

Al-Kindy College Medical Journal (KCMJ)

Research Article

A Bibliometric Analysis of Global Research on Dementia and its Cognitive Function

Suchismita Pahantasingh¹, Sasmita Das², Surjeet Sahoo³, Manoranjan Dash⁴, Pravati Tripathy², Jhunilata Pradhan⁵, Krishna Kumari Samantaray⁶, Rubi Pradhan⁷

- Dept. of Mental Health Nursing, SUM Nursing College. SOA Deemed to be University, Bhubaneswar, Odisha, India
- SUM Nursing College, SOA Deemed to be University, Bhubaneswar, Odisha, India.
- Department of Psychiatry, IMS and SUM Hospital, Bhubaneswar, Odisha, India.
- Faculty of Management science, SOA Deemed to be University, Bhubaneswar, Odisha, India
- Department of Medical Surgical Nursing, SOA Deemed to be University, Bhubaneswar, Odisha, India
- Dept. of community Health Nursing, SUM Nursing College. SOA Deemed to be University, Bhubaneswar, Odisha, India
- Dept. of Child Health Nursing, SUM Nursing College. SOA Deemed to be University, Bhubaneswar, Odisha, India * Corresponding author's email: <u>suchismitapahantasingh@soa.ac.in</u>

ABSTRACT

Article history: Received 22 April 2025 Accepted 11 June 2025 Available online 1 August 2025

https://doi.org/10.47723/1tp3pa39

Keywords: Dementia, Cognitive Function, Bibliometrics, Global trends.



This article is an open

Attribution (CC BY) license http://creativecommons.org/licenses/by/4.0/

access article distributed under the terms and conditions of the Creative Commons

> on all articles which has manifested the current trends and important areas of research on dementia. After an intensive analysis the study concluded that there is still a gap in international collaboration among leading countries. In India dementia can be a research gray area and focus of future attention.

> Introduction: Dementia is a neurocognitive disease manifested by progressive and global

declination in cognition. However, there is a lack of visualization analysis on research in the

field of dementia and cognitive function. To evaluate the impact and compare the scholarly

Material and methods Literature related to dementia and cognitive function were searched from Scopus database. In the area of dementia bibliometrics was used to analyze the leading authors, the journals with higher citation, higher collaboration between the countries, and

keywords. Scopus analysis and Biblioshiny R-package were used in the analysis of country

Results: Total 1753 articles were identified from Scopus database and among these 425 articles

were included in the study on basis of inclusion criteria. United states, China and Japan has the highest productivity and China, USA, Australia, Canada and Indonesia and has strong

collaboration. The research hotspots in this field focused on Dementia and its impact on

cognitive function. According to Lotka's Law, the studies in the field of dementia is limited and

Conclusion: Dementia is a major public health issues in India and this study has thrown light

work output and productivity among organizations, bibliometrics was used.

Introduction

Dementia is a syndrome occurring as a result of disease of the brain, which is usually chronic or progressive in nature caused by different types of diseases in which the nerve cells of the brain are damaged over time and may lead to deterioration in cognitive functions.1,2

It is also considered that Dementia is a major neurocognitive disorder and required residential care among older adults. Worldwide roughly

collaboration and global cited documents.

need to be conducted further.

around 46 million people are undergoing this condition and affecting their executive, psychic and physical spheres.³

The neurons of the brain are damaged in dementia caused different disease condition leads to progressive deterioration in executive brain function. ⁴ In the course of dementia there is progressive deterioration in functional activities and require assistance to manage day-to-day activities due to cognitive and functional impairment. Physical impairment associated with reduced quality of life in people with dementia and increased health care expenditure. ⁵

Worldwide dementia and cognitive impairment are rising and expected to increase more and more in developing countries. ⁶ Dementia is manifested by speech difficulties, memory, decision making and other executive functions which put impact on an individual's ability to carry out daily activities. ⁷

India is augmenting with its population and embracing highest aging composition and expected to excel China as the world's most populous country. India is a dwelling place of 1.37 billion people, entailing 18% of the total world population in 2019. India population by 2050 is expected to increase about 20% (319 million) of total Indian population on or above 60 years of age and holding 15.4% of Indian people aged 60 years and older globally. This demographic shift exhibits that there is increased longevity, because in India life expectancy rate has remarkably rising from 42.9 years in 1960 to 70.4 years in 2020 which is enlightening that India is in potential alarming stage because aging is the most common and aggravating risk factor for dementia. ⁸

The early onset of dementia occurs before the age of 65 years (working age) and those people affected with dementia after 65 years of age is called late-onset of dementia. The etiological theory of dementia is not clearly understood yet but due to dementia the anatomical and chemical changes occurs in brain, leading to damage of nerve cells and shrinkage of brain cell occurs. ¹

The course of mental and physical dysfunction of early or mild intellectual disability is nearly 20 years and lacked with knowledge to improve their disability through different modalities.⁹

The research on dementia currently has covered broad array. Nevertheless, the extensive investigation of the present research publication ground has not been considered to throw light on the content of published research. This type of bibliometric analysis would be contributively to portray the worldwide trends in the field of research pertaining to health and interventions for dementia patients to fulfil the purpose of the research and to find answers to the research questions.¹⁰

People living with dementia have difficulties in carrying out activities of daily living (ADLs) and Instrumental activities of daily living (IADLs) considered as global cognitive dysfunction, and they are lacked with adequate support and leads to increase dependency and vulnerability. ¹¹

The current study aims to reveal the global research publication trends, and its impact related to health and interventions for dementia client. However, the investigator tried to throw a comprehensive insight into the present global research status on the health of and interventions for dementia patients which consider global productivity among topmost countries and their research collaboration and keyword trends. To evaluate the impact and

compare the scholarly work output and productivity among organizations, bibliometrics was used. 12 13

One of the most common types of iMetrics is bibliometrics. Bibliometrics is supposed to give a "dynamic view of concepts and semantics". ¹⁴ Bibliometrics is the analysis of published information (e.g., books, journal articles, datasets, and blogs) and its related metadata (e.g., abstracts, keywords, and citations) by using statistics to describe or show relationships between the published works and considered as a quantitative performance indicators of published research, to recover from the disadvantage of bias in peer review and expert decisions. ^{15,16}

Subjects and Methods

Bibliometric analysis method was used in present study to achieve the purpose of the research and to get the answers to the unsolved research problems. Bibliometrics is described as the analysis of published documents which includes books, published articles, datasets, and blogs and its related metadata such as abstracts, author keywords, and document citations by using different statistical methods to find out or justify the relationships between the published documents.¹⁷

Hence visualized analysis method of bibliometrics was used by the researcher to explore the global trends of selected articles including journal article, country, organization and key word along with Scopus analysis descriptive data. Biblioshiny R-packages were also used to find out the research trends of dementia and cognitive function globally by exploring research gray areas, topmost author as well as total link strength of countries collaboration and citations by analyzing the relevant local and international studies through bibliometric methods.

Data collection

Scopus data base was used to collect the secondary data and didn't require any human interaction for which there was zero ethical issues attached to it and also institutional review board's permission was not needed. Articles from Scopus database were obtained between 18th and 21st October. The review of literature was done by using the keywords "dementia" AND "cognitive function". Then, from Scopus database the studies were filtered as per set categories (nursing, medicine, neuroscience, psychology and health profession), time period (1989-2024), publication type (final article) and language (English), source type (all open access journal). As a result of this inclusion criteria 1753 published articles were searched. Titles, abstracts, or full texts were cross checked to find out whether the documents are meeting the criteria or not. The selected articles were assessed and screened by two independent reviewers. The exclusion criteria of the studies were as follows: (1) publications without keywords (2) publications without abstract; (3) repeated publications Finally, 425 number of articles were retrieved from the database.

All the bibliographic information from Scopus database was extracted to an Excel datasheet. The downloaded bibliographic data included details of the author including contact information, study title, year of publication, abstract, keywords, and journal details

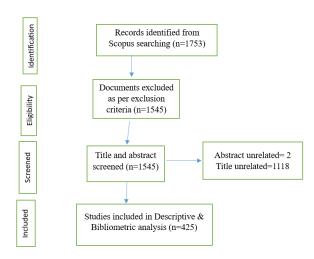


Figure 1: Flow chart for inclusion of publications on Dementia and cognitive function.

Results

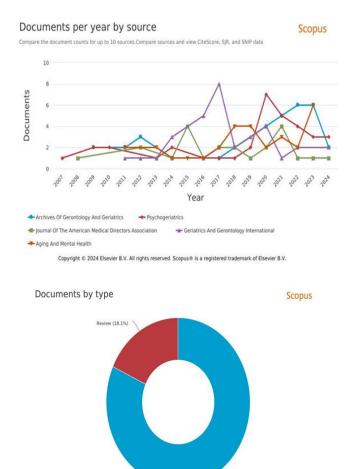


Figure 2: Distribution of publication by document types, subject area, and document per year by journal source.

Table-1: Top 10 Countries who published studies on Cognitive function and Dementia.

Name of the country	Number of publications
United state	80
Japan	73
China	54
Taiwan	42
South Korea	41
United Kingdom	31
Hong Kong	22
Canada	20
Spain	18
Australia	17

United State has the highest number of publications (80) and in top position among 50 countries across the globe that has researched the topic 'Cognitive function and Dementia' followed by other countries like Japan (72 publications), China (54 publications). Taiwan and South Korea also has done a fair number of studies 42 and 41 respectively and next to these countries United Kingdom (31), Hong Kong (22), Canada (20), Spain (18) and Australia has 17 numbers of publications. This country wise comparison showed the wide range of research has been conducted in these top 10 countries.

Bibliometric Analysis

Keywords and cluster analysis Co-occurrence with author keywords

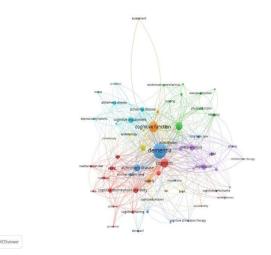


Figure 3: VOS viewer analysis of Co-occurrence with author keywords

The author keywords of the selected articles were analyzed using VOS viewer in which the minimum number of occurrence of keywords are 4. Among 913 keyword 62 keywords met the threshold which were selected for analysis. As shown in Fig 3 the 62 keywords were categorized into 8 clusters: cluster 1 cognition related search (bottom center in red), cluster 2 cognitive impairment related search (right top corner in green), cluster 3 dementia and cognitive

stimulation related search (center in sky blue), cluster 4 cognitive functioning related search (left center in yellow), cluster 5 quality of life related search (top right corner in purple) and cluster 6 Alzheimer's disease related search (top left corner in light blue), cluster 7 elderly and cognitive function related search (top in orange) and cluster 8 cognitive disorder and rehabilitation related search (right bottom in brown color).

In cognition related cluster, the most occurring key words are "cognition" (65 times), "physical activity" (26 times), "cognitive decline" (23 times). In the cluster cognitive impairment, the frequently used keywords are "mild cognitive impairment" (58 times), "memory" (10 times), "physical function" (7 times). In the cluster dementia and cognitive stimulation most occurring key words are "dementia" (202 times), "Alzheimer's disease" (43 times), "cognitive stimulation" (4 times). In cognitive function related search, the most frequently used keywords are "older adults" (32 times), "music therapy" (7 times) "cognitive functioning" (6 times). In quality-of-life cluster, the most occurring keywords are "depression" (33times), "quality of life" (11 times), and Cognitive dysfunction (7 times). In Alzheimer's disease related cluster "cognitive impairment" (34 times), "Alzheimer disease" (22 times). In elderly and cognitive function related cluster most occurring key words are "cognitive function" (95 times), "elderly" (25 times) and in last cluster of cognitive disorder and rehabilitation related the most frequently used key words are "cognitive performance" (5 times). Cognitive disorder (4 times).

Publication with keywords", "cognitive function", "cognitive impairment", "Alzheimer's disease" focuses on cognitive health of dementia patient and publication with keywords "cognitive stimulation", "Cognitive stimulation therapy", "occupational therapy", "rehabilitation", "non- pharmacological intervention", "psychosocial intervention" and "cognitive training" focuses on intervention for the target population.

Co-authorship analysis with author

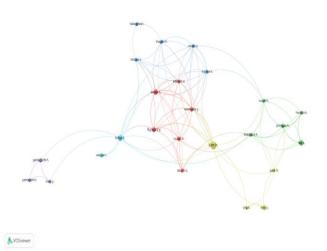


Figure 4: VOS viewer analysis of Co-authorship with author

Fig 4 depicts a collaboration map among the principal author who have published articles on dementia based on co-authorship analysis. In co-authorship analysis among 67 documents 25 documents are connected. In respect to co-authorship and author analysis the author's name mentioned in the circle, the larger the size of the circle wider the network of collaboration. The lines connecting the author to author represents the related research in the field of dementia.

Among the top authors Kim h. has highest number of documents (n=11) and total link strength is 27 and coming under cluster 4.

C. R- Biblioshiny analysis Country Collaboration Map

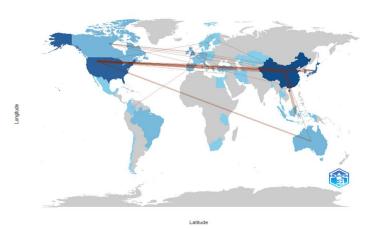


Figure 5: Country collaboration map

The map illustrates the country collaboration in the field of research on dementia. The blue color justifies the intensity of the shaded country proportionate to the total number of productions of the country. In the field of dementia, the deeper the color the higher the number of published documents. The deep blue indicated countries has higher number of publications such as China, USA, Australia, Canada and Indonesia and has strong collaboration with each other.

Citation analysis of documents

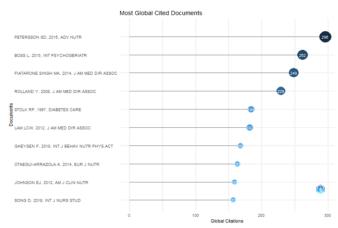


Figure 6: Top 10 global cited documents (retrieved from Biblioshiny)

The top ten cited global documents were examined from R studio Biblioshiny. In terms of most cited documents Petersson SD, 2016, ADV NUTR obtained the highest number (n=296) of citation. The next highest cited document is Boss L, 2015, INT psychogeriatric has gathered 262 citations. Following these documents Fiatarone Singh MA, 2014, J AM MED DIR ASSOC received 249 citations. The remaining seven more documents has accumulated a total of 1242 citations. Those documents were authored by Stolk RR etal, LAM LCW et al, Gheysen F et al, Otaegui- Arrazola A et al, Jhonson Ej et al and Song D et al.

Research trend analysis through Word cloud



Figure 7: Trend analysis through word cloud

The word cloud for current paper is used to study the most occurring words, indicating that the majority of the analysis is done in those areas. ¹²

While analyzing the most recurrent research keywords in figure 7, it remarked that the font size of the keywords is positively correlated with the frequency of words. Hence the words which were used more often were seen in bigger font size in the word cloud. ¹⁸

The most frequently used words are aged (558 times), cognition (545, female (435), dementia (419) and so on.

Author productivity analysis through Lotka's Law

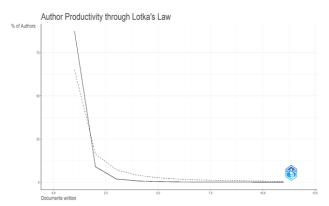


Figure 8: Global author productivity

Bibliometrics explains the scientific productivity and its distribution among authors globally based on Lotka's law which was started by Alfred J. Lotka. Agreeing to Lotka's law the number of papers published by the authors is inversely proportional to that number. It uses mathematical distribution of power law. It benefits the author to comprehend the depth of technical productivity and has utilization for study trend assessment, organizational or country collaboration, and study output patterns. ⁴

Fig.8 depicts author productivity on dementia and cognitive function. About 87.4% of authors have published one and only paper on dementia and cognitive function, 9% authors published two articles and three papers have published by 1.9% of authors. As per Lotka's law these findings justify that there is a less number of very prolific authors, a substantial quantity of moderately productive authors.

Discussion

Bibliometric analysis helps to comprehend and explore the history and trends of a research area. ¹⁹ The aim of this study was to explore bibliometric research productivity and to throw a light on global productivity in the field of dementia. The significance of dementia and cognitive functioning associated elderly was clearly visible in this bibliometric analysis.

The descriptive Scopus analysis revealed a mark-able growth in research output on dementia which are original article. In terms of country wise research production United States has done extensive investigation on this part and followed by other countries like Taiwan, China and Japan.

In author keyword and cluster analysis in VOS viewer "dementia" is the highest occurring keywords and next to it is "Cognition" and "cognitive impairment" focuses on cognitive health of dementia patient and in terms of collaboration map among the principal author who have published articles on dementia based on co-authorship analysis Kim h. has highest number of documents.

In social structure countries collaboration world map through Biblioshiny analysis China, USA, Australia, Canada and Indonesia and has strong collaboration with each other and possessing utmost number of publications in the area of dementia whereas India has very less publications and collaboration on this aspect may be due to elderly composition is less in comparison to these countries.

In terms of most global cited documents Petersson SD, 2016, ADV NUTR obtained the highest number (n=296) of citation. The next highest cited document is Boss L, 2015, INT psychogeriatric has gathered 262 citations. Following these documents Fiatarone Singh MA, 2014, J AM MED DIR ASSOC received 249 citations.

The world cloud showed the most common keywords were clearly "aged". It is essential to highlight that this keyword could be used as a probing that the document was about clinical research. ¹²

At last, a majority of authors have published only one paper, signifying that the total number of authors focusing on the selected area remains inadequate. Lotka proposed the Law of scientific productivity, which describes the frequency of publications by authors in a given field. Lotka's law states that the number of authors who have published in that area should not surpass 60% of the total number of authors, if it is then it is considered to be developed. ²⁰ Those who have published two works should be ½ of those who have published

one work, and those who have published three works should be 1/9 of those who have published one work (Lotka, 1926). As per Lotka's law the author productivity in current study is less by prolific authors.

The results of the study recommended that the topic should be related to the concern of people living with dementia. ¹². Hence it is clinched that the relevant content related to dementia is limited and needs further research on this aspect.

Though there was a detailed descriptive and quantitative analysis still the study is limited to some areas as publications were limited to Scopus database only which does not index all journals, so articles from other databases (e.g., WOs and PubMed) may have failed to spot. In addition, the publications restricted to nursing field only, which may introduce publication bias. For example, the research in other field like medical science, social science, humanities and psychology may have a greater number of publications which would have given a wide range of research in the field of Dementia.

Conclusion

Bibliometric analysis is newer adaptive method of published article analysis in medical field by using different software like Vos viewer analysis and R studio Biblioshiny analysis and this study identified significance of conducting study related to dementia as there is still a gap in international collaboration among prolific countries engaged in the field of dementia. As the elderly composition is increasing, India has to take more research initiative in the field of Dementia and their cognitive function. Dementia can be a research hotspot or grey area and may be the focus of future thoughtfulness.

Acknowledgments

Funding

This research did not receive any grant from funding agencies Conflict of Interest

Authors declare no conflict of interest.

Data availability

Data are available upon reasonable request.

ORCID

Suchismita Pahantasingh	0000-0003-1367-2693
Sasmita Das	0000-0003-1084-7304
Surjeet Sahoo	0000-0003-2445-9994
Manoranjan Dash	0000-0003-3510-3299
Jhunilata Pradhan	0009-0005-1625-7788
Krishna Samantaray	0009-0000-0256-254X
Rubi Pradhan	0009-0008-7672-0756

References

- [1] Dening T, Sandilyan MB. Dementia: definitions and types. Nursing Standard (2014+). 2015 May 13;29(37):37. https://doi.org/10.7748/ns.29.37.37.e9405
- [2] Chan JY, Liu J, Chan AT, Tsoi KK. Exergaming and cognitive functions in people with mild cognitive impairment and dementia: a meta-analysis. npj Digital Medicine. 2024 Jun 15;7(1):154. https://doi.org/10.1038/s41746-024-01142-4

- [3] Jiménez-Palomares M, González-López-Arza MV, Garrido-Ardila EM, Montanero-Fernández J, Rodríguez-Domínguez T, Rodríguez-Mansilla J. Effects of a cognitive stimulation program in institutionalized patients with dementia. Journal of personalized medicine. 2022 Nov 1;12(11):1808. https://doi.org/10.3390/jpm12111808
- [4] Dagli N, Haque M, Kumar S. Bibliometric analysis and visualization of clinical trials on the therapeutic potential of essential oils (1967-2024). Cureus. 2024 Apr 1;16(4) https://doi.org/10.7759/cureus.57430
- [5] Laver K, Dyer S, Whitehead C, Clemson L, Crotty M. Interventions to delay functional decline in people with dementia: a systematic review of systematic reviews. BMJ open. 2016 Apr 1;6(4):e010767. https://doi.org/10.1136/bmjopen-2015-010767
- [6] Gurung N, Upendra S. A Study to Assess the Effectiveness of Cognitive Stimulation Therapy with Reference to Cognitive Level among Patient with Dementia in Selected Rehabilitation Center of Pune District. Indian Journal of Public Health Research & Development. 2019 Aug 1;10(8). https://doi.org/10.5958/0976-5506.2019.01930.2
- [7] Sobral M, Pestana MH. Virtual reality and dementia: A bibliometric analysis. The European Journal of Psychiatry. 2020 Jul 1;34(3):120-31. https://doi.org/10.1016/j.eipsy.2020.04.004
- [8] Lee J, Meijer E, Langa KM, Ganguli M, Varghese M, Banerjee J, Khobragade P, Angrisani M, Kurup R, Chakrabarti SS, Gambhir IS. Prevalence of dementia in India: National and state estimates from a nationwide study. Alzheimer's & Dementia. 2023 Jul;19(7):2898-912. https://doi.org/10.1002/alz.12928
- [9] Jenkins E, Koirala B, Rodney T, Lee JW, Cotter VT, Szanton SL, Taylor JL. Home/community-based interventions to improve function in persons with mild cognitive impairment/early dementia. Geriatric Nursing. 2021 Sep 1;42(5):1109-24.

https://doi.org/10.1016/j.gerinurse.2021.06.023

- [10] Çiçek Korkmaz A, Altuntaş S. A bibliometric analysis of COVID-19 publications in nursing by visual mapping method. Journal of Nursing Management. 2022 Sep;30(6):1892-902. https://doi.org/10.1111/jonm.13636
- [11] Lee-Cheong S, Amanullah S, Jardine M. New assistive technologies in dementia and mild cognitive impairment care: A PubMed review. Asian Journal of Psychiatry. 2022 Jul 1;73:103135.

https://doi.org/10.1016/j.ajp.2022.103135

- [12] Patil RR, Kumar S, Rani R, Agrawal P, Pippal SK. A bibliometric and word cloud analysis on the role of the internet of things in agricultural plant disease detection. Applied System Innovation. 2023 Feb 9;6(1):27. https://doi.org/10.3390/asi6010027
- [13] Rosas SR, Kagan JM, Schouten JT, Slack PA, Trochim WM. Evaluating research and impact: a bibliometric analysis of

- research by the NIH/NIAID HIV/AIDS clinical trials networks. PloS one. 2011 Mar 4;6(3):e17428. https://doi.org/10.1371/journal.pone.0017428
- [14] Jarden RJ, Narayanan A, Sandham M, Siegert RJ, Koziol-McLain J. Bibliometric mapping of intensive care nurses' wellbeing: development and application of the new iAnalysis model. BMC nursing. 2019 Dec;18:1-1. https://doi.org/10.1186/s12912-019-0343-1
- [15] Sobral M, Pestana MH. Virtual reality and dementia: A bibliometric analysis. The European Journal of Psychiatry. 2020 Jul 1;34(3):120-31. https://doi.org/10.1016/j.ejpsy.2020.04.004
- [16] Wang Z, Zhu X, Wen Y, Shang D. Bibliometric analysis of global research on the role of apolipoprotein E in Alzheimer's disease. Heliyon. 2023 Jul 1;9(7). https://doi.org/10.1016/j.heliyon.2023.e17987
- [17] Zhanzhang Wang, Xiuqing Zhu, Yuguan Wen, Dewei Shang, "Bibliometric analysis of global research on the role of apolipoprotein E in Alzheimer's disease", Heliyon, Volume 9, Issue 7,2023,e17987, ISSN 2405-8440 https://doi.org/10.1016/j.heliyon.2023.e17987

- [18] Alkhammash R. Bibliometric, network, and thematic mapping analyses of metaphor and discourse in COVID-19 publications from 2020 to 2022. Frontiers in psychology. 2023 Jan 16;13:1062943.
 - https://doi.org/10.3389/fpsyg.2022.1062943
- [19] Sarpong AA, Arabiat D, Gent L, Towell-Barnard A. A bibliometric analysis of missed nursing care research: current themes and way forward. InNursing Forum 2023 (Vol. 2023, No. 1, p. 8334252). Hindawi. https://doi.org/10.1155/2023/8334252
- [20] Güler G. A Bibliometric Analysis on Power Analysis Studies. Journal of Measurement and Evaluation in Education and Psychology. 2023;14(3):235-48. https://doi.org/10.21031/epod.1343984

To cite this article:

Pahantasingh SP, Das S, Sahoo S, Dash M, Tripathy P, Pradhan J, et al. A Bibliometric Analysis of Global Research on Dementia and its Cognitive Function. Al-Kindy Col. Med. J. 2025;21(2):129-135. https://doi.org/10.47723/1tp3pa39