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Global Research Trends on Fluid Restriction Self-Efficacy, Adherence, and Interdialytic Weight Gain in Hemodialysis

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Abstract

Purpose : This study aims to analyse global trends and developments in research on interdialytic weight gain (IDWG) in patients undergoing haemodialysis, with a focus on behavioural factors such as self-efficacy and adherence to fluid restrictions. This study also aims to map the growth of scientific publications, identify key research themes, and explore research gaps in the literature regarding fluid management in haemodialysis patients.

Design/Methodology/Approach : This study employs a bibliometric analysis approach with a descriptive quantitative design. Bibliographic data were obtained from the Scopus database for the period 2016–2025 using keywords related to interdialytic weight gain and haemodialysis. A total of 170 articles meeting the inclusion criteria were analysed using the Bibliometrix package in RStudio to identify publication trends, author productivity, and research collaboration patterns. Keyword network visualisation and thematic structure mapping were performed using VOSviewer software.

Findings : The analysis results indicate that publications on IDWG in haemodialysis patients have shown steady growth with an annual growth rate of 6.17%. This study also reveals a high level of

scientific collaboration, with an average of seven authors per article and international collaboration accounting for 24.12%. Thematic analysis indicates that the majority of research remains focused on physiological aspects such as fluid management, cardiovascular complications, and patient outcomes, whilst patient behavioural dimensions such as self-efficacy and adherence to fluid restrictions remain relatively under-explored.

Originality/Value : This study provides a comprehensive overview of the global research landscape regarding IDWG and identifies research gaps in the behavioural and psychosocial dimensions of patients. These findings underscore the importance of a multidisciplinary approach that integrates behavioural aspects into fluid management for haemodialysis patients.

Keyword: Bibliometric Analysis, Interdialytic Weight Gain, Haemodialysis, Self-Efficacy, Adherence to Fluid Restriction.

INTRODUCTION

The transformation of global healthcare indicates that chronic diseases, including end-stage renal disease (ESRD), are becoming one of the major challenges facing modern healthcare systems. Patients with ESRD undergoing haemodialysis require strict fluid management to prevent the accumulation of excess fluid in the body. Fluid restriction is a key component of outpatient haemodialysis patient management, as the failing kidneys are unable to excrete fluid adequately. The inability to control fluid intake between dialysis sessions can lead to interdialytic weight gain (IDWG), which is consistently associated with an increased risk of cardiovascular morbidity, mortality, and a reduced quality of life for patients (Lee et al., 2021). Nevertheless, patient adherence to fluid restrictions remains a major challenge in clinical practice, with reported rates of non-adherence ranging from 30% to 74% among haemodialysis patients in various countries.

Interdialytic weight gain (IDWG) is one of the key indicators used to assess the success of fluid

management in haemodialysis patients. IDWG reflects the amount of fluid accumulated in the body during the interdialytic period as a result of excessive fluid and sodium intake, as well as the kidneys' limited ability to excrete fluid (Ramadhan et al., 2023). Various studies have shown that high IDWG is associated with a number of serious complications, such as pre-dialysis hypertension, haemodynamic instability during dialysis, increased cardiac workload, and an increased risk of hospitalisation and mortality in patients with end-stage renal disease (ESRD) (Flythe et al., 2013). In addition to these effects, uncontrolled IDWG also increases the burden on healthcare services as it requires more aggressive ultrafiltration strategies and the management of more complex complications (Kalantar-Zadeh et al., 2022). Consequently, controlling IDWG has become a key priority in the management of haemodialysis patients across various healthcare systems, including in developing countries facing resource constraints in the management of chronic diseases (Saran et al., 2020).

Although physiological factors play a role in the increase in IDWG, various studies indicate that interdialytic weight control is heavily influenced by patient behaviour, particularly adherence to fluid restrictions and the recommended diet. In the context of chronic disease management, adherence is a key component of patients' self-management behaviour, encompassing the ability to follow medical recommendations, control fluid intake, and consistently maintain a healthy lifestyle. Good self-management behaviours, such as effective communication with healthcare professionals, partnership in the care process, and self-advocacy, have been shown to contribute to better control of IDWG baik (Natashia et al., 2019). Conversely, non-adherence to fluid restrictions is one of the main factors leading to increased IDWG in haemodialysis patients (Ozen et al., 2019). Low levels of adherence are often influenced by various psychosocial factors, such as chronic stress, fatigue from long-term therapy, and limited social support. In this context, the presence of strong social support from family and the surrounding community has been shown to play a crucial role in improving patient adherence to treatment plans and fluid management (Rondhianto et al., 2024);(Noviana & Zahra, 2022). Patients who demonstrate better adherence tend to have lower IDWG and a better quality of life compared to patients with low adherence (Alikari et al., 2022).

In addition to social and behavioural factors, psychological aspects also play a significant role in determining a patient's success in maintaining adherence to fluid restrictions. One psychological construct that has been extensively studied in the management of chronic diseases is self-efficacy, which refers to an individual's belief in their ability to perform the behaviours necessary to achieve specific health goals. This concept forms a key part of Social Cognitive Theory, which emphasises that an individual's belief in their own capabilities can influence motivation, persistence, and success in adopting health-related behaviours. Various studies indicate that self-efficacy has a

positive association with treatment adherence and self-management behaviours across various chronic conditions, including heart failure, diabetes, and chronic kidney (R. Zhang et al., 2025);(Wu et al., 2021);(Wierdsma et al., 2011);(Krzemińska et al., 2021). In haemodialysis patients, high self-efficacy is associated with better ability to control fluid intake, adhere to dietary restrictions, and maintain self-care behaviours consistently, which ultimately contributes to more optimal control of IDWG. Conversely, low self-efficacy is often associated with non-compliance with fluid restrictions and increased IDWG, particularly in patients experiencing treatment fatigue due to long-term haemodialysis (Alikari et al., 2022). Recent research also indicates that self-efficacy can act as a key mediator between educational interventions and clinical outcomes, with increased self-efficacy proven to improve adherence and reduce IDWG in haemodialysis patients (L. Zhang et al., 2025).

A number of previous studies have examined the relationship between self-efficacy, adherence, and interdialytic weight gain (IDWG) in haemodialysis patients; however, the results of these studies still show variation in their focus and analytical approaches. A study conducted by (Turan et al., 2026), demonstrated that self-efficacy has a significant positive association with adherence to fluid and dietary restrictions, although the study focused more on behavioural outcomes without evaluating IDWG as a primary indicator. Another study by (L. Zhang et al., 2025) found that self-efficacy and social support play a significant role in fluid intake management, with patients exhibiting higher levels of self-efficacy tending to have lower IDWG. However, this study has not comprehensively integrated the role of adherence as a mediating variable in the relationship between self-efficacy and IDWG. Meanwhile, an intervention study conducted by (Pradhan et al., 2025) demonstrated that educational and psychosocial approaches can improve IDWG control as well as the quality of life of haemodialysis patients. These findings suggest that the relationship between self-efficacy, adherence, and IDWG still requires more integrated research to understand the behavioural mechanisms influencing fluid control in haemodialysis patients.

Based on the above discussion, it can be concluded that the control of interdialytic weight gain (IDWG) in haemodialysis patients is influenced not only by clinical factors, but also by behavioural and psychosocial factors, particularly self-efficacy and adherence to fluid restrictions. Although the relationship between these variables has been extensively studied, existing reviews remain fragmented and have not provided a comprehensive overview of research developments, publication trends, patterns of scientific collaboration, and the structure of research themes in the global literature. Therefore, an approach is required that can systematically map the research landscape in this field. This study aims to analyse global research trends and developments regarding self-efficacy, adherence to fluid restrictions, and interdialytic weight gain in haemodialysis patients using a bibliometric approach. Through this analysis, it is hoped that patterns of

publication growth, contributions by countries and institutions, scientific collaboration networks, and emerging research themes can be identified, thereby providing a scientific basis for the development of future research and interventions.

METHODS

Study Design

This study employs a bibliometric analysis approach with a descriptive quantitative design to map the global development of research on interdialytic weight gain (IDWG) in patients undergoing haemodialysis. Bibliometric analysis was used to identify publication trends, the contributions of authors and institutions, and the conceptual structure within the scientific literature.

Data Source and Search Strategy

Bibliographic data were obtained from the Scopus database due to its extensive coverage of international journals and consistent metadata for bibliometric analysis. The search was conducted in the title, abstract and keywords fields using the following combination of keywords: (TITLE-ABS-KEY ('INTERDIALYTIC WEIGHT GAIN') AND TITLE-ABS-KEY (Hemodialysis)) AND PUBYEAR > 2016 AND PUBYEAR < 2025 AND (LIMIT-TO (SRCTYPE , 'j')) AND (LIMIT-TO (OA , "all")) AND (LIMIT-TO (EXACTKEYWORD , 'Hemodialysis')) AND (LIMIT-TO (SUBJAREA , 'MEDI') OR LIMIT-TO (SUBJAREA , 'NURS')) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , 'English')). to ensure the inclusion of relevant publications. Inclusion criteria include research articles and review articles published in reputable scientific journals that discuss the application of digital health technologies in the context of chronic disease management. Exclusion criteria include editorials, letters to the editor, conference proceedings, and publications that do not specifically address the research topic. The publication year range is limited to 2016–2025, and only English-language articles were included in the analysis.

Data Analysis

Data analysis was conducted using the Bibliometrix and RStudio software packages to analyse

publication performance and research trends. Bibliometric network visualisation was carried out using VOSviewer to map keyword co-occurrence relationships and identify thematic structures within the literature. The analysis covered annual publication growth, author productivity, collaboration patterns, and the mapping of research concepts.

Inclusion and Exclusion Criteria

Figure 1. Research Flowchart

RESULTS

A preliminary analysis was conducted to identify the general characteristics of the research dataset under analysis. The dataset in this study comprises scientific publications relating to interdialytic weight gain (IDWG) in haemodialysis patients during the period 2016–2025. Basic information regarding the number of documents, publication sources, citation patterns, and authorship characteristics was used to describe the structure and development of the literature in this field. A summary of the dataset characteristics is presented in Table 1.

Table 1. Key Information Data

Description

Results

MAIN INFORMATION ABOUT DATA

Timespan

2016:2025

Sources (Journals, Books, etc)

81

Documents

170

Annual Growth Rate %

6,17

Document Average Age

5,18

Average citations per doc

16,47

References

15699

DOCUMENT CONTENTS

Keywords Plus (ID)

1448

Author's Keywords (DE)

456

AUTHORS

Authors

1049

Authors of single-authored docs

3

AUTHORS COLLABORATION

Single-authored docs

3

Co-Authors per Doc

7

International co-authorships %

24,12

DOCUMENT TYPES

article

170

Based on the characteristics of the dataset for the period 2016–2025, there were 170 articles published in 81 journal sources. The data shows an annual growth rate in publications of 6.17%, indicating a gradual increase in research interest in this field of study. The average document age of 5.18 years indicates that the majority of publications are relatively recent, suggesting that the research topics are still evolving and remain relevant to current scientific issues. Furthermore, an average of 16.47 citations per document indicates that the articles in the dataset have a reasonably strong academic impact and are frequently cited as references in subsequent research.

In terms of content, there are 1,448 Keywords Plus and 456 Author's Keywords, indicating the diversity of topics and concepts within the analysed literature. Meanwhile, in terms of authorship, there are 1,049 authors contributing to these publications, with an average of 7 authors per article, indicating a high level of research collaboration. This is reinforced by an international collaboration rate of 24.12%, indicating the involvement of researchers across national borders. All documents in the dataset are journal articles, and thus possess relatively high academic quality as they have undergone a peer-review process. Overall, these findings suggest that this field of research is developing collaboratively and makes a significant scientific contribution.

Figure 2. Publications by Year

The annual publication graph illustrates the trend in research on the topic of Interdialytic Weight Gain in the context of patients undergoing haemodialysis during the period 2016–2025. Overall, the number of publications shows an upward trend with some fluctuations, with 2025 recording the highest number of publications during the observation period. A study conducted by (Ozen et al., 2025) indicates that factors such as interdialytic weight gain (IDWG), dialyzer type, and age play a

role in determining the duration of a patient's recovery following haemodialysis (dialysis recovery time), which reflects the patient's level of fatigue and ability to resume activities after dialysis therapy. In line with these findings, the study by (Al Barbandi et al., 2025) emphasises that excessive interdialytic weight gain is a key indicator of fluid overload associated with an increased risk of cardiovascular events in haemodialysis patients. Through a quality improvement approach involving patient education, nurse-led communication, and modification of dialysate sodium concentration, the study successfully reduced the incidence of IDWG significantly. Furthermore, a study (Yangöz et al., 2025) highlights the importance of patient behavioural factors, particularly self-efficacy in managing fluid intake, which has been shown to correlate with inter-dialysis weight gain. These findings confirm that the success of fluid control in haemodialysis patients is not solely influenced by the patient's ability to self-manage daily fluid intake. Overall, this trend indicates that research interest in the topic of IDWG in haemodialysis patients continues to grow and has seen a significant resurgence in recent years.

Figure 3. Cross-border collaboration

Source: Rstudio

The figure shows a map of international collaborative networks between countries in research relating to interdialytic weight gain (IDWG) and haemodialysis therapy. This visualisation was generated through bibliometric analysis using VOSviewer software, which maps scientific collaboration based on joint publications between countries. On the map, the intensity of the colour represents a country's level of research productivity, whilst the connecting lines indicate the existence of scientific collaboration through joint publications.

The visualisation results indicate that several countries play a significant role in the global research collaboration network. The United States appears as one of the main hubs of collaboration, with a relatively high number of connections to various other countries. This position highlights the country's significant contribution to the development of research related to haemodialysis and fluid management in patients with chronic kidney disease. The dominance of developed nations within the global research network is also consistent with previous findings indicating that research capacity, resource availability, and the number of academic institutions play a crucial role in

determining research productivity and impact in the field of nephrology (Flythe et al., 2013); (Kalantar-Zadeh et al., 2022).

Furthermore, several other countries, such as Canada, Italy, India, Hong Kong, and New Zealand, also demonstrate active involvement in international collaborative networks. The existence of collaborative relationships between these countries indicates that research on the management of IDWG and haemodialysis therapy is a global health issue requiring a multidisciplinary approach and international cooperation. Previous studies have emphasised that effective management of IDWG requires the integration of various strategies, including optimal fluid management, patient education interventions, and continuous monitoring of fluid status (Bossola et al., 2025); (Ramadhan et al., 2023).

In the European region, the United Kingdom and Italy appear to act as hubs within the research collaboration network. This position highlights the strategic role of these countries in bridging various international research groups and strengthening the exchange of scientific knowledge through cross-institutional collaboration. Meanwhile, the increasing contribution of Asian countries such as India and Hong Kong indicates that the Asian region is beginning to play an increasingly significant role in research related to chronic kidney disease and dialysis therapy. This aligns with the rising global prevalence of chronic kidney disease and the need for more effective management strategies for patients undergoing haemodialysis (Saran et al., 2020).

Overall, the collaborative network patterns shown in the visualisation indicate that research on IDWG and haemodialysis is advancing through extensive international cooperation. Cross-national collaboration contributes to improved research quality, expands the exchange of scientific knowledge, and supports the development of more comprehensive approaches to fluid balance management in haemodialysis patients. Nevertheless, the distribution of collaborations still shows a concentration in countries with more advanced research capacity, thereby opening opportunities for increased participation by developing countries in the global research network in the field of nephrology.

Source : Rstudio

The figure shows a visualisation of “Most Relevant Authors”, illustrating the most productive authors based on the number of documents (N of Documents) within a collection of scientific publications. The horizontal axis shows the number of documents published by each author, whilst the vertical axis shows the author’s name. The further to the right a point is on the graph, the higher the number of publications produced by that author within the research topic being analysed.

The graph indicates that there is one dominant author with approximately 11 publications, occupying the far-right position on the graph. This position indicates that this author has made the greatest contribution to the development of the literature in the field of study being analysed. One of the studies conducted (Kotanko P et al., 2018) showed that sodium adjustment has a positive effect on several parameters related to body fluid volume, particularly evident in the reduction of Interdialytic Weight Gain (IDWG), which is the increase in a patient’s body weight between two haemodialysis sessions and typically reflects fluid retention. Furthermore, there is a tendency towards improvement in pre-dialysis haemodynamic parameters, such as blood pressure, although these changes do not show strong statistical significance.

This dominance suggests that the author is likely a key researcher or a leading figure in the field of research, whether through independent research or collaboration with other researchers. The presence of a highly productive author often serves as an indicator of the existence of a centre of excellence or research leadership within a specific topic.

Figure 5. Network Mapping Based on Keywords

Source : Rstudio

The keyword network visualisation in the figure displays a keyword co-occurrence map generated using VOSviewer software. The map illustrates the conceptual relationships between research topics in the scientific literature concerning patients undergoing haemodialysis, particularly in the context of fluid management and the phenomenon of interdialytic weight gain (IDWG). In practice, IDWG is an important indicator reflecting the accumulation of body fluid between two dialysis sessions and is frequently used as a parameter to evaluate the effectiveness of fluid management in haemodialysis patients. In line with the findings reported by (Bossola et al., 2025), weight gain between dialysis sessions caused by excessive fluid intake is a key parameter in the assessment of fluid management in patients with chronic kidney disease. Excessive IDWG has been associated with an increased risk of cardiovascular complications, including left ventricular hypertrophy and cardiac dysfunction, making it a key indicator in monitoring the condition of patients undergoing long-term haemodialysis therapy.

Network visualisation analysis indicates that the research literature in this field forms several thematic structures reflecting the primary focus of research. One dominant thematic structure is located at the centre of the network with relatively large node sizes, indicating that keywords within that group have a high frequency of occurrence and strong connections with other keywords. These thematic structures generally encompass core concepts such as haemodialysis, fluid management, and IDWG. The central position of these concepts indicates that fluid balance control is a crucial issue in the care of patients with chronic kidney disease undergoing dialysis therapy. In this context, IDWG is frequently used as an indicator to evaluate patient adherence to fluid restrictions and the effectiveness of dialysis therapy strategies (Widyawati et al., 2019). However, adherence to fluid restrictions remains a significant challenge for the majority of haemodialysis patients. Various factors, including psychological conditions, stress levels, and family support, are known to contribute to patients' success in controlling fluid intake. These findings align with research (Mailani et al., 2021) which emphasises that effective fluid management strategies require a multidimensional approach, such as enhanced patient education, appropriate dietary management, and the use of technologies like bioimpedance analysis to assess fluid status more accurately.

Network visualisation also identified other thematic structures highlighting aspects of patient behaviour and adherence in haemodialysis therapy management. These thematic structures encompass concepts such as self-efficacy, adherence to fluid restrictions, and patient education interventions. The literature indicates that levels of self-efficacy have a significant influence on fluid intake management behaviour in haemodialysis patients. Patients with higher levels of self-efficacy tend to have better ability to control daily fluid intake, resulting in lower IDWG values compared to

patients with low self-efficacy (Zhong et al., 2025);(Turan et al., 2026)(Wijayanti et al., 2023). These findings confirm that the success of haemodialysis therapy management is influenced not only by medical and procedural factors, but also by psychological and behavioural factors in patients. Therefore, the development of interventions that not only focus on clinical aspects but also strengthen patients' psychological capacity through enhanced self-efficacy and health education is a crucial strategy for improving adherence to fluid restrictions and optimising outcomes in haemodialysis patients.

Figure 6. The development of research into interdialytic weight gain (IDWG) in haemodialysis

Source : VosViewer

The overlay visualisation in the figure illustrates the dynamics of research development regarding interdialytic weight gain (IDWG) in patients undergoing haemodialysis. The map was generated through bibliometric analysis using VOSviewer software, which maps co-occurrence relationships between concepts in the scientific literature whilst representing the temporal development of research. In this visualisation, node size indicates the frequency of a concept's appearance in scientific publications, whilst colour gradation reflects the average year of publication, thereby enabling the identification of the evolution of research focus over time.

The analysis results indicate that concepts related to haemodialysis hold the most dominant position within the research network, as evidenced by the large node size and their connections to various other issues such as IDWG, fluid management, cardiovascular complications, and patient mortality. These findings suggest that fluid balance management is a crucial aspect of care for patients with end-stage kidney disease. In line with this, research by (Christa et al., 2025) indicates that fluid overload is a significant risk factor for increased all-cause mortality and cardiovascular complications in dialysis patients. Furthermore, a large-scale study conducted by (Huang et al., 2018), involving over 9,000 patients, found that variability in fluid overload status, as measured by the fluid overload/extracellular water (FO/ECW) ratio, significantly increased the risk of death in the dialysis patient population.

From the perspective of the evolving literature, early-stage research tended to focus on the physiological aspects associated with increased IDWG. Studies during this period emphasised the relationship between fluid accumulation between dialysis sessions and various cardiovascular

complications, including hypertension, heart failure, and an increased risk of mortality in patients with end-stage kidney disease. The primary focus of research in this phase was to understand the pathophysiological mechanisms linking increased IDWG to cardiovascular disorders. In line with this, research by (Jonny et al., 2025) highlights the need for further studies to explore the long-term effects of various dialysis modalities on cardiovascular outcomes and to develop interventions capable of targeting the biological mechanisms underlying the relationship between IDWG and cardiovascular complications.

More recent research developments indicate a growing focus on patient-centred intervention approaches, including health education, self-management programmes, and enhancing self-efficacy in controlling fluid intake. These approaches emphasise the importance of patient empowerment in the management of chronic diseases. Various studies indicate that education- and self-management-based interventions can improve patients' knowledge, strengthen self-efficacy, and enhance adherence to fluid restrictions, which ultimately contribute to a reduction in IDWG scores and improved outcomes for haemodialysis patients (Parker, 2019);(Sajjadi et al., 2024);(Isnaini et al., 2021).

Overall, the evolving literature suggests a shift in the research paradigm within the field of haemodialysis, moving from an approach focused on physiological complications towards a more comprehensive approach that integrates patient-related factors, behavioural aspects, and psychosocial factors. The integration of these approaches is crucial because the successful management of IDWG is influenced not only by dialysis therapy but also by patients' adherence to fluid restrictions, educational support, and their ability to self-manage their chronic condition.

Gambar 7. Visualisasi overlay interdialytic weight gain (IDWG) hemodialisis (2016-2025)

Source : VosViewer

The figure shows a density visualisation of the co-occurrence network relating to interdialytic weight gain (IDWG) in patients undergoing haemodialysis. This visualisation was generated through bibliometric analysis using VOSviewer software, which maps research intensity based on the frequency of occurrence and conceptual relationships within the scientific literature. Areas with higher density represent the most frequently studied research topics, whilst areas with lower density indicate topics that have received relatively less attention in research.

The analysis results indicate that the highest research density centres on concepts related to haemodialysis, changes in body weight, and weight gain between dialysis sessions. These findings suggest that the scientific literature in this field is dominated by studies examining the relationship between haemodialysis therapy and patient fluid management. In practice, IDWG is frequently used as a key indicator in assessing fluid balance and patient compliance with fluid restrictions. Excessive increases in IDWG are known to be associated with fluid overload, hypertension, and an increased risk of cardiovascular complications and mortality in dialysis patients (Bossola et al., 2025).

Nevertheless, research in this area remains relatively sparse regarding patient behavioural factors, adherence to fluid restrictions, and patient-centred intervention strategies. This suggests that the behavioural and psychosocial dimensions of IDWG management remain relatively under-explored in the scientific literature, despite the fact that active patient involvement in the management of chronic disease is a key factor in improving treatment adherence (Natashia et al., 2019).

Overall, the findings of this study provide several important implications for future research. Firstly, the existing literature remains dominated by studies focusing on physiological outcome indicators related to interdialytic weight gain, whilst research exploring behavioural determinants such as self-efficacy, adherence to fluid restriction, and patient empowerment remains relatively limited. This imbalance highlights a significant research gap, necessitating more multidisciplinary research that integrates nephrological approaches with perspectives from behavioural science, health psychology, and patient-centred care. Future research could also examine the role of digital health technology-based interventions, structured self-management programmes, and family support in improving patient adherence to fluid restrictions and the management of IDWG in haemodialysis patients.

Although this study provides a comprehensive overview of the global research landscape regarding IDWG in haemodialysis patients, there are several limitations that should be noted. Firstly, the analysis in this study utilised only the Scopus database; consequently, there is a possibility that relevant publications from other databases, such as Web of Science or PubMed, were not included in the analysis. Secondly, the search strategy employed specific keywords related to IDWG and haemodialysis; consequently, it is possible that studies using different terminology were not identified during the data retrieval process. Thirdly, the bibliometric analysis focused on publication metadata—such as citation patterns, collaborative networks, and keyword occurrence—and thus did not evaluate the methodological quality or effectiveness of the individual studies analysed. Nevertheless, this study still makes an important contribution to mapping the development of the

scientific literature and identifying potential research directions for the development of fluid management strategies and improved outcomes in patients undergoing haemodialysis therapy.

CONCLUSIONS

This study provides a comprehensive overview of global research trends regarding interdialytic weight gain (IDWG) in patients undergoing haemodialysis therapy during the period 2016–2025, using a bibliometric analysis approach. The results indicate that scientific publications in this field have experienced relatively stable growth, characterised by a high level of author collaboration and the involvement of various countries in international research networks. Thematic structure analysis indicates that the majority of studies still focus on physiological aspects related to fluid management, cardiovascular complications, and patient outcomes in haemodialysis. Meanwhile, behavioural and psychosocial factors such as self-efficacy, adherence to fluid restrictions, and patients' self-management abilities have begun to emerge as developing research themes in recent years, although the intensity of such studies remains relatively lower compared to traditional approaches.

The results of the bibliometric analysis indicate that research on the control of IDWG in haemodialysis patients is evolving not only in terms of interventions but also encompasses the behavioural and psychological dimensions of patients in the management of daily fluid intake. Therefore, future research needs to develop a more integrative approach by combining behavioural and psychosocial perspectives in the management of haemodialysis patients. Furthermore, the development of patient-education-based interventions, self-management programmes, and the utilisation of digital health technologies have the potential to serve as effective strategies for improving adherence to fluid restrictions and optimising patient outcomes. Thus, the results of this bibliometric study are expected to serve as a scientific basis for researchers and healthcare practitioners in identifying new research directions and designing more comprehensive interventions for fluid balance management in haemodialysis patients.

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