



ORIGINAL ARTICLE

Global scientific research on social participation of older people from 2000 to 2019: A bibliometric analysis

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Abstract

Background: Social participation is an indicator of successful ageing and important determinant of health outcomes. As more studies have been conducted on social participation of older people, a comprehensive and quantitative analysis of the current literature will contribute to a better understanding of the main and novel issues and improve existing geriatric care services in this domain. However, limited bibliometric analysis was employed in this research field. Therefore, we conducted this study to investigate the research trend and quantitatively and comprehensively characterise the landscapes of publications on social participation of older people via bibliometric analysis methods.

Methods: Data were obtained from the Web of Science Core Collection in January 2020. CiteSpace 5.5.R2 and VOSviewer software packages were used to generate knowledge maps and analyse the publication outputs, countries/regions, institutions, journals, research hot spots and research frontiers.

Results: A total of 7,029 publications between 2000 and 2019 were retrieved, and the publication number per year continues to increase. The United States held a leading position in this research field, and Duke University was the most productive institution. Co-cited reference cluster analysis and keyword co-occurrence analysis showed that research hot spots contained factors of healthy ageing, quality of life, psychological problems and health status, especially dementia, function (including cognitive function) and frailty. Burst detection of keywords revealed that social participation, social support, instrumental activity, frailty and loneliness have been new research frontiers since 2015.

Conclusions: By analysing publications over the past 20 years, we found publication trends and characteristics in this field. These findings will hopefully provide new insight into the scientific landscapes and further directions in the study of social participation of older people.

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Implications for Practice: Social participation is strongly associated with physical and psychological problems and the well-being of older people. Related professionals, such as social workers, psychologists, nurses and many other health care practitioners, should raise widespread awareness and concern over research hot spots and frontiers on this topic to promote research knowledge translation and adoption into the practice of caring for older people.

KEYWORDS

CiteSpace, older people, scientometrics, social participation, VOSviewer

1 | INTRODUCTION

Populations around the world are rapidly ageing. It is estimated that by 2050, the world's population aged 60 years and older will total 2 billion, up from 900 million in 2015 (World Health Organization [WHO], 2018). Subsequent age-related diseases, decline of function and healthcare needs will no doubt impose a heavy burden on the family, nurses and other healthcare professionals and even society as a whole. Therefore, managing this demographic shift and promoting healthy ageing have become significant challenges worldwide.

For older people, social participation is regarded as an indicator of successful and healthy ageing, receiving considerable attention in recent research and policy reports. In 2002, the World Health Organization (WHO) policy framework proposed that enhancing social participation is a key component in response to ageing populations (WHO, 2002). Since social participation is a very broad concept that can take various forms, including leisure activities, meeting friends and volunteering, among others (Duppen et al., 2019), there is not yet a consensus regarding the definition. One commonly used definition of social participation focuses on a 'person's involvement in activities that provide interaction with others in society or the community' (Levasseur, Richard, Gauvin, & Raymond, 2010). Moreover, synonymous concepts such as social engagement, participation and community involvement are frequently used interchangeably with social participation (Bowes & McColgan, 2013; Levasseur et al., 2010; Piškur et al., 2014). Understanding social participation has progressed significantly over the past 2 decades due to a large volume of meaningful studies in this field. Empirically, community participation promotes well-being and quality of life for older people according to activity theory (Tabet, 2016). The existing literature illustrated that social participation, physical exercise and volunteer work are associated with favourable health outcomes, such as lower mortality, better physical or cognitive performance, and improved psychological distress at older ages (Kikuchi et al., 2017; Owari, Miyatake, & Kataoka, 2018; Sala et al., 2019).

Although many studies have been conducted related to social participation of older people, relatively few outlined the trends or

What does this research add to the existing knowledge of gerontology?

- Over the past 2 decades, researchers have paid increasing attention to social participation of older people. The United States maintains a leading position in this research field.
- The research hot spots over the past 20 years can be classified into healthy ageing, quality of life, psychological problems and health status such as dementia, function (including cognitive function) and frailty.
- The research frontiers seem to focus more on psychosocial health in recent years instead of only caring about the physical symptoms or mental health of older adults.

What are the implications of this new knowledge for nursing care with older people?

- Nurses should recognise that social participation is strongly associated with healthy ageing, quality of life, psychological problems and health status of older people to find effective measures to encourage social participation among old adults.
- Understanding research landscapes in terms of social participation of older people will add new insight into how to achieve healthy ageing.

How could the findings be used to influence policy, practice, research or education?

- This study provides an objective and quantitative overview on the research progress on social participation of older people that can serve as an important reference and entry point for further scientific research.
- The distribution of research power is uneven around the world. Useful measures and policies are needed to strengthen international collaboration among institutions.

structure of research in this field. Some empirical and qualitative review articles were expert-dependent and to a certain degree limited to some bibliometric quantitative factors, such as publication trends and hot spots in this field.

Bibliometric analysis, a well-established information science research method, was recently used to determine trends in scientific research and quantitative analysis of published studies (Wang et al., 2019; Zyoud & Fuchs-Hanusch, 2017). This type of study enables scholars to characterise the current status of research fields and assists them in planning their research direction to predict research trends (Boudry, Baudouin, & Mouriaux, 2018; Chang, Huang, & Lin, 2015). Thus, to provide a relatively objective and systemic overview of research on social participation of older people, this study used bibliometric tools to delineate the basic landscape, identify the representative research power and recognise research frontiers in this field. Nurses are on the frontline of health care, and nurse-led research is increasingly recognised as a critical pathway to practical and effective ways of improving patient outcomes (Curtis, Fry, Shaban, & Considine, 2017). The results obtained in this study could provide a useful reference for researchers and nurses, inspiring their possible direction of further research and clinical practice of nursing older people.

2 | METHODS

2.1 | Data acquisition

The Web of Science Core Collection (WoSCC) comprised high-quality literature has been the most frequently used authoritative platform for scientific literature (X.-Q. Huang, Fan, Ying, & Chen, 2019). As synonymous concepts of social participation can be used interchangeably, the search terms in this study were collected from previous systematic reviews or meta-analyses to retrieve as many relevant resources as possible (Dalemans, de Witte, Lemmens, van den Heuvel, & Wade, 2008; Jiesibieke et al., 2019; Shah, Frank, & Ehrlich, 2020). To further guarantee our reasonable selection of these terms and their relevant meanings, our team discussed them and invited suggestions from experienced specialists in the field of geriatric care and information specialists. Two investigators with experience in completing medical information retrieval conducted all of the searches independently and resolved controversial issues through discussion. We searched the WoSCC database in January 2020 using the following retrieval strategy: TS = ("social participation" OR "social involvement" OR "social engagement" OR "community participation" OR "community involvement" OR "community engagement" OR "activit* of daily living" OR "leisure activit*") AND TI = ("old* people" OR "old* adult*" OR "old* men" OR "old* women" OR "old* person" OR "old* population" OR elder* OR geriatric* OR ageing OR gerontol) (* is the wildcard character representing any string); time span: 2000–2019; and language type: no restriction. The search results were further streamlined to original articles and reviews. All of the other document types, including editorial material, book reviews, retracted publications, proceedings papers, meeting abstracts, early access, corrections, news items, letters,

book chapters and reprints, were excluded because they did not yield publications with sufficient study details and may not have been peer-reviewed (Brown, Gutman, Ho, & Fong, 2018) (Supplement S1). The search for keywords in abstracts and/or keywords yielded too many false-positive results that could have negatively affected the study's validity (Sweileh, 2018), so we only retrieved 'elderly' and its synonyms in the title. To validate the results' effectiveness, two authors independently reviewed the titles and abstracts of the top 100 most cited documents to access their relevance to the social participation of older people. A record was considered relevant if any terms were found in its title, abstract or keyword fields (Chen, Dubin, & Kim, 2014b). The results showed that 95 publications (95%) on average were closely related to and considered conforming to the scope of this study, indicating that our retrieval terms and strategies were appropriate (Fu, Sun, He, Liu, & Jing, 2019).

2.2 | Data analysis

Bibliometric mapping is a quantitative approach that visualises various bibliometric factors of scientific publications conducted in the form of different networks (Damar, Bilik, Ozdagoglu, Ozdagoglu, & Damar, 2018). In this study, VOSviewer was employed to analyse the co-authorship feature of countries/regions and institutions. To map the network of keyword co-occurrence, information on author keywords was extracted from downloaded bibliometric records. After merging some synonymous keywords (e.g. "activities of daily living" & "ADL" and "old adults" & "old people"), keywords with an occurrence frequency no less than 30 were chosen for visualisation using VOSviewer 1.6.14 software.

CiteSpace, which is specifically designed to conduct an analytic process of visualising and analysing scientific literature based on the JAVA platform, has been used to conduct several hundred scientometrics studies (Chen, Dubin, & Kim, 2014a). To comprehensively understand the research trend particularly research hot spots and fronts in the research field, we assessed the distribution of popular journals in the research field of social participation of older people, analysed co-cited reference networks, and detected burst keywords using CiteSpace 5.5.R2. A cluster analysis was also conducted based on co-citation analysis to identify the thematic concentration. The impact factor (IF) of each journal was determined according to the 2018 Journal Citation Reports.

3 | RESULTS

3.1 | Literature distribution

3.1.1 | Characteristics of publication outputs

A total of 7,029 publications indexed by the WoSCC were identified using the retrieval strategy. Among these publications, 6,699 (95.31%) were original articles and 330 (4.69%) were reviews. Regarding the

Publication Trends

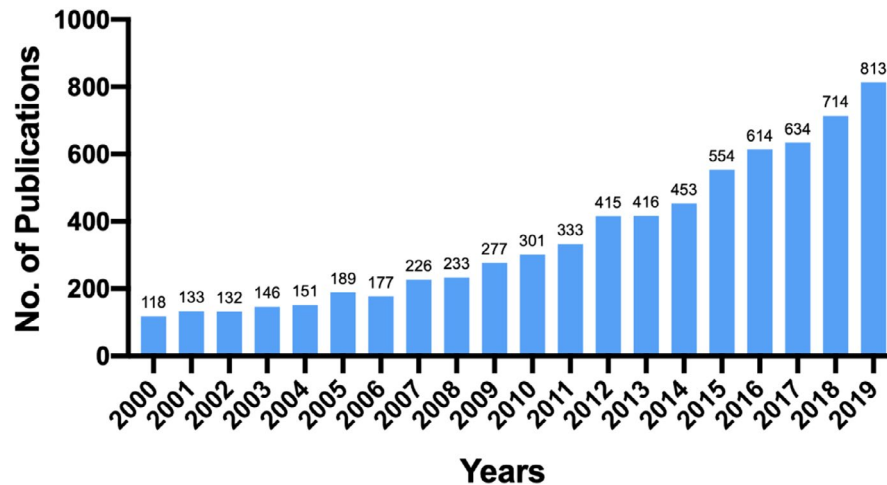


FIGURE 1 Publications trends of research on social participation of older people from 2000 to 2019

publication languages, most (94.21%) were in English, followed by Portuguese (1.54%), Spanish (1.42%) and German (1.22%) (Supplement S2). From 2000 to 2019, the number of publications on social participation of older people increased annually (Figure 1). Of note, over the past 5 years, more than 500 papers were published each year.

3.1.2 | Distribution of countries/regions

Over the past 20 years, 103 countries/regions worldwide have contributed to research on social participation of older people. The top 10 countries published 5,878 papers on social participation of older people as indexed in the WoSCC, accounting for 83.62% of the total number of publications (Table 1). The United States published the most reports in terms of social participation of older people, accounting for 31.88% ($n = 2,241$) of the total, followed by Japan ($n = 573$), the UK ($n = 454$), Canada ($n = 449$) and Australia ($n = 420$). Brazil and China were the only two developing countries among the top 10 most productive countries, demonstrating their considerable

academic progress over the past 2 decades. Studies from the United States, Italy, the UK and Canada overperformed regarding the citation frequency per article.

Country co-authorship analysis reflects the degree of communication between countries and influential countries in this field (Zheng & Wang, 2019). A total of 44 nodes representing countries/regions that published at least 10 reports related to this domain are shown in Figure 2. The distance and thickness of the line between the nodes denote the strength of collaboration among these countries/regions. The stronger links and closer nodes illustrate closer cooperation between two countries. With the largest nodes and densest links in the co-authorship map, the United States (40 links, 795 total link strength) played an irreplaceable leading role and closely cooperated with many countries in this research field. The co-authorship results also showed that the UK (39 links, 418 total link strength) had higher link strength than others, followed by the Netherlands (31 links, 289 total link strength), Australia (37 links, 286 total link strength), Italy (29 links, 281 total link strength), Canada (35 links, 277 total link strength), Germany (27 links, 254 total link strength),

Rank	Country (region)	Counts	Per cent (%)	Citations	Citations per article
1	USA	2,241	31.88	80,227	35.80
2	JAPAN	573	8.15	7,667	13.38
3	ENGLAND	454	6.46	14,188	31.25
4	CANADA	449	6.39	12,491	27.82
5	AUSTRALIA	420	5.98	7,526	17.92
6	BRAZIL	406	5.78	4,463	10.99
7	PEOPLES R CHINA	354	5.04	3,844	10.86
8	NETHERLANDS	335	4.77	9,553	28.52
9	SWEDEN	325	4.62	7,746	23.83
10	ITALY	321	4.57	10,913	34.00

TABLE 1 Top 10 countries publishing papers on social participation of older people during 2000–2019

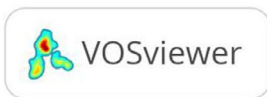
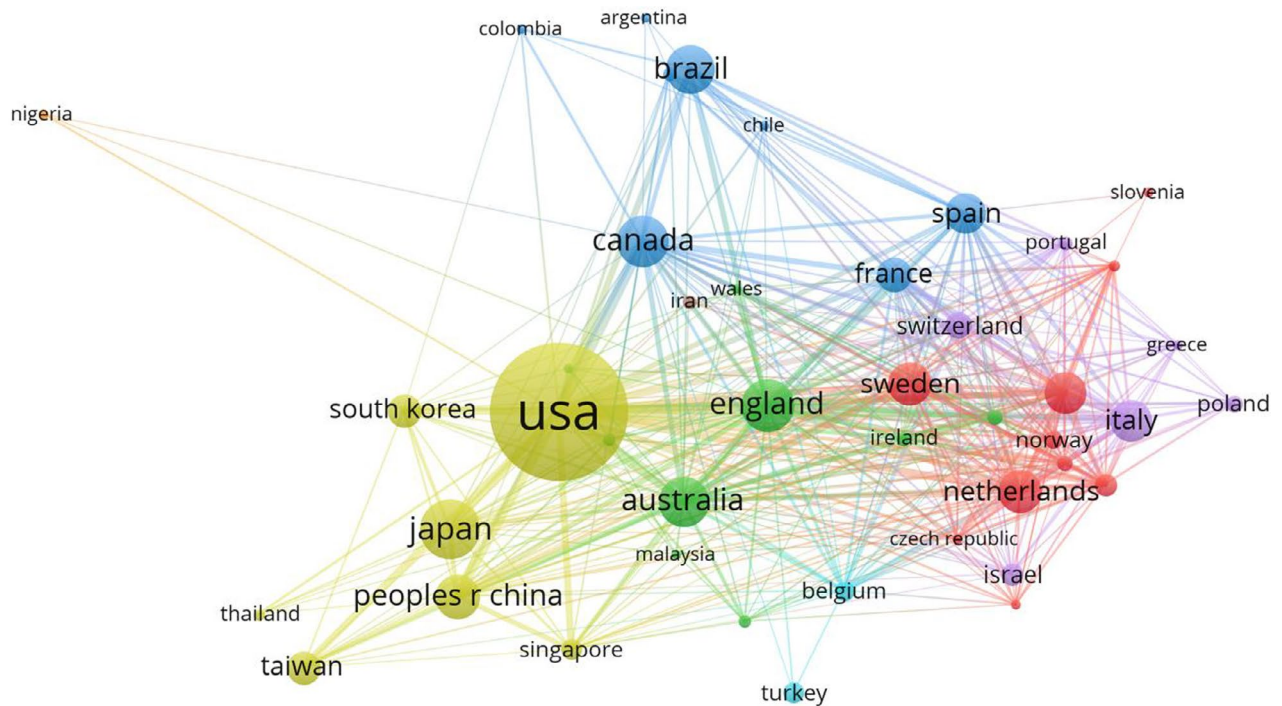


FIGURE 2 Co-authorship of countries/regions for research on social participation of older people from 2000 to 2019 (with a threshold of 10 publications)

Sweden (32 links, 217 total link strength) and China (24 links, 207 total link strength).

3.2 | Productivity analysis of institutions

There were 6,682 research institutions involved in research related to social participation of older people over the past 20 years. However, only 353 institutions met the threshold of 10 publications as displayed in Figure 3 (one institution without a connection to the others is not shown). The entire network was divided into several institutional cooperation groups. The red nodes mainly indicate US educational or research institutions; pink nodes demonstrate institutions in Brazil; green and blue nodes indicate institutions in Europe, and yellow nodes represent institutions in Japan. As shown in Table 2, Duke University was the leading research institution and contributed to 134 (1.91%) documents, followed by the University of Pittsburgh with 127 articles (1.81%), University of California-San Francisco with 126 articles (1.79%), and Karolinska Institute with 118 articles (1.68%). Specifically, the University of Pittsburgh (63.92) ranked first with respect to citations per article, followed by Johns Hopkins University (63.47) and the University of California-San Francisco (59.88). Half of the top 10 active institutions were from the United States, indicating its specific advantage in this research field.

3.3 | Distribution of journals

Understanding journals is especially important because it can assist scholars in the retrieval of research papers related to a specific field. This study identified 1,572 journals that published articles on social participation of older people. Table 3 illustrates the top 10 most active journals along with their basic information such as quartile, impact factor and number of citations per paper. The impact factor and quartile scores were the most widely used indicators of a journal's quality and rank and were listed based on the Journal Citation Reports (JCR). Three of the top 10 active journals were based in the United States, and additional three journals were from the UK. Among them, the *Journal of the American Geriatrics Society* was the most productive journal, with 326 publications comprising 4.64% of the documents. The second and third most productive journals were the *Archives of Gerontology and Geriatrics* and *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, accounting for 3.30% and 2.26%, respectively.

3.4 | The research hot spots and emerging trends based on keyword co-occurrence analysis

Keywords facilitate the concentration and refinement of core content and topicality of literature in the field (Chen, Dubin, & Kim,

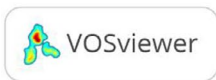
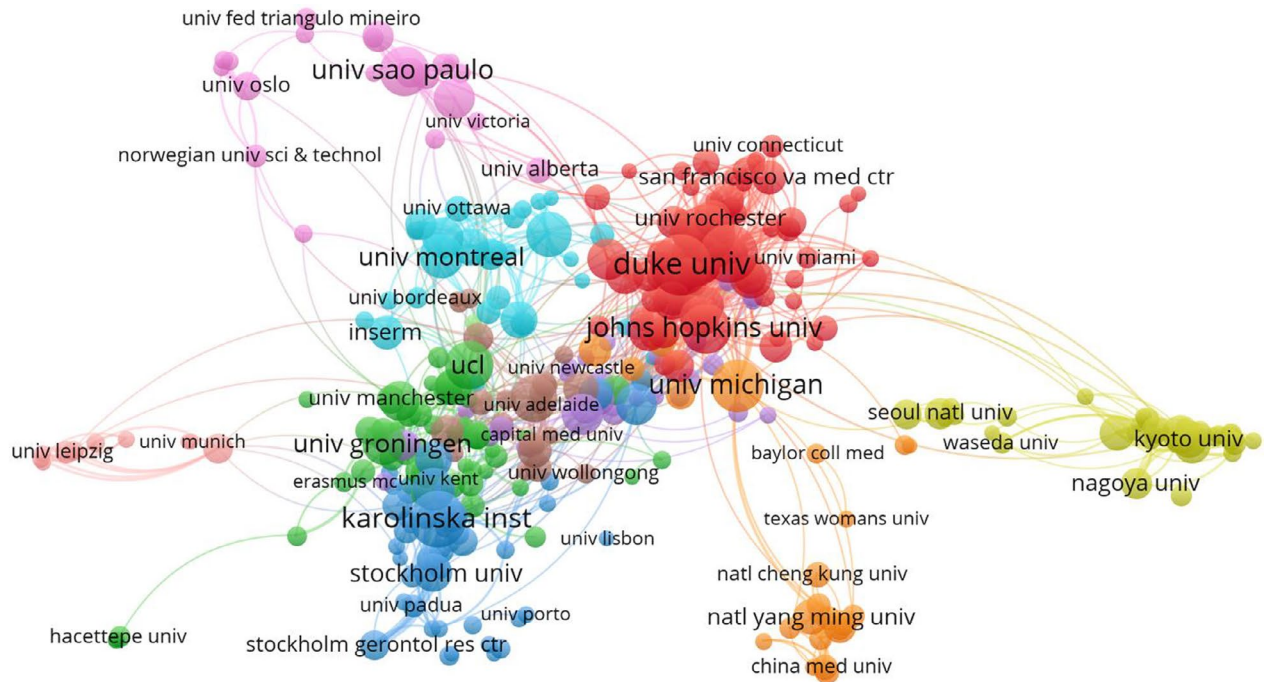


FIGURE 3 Institution co-authorship network for research on social participation of older people from 2000 to 2019 (with a threshold of 10 publications)

Rank	Institution	Country	No. of papers (%)	Total citations	Citations per paper
1	Duke Univ	USA	134 (1.91)	4,800	35.82
2	Univ Pittsburgh	USA	127 (1.81)	8,118	63.92
3	Univ Calif San Francisco	USA	126 (1.79)	7,545	59.88
4	Karolinska Inst	Sweden	118 (1.68)	2,764	23.42
5	Univ Michigan	USA	99 (1.41)	3,278	33.11
6	Johns Hopkins Univ	USA	90 (1.28)	5,712	63.47
7	Univ Sao Paulo	Brazil	89 (1.27)	1,477	16.60
8	UCL	UK	84 (1.20)	2,443	29.08
9	Univ Sydney	Australia	83 (1.18)	1,894	22.82
10	Univ Toronto	Canada	76 (1.08)	1,716	22.58

TABLE 2 Top 10 institutions publishing papers on social participation of older people during 2000–2019

2014a; Huang, Chen, & Zhou, 2020). As presented in Figure 4, the keyword co-occurrence network generated by VOSviewer contained 121 keywords and 2,829 co-occurrence links distributed in 6 clusters. These keywords were selected with a frequency of occurrence no less than 30 times, reflecting the range of research hot spots on social participation of older people. The size of the nodes was proportional to the occurrence of the terms, and the proximity of the terms represents their relatedness. We also identified the

top 30 keywords in the data set according to occurrence counts (Table 4). The keywords with the highest frequency were elderly, activities of daily living, ageing, aged, disability, quality of life, depression and dementia, among others.

Keywords that occur at high frequencies can reflect research hot spots, whereas burst keywords with a strong surge of frequency during a certain period are considered indicators of frontier topics or emerging trends (Miao et al., 2017; Zheng & Wang,

TABLE 3 Top 10 journals (by article count) on research of social participation of older people during 2000–2019

Rank	Journal	Articles, n (%)	Total Citations	Citations per Paper	Country of Publication	Impact Factor 2018	5-Year Impact Factor	Quartile
1	Journal of the American Geriatrics Society	326 (4.64)	4,266	13.09	USA	4.113	5.040	Q1
2	Archives of Gerontology and Geriatrics	232 (3.30)	1,439	6.20	Ireland	2.611	2.828	Q3
3	Journals of Gerontology Series A-Biological Sciences and Medical Sciences	159 (2.26)	2,726	17.14	USA	4.711	5.811	Q1
4	Geriatrics & Gerontology International	151 (2.15)	480	3.18	Japan	2.118	2.407	Q3
5	BMC Geriatrics	118 (1.68)	816	6.91	England	2.818	3.458	Q3
6	Aging Clinical and Experimental Research	103 (1.47)	780	7.57	Italy	2.331	1.934	Q3
7	Journal of Nutrition Health & Aging	92 (1.31)	587	6.38	France	2.660	3.215	Q3
8	International Journal of Geriatric Psychiatry	92 (1.31)	1,299	14.12	England	3.141	3.349	Q2
9	Journals of Gerontology Series B-Psychological Sciences and Social Sciences	91 (1.30)	1,988	21.85	USA	3.418	3.911	Q2
10	Age and Ageing	91 (1.30)	2,176	23.91	England	4.511	5.174	Q1

2019). In the present study, keywords with strong citation bursts were explored using CiteSpace V, and a total of 52 strongest burst keywords were identified (Supplement S3). Figure 5 displays the keywords that had the most recent bursts and the years in which they appeared from 2010 onwards. The blue line represents the time interval, while the duration of the burst keywords is depicted as the red line. The keyword loneliness, which emerged in 2017, had the strongest burst (40.25), followed by cognition (21.24) and functional decline (15.58). Social participation, social support, instrumental activity, frailty, and loneliness were the most recent burst keywords since 2015.

3.5 | Co-cited reference cluster analysis

It has been proven that co-cited reference networks can capture research focused on the underlying scientific community (Chen, Hu, Liu, & Tseng, 2012). A co-cited reference network was therefore generated via CiteSpace based on the top 50 most cited references every 2 years (Figure 6) using keyword terms and a log-likelihood ratio (LLR) weighting algorithm to calculate the label of clusters. No pruning was employed in the calculation. As shown in Figure 6, the visualisation of the knowledge network consisted of 556 nodes and 1,979 co-citation links from 2000 to 2019. Each node in the figure

equalled a cited reference, and the larger the node, the higher the citation frequency. The 'tree rings' with different colours represent the citation history, and citation bursts are marked by red rings (Chen, Dubin, & Kim,

2014a). The top 10 landmark co-cited references are summarised in Table 5 and were regarded as key articles in the knowledge evolution of social participation of older people. The co-cited times for the top 10 references were nearly consistent with the co-cited times per year. Among them, the node with the highest number of citations (73 citations) was a reference entitled 'Frailty in elderly people' published by Clegg, A in the *Lancet* in 2013. The second landmark reference was the World Report on Aging and Health 2015 (60 citations) published by the WHO.

According to Chen Chaomei, individual nodes in a network can be aggregated into clusters based on their interconnectivity, and each cluster represents a distinct specialty or thematic concentration (Chen, Dubin, & Kim, 2014b). In this study, co-cited references were classified into 16 clusters including prognosis, cognitive functioning, sarcopenic obesity, Alzheimer's disease and frail elderly, among others. Furthermore, the largest 10 clusters shown in Table 6 were highly homogeneous or consistent because the silhouette scores of the largest 10 clusters were all above 0.7. The largest cluster 0 prognosis that contained 121 member references was also the earliest issue based on the cluster's mean citation year. Cluster 1 cognitive functioning and cluster 9 successful ageing were relatively new clusters.

4 | DISCUSSION

In the present study, CiteSpace and VOSviewer were employed as quantified assessment tools to evaluate social participation of older people from 2000 to 2019. Our results showed that social



FIGURE 5 The keywords with the strongest citation bursts since 2010

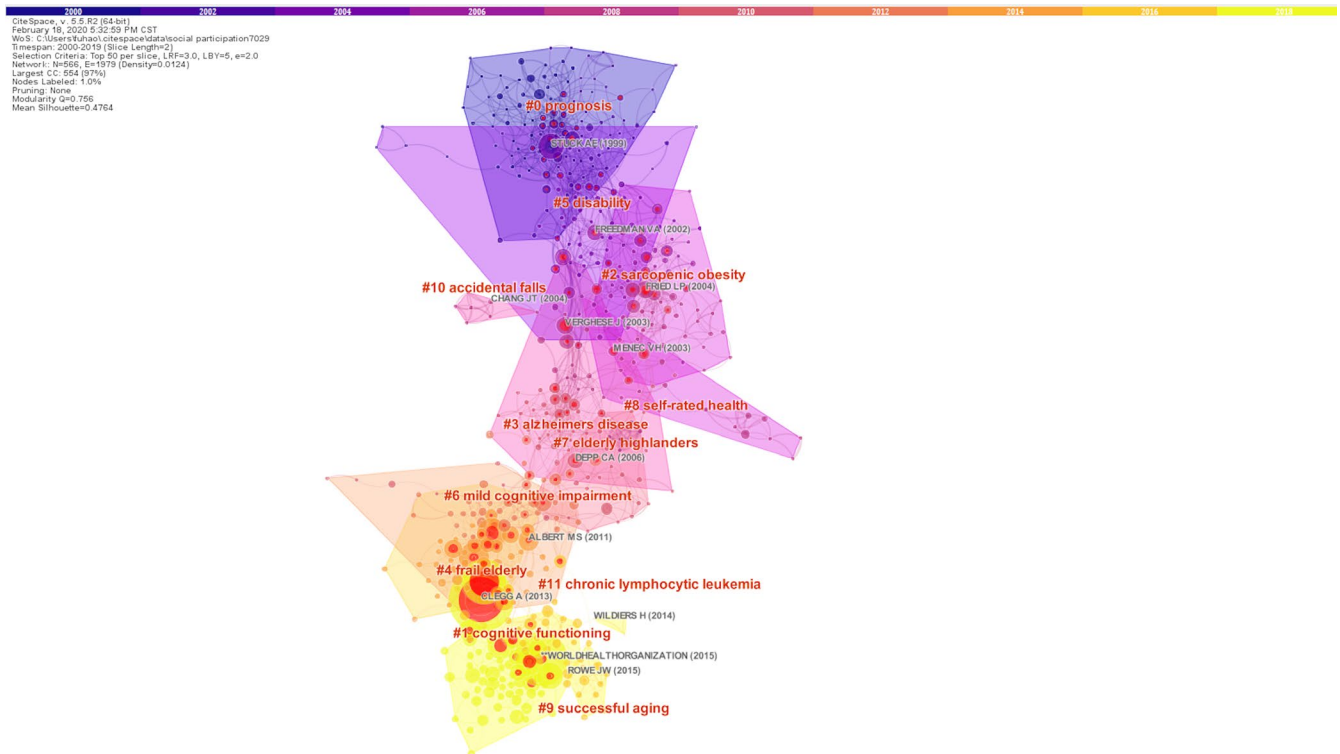


FIGURE 6 Clusters of co-cited references network from 2000 to 2019. Clusters are labelled in red text. The nodes denote co-cited references. The size of a node is proportional to the citation frequency of the document. The colour of rings and links corresponds to the year. Red rings indicate burst references, which mean rapid increases of citation counts

participation of older people has attracted increasing research attention and this trend is likely to continue, as illustrated by the steady increase in the number of annual publications.

The United States maintains a leading position regarding research into social participation of older people, which was partially supported by the evidence that half of the 10 most productive scientific institutions were located in the United States, and three of the top 10 active journals with good quality (the average 5-year impact factor was 4.92) were based in the United States. Also, documents

published by the United States had the highest average citations per article, providing further proof of its powerful academic impact. These results were roughly consistent with previous health-related bibliometric studies (Shen et al., 2018; Zhou, Tan, Qiu, Song, & Gao, 2018). A 2015 study showed that the United States had 6 of the top 10 productive institutions and the highest number of published articles on neurogenic bladder (Gao et al., 2015). We also found that developing countries/regions remained under-represented in the global research network, although Brazil and China made significant

TABLE 5 Top 10 most frequently co-cited references on social participation of older people during 2000–2019

Title	First Author	Journal	Year	Type	Co-cited Times	Co-cited Times per year
Frailty in elderly people	Clegg, A	Lancet	2013	Article	73	10.43
World report on ageing and health 2015	World Health Organization	World Rep Ag Hlth	2015	Report	60	12
Frailty consensus: a call to action	Morley, JE	J Am Med Dir Assoc	2013	Article	50	7.14
Sarcopenia: European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People	Cruz-Jentoft, AJ	Age Ageing	2010	Article	33	3
Gait speed and survival in older adults	Studenski, S	JAMA	2011	Article	33	3.3
International Society of Geriatric Oncology Consensus on Geriatric Assessment in Older Patients with Cancer	Wildiers, H	J Clin Oncol	2014	Review	33	5.5
Effect of structured physical activity on prevention of major mobility disability in older adults: the LIFE study randomized clinical trial	Pahor, M	JAMA-J Am Med Assoc	2014	Article	30	5
Social Participation and the Prevention of Functional Disability in Older Japanese: The JAGES Cohort Study	Kanamori, S	PLOS ONE	2014	Article	30	5
Loneliness and social isolation as risk factors for mortality: a meta-analytic review	Holt-Lunstad, J	Perspect Psychol Sci	2015	Review	29	5.8
Risk factors for functional status decline in community-living elderly people: a systematic literature review	Stuck, AE	Soc Sci Med	1999	Review	28	1.4

progress in the research field and ranked sixth and seventh, respectively, in terms of publication numbers.

Scientific collaborative networks are a hallmark of contemporary academic research (Conkova, Fokkema, & Dykstra, 2018). The country co-authorship map reflected that international cooperation in this research field was quite common. European countries such as the UK, the Netherlands and Italy not only had relatively high productivity but also close international cooperative relationships as indicated by higher co-authorship link strengths. This indicated that the geographical advantage was likely an important influencing factor in international research collaboration, which may lead to further changes in academic status. Additionally, the co-authorship network of institutions highlighted several institutional collaboration groups, such as the close partnerships with Duke University, the University of Rochester and Johns Hopkins University. However, these institutions' international collaboration was relatively weaker than intranational collaborations, which may be related to the lack of mature cooperation policies between national scientific communities. Scientists are no longer independent players, so additional measures are necessary to foster international collaborations among institutions, which may also assist developing countries to increase research capacity.

Among the 10 most productive journals, nearly all were in the geriatrics and gerontology JCR category. The journals also covered the nutrition and dietetics, psychiatry, psychology and multidisciplinary categories, indicating that geriatrics necessarily involves multidisciplinary cooperation. When considering the impact of a journal, all of the top 10 active journals had an IF >2.0, and 33.3% (3/10) of the top 10 most productive journals had a 5-year IF >5.0, demonstrating the high quality of the publications.

Regarding article keywords, as the retrieval terms, it is unsurprising that activities of daily living, social participation and elderly were the most frequent keywords. Generally, research areas related to social participation of older people were extensive. To more accurately ascertain the research direction, we comprehensively analysed the keyword co-occurrence networks, the top 30 high-frequency keywords and the clusters of co-cited references and summarised several popular research topics as follows: the predominant topics in the literature over the past 20 years were classified into healthy ageing, quality of life, psychological problems such as depression, and health status of older people (Table 4 and Figure 6).

One popular health status topic is the relationship between dementia and social participation. Dementia is a syndrome, usually with a chronic or progressive nature, in which there is deterioration in cognitive function (i.e. the ability to process thoughts) beyond what might be expected from normal ageing (WHO, 2019). Several recent longitudinal studies reported that social participation may reduce the risk of dementia onset (Nemoto et al., 2017; Zhou, Wang, et al., 2018), which could provide an important option for better prevention, treatment and care for older people with dementia.

The function has been globally recognised as a marker of health status in older adults (Fisher, Graham, Krishnan, & Ottenbacher, 2016). Our research found a group of keywords focusing on the

TABLE 6 The largest 10 clusters in the co-cited reference network.

Cluster ID	Size	Silhouette	Mean (year)	Label (TFIDF)	Label (LLR)	Label (MI)
0	121	0.9	1997	Daily living activities	Prognosis	Metamemory
1	77	0.852	2014	Adults	Cognitive functioning	Cognitive functioning
2	74	0.785	2004	Activities	Sarcopenic obesity	Assessment instruments
3	64	0.868	2005	Alzheimer's disease	Alzheimer's disease	Southern Thailand
4	56	0.876	2010	Daily living	Frail elderly	Score system
5	46	0.87	2000	Disability evaluation	Disability evaluation	Locomotor activity
6	37	0.86	2009	Daily living	Mild cognitive impairment	Assessment and classification
7	29	0.9	2006	Daily living	Elderly highlanders	Metabolic syndrome
8	20	0.935	2003	Social participation	Self-rated health	Outcomes
9	11	0.976	2013	Successful ageing	Successful ageing	Lesbian

health status and function of older people, such as disability, functional status, physical function, instrumental activities of daily life and cognitive function. Among the top 10 most frequently co-cited references (Table 5), some reports also focused on the effects of social participation on the prevention of mobility disability, gait speed or functional decline in older adults (Kanamori et al., 2014; Pahor et al., 2014; Studenski et al., 2011). A population-based cross-sectional survey found that promoting social participation among older adults could contribute to increasing physical activity, with potential benefits for chronic diseases (Kikuchi et al., 2017). Thus, as common forms of social participation, exercise and physical activity were also high-frequency co-occurrence keywords (Table 4). Combining the keywords in Table 4 with clusters 1 and 6 in Figure 6, as an important part of the functional system, cognitive function has also become a research hot spot. Focusing on cognitive function and social participation, it was reported that participation in some social activities could preserve cognitive function or decelerate further cognitive decline in older people. This view was supported by many recent cross-sectional or longitudinal studies (Fu, Li, & Mao, 2018; Sakamoto et al., 2017; Tomioka, Kurumatani, & Hosoi, 2018). Kyle J. Bourassa et al. found that social participation can predict two domains of cognitive functioning (memory and executive function), and the relative magnitude of this effect was comparable to physical health, depression and physical activity levels, which further elucidated the longitudinal association between social participation and cognitive function (Bourassa, Memel, Woolverton, & Sbarra, 2017).

Another popular topic related to health status that deserves further attention was frailty in older adults as illustrated by the representative keyword 'frailty' and 'frail elderly'. Cluster 4 in the co-cited reference network also demonstrated that 'frail elderly' played an important role in this research area. As a common geriatric syndrome with a high prevalence in older adults, frailty is usually considered progressive age-related deterioration in physiological systems that can lead to extreme vulnerability to stressors and carry an increased risk of adverse outcomes including hospitalisation and mortality (Anderson-Hanley et al., 2018; Beard et al., 2016). Among the top 3 most highly co-cited references, two emphasised

the research topic of frailty. Over the past 20 years, numerous definitions of frailty have been proposed, and measurement methods and potential causes have also been discussed. Of note, although frailty causes disability and restrictions on older people's engagement in leisure activities, it is still a manageable condition (Granbom, Kristensson, & Sandberg, 2017). Interventions should target those who are pre-disabled to prevent dependency. Previous gerontological studies documented that participation in social activities has protective effects against adverse frailty outcomes (Duppen et al., 2019; Granbom et al., 2017), although the reason why such an intervention works on frail older people is unclear.

Burst keywords detected by CiteSpace are considered important indicators of research frontiers or emerging topics over time (Yang, Wang, Wang, Yang, & Bian, 2019). As presented in Supplement S3, hip fracture, physical disability, functional status and prevention seemed to attract the most attention of peer researchers in the past 20 years, while social participation, social support, instrumental activity, frailty and loneliness have attracted research interest since 2015. This implies that researchers gradually paid more attention to psychosocial health instead of only focusing on physical symptoms or mental health of older adults. This transitioning trend might be related to the conceptual framework for action on the social determinants of health proposed by the World Health Organization (WHO, 2010). After all, social participation is an important method and a potentially modifiable factor to achieve healthy ageing.

Overall, this study's findings provide encouraging data on the research progress of social participation in older people. However, to promote social participation and successful ageing, it is necessary to identify why social participation is beneficial to health and ascertain the exact mechanisms or mediators. Based on the scientific landscapes we identified in this study, future research should consider improving understanding, measurement and monitoring of social participation. Furthermore, the potential for participation-based adjuncts to clinical nursing, especially in primary care settings where quality of life can be enhanced, remains to be explored. This implies that when caring for older people, particularly those with limited social participation due to disability, frailty, loss of a spouse or chronic

disease, nurses should formulate effective and tailored interventions to foster their social participation, thereby improving their health status and quality of life.

This study had limitations that merit mention. Although the WoSCC is a very authoritative database, some relevant articles might still have been missed when the WoSCC was used as the only database. In this study, we also attempted to identify overall research landscapes in terms of social participation of older people, but further efforts and studies are still needed to fully understand the details.

5 | CONCLUSIONS

In conclusion, this literature review has depicted scientific landscapes including publication numbers, countries, institutions, journals, hot spots and emerging trends over the past 20 years using bibliometric methods. The United States has a leading position in research into social participation of older people. International collaboration should be further promoted and strengthened. The *Journal of the American Geriatrics Society* is the most productive journal in terms of social participation of older people. The hot spots of retrieved literature covered aspects of healthy ageing, quality of life, psychological problems and health status, especially dementia, function (including cognitive function) and frailty, as well as their relationships with social participation of older people. Social participation, social support, instrumental activity, frailty and loneliness have become research frontiers over the past 5 years. These findings will help scholars better understand current research progress and predict future directions related to social participation of older people. Furthermore, by providing objective and reliable data on older people's social participation, nurses should pay close attention to the development of scientific research in this field to maintain good health status of older people by motivating them to actively participate. This will not only contribute to healthy ageing and social values of older people, but the professional identity of nurses and other healthcare practitioners will also improve after helping older people.

Implications for practice

- Social participation is strongly associated with physical and psychological problems and the well-being of older people.
- Understanding research landscapes in terms of social participation of older people will add new insight into how to achieve healthy ageing.
- Related professionals, especially nurses and many other health care practitioners, should transfer and adopt research knowledge related to social participation into the practice of caring for older people.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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REFERENCES

- Anderson-Hanley, C., Stark, J., Wall, K. M., VanBrakle, M., Michel, M., Maloney, M., ... Kramer, A. F. (2018). The interactive Physical and Cognitive Exercise System (iPACES™): effects of a 3-month in-home pilot clinical trial for mild cognitive impairment and caregivers. *Clinical Interventions in Aging*, 13, 1565–1577. <https://doi.org/10.2147/CIA.S160756>
- Beard, J. R., Officer, A., de Carvalho, I. A., Sadana, R., Pot, A. M., Michel, J.-P., ... Chatterji, S. (2016). The World report on ageing and health: a policy framework for healthy ageing. *The Lancet*, 387, 2145–2154. [https://doi.org/10.1016/s0140-6736\(15\)00516-4](https://doi.org/10.1016/s0140-6736(15)00516-4)
- Boudry, C., Baudouin, C., & Mouriaux, F. (2018). International publication trends in dry eye disease research: A bibliometric analysis. *The Ocular Surface*, 16, 173–179. <https://doi.org/10.1016/j.jtos.2017.10.002>
- Bourassa, K. J., Memel, M., Woolverton, C., & Sbarra, D. A. (2017). Social participation predicts cognitive functioning in aging adults over time: comparisons with physical health, depression, and physical activity. *Ageing & Mental Health*, 21, 133–146. <https://doi.org/10.1080/13607863.2015.1081152>
- Bowes, A., & McColgan, G. (2013). Telecare for older people: promoting independence, participation, and identity. *Research on Aging*, 35, 32–49. <https://doi.org/10.1177/0164027511427546>
- Brown, T., Gutman, S. A., Ho, Y. S., & Fong, K. N. K. (2018). A bibliometric analysis of occupational therapy publications. *Scandinavian Journal of Occupational Therapy*, 25, 1–14. <https://doi.org/10.1080/11038128.2017.1329344>
- Chang, Y.-W., Huang, M.-H., & Lin, C.-W. (2015). Evolution of research subjects in library and information science based on keyword, bibliographical coupling, and co-citation analyses. *Scientometrics*, 105, 2071–2087. <https://doi.org/10.1007/s11192-015-1762-8>
- Chen, C., Dubin, R., & Kim, M. C. (2014a). Emerging trends and new developments in regenerative medicine: a scientometric update (2000–2014). *Expert Opinion on Biological Therapy*, 14, 1295–1317. <https://doi.org/10.1517/14712598.2014.920813>
- Chen, C., Dubin, R., & Kim, M. C. (2014b). Orphan drugs and rare diseases: a scientometric review (2000–2014). *Expert Opinion on Orphan Drugs*, 2, 709–724. <https://doi.org/10.1517/21678707.2014.920251>
- Chen, C., Hu, Z.-G., Liu, S.-B., & Tseng, H. (2012). Emerging trends in regenerative medicine: a scientometric analysis in CiteSpace. *Expert Opinion on Biological Therapy*, 12, 593–608. <https://doi.org/10.1517/14712598.2012.674507>
- Conkova, N., Fokkema, T., & Dykstra, P. A. (2018). Non-kin ties as a source of support in Europe: understanding the role of cultural context. *European Societies*, 20, 131–156. <https://doi.org/10.1080/14616696.2017.1405058>
- Curtis, K., Fry, M., Shaban, R. Z., & Considine, J. (2017). Translating research findings to clinical nursing practice. *Journal of Clinical Nursing*, 26, 862–872. <https://doi.org/10.1111/jocn.13586>

- Dalemans, R., de Witte, L. P., Lemmens, J., van den Heuvel, W. J. A., & Wade, D. T. (2008). Measures for rating social participation in people with aphasia: a systematic review. *Clinical Rehabilitation*, 22, 542–555. <https://doi.org/10.1177/0269215507087462>
- Damar, H. T., Bilik, O., Ozdagoglu, G., Ozdagoglu, A., & Damar, M. (2018). Scientometric overview of nursing research on pain management. *Revista Latino-Americana De Enfermagem*, 26, e3051. <https://doi.org/10.1590/1518-8345.2581.3051>
- Duppen, D., Lambotte, D., Dury, S., Smetcoren, A.-S., Pan, H., De Donder, L., ... Schols, J. M. G. A. (2019). Social participation in the daily lives of frail older adults: Types of participation and influencing factors. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, gbz045. <https://doi.org/10.1093/geronb/gbz045>
- Fisher, S. R., Graham, J. E., Krishnan, S., & Ottenbacher, K. J. (2016). Predictors of 30-day readmission following inpatient rehabilitation for patients at high risk for hospital readmission. *Physical Therapy*, 96, 62–70. <https://doi.org/10.2522/ptj.20150034>
- Fu, C., Li, Z., & Mao, Z.-F. (2018). Association between social activities and cognitive function among the elderly in China: A cross-sectional study. *International Journal of Environmental Research and Public Health*, 15, 231. <https://doi.org/10.3390/ijerph15020231>
- Fu, L.-P., Sun, Z.-H., He, L.-P., Liu, F., & Jing, X.-L. (2019). Global long-term care research: A scientometric review. *International Journal of Environmental Research and Public Health*, 16, 2077. <https://doi.org/10.3390/ijerph16122077>
- Gao, Y., Qu, B. O., Shen, Y., Su, X.-J., Dong, X.-Y., Chen, X.-M., ... Pi, H.-Y. (2015). Bibliometric profile of neurogenic bladder in the literature: a 20-year bibliometric analysis. *Neural Regeneration Research*, 10, 797–803. <https://doi.org/10.4103/1673-5374.156985>
- Granbom, M., Kristensson, J., & Sandberg, M. (2017). Effects on leisure activities and social participation of a case management intervention for frail older people living at home: a randomised controlled trial. *Health & Social Care in the Community*, 25, 1416–1429. <https://doi.org/10.1111/hsc.12442>
- Huang, L., Chen, K., & Zhou, M. (2020). Climate change and carbon sink: a bibliometric analysis. *Environmental Science and Pollution Research International*, 27, 8740–8758. <https://doi.org/10.1007/s11356-019-07489-6>
- Huang, X.-Q., Fan, X.-W., Ying, J., & Chen, S.-Y. (2019). Emerging trends and research foci in gastrointestinal microbiome. *Journal of Translational Medicine*, 17, 67. <https://doi.org/10.1186/s12967-019-1810-x>
- Jiesisibieke, Z. L., Tung, T.-H., Xu, Q.-Y., Chen, P.-E., Hsu, S.-Y., Liu, Y., & Chien, C.-W. (2019). Association of acute kidney injury with frailty in elderly population: a systematic review and meta-analysis. *Renal Failure*, 41, 1021–1027. <https://doi.org/10.1080/0886022x.2019.1679644>
- Kanamori, S., Kai, Y., Aida, J., Kondo, K., Kawachi, I., Hirai, H., ... JAGES Group. (2014). Social participation and the prevention of functional disability in older Japanese: the JAGES cohort study. *PLoS One*, 9, e99638. <https://doi.org/10.1371/journal.pone.0099638>
- Kikuchi, H., Inoue, S., Fukushima, N., Takamiya, T., Odagiri, Y., Ohya, Y., ... Owen, N. (2017). Social participation among older adults not engaged in full- or part-time work is associated with more physical activity and less sedentary time. *Geriatrics & Gerontology International*, 17, 1921–1927. <https://doi.org/10.1111/ggi.12995>
- Levasseur, M., Richard, L., Gauvin, L., & Raymond, E. (2010). Inventory and analysis of definitions of social participation found in the aging literature: proposed taxonomy of social activities. *Social Science & Medicine*, 71, 2141–2149. <https://doi.org/10.1016/j.socscimed.2010.09.041>
- Miao, Y., Xu, S.-Y., Chen, L.-S., Liang, G.-Y., Pu, Y.-P., & Yin, L.-H. (2017). Trends of long noncoding RNA research from 2007 to 2016: A bibliometric analysis. *Oncotarget*, 8, 83114–83127. <https://doi.org/10.18632/oncotarget.20851>
- Nemoto, Y., Saito, T., Kanamori, S., Tsuji, T., Shirai, K., Kikuchi, H., ... Kondo, K. (2017). An additive effect of leading role in the organization between social participation and dementia onset among Japanese older adults: The AGES cohort study. *BMC Geriatrics*, 17, 297. <https://doi.org/10.1186/s12877-017-0688-9>
- Owari, Y., Miyatake, N., & Kataoka, H. (2018). Relationship between social participation, physical activity and psychological distress in apparently healthy elderly people: A pilot study. *Acta Medica Okayama*, 72, 31–37. <https://doi.org/10.18926/AMO/55660>
- Pahor, M., Guralnik, J. M., Ambrosius, W. T., Blair, S., Bonds, D. E., Church, T. S., ... Williamson, J. D. (2014). Effect of structured physical activity on prevention of major mobility disability in older adults: the LIFE study randomized clinical trial. *JAMA*, 311, 2387–2396. <https://doi.org/10.1001/jama.2014.5616>
- Piškur, B., Daniēls, R., Jongmans, M. J., Ketelaar, M., Smeets, R. J., Norton, M., & Beurskens, A. J. (2014). Participation and social participation: are they distinct concepts? *Clinical Rehabilitation*, 28, 211–220. <https://doi.org/10.1177/0269215513499029>
- Sakamoto, A. I., Ukawa, S., Okada, E., Sasaki, S., Zhao, W., Kishi, T., ... Tamakoshi, A. (2017). The association between social participation and cognitive function in community-dwelling older populations: Japan Gerontological Evaluation Study at Taisetsu community Hokkaido. *International Journal of Geriatric Psychiatry*, 32, 1131–1140. <https://doi.org/10.1002/gps.4576>
- Sala, G., Jopp, D., Gobet, F., Ogawa, M., Ishioka, Y., Masui, Y., ... Gondo, Y. (2019). The impact of leisure activities on older adults' cognitive function, physical function, and mental health. *PLoS One*, 14, e0225006. <https://doi.org/10.1371/journal.pone.0225006>
- Shah, K., Frank, C. R., & Ehrlich, J. R. (2020). The association between vision impairment and social participation in community-dwelling adults: a systematic review. *Eye (Lond)*, 34, 290–298. <https://doi.org/10.1038/s41433-019-0712-8>
- Shen, L.-N., Xiong, B., Li, W., Lan, F.-Q., Evans, R., & Zhang, W. (2018). Visualizing Collaboration Characteristics and Topic Burst on International Mobile Health Research: Bibliometric analysis. *Jmir Mhealth and Uhealth*, 6, e135. <https://doi.org/10.2196/mhealth.9581>
- Studenski, S., Perera, S., Patel, K., Rosano, C., Faulkner, K., Inzitari, M., ... Connor, E. B. (2011). Gait speed and survival in older adults. *JAMA*, 305, 50–58. <https://doi.org/10.1001/jama.2010.1923>
- Sweileh, W. M. (2018). Analysis of global research output on diabetes depression and suicide. *Annals of General Psychiatry*, 17, 44. <https://doi.org/10.1186/s12991-018-0214-2>
- Tabet, E. R. (2016). Activity participation and older adults' well-being. *SPACE: Student Perspectives about Civic Engagement*, 2, 5.
- Tomioka, K., Kurumatani, N., & Hosoi, H. (2018). Social participation and cognitive decline among community-dwelling older adults: a community-based longitudinal study. *The Journals of Gerontology Series B, Psychological Sciences and Social Sciences*, 73, 799–806. <https://doi.org/10.1093/geronb/gbw059>
- Wang, X.-Q., Peng, M.-S., Weng, L.-M., Zheng, Y.-L., Zhang, Z.-J., & Chen, P.-J. (2019). Bibliometric study of the comorbidity of pain and depression research. *Neural Plasticity*, 2019, 1–16. <https://doi.org/10.1155/2019/1657498>
- WHO. (2002). *Active ageing: A policy framework*. Geneva, Switzerland: World Health Organization. Retrieved from <https://apps.who.int/iris/handle/10665/67215>
- WHO. (2018). *Ageing and health*. Geneva, Switzerland: World Health Organization. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>
- WHO. (2019). *Dementia*. Geneva, Switzerland: World Health Organization. Retrieved from <https://www.who.int/news-room/facts-in-pictures/detail/dementia>
- WHO. (2010). *A conceptual framework for action on the social determinants of health*. (pp. 76). Geneva, Switzerland: World Health Organization.

- Yang, D.-W., Wang, X.-P., Wang, Z.-C., Yang, Z.-H., & Bian, X.-F. (2019). A scientometric analysis on hepatocellular carcinoma magnetic resonance imaging research from 2008 to 2017. *Quantitative Imaging in Medicine and Surgery*, 9, 465–476. <https://doi.org/10.21037/qims.2019.02.10>
- Zheng, K.-Y., & Wang, X.-Q. (2019). Publications on the association between cognitive function and pain from 2000 to 2018: A bibliometric analysis using CiteSpace. *Medical Science Monitor*, 25, 8940–8951. <https://doi.org/10.12659/msm.917742>
- Zhou, H.-Q., Tan, W.-L., Qiu, Z.-T., Song, Y.-Y., & Gao, S.-W. (2018). A bibliometric analysis in gene research of myocardial infarction from 2001 to 2015. *PeerJ*, 6, e4354. <https://doi.org/10.7717/peerj.4354>
- Zhou, Z., Wang, P., & Fang, Y. (2018). Social engagement and its change are associated with dementia risk among Chinese older adults: A longitudinal study. *Scientific Reports*, 8, 1551. <https://doi.org/10.1038/s41598-017-17879-w>
- Zyoud, S. H., & Fuchs-Hanusch, D. (2017). A bibliometric-based survey on AHP and TOPSIS techniques. *Expert Systems with Applications*, 78, 158–181. <https://doi.org/10.1016/j.eswa.2017.02.016>

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

Supplement S1-S2

Supplement S3

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