

Physiotherapy and the Elderly from 2010 to 2026: A Bibliometric Study

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Article Information

Submitted: 12 May 2026

Accepted: 23 May 2026

Publish: 31 May 2026

Keyword: Physiotherapy;
Elderly; Bibliometric;

Copyright holder: Gina
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Year: 2026

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Abstract

Introduction: The rapid increase in the elderly population has led to a rising prevalence of multimorbidity and has substantially expanded academic literature and evidence-based practice data, particularly in rehabilitation and physiotherapy. **Objective:** This study aimed to conduct a performance analysis and science mapping of global publications on geriatric physiotherapy, focusing on longitudinal publication trends, geographical contributions, intellectual network visualization, and emerging research trends through bibliometric analysis. **Method:** Data were retrieved from the Scopus database for the 2010-2026 period using the keyword strategy “physiotherapy AND elderly”. The data were then processed and visualized using VOSviewer to analyze research networks and thematic clusters. **Results and Discussion:** A total of 8,026 articles were identified and analyzed. Publication volume peaked in 2025 ($n = 1,199$; 14.94%), with the United States emerging as the leading contributor, producing more than 2,250 articles. A significant thematic shift was observed in keyword trends, moving from “RCT” and “strength” toward “telehealth” and “accessibility”. **Conclusion:** The transformation of study variables demonstrates that the geriatric physiotherapy research landscape has undergone a paradigmatic evolution, shifting from laboratory-based experimental approaches toward an integrated digital health ecosystem.

Introduction

Current global demographic transformation indicates a very rapid transition toward population ageing. Based on global projections, the proportion of the elderly population is expected to double from 12% in 2015 to 24% by 2050 (Mohan et al., 2025). This demographic shift is consistent with health achievements that have increased global Healthy Life Expectancy (HALE) (Ferrari et al., 2024). In response to these demographic and epidemiological dynamics, global health policies have been directed toward anticipating the emerging care burden. This vision is closely aligned with the United Nations Decade of Healthy Ageing (2021-2030) framework launched by the World Health Organization (WHO), which emphasizes improving the quality of life of older adults through the creation of age-friendly environments, integrated care, and the provision of long-term care (Keating, 2022). In the WHO South-East Asia Region (SEARO), national policies have shifted from merely preventing age discrimination toward implementing healthy ageing and ageing-in-place programs. These programs focus on comprehensive geriatric care so that older adults can maintain independence and functional utility within the community (Mohan et al., 2025).

In supporting these programs, physiotherapy services occupy a crucial and irreplaceable position. As a discipline focused on optimizing movement and function, physiotherapy provides evidence-based interventions such as resistance training, which has been shown to significantly reverse the effects of sarcopenia - a major predictor of disability - by improving muscle strength, lean mass, and overall physical performance (Tan et al., 2026). Through the principle of guided plasticity facilitation, combined exercises delivered by physiotherapists have been shown to produce superior synergistic effects on working memory, dynamic balance, and walking speed in older adults compared with single-mode physical exercise (Aminirakan et al., 2026).

The success of such evidence-based practice interventions has subsequently stimulated substantial academic interest, generating a rapid expansion of scientific information to validate more effective rehabilitation protocols for older populations. Annual publication growth in the field of older populations has reached approximately 4.97% per year (Uludogan & Çiracioglu, 2025), creating a new challenge in the form of information overload. This condition can make it difficult for clinicians and researchers to manually track the latest developments in evidence-based practice without the assistance of advanced data analysis tools.

In addition, the global literature is often still limited to simple descriptive analysis without a functional research design framework (Öztürk et al., 2024). This has resulted in knowledge fragmentation, in which research directions develop separately. In fact, identifying trends and research gaps is essential for expanding the boundaries of science by investigating relevant topics and mapping future research agendas through conceptual synthesis (Hoang, 2025).

To address these obstacles, bibliometric analysis serves as a highly valuable statistical instrument for revealing and visualizing collective knowledge from extensive scientific literature (Kumar et al., 2024). Bibliometric studies are needed to map the state of the art in a particular field of knowledge and to provide a strong basis for developing scientific projects by exploring the evolutionary nuances of a research field (Donthu et al., 2021). This method enables systematic interpretation of large volumes of unstructured data to obtain a comprehensive overview of the performance of articles, authors, institutions, and countries (Kumar et al., 2024).

Based on the annual growth of publications in the field of older populations, together with the increasing urgency of geriatric physiotherapy service needs, an updated bibliometric study in the field of physiotherapy for older adults is urgently required to integrate fragmented pieces of scientific evidence, identify new research opportunities, and strategically position scientific contributions (Kumar et al., 2024). This study aims to conduct performance analysis and science mapping of global publications on physiotherapy for older adults. It evaluates geographical contributions to understand the intellectual structure that dominates the field (Donthu et al., 2021). By utilizing VOSviewer software, this study visualizes intellectual networks and future trends through keyword analysis, thereby providing strategic insights into research directions and supporting the development of evidence-based global physiotherapy service standards (Hoang 2025; Kumar et al., 2024).

Method

Bibliometrics is a quantitative method for describing and mapping large bodies of scientific literature in order to identify knowledge, emerging ideas, and the development of research contributions (Donthu et al., 2021). Bibliometric methodology in health research is implemented through four systematic stages. First, objectives and scope are established retrospectively on a large dataset to examine research performance and map the scientific structure in depth. Second, analytical techniques are selected prospectively, including productivity performance analysis and science mapping to understand the dynamics of trends from the past to the future. Third, data are collected and cleaned from a credible database using a precise search strategy, including manual validation to minimize entry errors or duplication. Fourth, analysis is executed and results are reported by using enrichment instruments such as network metrics (centrality), clustering algorithms, and visualization through specialized software (Donthu et al., 2021; Kumar et al., 2024; Öztürk et al., 2024). This study used bibliometric analysis to provide a comprehensive overview of research on physiotherapy and the elderly based on the Scopus database extracted on April 29, 2026, through the following stages:

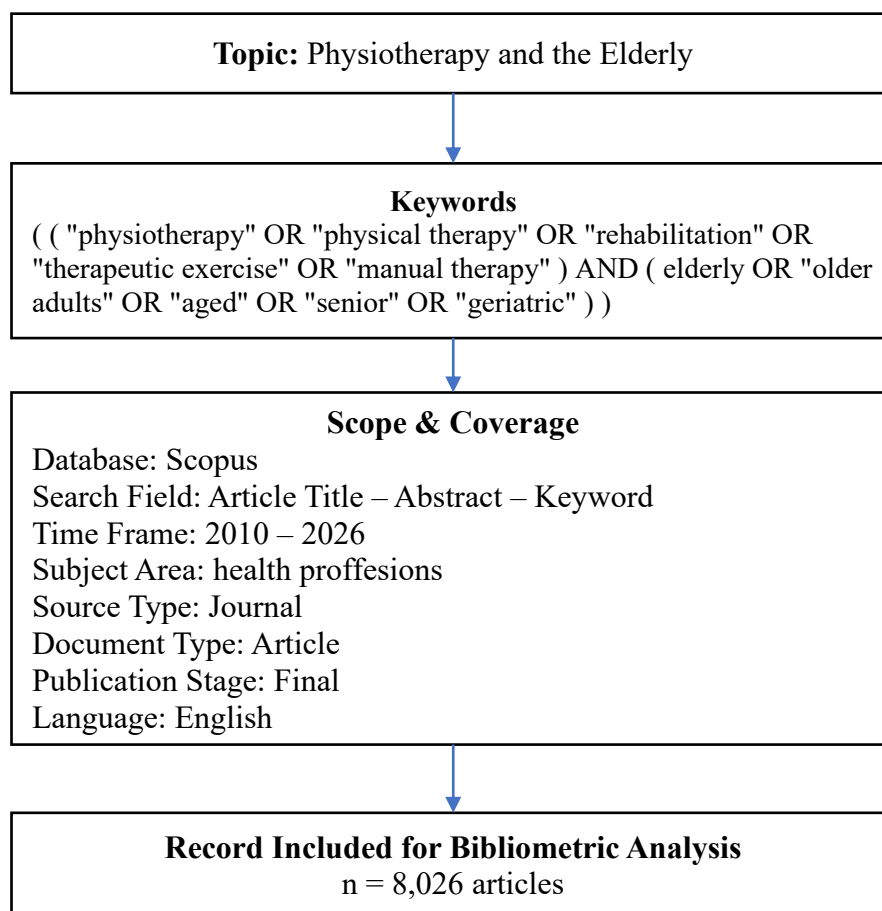


Figure 1. Article Search and Extraction Strategy

A total of 8,026 selected article publications were processed through bibliometric analysis using VOSviewer. Before visualization, the terms obtained from the selected articles underwent data cleaning using a thesaurus file (.txt) to merge abbreviations (e.g., “body mass index” into “bmi”, “minutes walking test” into “6mwt”), standardize terminology (e.g., “covid” and “sars cov” into “covid19”), and remove irrelevant words (e.g., “http”, “article”, “confidence interval”).

Results and Discussion

1. Results

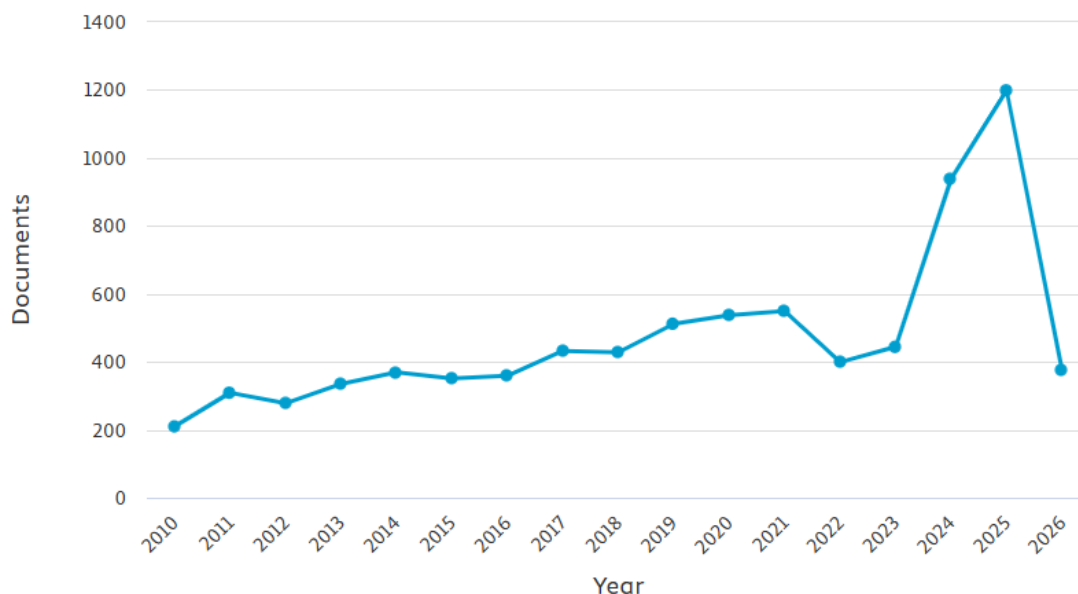


Figure 2. Trend in the Number of Published Articles from 2010 to 2026

The graph in Figure 2 shows a dynamic growth trend over the past 17 years. In 2010, 210 articles were recorded (2.62%). This number increased consistently but moderately, reaching 351 articles in 2015, with an average annual growth rate of approximately 11%. Subsequently, publication volume remained relatively stable at 300-400 articles per year, with a peak in 2019 of 512 articles (6.38%). Entering 2020, publication volume reached 537 articles (6.69%) and increased to 549 articles (6.84%) in 2021. However, the graph showed a significant decline in 2022 to 399 articles (4.97%), before increasing again to 444 articles (5.53%) in 2023. The data indicate a very sharp increase in publication volume in 2024 (n = 939; 11.70%), more than doubling from the previous year, and reaching the highest point (peak) in 2025 (n = 1,199; 14.94%) articles.

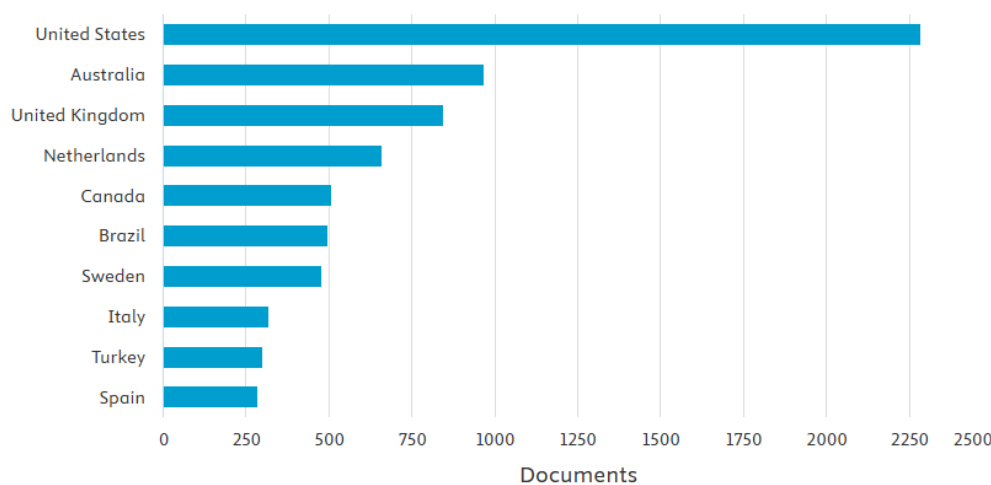


Figure 3. Top Ten Countries with the Highest Number of Publications on Physiotherapy and the Elderly

Figure 3 shows that the United States had the highest number of publications related to physiotherapy and the elderly (more than 2,250 articles), followed by Australia and the United Kingdom. Countries from Asia were not included among the top ten countries with the highest number of publications on physiotherapy and the elderly.

Table 1
Top Ten Keywords

Keyword	Occurrences, n (%)
RCT	1.013 (2.64%)
Baseline	953 (2.48%)
Need	873 (2.27%)
Support	658 (1.71%)
Work	579 (1.51%)
Discharge	567 (1.48%)
Physiotherapist	502 (1.31%)
Qualitative	489 (1.27%)
Strength	485 (1.26%)
Knowledge	477 (1.24%)

Keyword frequency analysis using VOSviewer revealed the main thematic focus in the literature reviewed. Of a total of 330 terms and 38,392 occurrences, the variables “rct” (n = 1,013; 32.64%) and “baseline” (n = 953; 2.48%) emerged as the most dominant terms, reflecting a strong research orientation toward randomized controlled trial designs and baseline or initial conditions as comparative standards for measuring the success, effectiveness, or change resulting from an experiment.

In third place, the keyword “need” (n = 873; 2.27%) indicates a significant focus on patient or service needs. Furthermore, the terms “support” (n = 658; 1.71%) and “work” (n = 579; 1.51%) were among the five most frequently discussed keywords. Operational and professional aspects appeared in the following rankings through the keywords “discharge” (n = 567; 1.48%) and “physiotherapist” (n = 502; 1.31%). Meanwhile, research methodology was again reflected in the keyword “qualitative”, which ranked eighth with 489 occurrences (1.27%).

The top ten list was completed by the keyword “strength”, which appeared 485 times (1.26%), and “knowledge”, with 477 occurrences (1.24%). Overall, these data reflect a strong relationship between clinical research methods, service support needs, the role of physiotherapy professionals, and physical and knowledge-related elements in the literature on physiotherapy for older adults. In addition, “qualitative” research (n = 489; 1.27%) also appeared as another study design option.

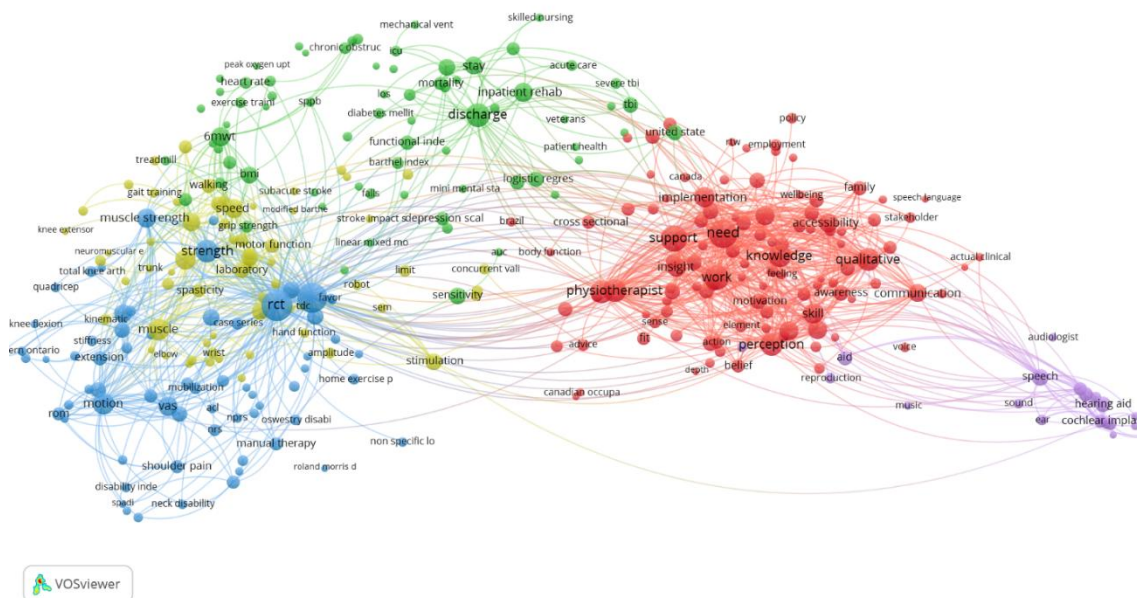


Figure 4. Network Visualization from VOSviewer

Based on the network visualization from VOSviewer, five keyword clusters were identified, each indicating a research focus. The blue cluster focused on experimental research aspects, with the main variables “rct”, “baseline”, “strength”, and “motion”. The red cluster was the densest cluster and focused on the analysis of needs and behaviours of older adults related to physiotherapy, with the main variables “need”, “support”, “knowledge”, “work”, and “physiotherapy”. The green cluster referred to post-discharge rehabilitation, with the main variables “discharge”, “6mwt”, and “inpatient rehabilitation”. The yellow cluster focused on rehabilitation targets and motor performance, with the main variables “limb”, “speed”, and “muscle”. The purple cluster focused on rehabilitation related to listening and speaking abilities, with the main variables “speech”, “hearing impairment”, and “hearing aid”. Meanwhile, the interconnection of discussions related to the variable “physiotherapist” was linked across clusters with the main variables “rct”, “baseline”, “discharge”, “support”, “need”, “knowledge”, “work”, and “qualitative”.

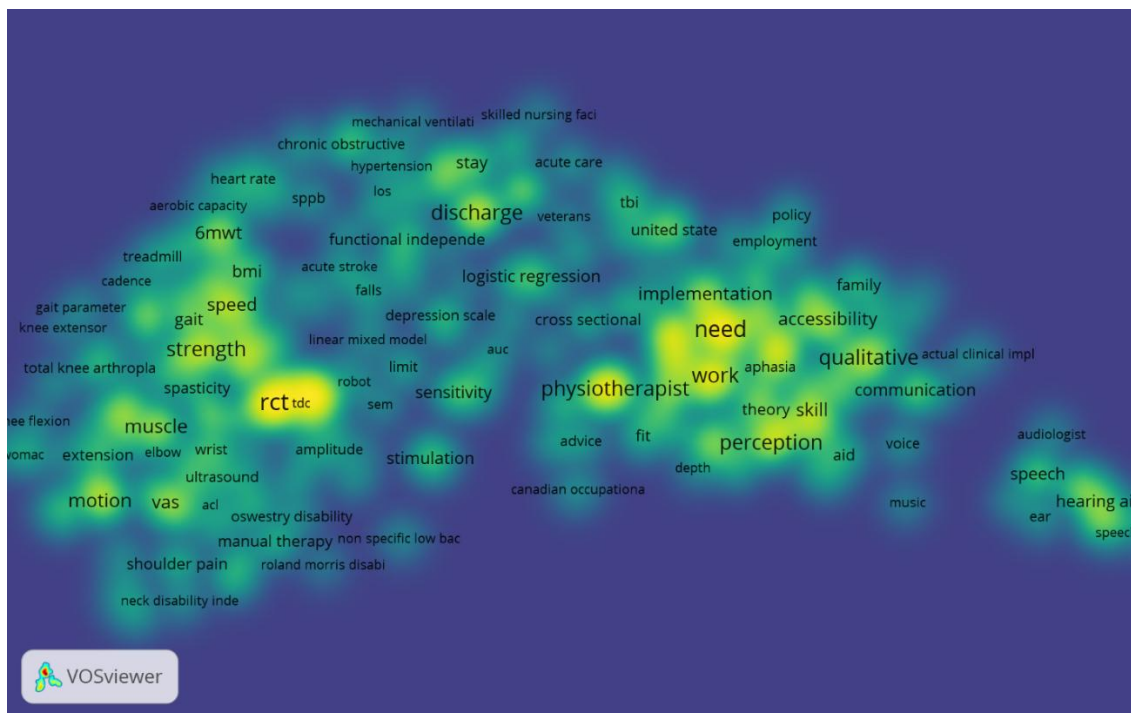


Figure 6. Density Visualization from VOSviewer

The density visualization results in Figure 6 show that the largest concentration, or well-researched area, was identified by the brightest and densest colour, namely “rct”, “baseline”, “physiotherapist”, “need”, “support”, and “work”. Conversely, less frequently discussed research areas were marked by dimmer, more dispersed colours or peripheral positions, namely “music”, “skilled nursing”, “non-specific low back pain”, and “canadian occupational performance measure”. Research areas with potential for multidisciplinary investigation can be observed in topics with dimmer colours between two centres, including “motivation” (located between “work”, “knowledge”, and “skill”). Topics that are beginning to gain popularity but still have a limited research base can be seen in topics with dim colours but large labels, such as “manual therapy”, “shoulder pain”, “functional index”, and “depression scale”. Several of these rarely explored research areas have the potential to serve as research gaps for future studies.

2. Discussion

Annual Publication Trends

Analysis of annual publication trends from 2010 to 2026 (Figure 2) revealed significant dynamics in the development of geriatric physiotherapy science. The moderate growth of geriatric physiotherapy research during the early decade of 2010-2019 reflects increasing global awareness of demographic and epidemiological transitions that require a paradigm shift from curative treatment toward the maintenance of functional capacity. The study by Ferrari et al. (2024) demonstrated systematic global data collection over the past three decades regarding the burden of disease and healthy life expectancy, which has served as a catalyst for researchers and policymakers to begin paying special attention to older adults’ health. This is supported by Keating (2022), who emphasized that the decade became a crucial period in which international frameworks, such as preparations for the UN Decade of Healthy Ageing, began identifying knowledge gaps in supporting older adults to remain independent. Therefore, research growth during this period reflects the

efforts of the global scientific community to provide empirical evidence in response to the challenges of the ageing population, which have increasingly been felt by health systems in various countries along with the rising prevalence of disability and declining intrinsic capacity among the global older population.

Although the overall research trend increased, there was an indication of a slowdown in growth around 2022. This may have been caused by changes in research priorities during and after the pandemic, when academic focus shifted toward the integration of more complex digital technologies (Azizan & Rahayu, 2024). However, Roselina et al. (2026) stated that this period was actually a crucial phase for the emergence of health innovation; the COVID-19 pandemic acted as a catalyst that accelerated the adoption of applied technologies to address social isolation and barriers to physical service access among older adults. Research growth began to show an exponential pattern in line with the global need for older adults' independence through assistive technology and remote health monitoring.

Publication trends then experienced a very sharp exponential increase during 2024-2025. This phenomenon was marked by the emergence of new keywords dominating the literature, namely "telehealth", "usability", "accessibility", and "health system" (Figure 5). This indicates that geriatric physiotherapy has undergone a fundamental transformation: from previously focusing on traditional and laboratory-based physical recovery methods to becoming a discipline that is highly dependent on the digital technology ecosystem. This integration aligns with global efforts to improve the quality of life and well-being of older adults through health systems that are more adaptive, efficient, and inclusive in the post-pandemic era. The rapidly ageing global population has placed extraordinary pressure on conventional health systems, thereby encouraging the adoption of digital technology as a strategic solution to improve the accessibility and efficiency of care beyond physical clinics. This surge was driven by the urgent need to ensure continuity of care for older adults, where telehealth technology is now positioned not only as an alternative but also as a vital component of an integrated health system for remotely monitoring the functional capacity of older adults. The focus on "usability" and "accessibility" in the most recent literature demonstrates critical awareness that the successful implementation of digital physiotherapy depends heavily on the extent to which technology can be accessed and used easily by older adults, who often face barriers in digital literacy. Thus, the integration of technology into the health system ecosystem represents an adaptive response to the challenges of population ageing, in which physiotherapy is beginning to transform toward a more precise, efficient, and inclusive hybrid model (Liu et al., 2026).

Dominance of Countries with the Highest Number of Publications

The United States was found to be the country with the highest number of publications (Figure 3). This dominance indicates that this developed country has made strategic investments in addressing demographic challenges through science and health innovation. The USA has explored elderly rehabilitation strategies since the early phase of literature growth, thereby establishing a more robust data foundation. In addition, the USA has pioneered health-care solutions tailored to the complex needs of the elderly population, including the use of digital technology in rehabilitation (Azizan & Rahayu, 2024).

The low contribution of geriatric physiotherapy research from Asian countries in the global publication landscape is mainly attributable to the phenomenon of “growing old before growing rich”, in which economic pressures force governments to prioritize basic population needs rather than investment in long-term care infrastructure and complex health research (Mohan et al., 2025). This inequality is exacerbated by the cultural paradigm of familism, which places elder care as an informal family responsibility, thereby limiting professional clinical involvement and the provision of institution-based research data required in standard scientific literature (Keating, 2022). As a result, the research ecosystem in Asia, particularly in the South-East Asia region, tends to be fragmented, with weak systems for rigorous clinical evaluation, creating an epistemic gap in which geriatric physiotherapy innovations from this region are often not documented in mainstream international publications, which remain dominated by research standards and agendas from Global North countries.

Top Keywords and Term Development Based on VOSviewer Analysis

Keyword analysis and network visualization revealed a profound transformation in global physiotherapy research for older adults. Based on keyword frequency (Table 1), the dominance of the variables “RCT”, with 1,013 occurrences, and “Baseline”, with 953 occurrences, confirms that the gold standard of research in this field still relies on rigorous experimental methodology. This correlates with the Blue Cluster in the Network Visualization (Figure 4), which shows that physical parameters such as “strength” and “motion” represent the initial foundation for determining the efficacy of physiotherapy services.

The Overlay Visualization (Figure 5) shows a significant shift in focus from older topics such as “strength” and “laboratory” (2010s period) toward modern topics such as “telehealth” and “accessibility” (2024-2026 period). This finding indicates that physiotherapy research has moved toward the implementation of inclusive health systems. According to Wang et al. (2023), the integration of digital technology and artificial intelligence in geriatric care has triggered a surge in publications because of its ability to overcome accessibility barriers for older adults with mobility limitations.

Research trends in geriatric physiotherapy show a significant paradigm transformation: from an initial focus in the 2010s on validating laboratory-based physical interventions toward the implementation of inclusive digital technologies during the 2024-2026 period. This shift also reflects a transition from a centralized clinical rehabilitation model toward an adaptive and accessible health system (Liu et al., 2026). This is in line with the WHO ICOPE (Integrated Care for Older People) guidance, which emphasizes that physiotherapy is no longer viewed as a stand-alone physical intervention but rather as an integral component of integrated care pathways, including person-centred assessment and pathways (WHO, 2024). As described in the ICOPE handbook, the management of older adults now requires a multidisciplinary approach that includes intrinsic capacity screening, pain management, and the provision of assistive mobility products integrated at the primary care level. The integration of telehealth technology with ICOPE workflows enables continuous monitoring of the specific needs of older adults that were previously difficult to reach through rigid laboratory-based research models. Thus, modern physiotherapy research now focuses more on usability and accessibility to ensure that every physiotherapy intervention can be integrated into age-friendly community care systems, support independence, and ensure equitable access to services without geographical barriers.

The Red Cluster, which highlights the variables “need”, “support”, and “knowledge”, reflects a shift in focus from merely treating disease toward strengthening intrinsic capacity, namely the combination of all physical and mental capacities possessed by an individual. In this context, physiotherapists play an important role in a person-centred approach that assesses not only physical deficits but also the self-resilience of older adults in facing functional decline. The emergence of the variable “discharge” in the Green Cluster further emphasizes the importance of integrated care, in which the transition from inpatient care to the community must ensure a supportive environment so that the functional ability of older adults remains optimal at home.

The intellectual structure of this research shows increasingly specific and holistic diversification, consistent with the ICOPE vision of functional independence. The Yellow Cluster, which focuses on motor performance (limb, speed, muscle), is now integrated with sensory aspects in the Purple Cluster (hearing impairment, speech). This expansion of focus indicates that modern geriatric rehabilitation recognizes that the interaction between intrinsic capacity, such as hearing and muscle strength, and environmental factors is a key determinant of quality of life. By integrating various aspects of body function, physiotherapy helps older adults maintain the ability to do the things they value, which is the core of healthy ageing.

Conclusion

Geriatric physiotherapy research has transformed from a laboratory-based clinical approach toward an integrated digital health ecosystem. The surge in research over the past two years indicates an adaptive response to the challenges of the global ageing population by adopting telehealth and digital innovation as key solutions. This shift is driven by the need for more inclusive and accessible services, particularly in regions with limited infrastructure. Referring to the WHO integrated care framework, physiotherapy is now evolving into a vital and holistic component through remote monitoring systems that reduce dependence on conventional clinics. Although challenges related to global research inequality remain, the current research direction is committed to creating a more democratic, adaptive, and technology-oriented health system to ensure that the mobility and independence of older adults from various economic backgrounds are optimally maintained. This bibliometric analysis was limited to data from Scopus; therefore, local publications or journals not indexed in this database may have been missed. This study tends to be quantitative; therefore, deeper analysis of methodological quality or specific findings from each article cluster may be conducted in future research.

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