



RESEARCH ARTICLE

A Bibliometric Analysis of Publications in Chronic Kidney Disease with Hemodialysis: One Decades Study in 2014-2024

Suhastinah¹, Syamsul Arifin², Eko Suhartono³, Roselina Panghiyangani⁴, Rosihan Adhani⁵

¹Department of Public Health, Master's Program, Faculty of Medicine and Health Sciences, Lambung Mangkurat University, Banjarbaru

¹Department of Internal Medicine, Brigjend. H. Hasan Basry Hospital, Kandangan, South Kalimantan, Indonesia

²Department of Health Administration and Policy, Faculty of Medicine and Health Science, Lambung Mangkurat University, Banjarbaru, Indonesia

³Department of Medical Chemistry/Biochemistry, Faculty of Medicine and Health Science, Lambung Mangkurat University, Banjarbaru, Indonesia

⁴Department of Biomedicine, Faculty of Medicine and Health Science, Lambung Mangkurat University, Banjarmasin, Indonesia

⁵Department of Dental Public Health, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

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***Corresponding Author:**

quangpd@ftu.edu.vn

ABSTRACT

Chronic renal failure (CRF) is a significant global health problem. This article presents a bibliometric analysis of research publications related to CRF with hemodialysis therapy over a decade (2014-2024). Data were collected from the Scopus database using the Publish or Perish (PoP) application and analyzed using VOSviewer. The results showed an increase in publications related to GSK and hemodialysis, with diverse research topics, including quality of life, peritoneal dialysis, mortality, depression, and patient compliance. Spain, Brazil and Latin America were the main contributors to these publications. This analysis provides valuable insights into research trends and key contributions in the management of CRF through hemodialysis, as well as identifying potential areas for further research.

INTRODUCTION

Chronic renal failure (CRF) is a degenerative disease that is a major concern in global health. Based on data from the World Health Organization (WHO) in 2019, the prevalence of CRF was 1.3 million people in the world (Lee et al., 2024). Chronic renal failure (CRF) is a progressive and irreversible impairment of kidney function. Progressive kidney damage has fatal consequences and is characterized by uremia or urea and other nitrogenous wastes circulating in the blood and its complications if dialysis or kidney transplantation is not performed (Narsa et al., 2022).

The progression of CFR often proceeds without significant symptoms until it reaches an advanced stage. The basic mechanism of CRF is injury to the kidney tissue that causes a reduction in kidney mass, which then results in an adaptation process in the form of hypertrophy of the remaining normal kidney tissue and hyperfiltration. In the earliest stages, there is a loss of renal capacity when the basal glomerular filtration rate (GFR) is still normal or even increasing. In the final stage of end-stage renal disease (ESRD), the kidneys are no longer able to perform excretory and regulatory functions

adequately, so therapy is required. One therapy that is widely used is hemodialysis (Pretto et al., 2020).

Hemodialysis is the process of exchanging dissolved substances and body waste products. Residual substances that accumulate in CFR patients are withdrawn by a semipermeable membrane passive diffusion mechanism. The transfer of metabolic waste products takes place following a decreasing concentration gradient from the circulation into the dialysate (Aisara et al., 2018). Hemodialysis is performed routinely, usually three times a week, with each session lasting between three to five hours. The procedure requires good vascular access, such as an arteriovenous fistula or central venous catheter, to ensure adequate blood flow during the dialysis process. While hemodialysis can extend the life expectancy of GFT patients, the procedure also comes with various challenges and complications. Some common complications associated with hemodialysis include hypotension, infection at the vascular access, and electrolyte imbalance (Castellano et al., 2022).

Based on the prevalence of CFR, it can be seen that the increasing trend is quite alarming. Many studies have been conducted on the topic of CFR with hemodialysis therapy, but there is no mapping of these studies. Therefore, it is necessary to conduct a bibliometric analysis to comprehensively identify the main topics and research results on CFR with hemodialysis therapy (Hu et al., 2010). Bibliometric analysis aims to obtain maps and trends of scientific publications, author productivity data and journal publishers. Thus, it is expected that bibliometric analysis can enrich the data of the study results and become a source of literacy regarding CFR with hemodialysis therapy.

METHODS

Data Collection

Data were obtained from the Scopus database using the Publish or Perish (PoP) application which is downloaded for free via the web <https://harzing.com/resources/publish-or-perish> with the criteria (a) original research or review (b) keywords used chronic kidney disease and haemodialysis patient (c) Articles published from 2014 to 2024.

The data obtained was then stored in *.csv format and converted into *.xls format which was used to classify countries with the most documents, authors with the most citations, In addition, journals/publishers where publications and document productivity in each year were also recorded.

Data Analysis

The data that has been obtained is analyzed descriptively using VOSViewer which is downloaded from the website <https://www.vosviewer.com/>. The use of VOSViewer is aimed at visualizing the mapping of previous research, which includes the topic of chronic renal failure with hemodialysis (Elishian and Zuas, 2021).The visualization includes the 10 countries with the most documents, the authors with the most citations, the journals/publishers where they were published and the productivity of the documents in each year.

RESULTS AND DISCUSSION

Metric Citation Explanation

The search results through PoP using the Scopus database from 2014-2024, 200 articles were obtained, but 105 documents met the criteria. The document data metrics can be seen in Table 1.

Table 1. Citation metric results of Scopus data mining 2014-2024

Citation Metric	
Publication years	2014-2024
Citation years	10 (2014-2024)
Papers	105

Citation	359
Cites/year	35.90
Cites/paper	3.42
Cites/author	359.00
Papers/author	105.00
Author/papers	1.00
h-index	10

Based on the data in Table 1, research related to chronic renal failure and hemodialysis every year there is an increase in the number of documents. This can be seen in Figure 1.

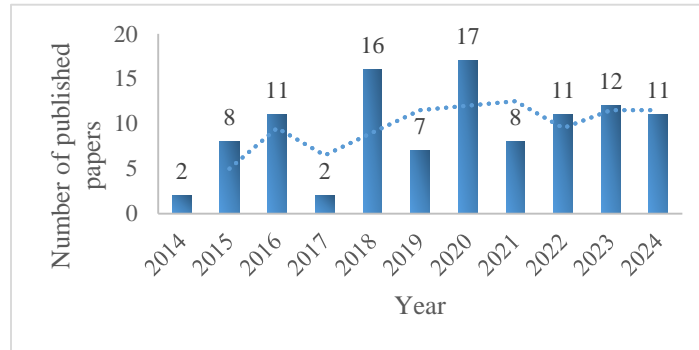


Figure 1. The Number of Published Papers of Chronic Renal Failure with Hemodialysis between 2014-2024

In general, research on CKD with hemodialysis therapy has increased from 2015-2024, but in 2014 and 2017 there were only 2 documents. This is because the number of patients with kidney failure is also not large. Meanwhile, in 2018 and 2020 there was an increase in the number of documents. However, from 2022 to 2024 the number of published documents remained relatively constant, around 11 to 12 documents.

Research topics related to chronic renal failure with hemodialysis are quite diverse. This can be seen from Figure 2.

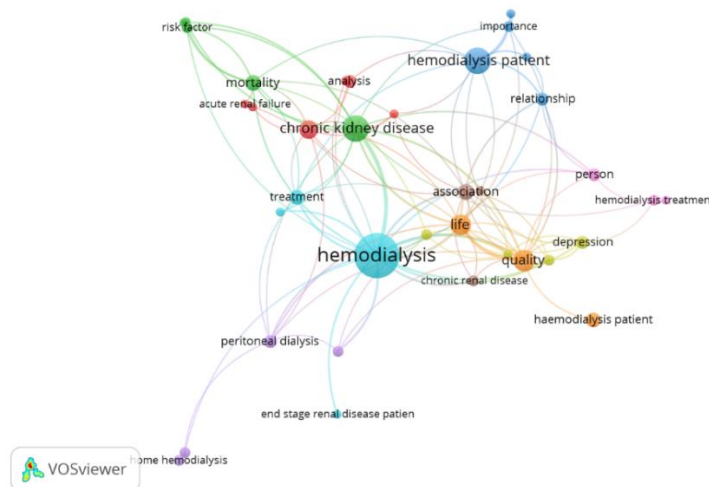


Figure 2: Relationship of hemodialysis-related research topics

Based on Figure 2, research topics related to hemodialysis can be mapped. The mapping of these topics can be seen in Figure 3.

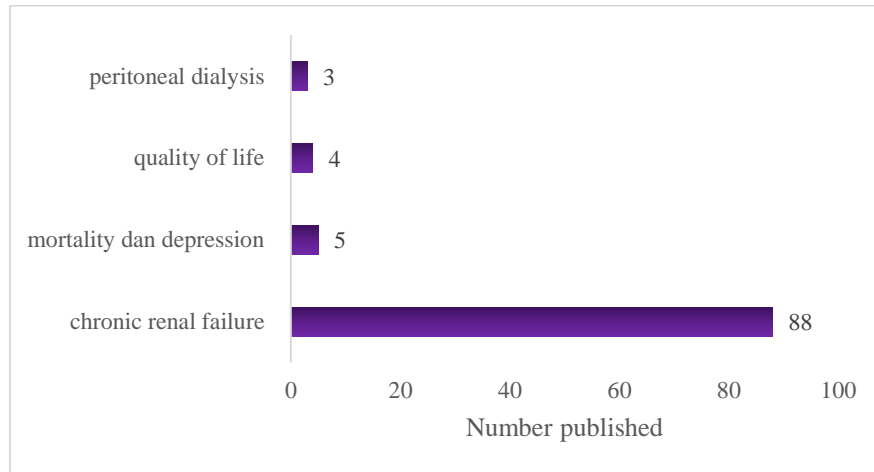


Figure 3: Research topics related to hemodialysis

Referring to Figure 3, it turns out that there are still many research topics that can still be developed for future studies. For example, the topics of quality life, peritoneal dialysis, and mortality and depression. In addition to the existing topics, the topic of adherence is also still an interesting topic to study. The topic of chronic renal failure is a widely researched topic related to hemodialysis. This topic is the most researched because hemodialysis is one of the treatments performed and is still a researched topic.

An interesting point related to figures 2 and 3 is that the country that contributes the most documents is Spain with 42 documents. In general, the top 10 countries contributing the most documents can be seen in Figure 4.

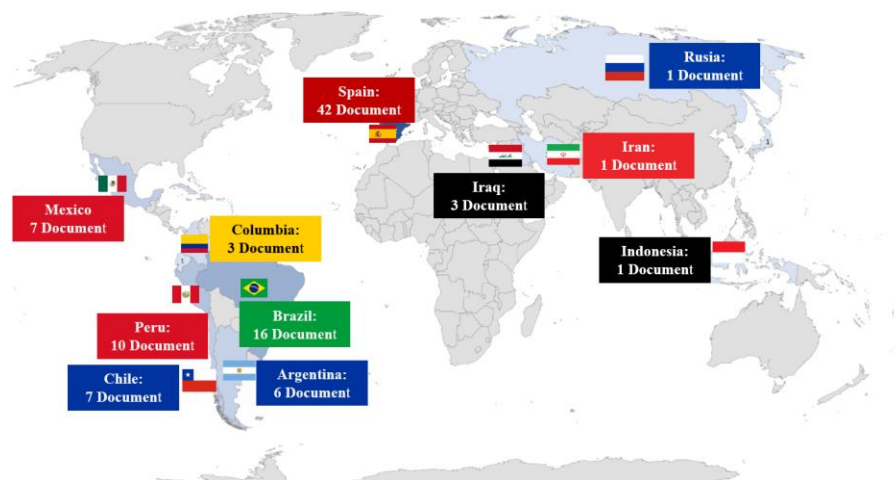


Figure 4. Countries contributing hemodialysis topic documents

Figure 4 shows that many publications were made by countries in Latin America such as Brazil, Peru Chile, Mexico, and Argentina. It is suspected that in these countries there are many chronic kidney failure problems that undergo hemodialysis therapy. In addition to countries, data was also obtained

on the 10 authors with the most citations related to the topic of research on CKD with hemodialysis therapy. This can be seen in table 2.

Table 1. The most cited authors

No	Author	Title	Citation
1	G.O. Rizo-Rivera	Treatment Of Hypertension in Patients on Hemodialysis and Chronic Renal Insufficiency	38
2	R. Pérez-García	Hyponatraemia, Mortality and Haemodialysis: An Unexplained Association	21
3	R.A. Aepúlveda	Survival Analysis of Patients Starting Hemodialysis in Chile Between 2013 And 2019	20
4	T. Monzón	Use HFR-Supra for Inflammatory Bowel Disease: A Case Report	16
5	R.D. Camargo Rubio	Bioethics in Advanced Chronic Kidney Patients with Renal Replacement Support Therapies: Hemodialysis, Peritoneal Dialysis and Transplants	13
6	M.K. Ali	Endovascular Therapy for Central Venous Obstruction as A Consequence of Prolonged Hemodialysis	12
7	T. Monzón	Curcumin Intake in Haemodialysis Patients	12
8	H.M. Villafuerte-Ledesma	Association Between Vitamin D Serum Levels and Inflammatory Markers in Patients on Hemodialysis	10
9	R.M. Sánchez Soriano	Long-Term Prognostic Impact of Anticoagulation on Patients with Atrial Fibrillation Undergoing Hemodialysis	10
10	T.L.L. Rebouças	Nanda-I Nursing Diagnoses for Chronic Kidney Patients on Hemodialysis: Scope Review	10

In addition, data has been obtained from 8 publishers who publish scientific articles. In detail, the 8 publishers of journals where the most documents are published will be presented as in Figure 5.

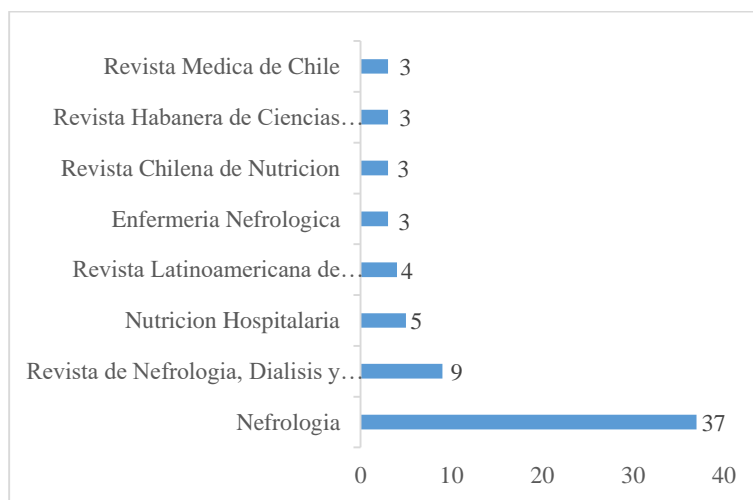


Figure 5. The most receptive journals publication

Figure 5, Nephrologia published 32 documents. Nefrologia is a publisher that publishes basic or clinical research articles related to nephrology, hypertension, dialysis and kidney transplantation.

Nefrologia has the same scope as the publisher of the journal *Revista de Nefrologia, Dialisis y Trasplante* which publishes the second most articles, which is 9 documents.

CONCLUSIONS

Bibliometric analysis of Chronic Kidney Disease (CKD) with hemodialysis therapy shows that research in this field has grown significantly in the last few decades. Many research topics can still be developed for future studies, namely the topics of quality life, peritoneal dialysis, and mortality and depression. In addition to the existing topics, the topic of adherence is also still an interesting topic to study. The topic of chronic renal failure is the most researched topic related to hemodialysis, because hemodialysis is one of the treatments that is still being researched. This analysis also identifies influential authors, journals and institutions in this field, providing a comprehensive overview of research trends and key contributions to the management of CKD through hemodialysis.

REFERENS

- Aisara S, Azmi S, and Yanni M, 2018. Gambaran Klinis Penderita Penyakit Ginjal Kronik yang Menjalani Hemodialisis di RSUP Dr. M. Djamil Padang. *Jurnal Kesehatan Andalas*. 7(1):42-50. <http://dx.doi.org/10.25077/jka.v7i1>
- Ali MK, and Hussein AM, 2023. Endovascular Therapy for Central Venous Obstruction As A Consequence of Prolonged Hemodialysis. *Revista Latinoamericana de Hipertension*. 18(7):300-304. <http://doi.org/10.5281/zenodo.10091450>
- Castellano S, Palomares I, Moissl U, Chamney P, Carretero D, Crespo A, et al. (2016). Appropriate assessment of body composition to identify haemodialysis patients at risk. *Nefrología*. 36: 268–274. <https://doi.org/10.1016/j.nefro.2016.06.001>
- Camargo Rubio RD, 2024. Bioethics in advanced chronic kidney patients with renal replacement support therapies: hemodialysis, peritoneal dialysis and transplants. *Acta Colombiana de Cuidado Intensivo*. 18(5). <https://doi.org/10.24857/rgsa.v18n5-067>
- Elishian C, Zuas O, 2021. Penelitian Arsenik (As) Di Indonesia: Analisis Bibliometrik 1990-2021. In: *Prosiding Seminar Nasional Penerapan Ilmu Pengetahuan Dan Teknologi*, 6: 189–198
- Rizo-Rivera GO, 2020. Treatment Of Hypertension in Patients on Hemodialysis and Chronic Renal Insufficiency. *Revista de la Federacion Argentina de Cardiologia*, 6. 10.56294/saludcyt2024744
- Hu J, Ma Y, Zhang L, Gan F, Ho YS, 2010. A historical review and bibliometric analysis of research on lead in drinking water field from 1991 to 2007. *Science of the Total Environment*. 408: 1738-1744. <https://doi.org/10.58905/athena.v1i4.121>
- Lee J, Oh S, Byon J, Lee W, Weon B, et al, 2024. Long-term exposure to high perceived temperature and risk of mortality among patients with chronic kidney disease. *Heliyon*, 10:e25222. <https://doi.org/10.1016/j.heliyon.2024.e25222>
- Pérez-García R, Palomares I, Merello JI, Ramos R, Maduell F, Molina M, Aljama P, Marcelli D; ORD Group. 2016. Hyponatraemia, mortality and haemodialysis: An unexplained association. *Nefrologia*, 36(1): 42-50. English, Spanish. doi: 10.1016/j.nefro.2015.10.005.
- Pretto CR, Winkelmann ER, Hildebrandt LM, Barbosa DA, Colet CF, Stumm EMF. Quality of life of chronic kidney patients on hemodialysis and related factors. *Rev. Latino-Am. Enfermagem*. 2020;28:e3327. <http://dx.doi.org/10.1590/1518-8345.3641.3327>.
- Rebouças TLL, Lins SMSB, Santana RF, Tavares JMAB, Pereira SK, Paula MCSM, Assad LG. NANDA-I nursing diagnoses for chronic kidney patients in hemodialysis: scope review, 2024. *Rev baiana enferm*. 38:e53348
- Sánchez Soriano RM, Albero Molina MD, Chamorro Fernández CI, Juliá-Sanchís R, López Menchero R, Del Pozo Fernández C, Grau Jornet G, Núñez Villota J, 2018. Long-term prognostic impact of anticoagulation on patients with atrial fibrillation undergoing hemodialysis. *Nefrologia (Engl Ed)*. 38(4):394-400. English, Spanish. doi: 10.1016/j.nefro.2017.11.026.

- Sepúlveda RA, Pavlovic A, Corsi O, Jara A, 2020. Survival analysis of patients starting hemodialysis in Chile between 2013 and 2019. *Rev Med Chil.* Dec;148(12):1715-1724. Spanish. doi: 10.4067/S0034-98872020001201715.
- Monzón T, Valga F, Henríquez F, Alonso F, Parodis Y, Hillebrand S, Pérez GA, 2021. Use HFR-supra for inflammatory bowel disease: A case report. *Nefrologia (Engl Ed)*, 23:S0211-6995(21)00053-9. English, Spanish. doi: 10.1016/j.nefro.2020.11.018.
- Monzón T, Valga F, Henriquez F, 2018. Curcumin intake in hemodialysis patients. *Nefrologia (Engl Ed)*, 38(6):676-677. English, Spanish. doi: 10.1016/j.nefro.2017.12.002.
- Narsa, A.C., Maulidya, V., Reggina, D., Andriani, W., Rijai, H.R. (2022). Studi Kasus: Pasien Gagal Ginjal Kronis (Stage V) dengan Edema Paru dan Ketidakseimbangan Cairan Elektrolit. *Jurnal Sains dan Kesehatan*, 17- 22.
- Villafuerte-Ledesma HM, Moragrega B, Castellón E, Luzón-Alonso M, García-Mena M, 2020. Association between vitamin D serum levels and inflammatory markers in patients on hemodialysis. *Gac Med Mex.* 156(6):509-515. English. doi: 10.24875/GMM.M21000452.