequency and connectivity. The densest hotspots appear centered around the general terms *human*, *aged*, and *male*, as well as *article*, which serve as nodes connecting various clinical themes and patient populations. Around this center emerges a medium-to-high density reflecting the literature's primary focus on the spectrum of kidney disorders and clinical outcomes, such as *chronic kidney failure*, which is closely linked to *hemodialysis/dialysis/renal dialysis therapy* and related terms, and the theme *acute kidney failure/acute kidney injury*, which is linked to *complication*, *creatinine*, *hemoglobin*, and *kidney function*. Other prominent areas of density reflect the context of healthcare care and outcomes, including *hospitalization/hospital admission*, *length of stay*, *mortality*, *risk factors*, and *comorbidities*, including important co-morbidities such as *hypertension* and *heart failure*. On the right side, the infection and respiratory clusters (e.g., *pneumonia*, *sepsis*, *respiratory failure*, *COVID-19*) are visible, along with markers and supporting tests such as *C-reactive protein*, *chest radiography*, and *computer-assisted tomography*, although their intensity is not as pronounced as in the center. Meanwhile, the more peripheral blue-green areas, such as *palliative therapy*, *terminal care*, *quality of life*, *psychology*, and *conservative treatment*, show themes that remain relevant but are relatively less dominant.

DISCUSSION

The research corpus on palliative care for patients with kidney failure lies at the intersection of complex clinical needs, the limitations of curative therapies, and the demands of maintaining patients' quality of life. Kidney failure, particularly in the advanced stages, is associated not only with decreased organ function but also with persistent symptom burden, repeated treatment decisions, and the need for prolonged psychosocial support. Therefore, the themes emerging in the keyword mapping can be interpreted as a reflection of care practices that often place patients with kidney failure in a "trade-off" between prolonging survival and maintaining dignity and comfort (Cibula et al., 2023). The keyword network shows a predominance of demographic and clinical terms related to the elderly population, comorbidities, and inpatient outcomes, confirming that the kidney failure patients focused on in the literature are generally high-risk and clinically complex. This context is important in palliative care because decisions regarding dialysis, limiting interventions, and transitioning to conservative care often occur in the elderly with multiple illnesses (Løhre et al., 2023). Therefore, palliative care in kidney failure should not be understood

solely as a final phase, but rather as a parallel approach that can be implemented early to assist with symptom management, communication of goals of care, and prioritization of patients and families (Leniz et al., 2024).

The strong link between chronic kidney failure, dialysis, and hemodialysis demonstrates that the literature remains largely focused on renal replacement therapy, which is clinically central to the disease process for many patients. However, the presence of keywords such as palliative therapy, terminal care, conservative treatment, and quality of life indicates a growing recognition that dialysis is not always the best option for all patients, particularly the very elderly and those with severe comorbidities (Chen et al., 2022). In these groups, the benefits of dialysis are often outweighed by the burden of therapy, frequent hospitalizations, fatigue, and decreased daily function, making palliative and conservative approaches increasingly relevant alternatives (Comrie et al., 2024).

The presence of the terms psychology and quality of life, although not as prominent as the acute clinical theme, signals that the patient dimension has not yet fully become the center of scientific discussion. In fact, in palliative care practices for kidney failure, symptoms such as pain, pruritus, nausea, dyspnea, insomnia, fatigue, and emotional distress are often the primary reasons for decreased quality of life (Yan et al., 2024). The density map showing lower levels of palliative and psychology themes could be interpreted as an opportunity to strengthen more patient-oriented research, including measuring meaningful patient outcomes, treatment preferences, caregiver burden, and evaluating interventions for symptom control specific to kidney failure (Romero-Correa et al., 2022).

The prominent themes of acute complications such as acute kidney injury, sepsis, pneumonia, respiratory failure, and COVID-19 reflect the reality that the course of kidney failure is often shaped by episodes of acute decompensation and recurrent infections (Romero-Correa et al., 2022). These acute episodes often serve as turning points, forcing rapid decision-making, such as escalating intensive care, continuing or discontinuing dialysis, or changing treatment goals (Abudayyeh et al., 2020). In the palliative care context, this situation underscores the importance of early advance care planning, including prognostic discussions, establishing treatment goals, and preparing families for the possibility of sudden deterioration, so that clinical decisions are not merely reactive to crises (Tobin et al., 2022).

The overlay map showing the sharpening of themes toward clinical monitoring, biomarkers, and ancillary testing can be interpreted as a research trend emphasizing risk stratification and acute clinical management. This trend is crucial for patient safety, but it can make palliative care appear a "fringe" if not balanced with studies on communication, shared decision-making, and integrated care models (Gotou et al., 2022). In palliative care for kidney failure, the quality of communication and continuity of care often determine the patient experience more than laboratory indicators alone, so the integration of the two needs to be strengthened to ensure that the palliative approach is not separated from the mainstream of kidney care (Blum et al., 2023).

The concentrated distribution of publications in specific countries also has implications for how palliative care for kidney failure is understood and implemented. Health systems with widespread dialysis access and robust clinical data tend to produce research focused on hospital outcomes, risk prediction, and intensified monitoring, whereas contexts with limited dialysis access or a predominant infection burden may favor conservative care models and community-based palliative care (Lebovitz et al., 2024). This disparity is important because palliative care approaches are highly influenced by resources, culture, and referral systems, so research findings from one context are not always directly transferable to another (Otsuki et al., 2022).

The research landscape shows that palliative care for patients with kidney failure is still often "attracted" by central clinical themes such as dialysis, acute complications, comorbidities, and inpatient outcomes, while truly patient-centered themes such as quality of life, psychology, conservative care, and terminal care are not as well-developed as acute clinical themes (Demuro et al., 2024). This underscores the need to strengthen the research agenda that evaluates integrated kidney palliative care models, including symptom management strategies, goal-of-care communication, caregiver support, and mechanisms for transitioning care from the hospital to the community (Crooks et al., 2023). An interdisciplinary approach that connects nephrology, geriatrics, palliative care, psychology, and intensive care will help ensure that kidney failure services not only pursue clinical stability but also provide better quality of life and care decisions that align with patient values (Karlic et al., 2023).

CONCLUSION

This bibliometric analysis shows that research on palliative care for patients with kidney failure remains strongly focused on clinical and service themes, particularly chronic kidney failure, dialysis, acute episodes of deterioration, comorbidities, and hospital outcomes. At the same time, keywords representing palliative approaches such as palliative therapy, terminal care, conservative treatment, quality of life, and psychology emerged as important but relatively less dominant themes, indicating that patient-centered outcomes and psychosocial dimensions have not yet become mainstream compared to clinical indicators and complications. Practically, kidney failure services need to integrate palliative care earlier and more structured to support symptom control, communicate goals of care, share decision-making regarding dialysis or conservative treatment, and ensure continuity of care from the hospital to the community. Future research should strengthen meaningful outcome measures for patients and caregivers, employ prospective and longitudinal designs, and test models of kidney palliative care implementation across resource-based contexts. Standardization of terminology and reporting is also crucial to enhance comparability, while multicenter, cross-country collaboration is needed to reduce contextual bias and enhance the global relevance of findings.

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