ORIGINAL ARTICLE

TRENDS AND GLOBAL RESEARCH PATTERNS IN GERIATRIC REHABILITATION: A 10-YEAR BIBLIOMETRIC ANALYSIS

Turkish Journal of Geriatrics
2025; 28(4):512–524

DOI: 10.29400/tjgeri.2025.468

İbrahim ULUDOĞAN
Ayşe Merve ÇIRACIOĞLU

Eskisehir City Hospital, Physical Medicine and Rehabilitation, Eskisehir, Türkiye

Correspondence

İbrahim ULUDOĞAN
Phone : +902226114000
e-mail : ibrahimuludogan15@hotmail.com

Received : Oct 09, 2025
Accepted: Nov 22, 2025

Cite this article as:
Uludoğan İ, Çıracıoğlu AM. Trends and Global Research Patterns in Geriatric Rehabilitation: A 10-Year Bibliometric Analysis. Turkish Journal of Geriatrics 2025; 28(4):512–524.
doi: 10.29400/tjgeri.2025.468

Abstract

Inroduction: As life expectancy increases globally and populations age swiftly, the significance of geriatric rehabilitation has grown progressively each year. The objective of this study was to conduct a systematic bibliometric analysis of the scientific literature on geriatric rehabilitation published in the last decade.

Materials and Method: The Web of Science Core Collection database was used to examine scientific papers on geriatric rehabilitation from 2015 to 2025. We used VOSviewer and Bibliometrix to do bibliometric analyses. The research analyzed yearly publication trends, contributions by country, productivity of authors and institutions, prominent journals, collaboration networks, citation distributions, co-citation analyses, keywords, and commonly cited references.

Results: We found a total of 666 publications, of which 588 were original articles and 78 reviews. The average yearly increase in publications was 4.97%. The Netherlands ranked first in both publication numbers and international collaborations, followed by Germany and Australia. Vrije University Amsterdam and Leiden University were among the most productive universities. Commonly used keywords were "rehabilitation," "geriatric rehabilitation," "older adults," "aging," and "frailty." In the last few years, the keywords "virtual reality," "index," "consensus," "hospitalization," and "quality of life" have become more popular.

Conclusion: Our analysis shows that research on geriatric rehabilitation has been steadily increasing over the past ten years. Research in this domain has predominantly concentrated on functional enhancement; however, recent years have witnessed an expansion in technological applications and multidisciplinary methodologies. These kinds of studies are expected to help future research and health policy.

Keywords: Geriatrics; Rehabilitation; Bibliometrics.

INTRODUCTION

Rehabilitation is a multidisciplinary health service aimed at augmenting individuals' functional capacity, facilitating independent living, and enhancing quality of life. The World Health Organization (WHO) states that rehabilitation is a comprehensive and organized set of actions designed to reduce health-related disabilities and enhance functional levels.

Longer life expectancy, a high number of chronic diseases, and an aging population have all made rehabilitation services more critical than ever. The United Nations' 2022 report says that by 2050, about 16% of the world's population will be 65 years old or older (1). Geriatric rehabilitation is crucial for enabling older adults to remain independent and maintain their quality of life.

Geriatric rehabilitation encompasses the management of sarcopenia, frailty, declines in physical performance, cardiopulmonary diseases, nutritional deficiencies, cognitive decline, and the increased risk of falls associated with aging. It is a comprehensive approach that considers psychological and social factors alongside physical function. A multidisciplinary team of geriatricians, physiatrists, physiotherapists, occupational therapists, psychologists, and social workers provides care. This team designs and carries out personalized treatment plans for each person based on their needs. Cruz-Jentoft and associates highlighted the significance of geriatric rehabilitation in addressing age-related muscle mass deterioration that may restrict autonomy (2).

The increasing demand in this sector is directly affecting scientific research trends. Bibliometric methods, which are statistical and mathematical tools used to look at academic patterns in a field, are being used more and more to learn about the development dynamics and research directions of the geriatric rehabilitation literature. Nonetheless, studies specific to the field are still quite limited. Azizan et al. have done two bibliometric studies that stand out. The first one looks at SCOPUS data from 1948 to 2022, and the second one looks at SCOPUS and Web of Science (WoS) data from 1947 to 2023. Both claim that the number of publications has increased significantly over the last 25 years. The United States has the most publications, followed by Germany and Canada. Some of the most common keywords are "rehabilitation," "aged," and "hip fracture" (3,4).

The objective of our study is to methodically analyze the scientific literature on geriatric rehabilitation published in the past decade. We use bibliometric analysis to find out about current publication trends, popular research topics, and patterns of international collaboration. Our goal is to help future studies.

MATERIALS AND METHOD

This bibliometric study seeks to discern trends and global research patterns in geriatric rehabilitation by analyzing scientific publications indexed in the Web of Science Core Collection (WoS-CC) from the past decade. The search strategy was delineated as Topic Search (TS)=("geriatric rehabilitation" OR "rehabilitation in older adults" OR "rehabilitation in the elderly" OR "rehabilitation of the aged").

A database search was conducted on May 17, 2025, encompassing studies published within the last decade (2015–2025). In total, 666 records were identified, comprising 588 original research articles and 78 review articles. The analysis encompassed authors, countries, institutions, citations, co-citation trends, journals, keywords, and references.

In our study, publication counts, citation counts, and h-indexes for authors, countries, and institutions were obtained from the Web of Science Core Collection (WoS-CC) database. Document and reference citation analyses and keyword analyses were performed using Bibliometrix, an R-based open-source bibliometric analysis software. This software thoroughly analyzes WoS-CC data and lets you look at critical bibliometric factors like yearly publication trends, productivity indicators, collaboration metrics, citation analyses, bibliographic structure, and thematic evolution (5). VOSviewer (version 1.6.20, Leiden University, Leiden, the Netherlands) was also used to make network maps based on co-authorship, keyword co-occurrence, and co-citation, as well as to analyze journal publication numbers and citation patterns.

RESULTS AND DISCUSSION

Publication outputs

Bibliometric analyses utilizing primary databases demonstrate a consistent increase in scientific output regarding geriatric rehabilitation in recent years. Azizan and colleagues assert that the inaugural scientific publication in the domain was released in 1948. From the middle of the 1990s to 2013, the number of publications increased significantly, but this trend slowed down after that. On the other hand, the number of publications has been going up again since 2019 (3). Fan Zhang and colleagues published a bibliometric study in 2024 that found a significant rise in research articles on geriatric assessment from 2004 to 2023. In 2022, the number of articles published each year reached a high of 415 (6).

Our results align broadly with existing literature. We found 666 publications in our analysis of the years from 2015 to 2025. Of these, 588 were original research articles and 78 were reviews. The 4.97% average annual increase suggests that interest in the field has resumed. Figure 1 illustrates that both the number of publications and the number of citations increase significantly, particularly after 2020. People think this rise is because older adults needed more health care, care, and rehabilitation during the COVID-19 pandemic. The pandemic's effects on health care and society increased scientific interest in geriatric rehabilitation, which has been seen in the number of publications.

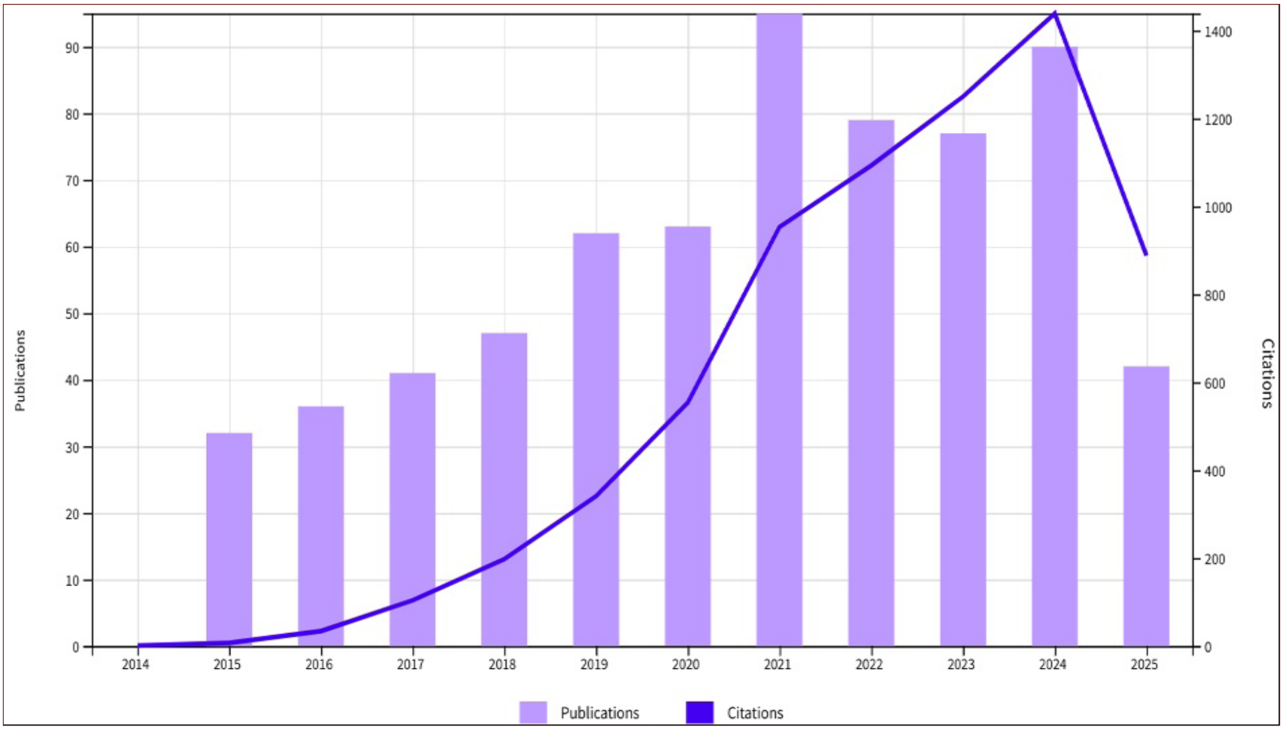

Figure 1. Bibliometric Overview of the Analyzed Publications Annual growth trends in publications and citations (WoS-CC)

Countries/Regions

Table 1 shows the number of publications by country. Of the 62 countries studied, the Netherlands has the most publications (n = 175), followed by Germany (n = 102) and Australia (n = 82). The United States (AC: 12.33) and China (AC: 13.43) have the highest mean citations per paper, which means that research published in these countries has a significant impact on science. In a separate study of geriatric assessment publications from 2004 to 2023, the US was the top country contributor, followed by Italy (14.98%), France (10.16%), the UK (10.11%), Germany (7.54%), Canada (7.19%), the Netherlands (6.60%), Spain (6.55%), Australia (6.08%), and China (5.76%) (6).

Figure 2 illustrates how countries collaborate. The Netherlands and Germany are in the top spots, which indicates that they are essential not only because of the number of publications they produce but also due to the numerous international

Table 1. Key Metrics of the Top 10 Countries, Authors, and Institutions by Publication Count

Countries	P	TC	AC	Authors	P	TC	AC	Institutions	P	C
Netherlands	175	2009	11.59	Maier AB	46	410	8.1	Vrije University Amsterdam	78	808
Germany	102	1014	9.94	Achterberg WP	39	532	13.3	Leiden University	51	564
Australia	82	901	11.12	Reijnierse EM	31	338	10.9	University of Melbourne	50	469
Canada	56	424	7.57	Schols JMGA	24	513	21.38	University of Amsterdam	47	652
USA	52	641	12.33	Bauer JM	23	312	13.57	Royal Melbourne Hospital	45	400
China	49	658	13.43	Hertogh CMPM	21	288	13.71	National University of Singapore	44	321
Switzerland	45	664	10.34	Lim WK	19	252	13.26	Ruprecht Karls University Heidelberg	43	519
Singapore	44	321	7.3	Gordon AL	18	329	18.28	Maastricht University	40	599
Spain	38	396	10.42	Meskers CGM	18	142	7.89	Radboud University Nijmegen	19	268
Israel	34	185	5.44	Wattel EM	18	227	12.61	Tel Aviv University	19	101

P: Publication, TC: Times Cited, AC: Average Cited, C: Citation

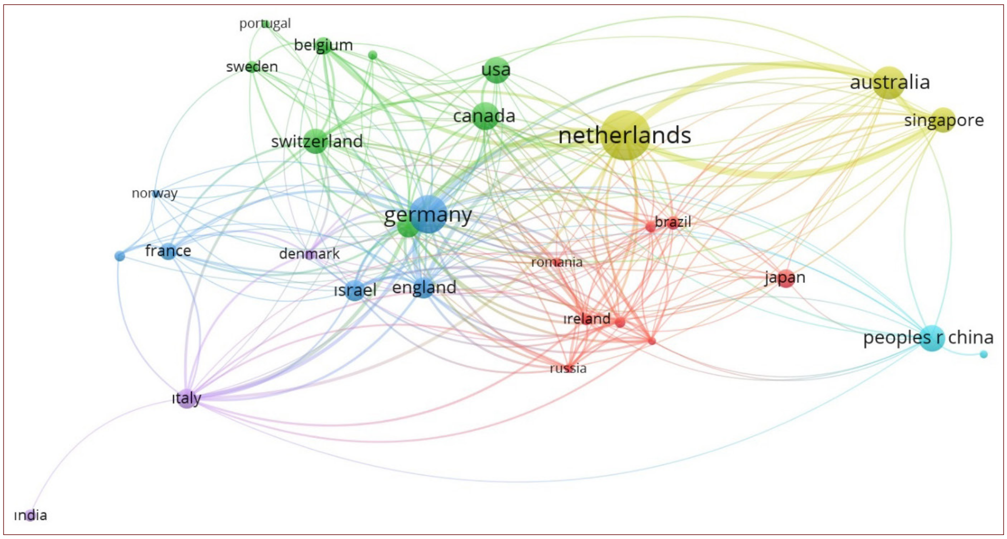

Figure 2. Cross-Country Collaboration Network Generated by VOSviewer

research projects in which they are involved. The relatively large older populations in these countries likely motivate extensive research into age-related conditions.

Authors

The top ten authors who have helped in this area are listed in Table 1. Maier tops the list with 46 publications, followed by Achterberg with 39 publications and Reijnierse with 31 publications. Maier, Achterberg, and Schols are also notable for their scientific impact, as shown by their high citation counts and h-index values.

Figure 3a shows the authors who are most often cited together. The colored clusters show groups of researchers who work in similar fields and are often cited together. Folstein, Mahoney, Tinetti, Podsiadlo, and Cameron are some of the most important people in the red cluster. They focus on evaluating older adults' cognitive and physical function and activities of daily living. The green cluster has Grund, Bachmann, and Covinsky, who are experts in health services, models of care, and functional decline. Rockwood, Katz, Lawton, and Guralnik are all well-known for their work on geriatric assessment scales and frailty, which are part of the yellow cluster. The blue cluster includes experts like Cruz-Jentoft, Cederholm, and Beaudart, who are working on sarcopenia and nutrition. This group is also connected to the European Society for Clinical Nutrition and Metabolism (ESPEN) and EWGSOP guidelines. Folstein, Guralnik, and Rockwood are examples of authors in more central positions with the most co-citation counts. They connect different clusters.

Institute

Table 1 shows the ten institutions that published the most papers. With 78 publications, Vrije Universiteit Amsterdam (n = 78) ranked first, followed by Leiden University (n = 51) and the University of Melbourne (n = 50). Four Dutch universities are in the top ten, which is interesting. This pattern indicates that the Netherlands is a leading player in geriatric rehabilitation, both in terms of the number of services it offers and the number of institutions

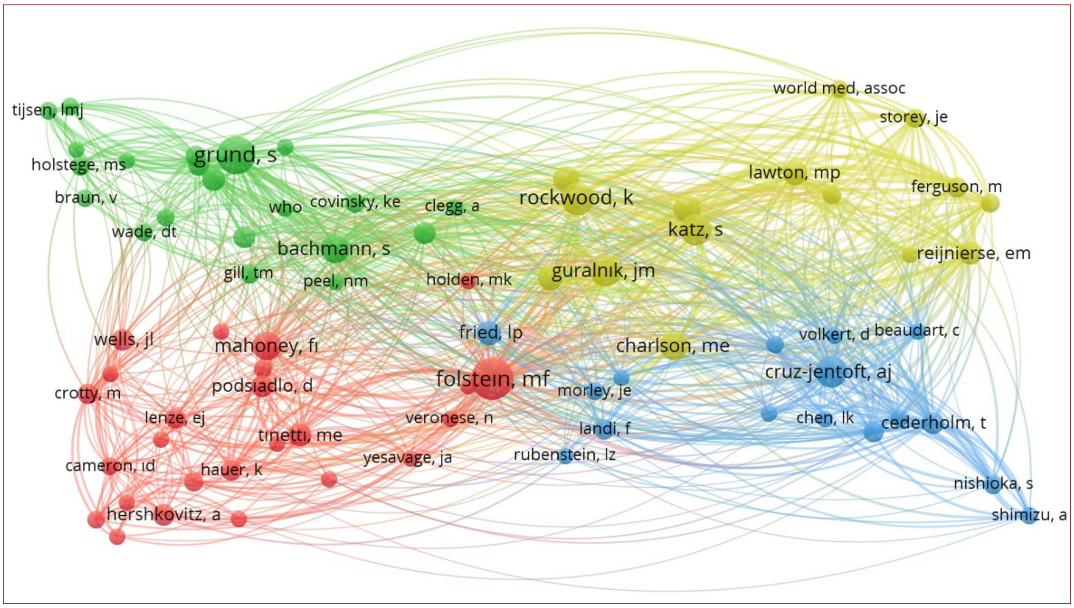

Figure 3a. Co-cited authors network (VOSviewer)

it collaborates with. As the older population increases, the growth of research, health policy initiatives, and collaboration among universities in this area strengthens this trend. The inclusion of institutions like the University of Melbourne (Australia), the National University of Singapore, Heidelberg University (Ruprecht-Karls-Universität Heidelberg, Germany), and Maastricht University (Netherlands) indicates that geriatric rehabilitation research encompasses a broad geographic scope.

Journals

Table 2 shows the ten journals with the most articles and citations in geriatric rehabilitation. BMC Geriatrics, the Journal of the American Medical Directors Association, and European Geriatric Medicine are the top three journals in terms of both publication and citation counts. These titles are the most critical places in the field.

Figure 3b displays the journals that are most often cited together in geriatric rehabilitation. Age

Table 2. Key Metrics of the Top 10 Journals by the Most Publications and Citations

Most publication	P	C	Most-cited	P	C
BMC Geriatrics	38	483	Journal of the American Medical Directors Association	27	582
Journal of the American Medical Directors Association	27	582	BMC Geriatrics	38	483
European Geriatric Medicine	26	355	European Geriatric Medicine	26	355
Journal of Clinical Medicine	17	105	Age and Ageing	10	170
Disability and Rehabilitation	16	158	Disability and Rehabilitation	16	158
Archives of Physical Medicine and Rehabilitation	12	146	Archives of Gerontology and Geriatrics	8	154
Nutrients	12	104	Archives of Physical Medicine and Rehabilitation	12	146
Aging Clinical and Experimental Research	11	140	Clinical Rehabilitation	11	140
Clinical Rehabilitation	11	111	Aging Clinical and Experimental Research	11	111
Topics in Geriatric Rehabilitation	11	16	Journal of Clinical Medicine	17	105

P: Publication, C: Citation, BMC: BioMed Central

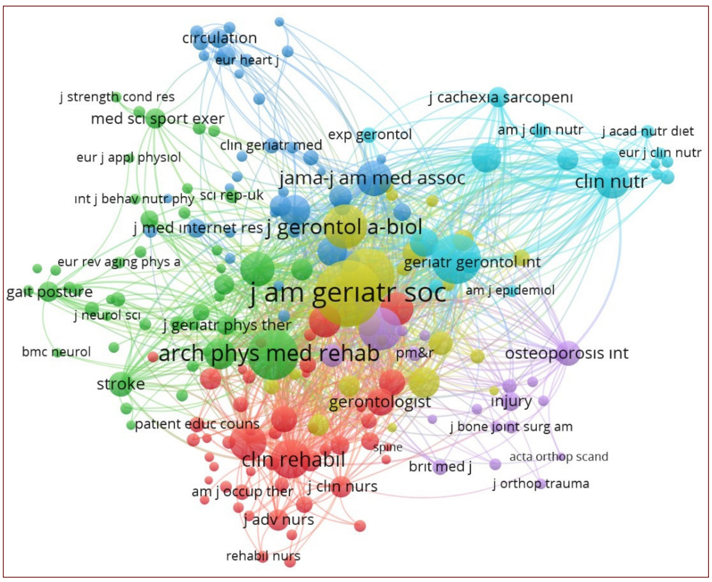

Figure 3b. Co-cited journals network (VOSviewer)

and Ageing, the Journal of the American Geriatrics Society, and The Journals of Gerontology: Series A – Biological Sciences are some of the most critical geriatrics journals in the yellow cluster. The green cluster includes journals that focus on rehabilitation and exercise, such as the Archives of Physical Medicine and Rehabilitation, the Journal of Geriatric Physical Therapy, Gait & Posture, and Medicine & Science in Sports & Exercise. Some of the clinical rehabilitation and physical medicine journals in the red cluster are Clinical Rehabilitation, the Journal of Rehabilitation Medicine, and the European Journal of Physical and Rehabilitation Medicine. The blue and turquoise clusters focus on nutrition and sarcopenia. They include Clinical Nutrition, the Journal of Cachexia, Sarcopenia, and Muscle, and The Journal of the American Medical Association. The purple cluster includes Osteoporosis International and The Journal of Bone and Joint Surgery, which are both about bone health and osteoporosis. The Journal of the American Geriatrics Society, the Archives of Physical Medicine and Rehabilitation, and Age and Ageing are the three journals that are most often cited together.

Citations

Table 3 shows the ten most-cited studies on rehabilitation for older people. The global and local citation counts are used to judge these works separately. The randomized controlled trial by Liu et al. that examined how well respiratory rehabilitation worked in older adults after COVID-19 is the most cited paper in the world, with 434 citations. This shows how the pandemic has affected the field (7). The research conducted by Bouwstra et al. regarding

Table 3. Key Metrics of the Top 10 Most Global and Local Cited Documents

Most Global Cited Documents	C	First Author	Journal	Year
Respiratory Rehabilitation in Elderly Patients with COVID-19: A Randomized Controlled Study (7)	434	Liu K.	Complementary Therapies in Clinical Practice	2020
Measurement Properties of the Barthel Index in Geriatric Rehabilitation (8)	137	Bouwstra H.	Journal of the American Medical Directors Association	2019
Impacts of Robot Implementation on Care Personnel and Clients in Elderly Care Institutions (9)	119	Melkas H.	Journal of Stroke and Cerebrovascular Diseases	2020
Prevalence of Stroke-Related Sarcopenia: A Systematic Review and Meta-Analysis (16)	113	Su Y.	Journal of Stroke and Cerebrovascular Diseases	2020
Assessing Minimal Detectable Changes and Test-Retest Reliability of the Timed Up and Go Test and the 2-Minute Walk Test in Patients with Total Knee Arthroplasty (17)	107	Yüksel E.	The Journal of Arthroplasty	2017
Cardiac Rehabilitation in Older Adults (18)	97	Schopfer W.	Canadian Journal of Cardiology	2016
European Consensus on Core Principles and Future Priorities for Geriatric Rehabilitation: Consensus Statement (15)	87	Grund S.	European Geriatric Medicine	2020
Factors Influencing Home Discharge After Inpatient Rehabilitation of Older Patients: A Systematic Review (19)	85	Everink IHJ.	BMC Geriatrics	2016
Prevalence of Malnutrition Comparing the GLIM Criteria, ESPEN Definition, and Malnutrition Risk in Geriatric Rehabilitation Patients (20)	75	Clark AB.	Clinical Nutrition	2020
Rehabilitation Interventions for Older Individuals with Cognitive Impairment Post-Hip Fracture: A Systematic Review (21)	71	Resnick B.	Journal of the American Medical Directors Association	2016

C: Citation ,GLIM:Global Leadership Initiative on Malnutrition; ESPEN: European Society for Clinical Nutrition and Metabolism; MST: Malnutrition Screening Tool, BMC: BioMed Central

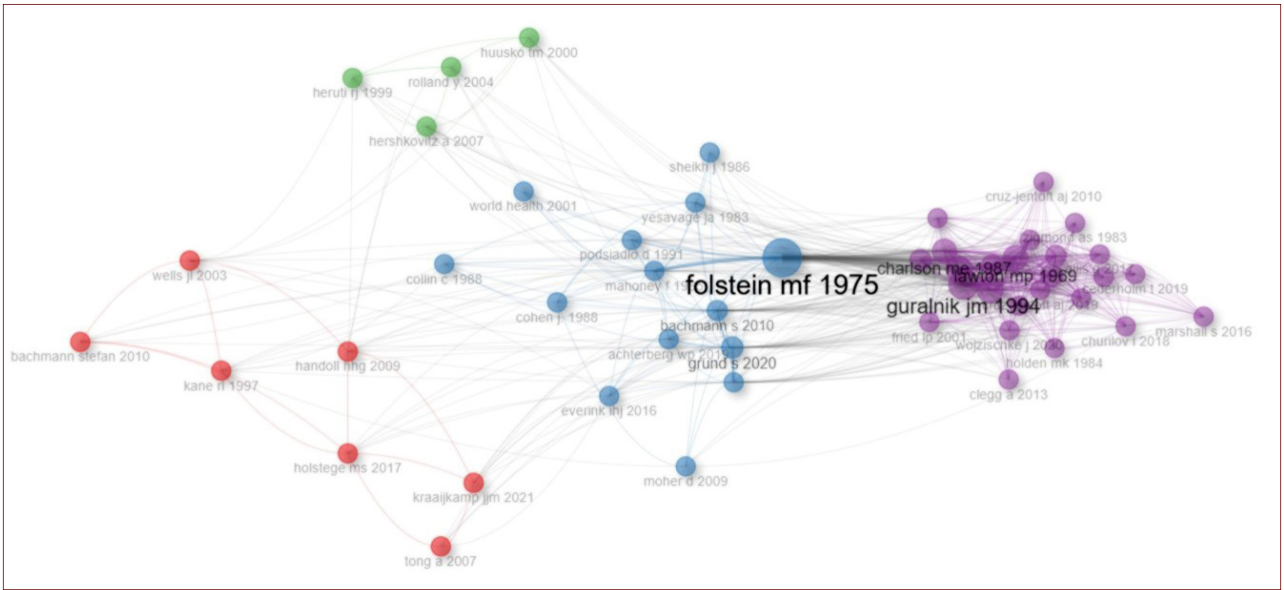

Figure 3c. Co-cited documents network (Biblioshiny)

the measurement properties of the Barthel Index is ranked second, with 137 global citations (8). Melkas et al. are in third place with 119 global citations for their study of how robotic technologies are used in elder care services and how they affect them (9). In the most cited set, topics such as post-stroke sarcopenia, robot-assisted care systems, and the relationship between nutrition and function stand out.

Figure 3c shows the co-citation network in the literature on rehabilitation for older people. There are four main groups: cognitive assessment, physical functioning, care organization, and rehabilitation for specific patient types. The blue cluster is all about testing cognitive skills, and the Mini-Mental State Examination (MMSE) created by Folstein et al. is at the heart of it (10). The purple cluster is based on Guralnik's Short Physical Performance Battery (SPPB), which connects physical function closely with mortality, care needs, and quality of life (11). The red cluster contains the systematic review by Bachmann (2010) about the impact of inpatient rehabilitation on functionality, home care, and mortality (12). The studies in the green cluster examine the effectiveness of hip-fracture rehabilitation for individuals with cognitive impairment. They suggest that even if MMSE scores are low, these patients still benefit significantly and should be included in rehabilitation programs.

Keywords

Commonly used keywords were "rehabilitation," "geriatric rehabilitation," "older adults," "aging," and "frailty." In the last few years, words like "virtual reality," "index," "consensus," "hospitalization," "quality of life," "risk," and "older adults" have received a lot of attention. These terms have become more common since 2021. They point to the growing importance of technology, measurement and assessment methods, and a multidisciplinary focus on quality of life in older adults (Figure 4a).

Figure 4b illustrates the thematic clustering of prominent concepts in geriatric rehabilitation. The words "geriatric rehabilitation" and "rehabilitation" are the most important ones in the center, and they are surrounded by color-coded clusters. The red cluster includes service models and technological uses like telemedicine, virtual reality, post-acute care,

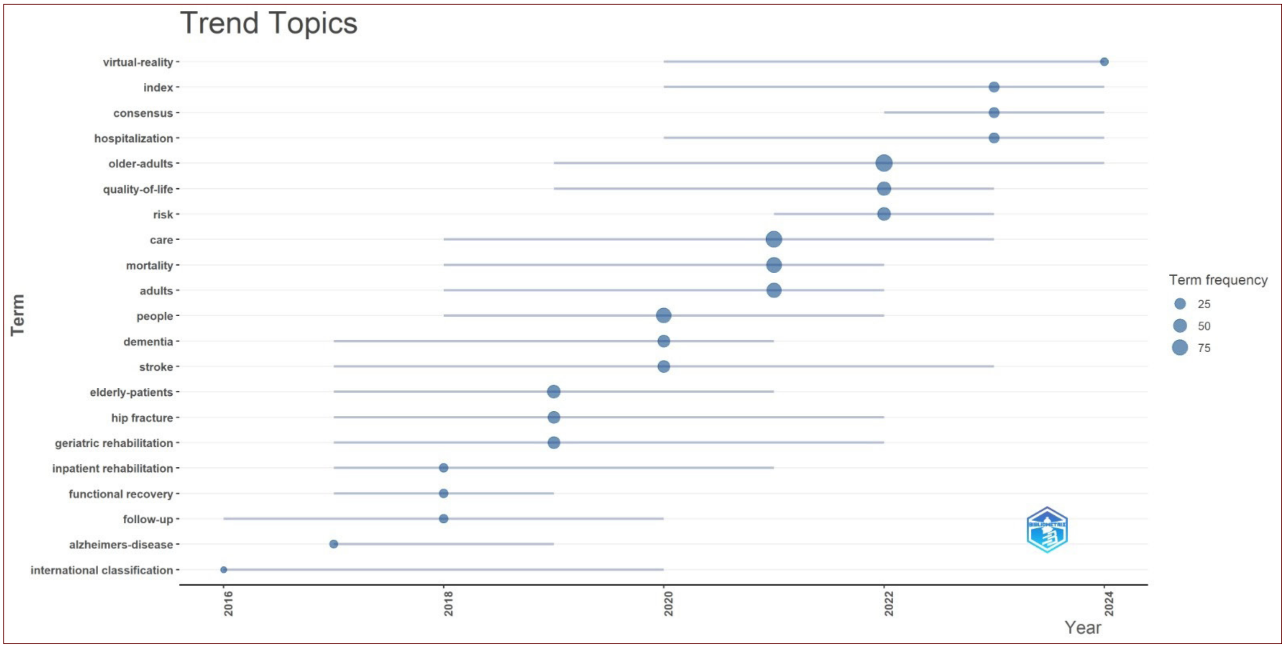

Figure 4a. Trend Topics in Keywords (Biblioshiny).

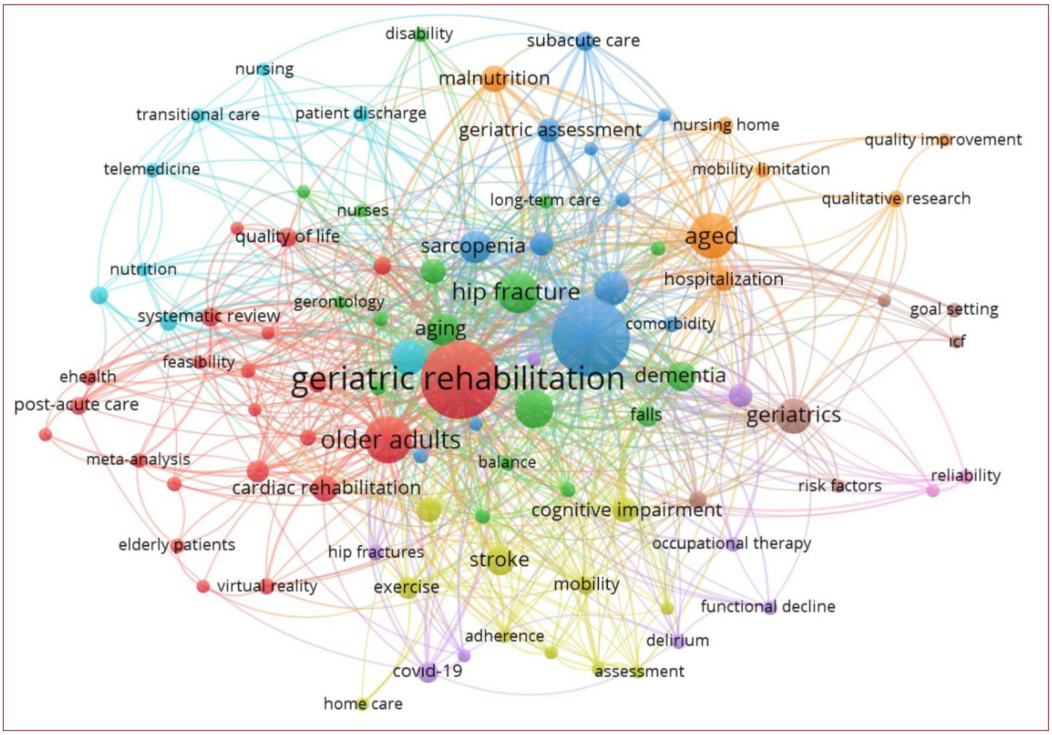

Figure 4b. Co-occurrence Analysis of Keywords (VOSviewer)

and cardiac and pulmonary rehabilitation. The blue cluster is all about clinical conditions and tests, such as sarcopenia, geriatric assessment, and subacute care. The turquoise cluster includes services that help with care transitions, such as discharge, nursing care, telemedicine, and nutrition. The green cluster has themes about hip fractures, aging, dementia, and falls. The yellow cluster has themes about cognitive impairment, stroke, mobility, and exercise assessment. The orange/pink cluster focuses on improving quality, measuring outcomes, and measurement tools, as well as home-based care. The purple cluster is about COVID-19, delirium, functional status, and occupational therapy. The strong connections between these keyword networks suggest that geriatric rehabilitation will keep changing in the next few years in terms of care systems, new technologies, clinical assessments, nutrition, and quality of life.

References

Table 4 shows the sources that have the most local citations. The MMSE, created by Folstein in 1975, is at the top with 132 citations (10). The Short Physical Performance Battery, created by Guralnik in 1994, and the systematic review by Bachmann from 2010 come next (11,12).

Figure 5 displays the most commonly co-cited sources in geriatric rehabilitation. Folstein, Guralnik, and Rockwood are the most frequently cited references. The works of Folstein (1975) and Rockwood (2005) in the green cluster concentrate on cognitive screening, comorbidity, and frailty (10,13). The red cluster has the 2019 guidelines by Cruz-Jentoft and Cederholm that focus on how to diagnose sarcopenia and how to eat well. These papers are often cited because they show how critical muscle mass and nutrition are for older

Table 4. Key Metrics of the Top 10 Most Local Cited References

References	C	First Author	Journal	Year
Mini-Mental State: A Practical Method for Grading the Cognitive State of Patients for the Clinician (10)	132	Folstein, M	Journal of Psychiatric Research	1975
A Short Physical Performance Battery Assessing Lower Extremity Function: Association with Self-Reported Disability And Prediction of Mortality and Nursing Home Admission (11)	71	Guralnik, J	The Journals of Gerontology, Series A: Biological Sciences and Medical Sciences	1994
Inpatient Rehabilitation Specifically Designed for Geriatric Patients: Systematic Review and Meta-Analysis of Randomized Controlled Trials (12)	62	Bachmann S	BMJ	2010
European Consensus on Core Principles and Future Priorities for Geriatric Rehabilitation: Consensus Statement (15)	61	Grund S	European Geriatric Medicine	2020
Functional Evaluation: the Barthel Index (22)	60	Mahoney FI	Maryland State Medical Journal	1965
The Montreal Cognitive Assessment (MoCA): A Brief Screening Tool for Mild Cognitive Impairment (23)	54	Nasreddine ZS	Journal of the American Geriatrics Society	2005
A global clinical measure of fitness and frailty in elderly people (13)	53	Rockwood K	Canadian Medical Association Journal	2005
Studies of Illness in the Aged: The Index of ADL – A Standardized Measure of Biological and Psychosocial Function (24)	48	Katz S	Journal of the American Medical Association	1963
Assessment of Older People: Self-Maintaining and Instrumental Activities of Daily Living (25)	45	Lawton MP	The Gerontologist	1969

C: Citation, BMJ: British Medical Journal

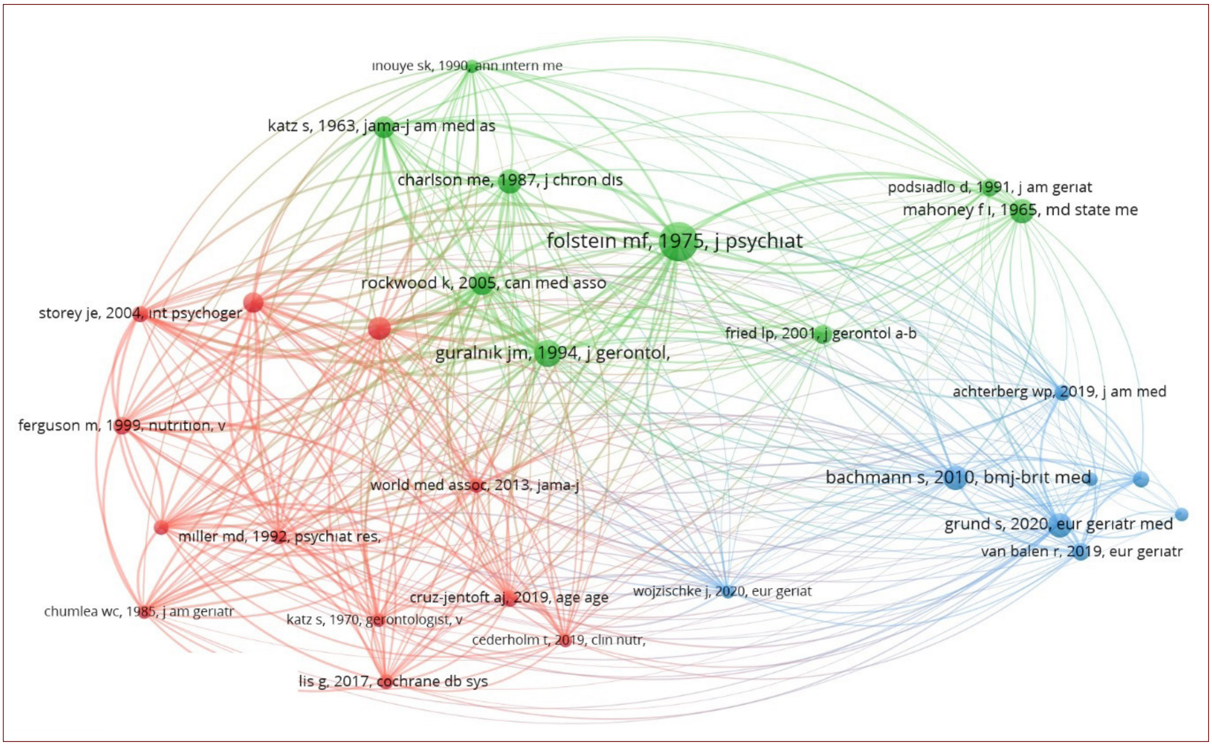

Figure 5. Co-cited references network (VOSviewer)

adults (2,14). The blue cluster, which includes Grund (2020) and Bachmann (2010), talks about European care models and structural ways to organize and combine geriatric rehabilitation services (12,15). When you consider all these results together, they suggest that geriatric rehabilitation services in Europe are well-coordinated.

This study has both strengths and limitations.

As one of the few bibliometric analyses focusing on geriatric rehabilitation, it offers a comprehensive overview of publication trends, collaborations, and research themes over the past decade.However, the analysis was limited to English-language articles indexed in the Web of Science Core Collection, which may have excluded relevant studies from other databases. Moreover, some recently published high-quality papers may not yet have received sufficient citations to be fully represented in the results.

Future studies should combine data from multiple databases and include non-English publications to provide a broader perspective on global research activity.

CONCLUSION

This study delineates the key trends, collaborative networks, and scientific clusters in geriatric rehabilitation by analyzing literature published between 2015 and 2025. The field has consistently increased its academic output over the past decade. In recent years, technology-enabled, multidisciplinary, and function-focused approaches have gained prominence. The increasing significance of subjects like frailty, robot-assisted rehabilitation, and telerehabilitation indicates future research priorities and clinical trajectories. In network analyses, the central roles of countries like the Netherlands, Germany, and Australia show

how important international collaboration is to the field's growth around the world. We anticipate that this study will function as a valuable resource for researchers and policymakers in comprehending trends, collaborative dynamics, and thematic priorities within geriatric rehabilitation.

Funding: None.

Competing interests: The authors declare that they have no competing interests.

Ethical approval: This study did not involve human or animal subjects; therefore, obtaining approval from an ethics committee was deemed unnecessary.

Clinical Trial: Not applicable.

Consent to participate: All authors gave consent to participate.

Consent for Publication: All authors have given written consent for publication.

Author contributions: All authors contributed to the conceptualization and design of the study, as well as to the preparation of materials, data collection, and analysis. All authors read and approved the final manuscript.

REFERENCES

1. Beard JR, Officer A, de Carvalho IA, et al. The World report on ageing and health: a policy framework for healthy ageing. Lancet. 2016;387(10033):2145-2154. doi:10.1016/S0140-6736(15)00516-4.
2. Cruz-Jentoft AJ, Bahat G, Bauer J, et al., Writing Group for the European Working Group on Sarcopenia in Older People 2 (EWGSOP2), and the Extended Group for EWGSOP2. Sarcopenia: revised European consensus on definition and diagnosis. Age Ageing. 2019;48(1):16-31. doi:10.1093/ageing/afy169. Erratum in: Age Ageing. 2019;48(4):601. doi:10.1093/ageing/afz046.
3. Azizan A, Azmi A, Mohd Yusof MYP. Bibliometric analysis on geriatric rehabilitation in Scopus database (1948–2022). Top Geriatr Rehabil. 2024;40(1):60-68. doi:10.1097/TGR.0000000000000423.
4. Azizan A, Rahayu SR. Visualizing the knowledge structure of geriatric rehabilitation: a bibliometric analysis. KEMAS: Journal of Public Health. 2024;19(4):499-510. doi:10.15294/kemas.v19i4.45494.
5. Aria M, Cuccurullo C. Bibliometrix: An R-tool for comprehensive science mapping analysis. J Informetr. 2017;11(4):959-975. doi:10.1016/j.joi.2017.08.007.
6. Zhang F, Xiong Y, Meng X, et al. Bibliometric analysis of comprehensive geriatric assessment from 2004 to 2023. J Multidiscip Healthc. 2024;17:5901-5915. doi:10.2147/JMDH.S488030.
7. Liu K, Zhang W, Yang Y, et al. Respiratory rehabilitation in elderly patients with COVID-19: a randomized controlled study. Complement Ther Clin Pract. 2020;39:101166. doi:10.1016/j.ctcp.2020.101166.
8. Bouwstra H, Smit EB, Wattel EM, et al. Measurement properties of the Barthel Index in geriatric rehabilitation. J Am Med Dir Assoc. 2019;20(4):420-425.e1. doi:10.1016/j.jamda.2018.09.033.
9. Melkas H, Hennala L, Pekkarinen S, et al. Impacts of robot implementation on care personnel and clients in elderly-care institutions. Int J Med Inform. 2020;134:104041. doi:10.1016/j.ijmedinf.2019.104041.
10. Folstein MF, Folstein SE, McHugh PR. Mini-mental state: a practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975;12(3):189-98. doi:10.1016/0022-3956(75)90026-6.
11. Guralnik JM, Simonsick EM, Ferrucci L, et al. A short physical performance battery assessing lower extremity function: association with self-reported disability and prediction of mortality and nursing home admission. J Gerontol. 1994;49(2):M85-94. doi:10.1093/geronj/49.2.m85.
12. Bachmann S, Finger C, Huss, et al. Inpatient rehabilitation specifically designed for geriatric patients: systematic review and meta-analysis of randomised controlled trials. BMJ. 2010;340:c1718. doi:10.1136/bmj.c1718.
13. Rockwood K, Song X, MacKnight C, et al. A global clinical measure of fitness and frailty in elderly people. CMAJ. 2005;173(5):489-95. doi:10.1503/cmaj.050051.

14. Cederholm T, Jensen GL, Correia MITD, et al., GLIM Core Leadership Committee, GLIM Working Group. GLIM criteria for the diagnosis of malnutrition: a consensus report from the global clinical nutrition community. Clin Nutr. 2019;38(1):1-9. doi:10.1016/j.clnu.2018.08.002.

15. Grund S, Gordon AL, van Balen R, et al. European consensus on core principles and future priorities for geriatric rehabilitation: consensus statement. Eur Geriatr Med. 2020;11(2):233-238. doi:10.1007/s41999-019-00274-1.

16. Su Y, Yuki M, Otsuki M. Prevalence of stroke-related sarcopenia: a systematic review and meta-analysis. J Stroke Cerebrovasc Dis. 2020;29(9):105092. doi:10.1016/j.jstrokecerebrovasdis.2020.105092.

17. Yuksel E, Kalkan S, Cekmece S, et al. Assessing minimal detectable changes and test-retest reliability of the Timed Up and Go test and the 2-minute walk test in patients with total knee arthroplasty. J Arthroplasty. 2017;32(2):426-430. doi:10.1016/j.arth.2016.07.031.

18. 18. Schopfer DW, Forman DE. Cardiac rehabilitation in older adults. Can J Cardiol. 2016;32(9):1088-96. doi:10.1016/j.cjca.2016.03.003.

19. Everink IH, van Haastregt JC, van Hoof SJ, et al. Factors influencing home discharge after inpatient rehabilitation of older patients: a systematic review. BMC Geriatr. 2016;16:5. doi:10.1186/s12877-016-0187-4.

20. Clark AB, Reijnierse EM, Lim WK, et al. Prevalence of malnutrition comparing the GLIM criteria, ESPEN definition and MST malnutrition risk in geriatric rehabilitation patients: RESORT. Clin Nutr. 2020;39(11):3504-3511. doi:10.1016/j.clnu.2020.03.015.

21. Resnick B, Beaupre L, McGilton KS, et al. Rehabilitation interventions for older individuals with cognitive impairment post-hip fracture: a systematic review. J Am Med Dir Assoc. 2016;17(3):200-5. doi:10.1016/j.jamda.2015.10.004.

22. Mahoney FI, Barthel DW. Functional evaluation: the Barthel index. Md State Med J. 1965;14:61-65.

23. Nasreddine ZS, Phillips NA, Bédirian V, et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc. 2005;53(4):695-9. doi:10.1111/j.1532-5415.2005.53221.x. Erratum in: J Am Geriatr Soc. 2019;67(9):1991. doi:10.1111/jgs.15925.

24. Katz S, Ford AB, Moskowitz RW, Jackson BA, et al. Studies of illness in the aged. The index of ADL: a standardized measure of biological and psychosocial function. JAMA. 1963;185:914-919. doi:10.1001/jama.1963.03060120024016.

25. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. Gerontologist. 1969;9(3):179-86.