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Unveiling Global Research Trends and Collaboration Patterns in Alzheimer's Disease: A Bibliometric Perspective

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Abstract

Alzheimer's disease is one of the most common forms of dementia and poses a major challenge to global health, especially as the aging population increases. With the high research interest in this topic, a scientific mapping is needed to identify trends, major contributors, and current research focuses in the field of Alzheimer's. This study uses a bibliometric approach with a Scopus database published in the period 2023 to 2025, then the data is analyzed using bibliometrix software. The results show an annual publication growth rate of 19.67% with an average of citations per document of 3,524. The most productive journals are alzheimer's and dementia (1,093 documents), followed by Journal of Alzheimer's Disease (817 documents). The most active authors are Wang Y (493 documents), Zhang Y (437), and Li Y (410). The most affiliations come from University of California And Harvard Medical School, while the countries with the largest contributions are the United States, China, and India. Alzheimer's research shows rapid development in terms of quantity and international collaboration. The United States and China are the main centers of scientific contribution, both in terms of the number of publications and citations. These results are important as a basis for making research policies, cross-country collaborations, and determining the direction of future research in efforts to overcome alzheimer's disease.

Keywords: Alzheimer's, bibliometric, bibliometrix software, scopus

Introduction

Alzheimer's disease is the most common form of dementia, accounting for approximately 60–70% of all dementia cases globally [1]. It is characterized by progressive cognitive decline, short and long term memory impairment, disorientation, language impairment, and behavioral and personality changes [2]. There is currently no curative therapy for Alzheimer's, and most treatments are palliative, aiming to slow disease progression and improve quality of life [3], [4]. As life expectancy increases in many countries, the social and economic burden of Alzheimer's continues to increase, making it one of the most pressing public health challenges of the 21st century. Therefore, a deeper understanding of the disease mechanisms, as well as efforts to develop biomarkers and innovative therapies, are of primary concern to the global scientific community [5]. In the past three years, from 2023 to 2025, research related to Alzheimer's disease has experienced very rapid development. Technological advances in bioinformatics, neuroimaging, metabolomics, and artificial intelligence have driven deeper exploration of biomarkers, therapeutic targets, and personalized approaches in the diagnosis and treatment of Alzheimer's [6]. In addition, current issues such as the relationship between Alzheimer's and COVID-19, metabolic disorders, and the influence of environmental and

epigenetic factors have also expanded the scope of research in this field [7]. The drastic increase in the number of scientific publications during this period reflects the increasing global interest and urgency in addressing this neurodegenerative disease. However, with the huge and rapidly growing volume of scientific data, a systematic approach is needed to assess how research directions and patterns are evolving globally [8].

Bibliometric analysis is a quantitative method that allows researchers to evaluate the dynamics of scientific publications in a particular field comprehensively [9], [10]. Through bibliometrics, important aspects such as annual publication trends, dominant keywords, institutional and international collaborations, and identification of the most influential researchers and journals can be analyzed [11], [12]. This approach can also reveal the conceptual and intellectual structure in the Alzheimer's field and help map the research map over time. By utilizing software such as VOSviewer, Biblioshiny, and R Bibliometrix, bibliometric analysis is able to provide visualization of collaboration networks, trends in key topics, and the dynamics of the evolution of Alzheimer's research over a certain period [13]. Therefore, this study aims to conduct a bibliometric analysis of global trends in Alzheimer's disease research published between 2023 and 2025. Data were collected from reputable databases such as Scopus and/or Web of Science to ensure a broad and valid literature coverage [14]. This study focuses on identifying topic trends, collaborations between countries and institutions, high-impact publications, and research development directions based on keywords that appear consistently. The results of this study are expected to provide a comprehensive understanding of the current scientific landscape in the field of Alzheimer's, as well as being a basis for making research policies and developing future strategies in overcoming this disease.

Materials and Methods

Materials

The data source for this bibliometric analysis comes from the Scopus database (https://www.scopus.com), accessed on May 14, 2025. Scopus was chosen because it has a wide indexing coverage, high data quality, and complete metadata, including information on authors, institutional affiliations, keywords, publication sources, and data citations. Data were obtained using the following search string: ("Alzheimer" and "Alzheimer's Disease"). Only documents with the types of original articles (original research), review articles (reviews), and conference papers (conference papers) were included. Documents such as editorials, letters to the editor, and non-peer-reviewed publications are common.

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Methods

This study uses a bibliometric analysis approach to explore trends and patterns in global scientific literature related to Alzheimer's disease published during the period 2023 to 2025 [15]. Some of the main components analyzed in this study include: document type and language, development of the number of publications per year, most frequently used keywords, citation analysis and number of cited articles, countries with the most cited publications, and patterns of international collaboration in Alzheimer's research [16], [17]. The analysis focuses only on English-language documents, while all non-English publications are excluded from the analysis to maintain consistency and clarity in data interpretation.

Bibliometric indicators analyzed in this study include: (1) document types and languages, (2) annual publication development during the period 2023–2025, (3) Most Relevant Publication Sources (4) Most Productive Authors (5) Most Influential Institutions (6) Country of Origin of Corresponding Authors (7) Most Cited Countries. Data on the most active and most cited authors, institutions, and publications were collected directly from Scopus by calculating the number of citations and documents published per year. For data visualization, two software were used, namely Biblioshiny (RStudio). VOSviewer was used to map the collaboration network between countries, institutions, and relationships between keywords, while Biblioshiny was used for descriptive statistical analysis and presentation of trend graphs and Alzheimer's research topic maps [18], [19].

Results and Discussion

Bibliometric analysis of publications related to Alzheimer's disease during the period 2023 to 2025 resulted in a total of 19,764 documents spread across various scientific publication sources. The annual growth of publications reached 19.67%, with an average document age of 0.927 years and an average of 3,524 citations per document. Content analysis showed that there were 53,167 Keyword Pluses and 29,760 keywords from authors, reflecting the diversity of research topics. A total of 75,057 authors were involved, with 1,171 documents written individually. The

average number of authors per document was 8.38, and 28.51% of publications were the result of international collaboration.

Table 1. Descriptive statistics of publications related to Alzheimer's disease in the period 2023–2025 based on data from Scopus.

Category	Mark
Main information about data	
Timespan	2023:2025
Sources (Journals, Books, etc)	2765
Documents	19764
Annual Growth Rate %	19.67
Document Average Age	0.927
Average citations per doc	3,524
References	0
Document contents	
Keywords Plus (ID)	53167
Author's Keywords (DE)	29760
AUTHORS	
Authors	75057
Authors of single-authored docs	801
Authors collaboration	
Single-authored docs	1171
Co-Authors per Doc	8.38
International co-authorships %	28.51

The results of the bibliometric analysis in Figure 1 present a list of journals or publication sources that published the most articles related to Alzheimer's disease research during the period 2023–2025. This graph shows that scientific publications on Alzheimer's are concentrated in a number of specialized journals with high reputations in the fields of neurology and neurodegeneration. The journal "Alzheimer's and Dementia" is in the top position as the source with the most publications, namely 1,093 documents, followed by the "Journal of Alzheimer's Disease" with 817 documents, and the "Journal of Alzheimer's Disease: JAD" with 411 documents. These journals have consistently been the main place for researchers to publish the latest findings related to Alzheimer's. In addition, journals such as "Alzheimer's Research and Therapy" (292 documents), "Neurology" (278 documents), and "Journal of Prevention of Alzheimer's Disease" (201 documents) are also included in the list of productive sources. Meanwhile, multidisciplinary journals such as “Frontiers in Pharmacology” and “Neurobiology of Aging” also show significant contributions in disseminating cross-disciplinary research relevant to Alzheimer’s. This finding shows that the focus of Alzheimer’s research is very concentrated in specific journals, which strengthens their role as the main media in the development of science in the field of neurodegenerative.

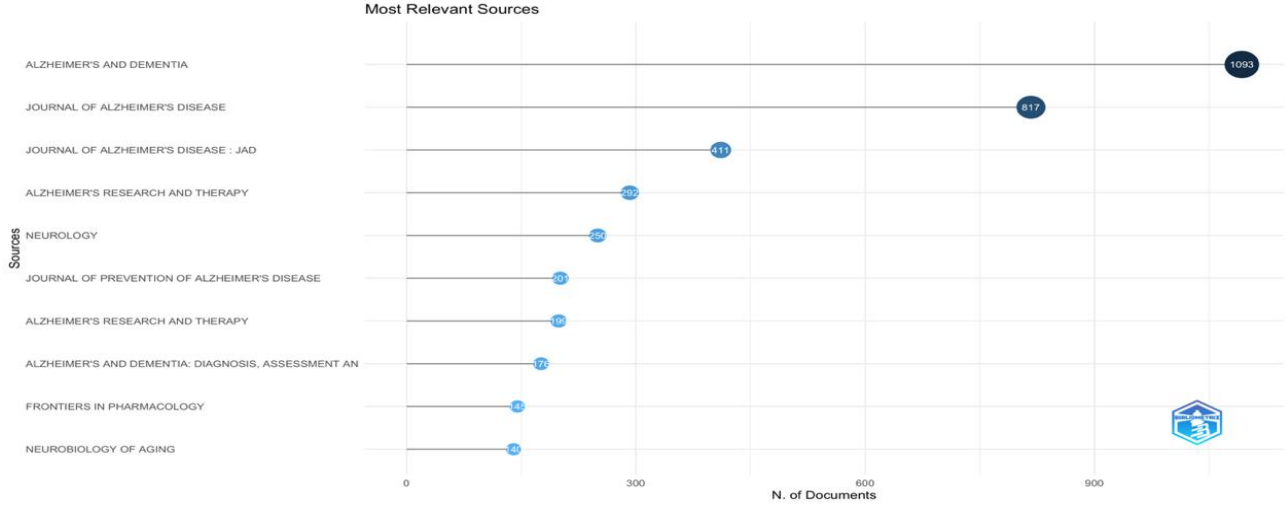

Figure 1. The most relevant publication sources related to Alzheimer's disease (2023–2025), based on the number of published documents. Visualization created using Biblioshiny.

Results in Figure 2 show the list of the most productive authors in Alzheimer's disease research during the period 2023–2025 based on the number of documents published. The graph shows that several authors consistently produce a large number of scientific contributions, reflecting their dominance in Alzheimer's research. Author Wang Y ranks first with a total of 493 documents, followed by Zhang Y with 437 documents, and Li Y with 410 documents. These authors appear to have an intensive research focus on neurodegenerative diseases, especially Alzheimer's, and are likely to be involved in various international collaborations and large projects. Other authors who also recorded high productivity were Wang J (341 documents), Wang X (338 documents), and Liu Y (300 documents). Meanwhile, names such as Chen Y, Zhang J, and Li X, although at the bottom of the graph, still show a significant number of publications above 250 documents. These data reflect the consistent contribution of a number of researchers in supporting scientific progress in the field of Alzheimer's disease and opening up opportunities for collaboration across institutions and countries.

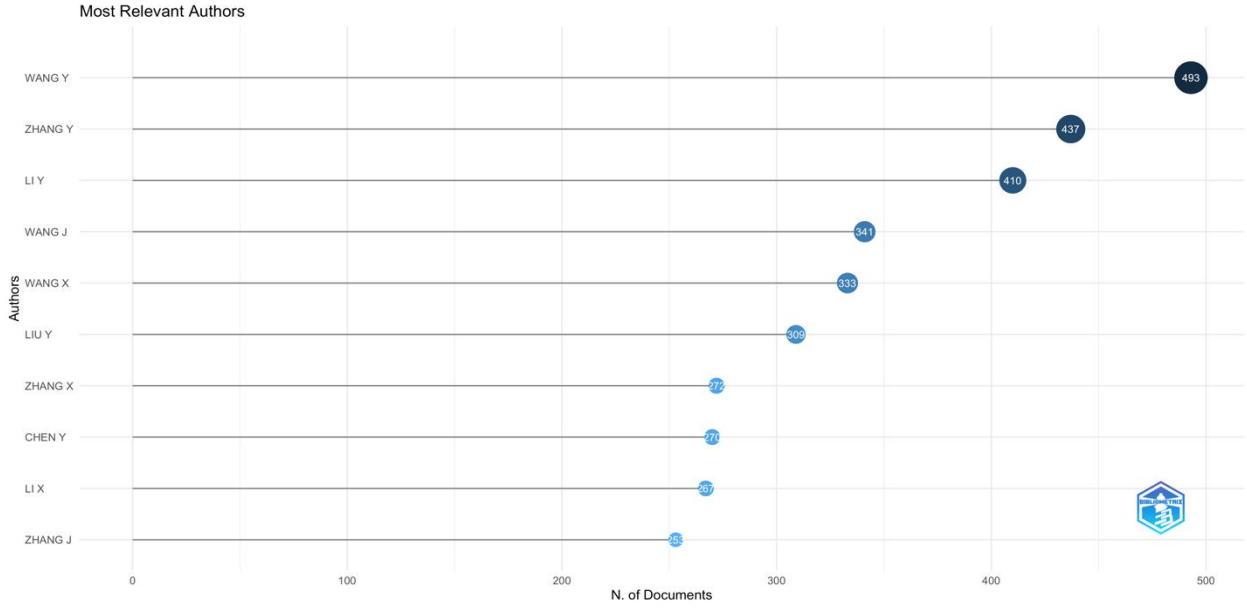

Figure 2. List of the most productive authors in Alzheimer's research (2023–2025) based on the number of documents published. Visualization created using Biblioshiny.

The bibliometric analysis results in Figure 3 show the most relevant or influential affiliated institutions in publications related to Alzheimer's disease during the period 2023–2025. These affiliates are assessed based on the number of articles published by researchers affiliated with the institution. The University of California is in the top position with a total of 1,358 articles, making it the most active institution in scientific contributions to Alzheimer's research. This is followed by Harvard Medical School with 779 articles, strengthening its position as a leading medical research center in the world. Other renowned institutions such as the Mayo Clinic (508 articles), University College London (504 articles), and Capital Medical University (398 articles) also play an important role in producing high-quality research. Affiliations from various countries are also significant, such as the University of Toronto (382 articles), reflecting extensive global collaboration in Alzheimer's research. Several institutions in the United States, including the Indiana University School of Medicine, the University of Pennsylvania, and the University of Pittsburgh, are also centers of scientific activity on this topic. Meanwhile, Fudan University from China is also in the top 10, indicating Asia's increasing contribution to this field.

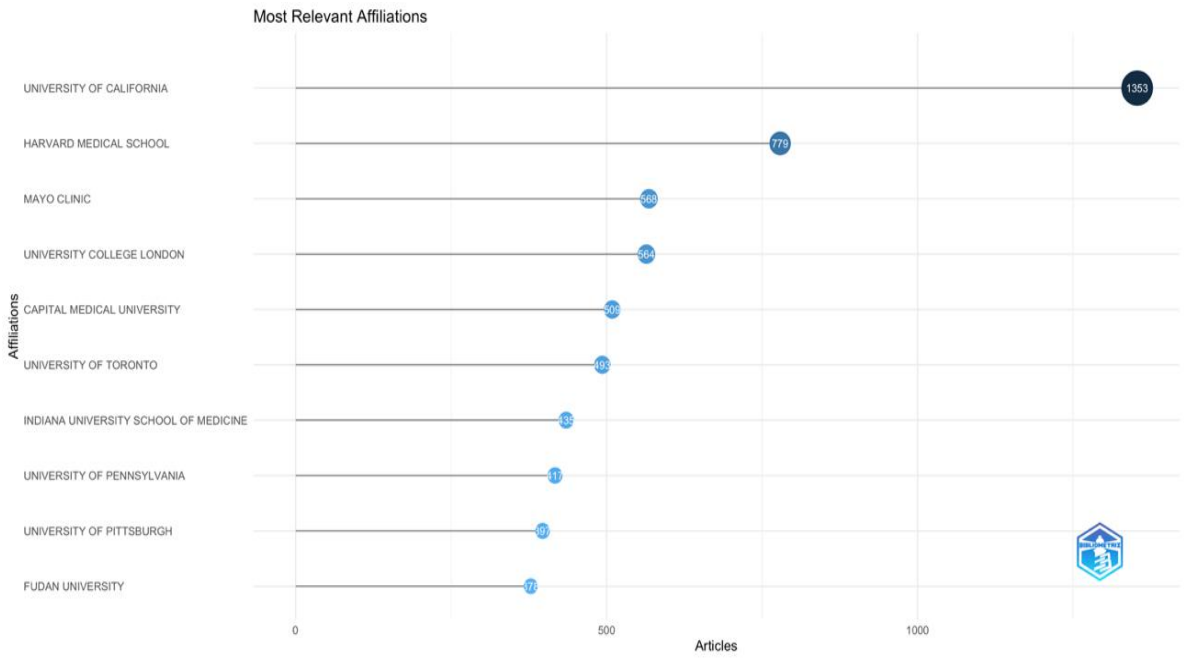

Figure 3. Most relevant institutional affiliations in Alzheimer's research (2023–2025) based on the number of articles published. Visualization created using Biblioshiny.

The results of the bibliometric analysis in Figure 4 show the distribution of documents by country of origin of the corresponding author in Alzheimer's research during the period 2023–2025. This graph illustrates two types of publications: SCP (Single Country Publications) and MCP (Multiple Country Publications), which represent the level of international collaboration of each country. The United States (USA) ranks highest as the country with the largest number of publications, both from domestic (SCP) and international (MCP) collaborations, with a total of more than 4,500 documents. Followed by China, which also shows a large contribution with more than 4,000 publications, although the proportion of international collaboration is less than the United States. India, the United Kingdom, and Italy follow as countries with significant contributions, indicating high global interest in Alzheimer's studies. Countries such as Korea, Japan, Canada, and Germany also occupy important positions in scientific publications in this field, indicating the active involvement of Asia, Europe, and North America. It is also apparent that countries such as Spain, Iran, and Australia have a fairly large share of international collaboration, as indicated by the high proportion of MCP. This reflects the importance of cross-border collaboration in strengthening the quality and scope of global scientific research on Alzheimer's disease (24).

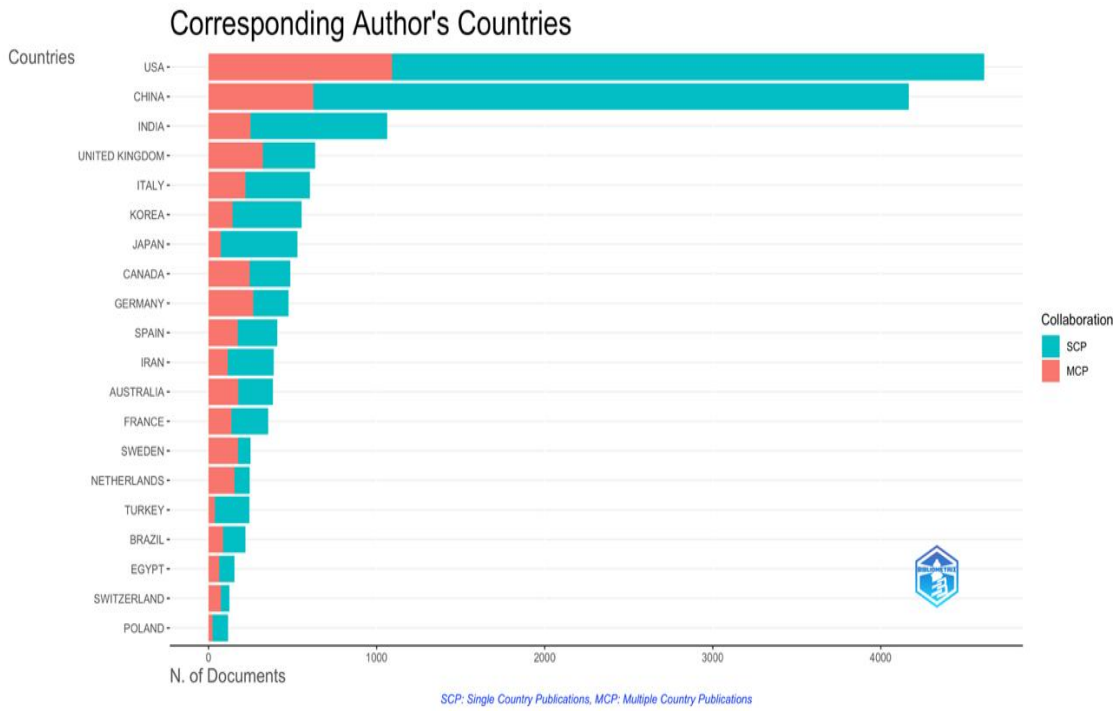

Figure 4. Country of origin of corresponding authors in Alzheimer publications (2023–2025) with indication of national (SCP) and international (MCP) collaborations. Visualization created using Biblioshiny.

The bibliometric analysis results in Figure 5 show a map of the distribution of global scientific contributions related to Alzheimer's research during the period 2023–2025. Darker blue indicates a higher number of publications, while light blue to gray colors indicate lower to no contributions. The United States and China appear to dominate in terms of the number of publications, marked by the striking dark blue color. Countries such as India, the United Kingdom, Canada, Germany, Japan, and South Korea also show high publication intensity, indicating substantial research activity in the region. Most countries in Western Europe, East Asia, and North America actively participate in scientific publications, while some regions in Africa, Central America, and Central Asia show limited participation or even no recorded contributions. This map illustrates the geographical imbalance in scientific production, with developed countries still the main centers of Alzheimer's research. However, the increasing contributions from developing countries such as India and Brazil indicate the potential for growth in global collaboration and research in the future.

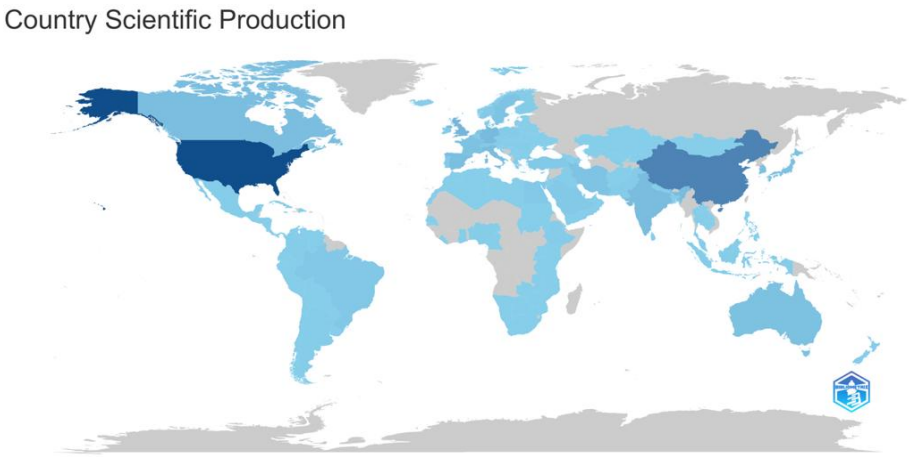

Figure 5. World map of Alzheimer's-related scientific production by author's country of origin. Dark blue indicates the highest number of publications, and light blue to gray indicates lower contributions. Data visualized using Biblioshiny.

The bibliometric analysis results in Figure 6 show the countries with the highest number of citations in scientific publications related to Alzheimer's during the period 2023–2025. The United States is in first place with a total of 18,646 citations, followed by China with 14,411 citations. This shows that publications from these two countries are not only productive but also have a high scientific impact. India, the United Kingdom, and Canada each received more than 500 citations, indicating a significant contribution to the development of knowledge in this field. Other countries such as Italy, Germany, Australia, South Korea, and Sweden are also in the top ten, although their number of citations is relatively lower. This distribution underlines the dominance of developed countries in terms of scientific influence, although some developing countries are beginning to show increasing visibility and impact in the global scientific community.

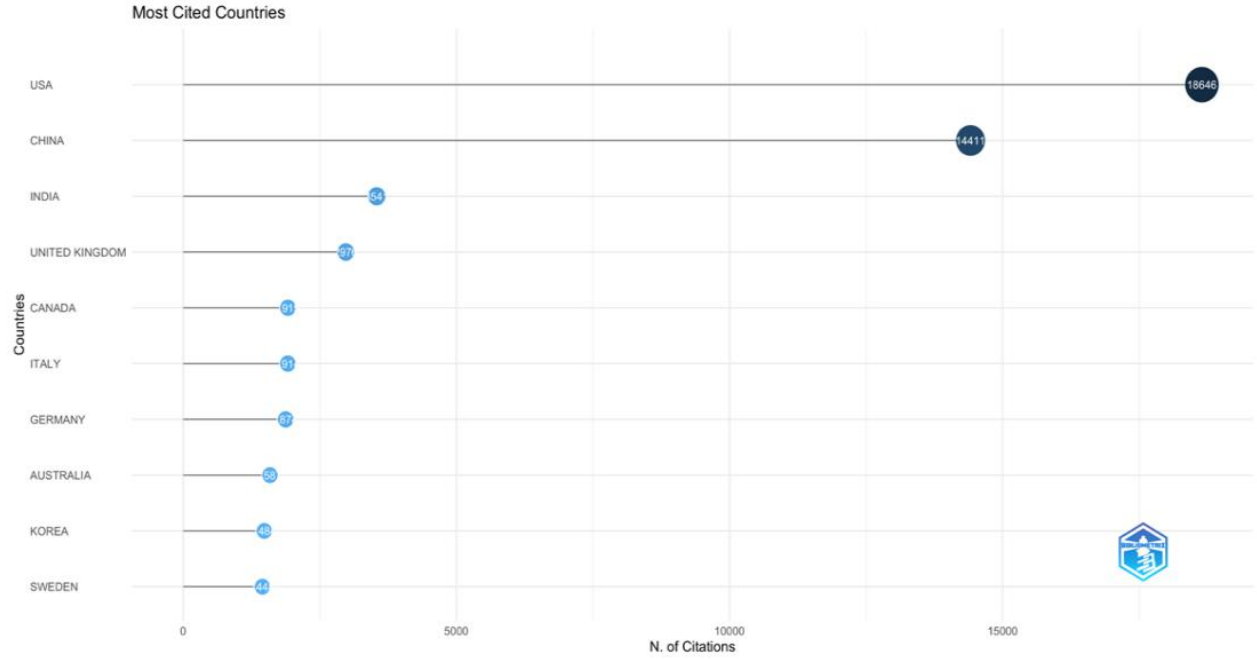

Figure 6. Countries with the highest number of citations in Alzheimer's-related scientific literature. The USA and China stand out significantly, indicating a high level of influence in the global academic community. Visualizations are performed using data from Biblioshiny.

Bibliometric analysis of the literature on Alzheimer's disease from 2023 to 2025 shows a significant growth trend with an annual growth rate of 19.67%. This reflects the increasing global attention to this neurodegenerative issue. The co-occurrence network visualization from Keywords Plus indicates that the main focus of research is still on clinical and demographic aspects, such as human, male, female, aged,and Alzheimer's disease itself(25). The dense network structure and strong connectivity indicate that published studies tend to have similar thematic focuses and approaches, such as controlled clinical trials and elderly human population studies. This also confirms that the direction of Alzheimer's research is largely translational with an orientation toward clinical intervention, epidemiology, and evidence-based therapy development(26). In terms of publication, the main sources of Alzheimer's research are dominated by highly reputable journals such as Alzheimer's and Dementia, Journal of Alzheimer's Disease, and Alzheimer's Research and Therapy. The fact that thousands of articles are published by these journals shows the high concentration of research in a few leading platforms, and also shows the scientific center of gravity in this field. Furthermore, the most published authors come from countries with strong research infrastructure, with names such as Wang Y and Zhang Y emerging as the most prolific authors. Collaboration across institutions and countries is also quite high, as reflected by the ratio co-authors per document which reached 8.38 and the percentage of international collaboration was 28.51%. This indicates a global synergy in addressing the challenges posed by Alzheimer's, although the dominance of authors from the East Asian region (especially China) is an interesting phenomenon to observe further(27).

Furthermore, the analysis of affiliations and contributions by country highlights the dominance of institutions from the United States, such as the University of California and Harvard Medical School, which consistently top the publication productivity. Countries such as the US and China are not only productive, but also top the list in terms of

the number of citations, indicating the quality and impact of their research in the global scientific community. India, the UK and Canada also make significant contributions, both in terms of the quantity of publications and their scientific impact. The scientific distribution map shows that scientific production related to Alzheimer's has expanded geographically, although it is still concentrated in developed countries(28). This highlights the need to strengthen research capacity in developing countries in order to broaden global knowledge of the disease and create solutions that are inclusive and diverse across populations.

Conclusion

The results of the bibliometric analysis show that research on Alzheimer's disease is growing rapidly in the 2023–2025 time frame, with annual publication growth reaching 19.67%. The most relevant journals that are the main place of publication are Alzheimer's and Dementia (1093 documents), followed by Journal of Alzheimer's Disease (817 documents), and Alzheimer's Research and Therapy (292 documents). The most productive author in this field is Wang Y (493 publications), followed by Zhang Y (437 publications) and Li Y (410 publications). They have contributed greatly to enriching the scientific literature on Alzheimer's, especially in the aspects of diagnosis, therapy, and pathophysiology. The dominance of publications comes from the United States, China, and India, with the strongest affiliations such as University of California, Harvard Medical School, and Mayo Clinic. The findings highlight the importance of international collaboration in supporting Alzheimer's research and the need to expand contributions from developing countries in the future.

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Declarations

Author contribution	:	Danang Prasetyaning Amukti contributed to the conceptualization and design of the study, methodology, data curation, formal analysis, and visualization, and drafted the original manuscript. Ria Indah Pratami and RA Dewinta Sukma Ananda contributed to methodology, software, data curation, and validation, and participated in manuscript review and editing. Daru Estiningsih contributed to investigation, resources, supervision, and project administration, and reviewed and edited the manuscript. Moch. Saiful Bachri contributed to formal analysis, visualization, and validation, and reviewed and edited the manuscript. Muhammad Ma'ruf contributed to literature search, data curation, and validation, and reviewed and edited the manuscript. All authors approved the final manuscript.
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Conflict of interest	:	The authors declare that no conflict of interest.
Ethics Declaration	:	We confirm that this work has been written based on ethical research principles in compliance with our university's regulations and that the necessary permission was obtained from the relevant institution during data collection. We fully support Clips commitment to upholding high standards of professional conduct and practicing honesty in all academic and professional activities.
Additional information	:	There is not any more information available for this paper.

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