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Review Article

Patient Satifaction with Telepharmacy Services: Bibliometric Analysis

Eva Sartika Dasopang, Emilia Hasibuan, Siti Syarah
Faculty of Pharmacy, Tjut Nyak Dhien University, Medan, North Sumatera, Indonesia

Abstract
Telepharmacy, the remote delivery of pharmaceutical services using information and communication technologies, is an increasingly popular trend in healthcare and has great potential to improve patient satisfaction and access to healthcare. The use of bibliometric analysis can provide a more comprehensive understanding of research developments in this area. This study used bibliometric analysis of international publications using the keywords telepharmacy AND patient satisfaction from 2016 to 2023 using data sources from Scopus and further visual analysis using VOSviewer. Fifty-two suitable documents were obtained from 207 documents received. The keyword-related searches yielded 10 articles each in 2021 and 2023, and showed an increasing trend of publications related to telepharmacy and patient satisfaction, especially in 2022 (19 articles). The results also showed the existence of three main clusters related to telepharmacy, namely patient satisfaction, pharmacy and pharmacy services. This study shows that telepharmacy has emerged as an important area of research, especially during the COVID-19 pandemic. Telepharmacy has the potential to improve patient access to pharmaceutical services, increase patient satisfaction and improve the overall quality of healthcare.

Keywords: bibliometrics, patient satisfaction, services, telepharmacy

Kepuasan Pasien Terhadap Layanan Telefarmasi: Analisis Bibliometrik

Abstrak
Telefarmasi merupakan pemberian layanan farmasi jarak jauh dengan menggunakan teknologi informasi dan komunikasi, merupakan tren yang semakin populer di bidang kesehatan dan memiliki potensi besar untuk meningkatkan kepuasan pasien dan akses ke layanan kesehatan. Penggunaan analisis bibliometrik dapat memberikan pemahaman yang lebih komprehensif tentang perkembangan penelitian di bidang ini. Penelitian ini menggunakan analisis bibliometrik terhadap publikasi internasional menggunakan kata kunci telefarmasi AND kepuasan pasien dari tahun 2016 hingga 2023 dengan menggunakan sumber data dari Scopus dan dilanjutkan analisis visualnya dengan menggunakan VOSviewer. Diperoleh 52 dokumen yang sesuai dari 207 dokumen yang diperoleh. Penelitian yang terkait dengan kata kunci diperoleh masing-masing 10 artikel pada tahun 2021 dan 2023 dan menemukan tren peningkatan publikasi yang berkaitan dengan telefarmasi dan kepuasan pasien, terutama pada tahun 2022 (19 artikel). Hasil juga menunjukkan adanya tiga klaster utama yang terkait dengan telefarmasi yaitu kepuasan pasien, farmasi dan layanan farmasi. Studi ini menunjukkan bahwa telefarmasi telah muncul sebagai bidang penelitian yang penting, terutama selama pandemi COVID-19. Telefarmasi memiliki potensi untuk meningkatkan akses pasien ke layanan farmasi, meningkatkan kepuasan pasien, dan meningkatkan kualitas layanan kesehatan secara keseluruhan.

Kata kunci: bibliometrik, kepuasan pasien, pelayanan, telefarmasi

Correspondence: Eva Sartika Dasopang, Faculty of Pharmacy, Tjut Nyak Dhien University, Medan, North Sumatera, Indonesia, email: evasartikadasopang@yahoo.com
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Introduction

Rapid advances in information and communication technology (ICT) have made it an indispensable aspect of modern life. One of its applications is in medicine, where ICT can help people around the world receive better healthcare. The quality and accessibility of healthcare services for communities around the world could be improved through the use of ICT in healthcare, such as telemedicine and telepharmacy.[1,2] The practice of pharmacists providing pharmaceutical services to patients remotely, without face-to-face interaction, is known as telepharmacy. This service uses information and communication technologies to facilitate communication between patients and pharmacists. The popularity of this service has increased, especially since the COVID-19 pandemic.[3] Easy access, flexibility, direct patient-pharmacist communication and the ability of pharmacists to educate patients about drug interactions, side effects and correct use of prescriptions are some of the elements that can influence patient satisfaction. Patient satisfaction is a critical factor to consider when developing telepharmacy services. The success of any healthcare service, including telepharmacy, is measured by patient satisfaction. According to several previous studies, 76.5% of COVID-19 patients were satisfied with the telepharmacy services they received.[4] Another study found that people with hypertension were more satisfied (>95%) with the use of telepharmacy. Telepharmacy users have many good experiences, which increases patient satisfaction.[5,6] The provision of accurate and precise medicines to patients, combined with collaboration with other healthcare professionals, is an important aspect of optimising drug therapy. This has the potential to reduce irrational drug use, minimise adverse drug reactions, improve therapeutic efficacy and ultimately reduce healthcare costs.[7] While telepharmacy offers many benefits, it also has some limitations that need to be considered, including the need for adequate internet connectivity to facilitate telepharmacy services. Patients and healthcare providers need compatible and appropriate devices, such as smartphones, computers or tablets, as well as the necessary applications. In addition, the security of patient data must be strictly protected.[8,9]

Bibliometric analysis is a quantitative method that can be used to map the landscape of telepharmacy research, particularly in the context of patient satisfaction. Bibliometric data can be obtained from Scopus and analysed using VOSviewer.[10,11] Through this comprehensive bibliometric analysis of the existing literature, it is possible to identify current research trends, identify knowledge gaps and evaluate existing research methodologies.[12] The results of the bibliometric analysis can be used to develop a comprehensive theoretical framework, identify key factors influencing patient satisfaction and design targeted interventions to improve the quality of telepharmacy services. In addition, bibliometric analysis plays an important role in supporting policy making, both in the development and evaluation of telepharmacy programmes. Therefore, bibliometric analysis serves as a valuable tool for researchers, practitioners and policy makers in their efforts to improve the quality of telepharmacy services and achieve optimal patient satisfaction.[13,14]

Method

This study uses a bilbiometric approach to quantitatively analyse international publications using the Scopus database. Scopus was chosen because of its comprehensive coverage, high quality data and advanced search capabilities. The basic steps were to access the Scopus website

and enter the keywords telepharmacy AND patient satisfaction. The Boolean operator AND was used to find articles containing both keywords and 207 articles were obtained. Then 155 articles were excluded because they did not meet the inclusion criteria. Inclusion criteria included: publication year 2016-2023, english language articles, title and abstract with keywords and not a review journal. Based on the inclusion criteria, 52 eligible articles were retrieved. After obtaining relevant search results (52 articles from Scopus), export the data into a format compatible with VOSviewer, CSV (Comma Separated Values) is usually a common choice. Next, import the data into VOSviewer by opening the VOSviewer application, selecting the CSV file exported from Scopus and clicking 'run' to start analysing. VOSviewer is used to create network visualisations and identify research trends. VOSviewer is software specifically designed to perform bibliometric analysis. VOSviewer transforms bibliometric data from source such as Scopus into interactive network visualisations. These networks can show relationships between different entities, such as collaborations between authors, networks of institutions involved in research, relationships between journals based on published articles, and relationships between research topics.[15]

Theme Mapping Using VOSviewer

A bibliometric analysis of 52 Scopus-indexed documents with the keywords "telepharmacy" and "satisfaction" identified three main clusters. Visualizations generated using VOSviewer revealed significant relationships between key terms within each cluster, represented by different colors 16–18. VOSviewer produced three types of bibliometric visualizations: network, overlay, and density. The network visualization provided a clear and comprehensive overview of the relationships between concepts within the research domain. Each node in the graph represented a concept or keyword, and the edges connecting the nodes indicated the strength of the relationship between the two concepts. The overlay visualization displayed trends in terms over time,

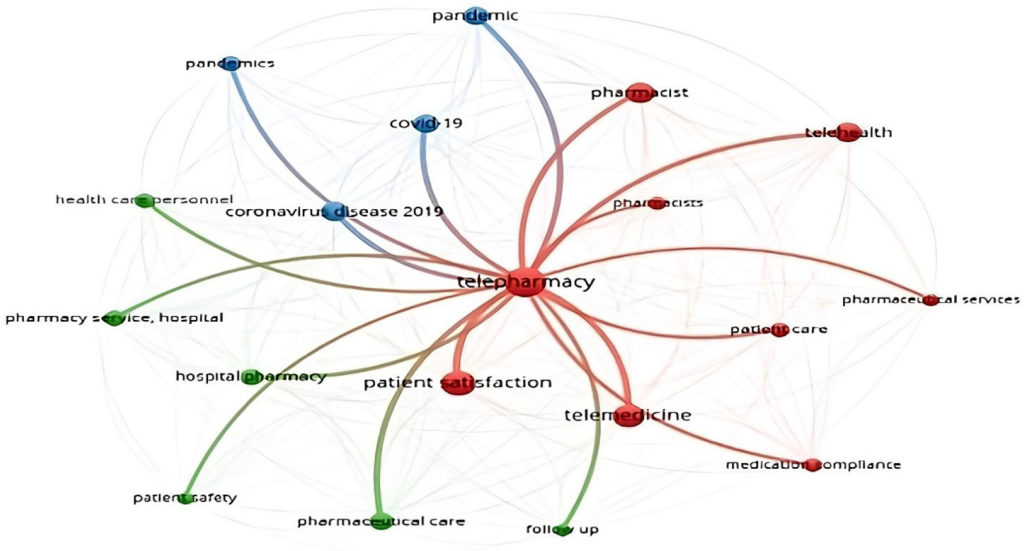

Figure 1 Topic Area Visualization Using VOSviewer Network Analysis

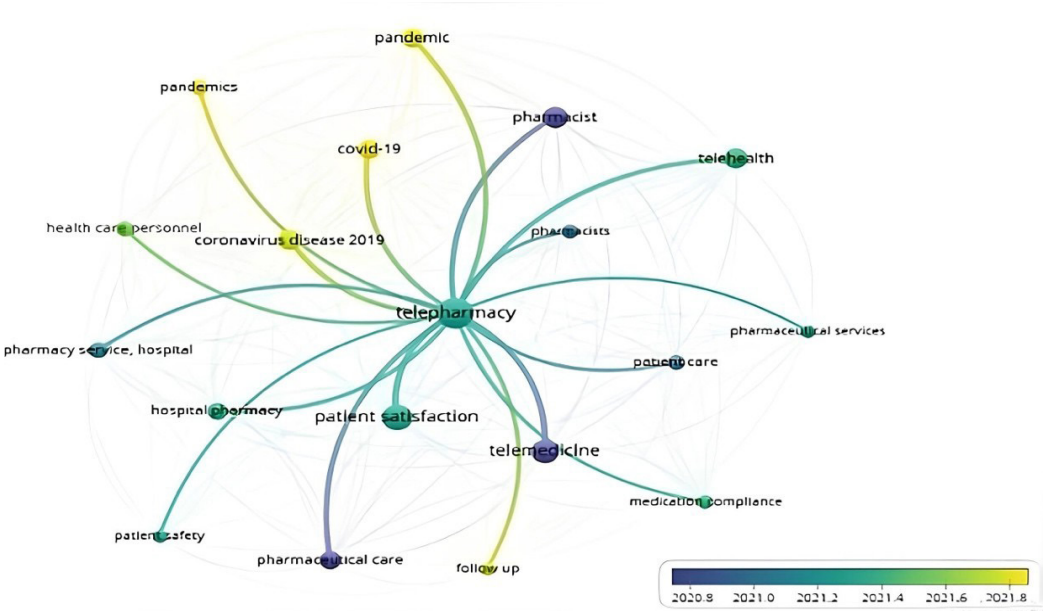

Figure 2 Overlay Visualization Using VOSviewer for Topic Visualization

while the density visualization indicated the frequency and relevance of a term in the research. Key terms identified in the publications included patient satisfaction, telepharmacy, telehealth, and pharmacist.

Figure 1 demonstrates that the larger the size of a node, the more frequently the corresponding concept appears in the research data. This indicates the significance of that concept within the research domain. The thickness of the edges connecting two nodes signifies the strength of the relationship between those two concepts. Thicker edges indicate a stronger association, as the two concepts co-occur more frequently within the same document. Nodes are assigned different colors to represent different clusters or groups, aiding in the identification of major themes within the research. The position of nodes within the graph also provides information; nodes that are closer together tend to have a stronger relationship.

The term "telepharmacy" is centrally positioned and exhibits numerous connections to other terms. This indicates that telepharmacy is a central concept in this research and is strongly linked to various other aspects. Terms such as "pandemic," "COVID-19," and "coronavirus disease 2019" are closely associated with "telepharmacy," suggesting its significant relevance and importance during the COVID-19 pandemic. Terms like "patient satisfaction," "patient care," and "patient safety" are tightly linked to "telepharmacy," indicating a strong focus on how telepharmacy can improve patient outcomes. The terms "pharmacist" and "pharmacists" are also closely related to "telepharmacy," highlighting the crucial role of pharmacists in providing telepharmacy services. Terms such as "telehealth" and "telemedicine" underscore the technological aspects of telepharmacy, involving the delivery of healthcare services remotely. Terms like "pharmaceutical services" and "medication compliance" demonstrate that telepharmacy encompasses not only technology but also the provision of pharmaceutical services and ensuring patient adherence to medication regimens.[19,20]

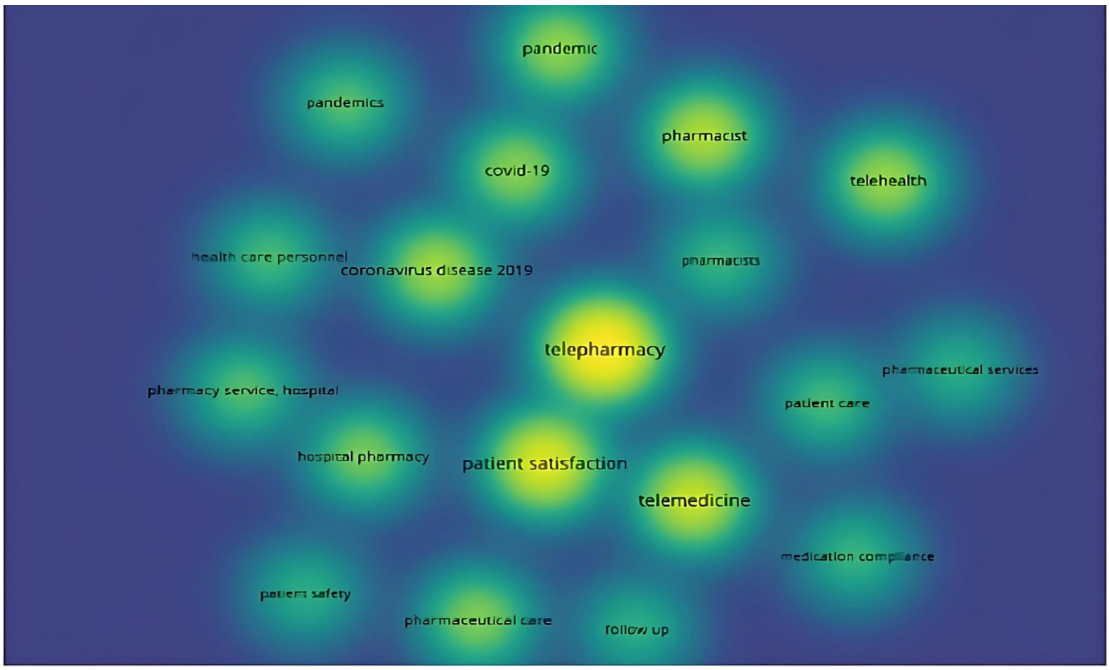

Figure 3 Topic Visualization Using VOSviewer Density Visualization

Analyzing the Interconnections among Core Concepts within the Domain of Telepharmacy

Figure 2 illustrates that prior to 2020, while relationships between telepharmacy and health concepts such as "patient satisfaction" and "medication compliance" existed, they were perhaps less pronounced. However, with the onset of the COVID-19 pandemic, the connections between telepharmacy and health concepts strengthened significantly. This suggests that telepharmacy has gained recognition as a viable solution to address healthcare challenges, particularly during pandemics. The relationship between "telepharmacy" and "telemedicine" has grown increasingly closer over time, indicating a strengthening integration between these two remote healthcare services. The concept of "patient satisfaction" remains a central focus in telepharmacy research, highlighting the growing interest in understanding how telepharmacy can enhance patient experiences. Additionally, "patient safety" is likely to become an increasingly relevant concept, especially in the context of remote medication administration. The predominance of deep blue in the 2020 visualization indicates a surge in research linking telepharmacy to the COVID-19 pandemic. The strong connections between telepharmacy-related concepts in 2020 reflect the critical role telepharmacy played in addressing the healthcare challenges posed by the pandemic.[19,21,22]

Density Visualization

Density visualization reveals that telepharmacy has become an integral part of the healthcare system, particularly during the COVID-19 pandemic. Telepharmacy has enabled patients to continue accessing essential pharmaceutical services without the need for in-person visits to pharmacies. Moreover, telepharmacy has contributed to improving patients' quality of life by enhancing medication adherence and

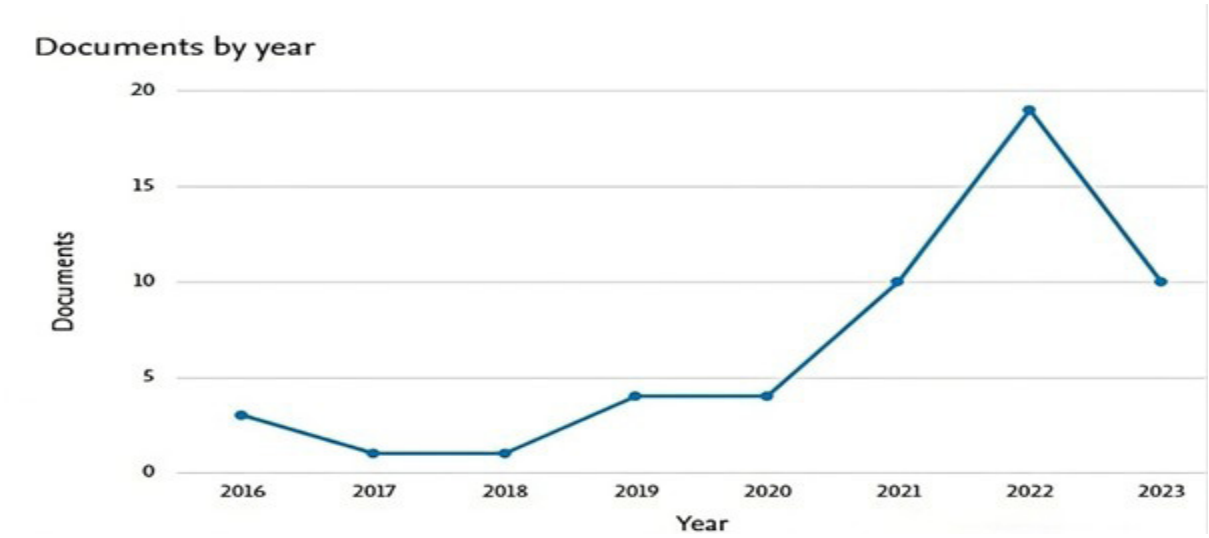

Figure 4 Trend of International Publications Over the Years

providing more personalized care. The benefits of density visualization include facilitating comprehension, as data visualizations make information more accessible and memorable. It also aids in identifying patterns and trends within data that may be difficult to discern when presented in textual format. Furthermore, density visualization allows us to explore the frequency and relationships between various concepts, revealing unexpected connections between previously unrelated concepts. Based on the visualization in Figure 3, brighter nodes with larger sizes indicate areas that have been extensively researched and indexed in Scopus. The majority of research is related to patient satisfaction and telemedicine. Conversely, nodes with darker colors represent topics that have been less explored, such as pharmacist, patient care, pharmaceutical services, medication compliance, follow-up, and several other

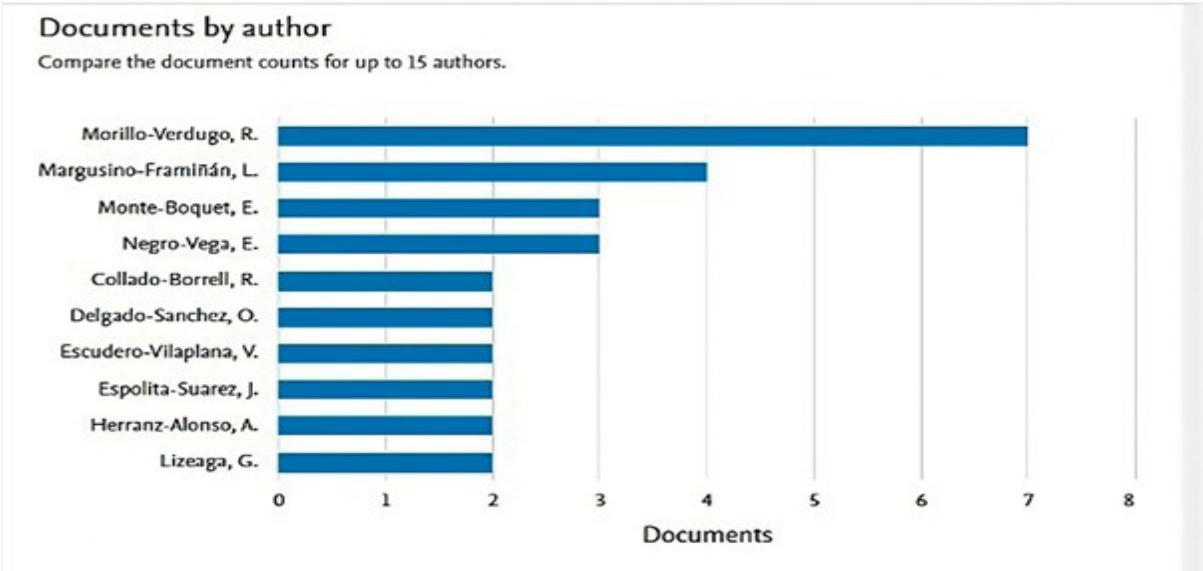

Figure 5 Author Ranking Based on International Publications

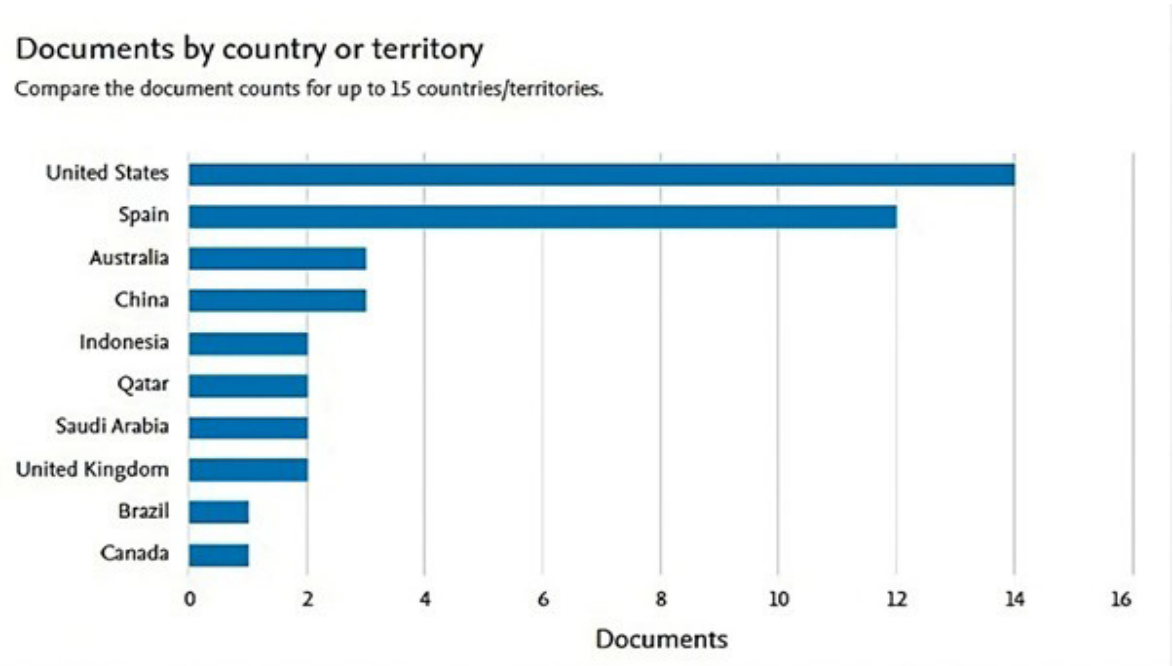

Figure 6 Ranking of Top-Producing Regions in International Publications

topics.

Number of Documents Published Annually from 2016 to 2023

Based on Figure 4, there was a significant increase in the number of documents published in 2021 and 2022, followed by a decrease in 2023. This suggests a surge in research interest and activity in this field during 2021 and 2022, which subsequently declined. There was a notable increase in the number of publications in 2021, peaking in 2022. This indicates heightened research interest and activity in the field during this period. After reaching a peak in 2022, the number of publications decreased in 2023. This decline may be attributed to several factors, such as shifts in research trends, resource constraints, or external influences. Prior to 2021, the number of publications tended to remain stable or even decrease, suggesting that interest in this topic may have been relatively low during this period.[23]

Productivity of Telehealth Pharmacy and Satisfaction Research

Based on Figure 5, the analysis of research on telehealth pharmacy and satisfaction from 2016 to 2023 yielded 15 documents. The top three most prolific authors were R. Morillo Verdugo, L. Margusino Framinan, E. Monte Boquet, and E. Negro Vega. R. Morillo Verdugo ranked highest with seven publications (13.5%). L. Margusino Framinan ranked second with four publications (7.7%), followed by E. Monte Boquet and E. Negro Vega in third place with three publications (5.8%).

Geographical Distribution of Authors

Figure 6 this horizontal bar chart compares the number of documents produced by various countries or regions. The length of each bar represents the number of documents produced by that particular country or region. The United States has the highest scientific publication productivity among the

countries presented in this chart, indicating a significant contribution to new research in the field. Spain ranks second, suggesting a considerable level of scientific publication productivity. Other countries such as Australia, China, Indonesia, and Saudi Arabia also have a notable contribution to scientific publications, although their output is lower compared to the United States and Spain. Countries like Qatar, Brazil, and Canada have a relatively lower number of publications compared to the other countries listed

Conclusion

This bibliometric analysis provides a comprehensive overview of research conducted in the field of telepharmacy. The term "telepharmacy" occupies a central position in the concept network, highlighting its significance in research, particularly during the COVID-19 pandemic. Numerous studies have linked telepharmacy to patient satisfaction, patient care, and patient safety. This suggests that one of the primary objectives of telepharmacy is to enhance the quality of healthcare services for patients. The term 'pharmacist' is closely connected to 'telepharmacy,' indicating the crucial role of pharmacists in providing telepharmacy services. Telepharmacy not only involves technology but also encompasses the provision of pharmaceutical services and ensuring patient adherence to medication. The findings of this study can serve as a foundation for the development of better policies and strategies for the implementation of telepharmacy in the future.

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Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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