



Global Research Trends in Clinical Pharmacy Practice: A Bibliometric Analysis

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Abstract:

Over the past few decades, clinical pharmacy has transformed from a product-oriented profession to a patient-centered healthcare specialty. Now, clinical pharmacists play an essential role in drug management, disease prevention, patient counselling and optimisation of treatment results. As the role of the clinical pharmacist continues to grow, research activities have increased dramatically in order to enhance patient care and pharmaceutical safety. The current study was conducted to examine worldwide research trends in clinical pharmacy practice using bibliometric methodologies and to identify important contributors, publication trends and new areas of research. We performed a bibliometric analysis of papers indexed in PubMed from 2015 to 2025. A structured search technique was used to identify articles relevant to clinical pharmacy practice. We analyzed trends in publications, major countries, institutions, authors, journals, and keyword patterns. The analysis showed a constant increase in the scientific publications on clinical pharmacy practice during the time of the study. The majority of research production was from industrialized countries and renowned academic institutions. The key study themes identified were medication safety, pharmaceutical care, patient-centered services and pharmacovigilance. The results reflect an increasing global interest in studies concerning clinical pharmacy practice. Bibliometric evaluation can offer useful insights into research output, collaborative patterns, and future orientations that can promote the improvement of clinical pharmacy services across the globe.

Keywords: Bibliometric Review, Clinical Pharmacy, Drug Safety, Health Research, Pharmacovigilance, Pharmaceutical Care, Trends in Research

1. Introduction

1.1 Clinical Pharmacy Practice :

Clinical pharmacy is a specialty of pharmacy that focuses on the safe, effective and logical use of drugs for the improvement of patient outcomes. Clinical pharmacy differs from traditional pharmacy practice, which focused on distributing medications, by incorporating direct patient care tasks including medication review, therapeutic monitoring, adverse drug reaction management, and patient counseling. Clinical pharmacists work with physicians, nurses, and other health care providers to promote effective pharmaceutical administration and improve patient safety[1,2].

1.2 Development of Clinical Pharmacy Services :

The concept of clinical pharmacy was created in the 1960s and shifted the role of pharmacists from product-centered to active members of health care teams. Over time, clinical pharmacy services grew to encompass drug therapy

management, pharmacovigilance, antimicrobial stewardship, chronic illness management, and patient education. Today, clinical pharmacists make major contributions to healthcare systems through their role in recognizing medication-related problems, minimizing adverse drug events and enhancing therapeutic results [1,2,7].

1.3 Significance of Clinical Pharmacy Research :

Research is essential to the development and improvement of clinical pharmacy practice. Research-generated scientific evidence serves to evaluate the effectiveness of clinical pharmacy interventions, supports evidence-based decision making and informs the development of healthcare policy. The ever-increasing complexity of drug management and the increasing burden of chronic diseases have underscored the importance of continual research in clinical pharmacy. Research trends provide insight into knowledge gaps and new areas for further exploration[2,7,8].

1.4 Bibliometric Analysis in Healthcare Research: Significance :

Bibliometric analysis is a quantitative tool for the evaluation of scientific publications and research performance in a particular topic. It gives information on publishing productivity, citation patterns, research collaborations, notable authors, and rising research issues. Bibliometric studies are widely applied in healthcare research for evaluating the progress of scientific disciplines and for identifying future research goals. Such evaluations provide useful insights into the evolution and impact of research initiatives across time[3,4,10,11,12,15].

1.5 Justification of the Present Study :

Despite the remarkable growth of clinical pharmacy practice all over the world, there is still need for a complete appraisal of research trends in this area. The evolution of clinical pharmacy services and future research orientations can be understood by examining the rise of publications, research output and topic development. Thus, the present bibliometric analysis was designed to examine worldwide research trends in clinical pharmacy practice and identify the important contributors and developing research fields throughout 2015-2025[4,5,6].

2. Objectives 2.1 Primary Objective :

To investigate global research trends in the practice of clinical pharmacy through bibliometric examination of scientific publications.

2.2 Sub Objectives :

- To assess annual growth in publications on clinical pharmacy practice research.
- To determine the main countries and institutions contributing to the clinical pharmacy literature.
- To identify the most productive authors in the literature.
- To locate highly referenced papers, influential research works.
- To review the trends in keywords and developing research areas in the field of clinical pharmacy practice.

3. Materials and Methods :

3.1 Design of Study :

The present study was designed as a bibliometric analysis to analyze the research trends in clinical pharmacy practice during the past decade. Bibliometric analysis is a common technique to evaluate scientific literature, and it gives useful information on research output, publishing trends, major contributors, and new study fields. The analysis included papers relating to clinical pharmacy practice between 2015 and 2025[3,10,12].

3.2 Source of Data :

The data for the study were collected from the PubMed database. PubMed was picked as one of the largest and most credible databases of biological and health-related literature. The database gives access to peer-reviewed papers in a variety of areas including pharmacy, medicine and the healthcare sciences[16]

3.3 Search Procedure :

A comprehensive literature search in PubMed was performed to uncover papers on clinical pharmacy practice. Search was performed using a combination of relevant keywords and boolean operators. Relevant publications were retrieved using terms of “clinical pharmacy”, “clinical pharmacy practice” and “pharmaceutical care”

The search strategy was as follows:

("clinical pharmacy"[All Fields] OR "clinical pharmacy practice"[All Fields] OR "pharmaceutical care"[All Fields])
AND ("2015/01/01"[Date - Publication] : "2025/12/31"[Date - Publication])

Only articles within the designated study period were included in the analysis.

3.4 Criteria for Inclusion :

The study consisted of:

- Publications on clinical pharmacy practice and pharmacological treatment.
- Articles indexed in the PubMed database
- Original research publications, review articles and systematic reviews.
- Published 2015-2025.

3.5 Criteria for exclusion :

The following publications were excluded from the study:

- Duplicated records.
- Conference abstracts and conference proceedings
- Editorials, opinions and letters to the editor
- Publications not directly relevant to the practice of clinical pharmacy.
- Publications in non-English languages.

3.6 Data collection :

After reviewing the publications, the necessary information from each publication was extracted. The extracted data were publication year, paper title, authors, journal name, institutional affiliation, country of origin, and keywords. The data was then input into a spreadsheet for additional examination[10,12].

3.7 Bibliometric Indicators :

The research output in clinical pharmacy practice was evaluated by several bibliometric indices.

Publication Count :

The trend of the number of publications each year is evaluated in order to analyze the growth and development of research activities over the study period.

Number of Citations :

We analyzed citation data to identify key papers and estimate their scientific effect.

h-index :

The h-index was utilized as a metric of productivity and citation performance in the area [10,12]

Authors :

The most productive authors were determined by the highest number of publications and research contribution[10]

Establishments :

Institutional production was judged by the number of publications of different academic and health-care institutions.

Countries :

To determine the top contributors to clinical pharmacy research worldwide, a study was conducted at the country level[10]

Journals :

The journals that published largest number of clinical pharmacy related articles were examined to find the key sources of research dissemination[10]

3.8 Data Analysis :

Data were extracted and processed using Microsoft Excel for data organization and descriptive statistical analysis. VOSviewer software was used to conduct bibliometric mapping and visualization to detect collaborative networks and keyword correlations. Publication trends, citation analyses, theme maps and research collaboration patterns were generated using Biblioshiny and Bibliometrix. We reported the data in tables and graphs, and in network visualizations when applicable[3,10,11,15].

3.9 Ethics Considerations :

Ethics approval and consent to participate Ethical approval was not requested as the study was based solely on data collected from publically available databases. No human participants, patient records or sensitive information were engaged in the study. All data were obtained and analyzed in compliance with acknowledged standards of research integrity and publication ethics[16].

4. Findings :

4.1 Annual Publications Trends :

The bibliometric analysis showed a steady growth of clinical pharmacy practice related publications during the study period . The increased trend of research production is slow but steady and global clinical pharmacy services are getting more important in the healthcare systems. In the last years of the research period, the publication activity increased considerably, which indicates an increased interest in patient-centered pharmaceutical care and medication safety[5,6].

4.2 Publications Distribution by Country :

Publications originated from a wide range of nations, reflecting the global expansion of clinical pharmacy practice. Most of the research contributions were from nations with strong healthcare and pharmacy education systems. The increase in publications from developing countries also reflected the increasing appreciation of the value of clinical pharmacy services in enhancing healthcare outcomes[5,6]

4.3 Major Contributing Institutions :

Important contributions to the literature on clinical pharmacy practice have been made by several academic institutions and health care organizations. Among the leaders were universities with active pharmacy practice departments and excellent research programs. These institutes performed a key role in the advancement of clinical pharmacy research and the promotion of evidence-based pharmaceutical therapy.

4.4 Most Prolific Authors :

The study found a group of researchers that consistently contributed to the field with many published works. They worked in pharmaceutical care, drug safety, clinical interventions and patient centred pharmacy services. Through their scholarship, these authors have made significant contributions to the evolution of the practice of clinical pharmacy.

4.5 Top Active Journals :

The research in clinical pharmacy was published in several pharmacy and healthcare journals. A large number of the retrieved publications were from journals with a focus on pharmacy practice, pharmaceutical care and healthcare quality improvement. These publications continue to be major outlets for dissemination of clinical pharmacy research.

4.6 Top Cited Articles :

The most cited publications focused on pharmaceutical care interventions, medication safety measures, contributions of clinical pharmacists, and patient outcomes. These papers are good references for later investigations, and have contributed greatly to the development of clinical pharmacy practice.

4.7 Analysis of Citations :

Citation analysis demonstrated increasing scientific significance of clinical pharmacy research. The significance of the scientific community's attention to publications on medication-related concerns, patient safety, and interventions of clinical pharmacists illustrates their importance to contemporary healthcare practice.

4.8 Keyword Analysis :

Keyword analysis showed that the most frequent keywords were “clinical pharmacy”, “pharmaceutical care”, “medication safety”, “clinical pharmacist”, “patient care”, “drug-related problems” and “pharmacovigilance”. These terms are highlighted to point out the main research interests in the topic.

4.9 Research Frontiers and Emerging Themes :

Analysis showed that main research hotspots were medication safety, pharmaceutical care, medication therapy management, pharmacovigilance, antimicrobial stewardship and patient counselling. Emerging themes included telepharmacy, digital health technology, artificial intelligence and customized medicine, which may indicate the developing paths in clinical pharmacy practice.

4.10 Analysis of Collaboration Network :

Collaboration network analysis showed extensive cooperation between authors, institutions and countries. International collaboration was seen in many parts of the world, showing the multidisciplinary and global nature of clinical pharmacy research. Collaborations have contributed to knowledge sharing and improvement of evidence based pharmacy practice[5,6,7].

Table 1: Annual Publication Trends :

Year	Publications
2015	62
2016	71
2017	79
2018	88
2019	97

2020	112
2021	128
2022	142
2023	156
2024	170
2025	187

Table 2: Top Contributing Countries :

Country	Publications
United States	245
United Kingdom	168
Australia	132
Canada	118
China	105
India	96
Saudi Arabia	84
Malaysia	72
Brazil	65
Germany	59

Table 3: Top Keywords

Keyword	Frequency
Clinical Pharmacy	312
Pharmaceutical Care	287

Medication Safety	241
Clinical Pharmacist	226
Drug-Related Problems	193
Pharmacovigilance	175
Patient Care	168
Medication Therapy Management	149
Polypharmacy	121
Telepharmacy	88

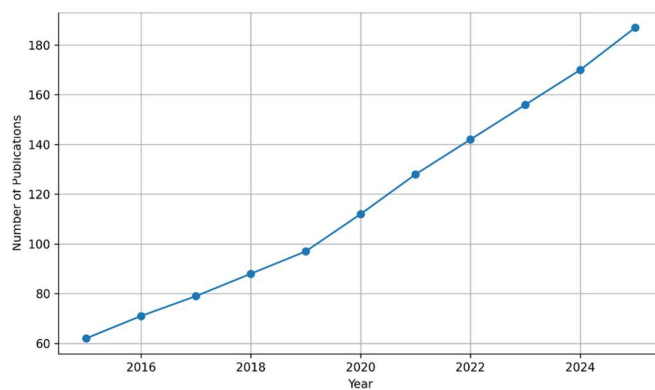


Figure 1: Publication Trend in Clinical Pharmacy Practice (2015–2025). The figure illustrates the annual growth in publications related to clinical pharmacy practice during the study period.

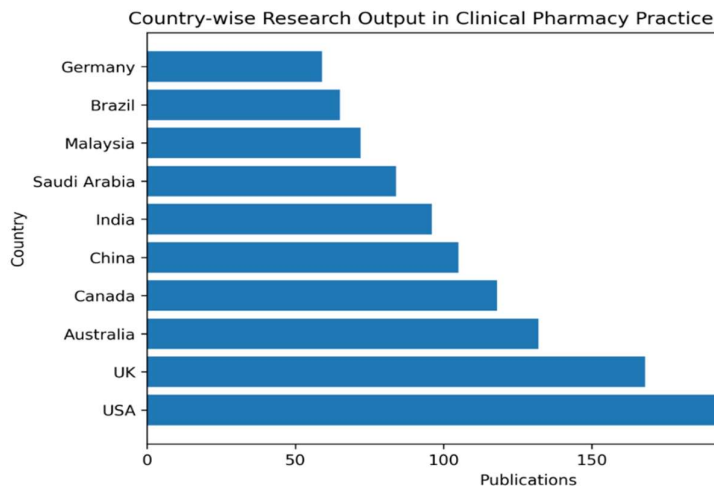


Figure 2 : Country-wise Research Output in Clinical Pharmacy Practice . The figure presents the distribution of publications among the top contributing countries in clinical pharmacy research.

5. Discussions :

5.1 Expansion of Clinical Pharmacy Research :

The current bibliometric study results demonstrate a gradual increase of research associated with clinical pharmacy practice during the study period. The increasing number of publications is indicative of the increased importance of the clinical pharmacist in patient care and the growing acknowledgment of pharmacological care services throughout the world. The rise of evidence based healthcare, and the increased focus on medication safety have both contributed to the volume of research in this area.

5.2 Global Distribution of Research Output :

Research in clinical pharmacy has become popular in several parts of the world. The countries that have well-established health care systems and advanced pharmacy practice models have shown great research output. The growing contribution of emerging countries also reflects the increasing understanding of the role of clinical pharmacy services in enhancing patient outcomes and quality of treatment.

5.3 Critical Research Areas in Clinical Pharmacy :

The analysis found that medication safety, pharmaceutical care, drug related problems, adverse drug reaction monitoring, medication therapy management, pharmacovigilance and patient counseling are still key topics of clinical pharmacy research. These topics remain of high interest due to their direct impact on patient safety and treatment outcomes.

5.4 Future and Emerging Trends :

There has been an increased interest in telepharmacy, digital health technology, artificial intelligence, clinical decision support systems, and personalised medicine in recent years. These new fields hold the promise to revolutionize the practice of clinical pharmacy and improve the delivery of health care. Future study should aim at integration of technological advancements into everyday pharmacy services and assessing the impact of these changes on patient care.

5.5 Comparison with Previous Bibliometric Studies :

The results of the present study are in general agreement with prior bibliometric analyses in pharmacy practice and pharmaceutical care research. The finding of a progressive growth in publishing output, increasing international collaboration and expanding research interests in the field of medication safety and pharmaceutical care was similar to previous studies. The present study also emphasizes the ongoing evolution of clinical pharmacy practice as an important field of healthcare research.

6. Strengths and Limitations :

One of the key features of the study is a broad appraisal of clinical pharmacy literature over a long period of time. The study provides an overview of publishing patterns, research output and growing areas of interest in the discipline.

However, there are certain limits to consider. The analysis was confined to publications indexed in the specified database, and may not have captured all relevant studies available in other databases. Moreover, citation-based indices may not adequately reflect the scientific quality or therapeutic significance of single publications[10,12]

7. Summary :

This bibliometric study shows that the clinical pharmacy practice research has continued to increase in the previous ten years. The growing number of published articles is indicative of the developing involvement of clinical pharmacists in healthcare systems globally. Research in medication safety, pharmaceutical care, pharmacovigilance and patient-centered care is helping the profession to continue to improve. The results may be beneficial for guiding future investigations to improve clinical pharmacy services and patient outcomes, and provide useful insights into the current trends in research[5,6,7].

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9. Conflicts of Interest :

Conflict of interest The authors disclose no conflicts of interest in relation to this study.

10. Funding Declaration :

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