Research Paper

Research hotspots and nursing inspiration in research of older adults with subjective cognitive decline from 2003 to 2023: A bibliometric analysis

Xiaotong Ding [a], Jiyuan Shi [a], Qing Wang [a, b], Hongli Chen [a], Xiuxiu Shi [c], Zheng Li [a, *]

[a] School of Nursing, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing, China
[b] School of Nursing, Lanzhou University, Lanzhou, China
[c] School of Nursing, Hangzhou Normal University, Hangzhou, China

ARTICLE INFO

ABSTRACT

Objectives: There has been a significant increase in subjective cognitive decline (SCD) studies in older adults over the years. A bibliometric analysis was conducted to demonstrate the current hotspots and emerging trends in SCD research in older adults and provide references for further research in this field.
Methods: The study conducted a bibliometric analysis based on co-citation analysis. From the Web of Science Core Collection database, this study obtained 1,436 manuscripts regarding SCD in older adults published from 2003 to 2023. Software CiteSpace was used to analyse the results for countries, institutions, authors, journals, keywords, top-cited papers, and burst citations scientifically and intuitively.
Results: Our result showed an overall upward trend in the volume of publications on SCD in the elderly population, suggesting that the study of SCD in older adults has attracted the attention of researchers. The United States dominates this research field, followed by China and France. The top three institutions were the University of California System, Institut National de la Sante et de la Recherche Medicale (Inserm), and UDICE-French Research Universities. Frank Jessen, Han Ying, and Kathryn Ellis were the top three researchers. The top three cited journals were *Neurology*, *Alzheimers & Dementia*, and *Journal of Alzheimer's Disease*. The keywords clustering were "depression", "functional connectivity", "cognitive reserve", "cognitive function", "physical activity", "recommendations", "dementia prevention", " behavioral disorders", "primary care", "early diagnosis", and "community-based study". Keywords with the highest citation bursts include "physical activity", "framework", "preclinical Alzheimer's disease", "future dementia", and "late life depression".
Conclusions: Parallel to the growth trend, the range of research scopes and topics is expanding steadily, focusing on early screening and prevention, negative emotion, and symptom management, broadening researchers' perspectives, which can provide reference and guidance for nursing researchers to conduct research.

What is known?

- Over the past 20 years, studies on subjective cognitive decline in older adults have increased dramatically. As a stage of "patients know, doctors don't know", subjective cognitive decline (SCD) is a state between normal cognitive ageing and mild cognitive impairment (MCI) and a critical window to delay the process of dementia.

What is new?

- The study used CiteSpace to explore the dynamic development trend, the research frontier, and the highly influential countries, institutions, and authors. The overview visualization map can provide novel insights into future research and offer a reference point for nurses starting new projects, especially for community nurses.

* Corresponding author.
E-mail address: zhengli@pumc.edu.cn (Z. Li).
Peer review under responsibility of Chinese Nursing Association.

1. Introduction

With the growth of the elderly population, the decline in cognitive performance in older adults has gradually attracted researchers' attention. The decline of cognitive function will lead to a reduction in health status and quality of life. It may result in memory complaints about poor executive function in older adults [1]. Subjective cognitive decline (SCD), also known as subjective memory complaints (SMC), subjective memory loss, or subjective memory impairment, is prevalent in older adults [2]. SCD is self-reported memory difficulties with no noticeable damage in the objective psychological test, which reflects a person's perception of their memory and daily memory performance [3].

As a stage of "patients know, doctors don't know", SCD is a state between normal cognitive ageing and mild cognitive impairment (MCI) [4]. A meta-analysis showed that in the long-term study of more than four years, 14.1% of people with SCD developed dementia, and 26.6% continued to develop MCI [5]. Some studies have reported that SMC was related to depression, anxiety, distress, inferior quality of life [6], and lower memory self-efficacy [7]. Another study also pointed out that SCD patients already had medial temporal lobe atrophy [8], associated with decreased volume of the hippocampus and amygdala [9]. There are an increasing number of studies on SCD. However, to our knowledge, the bibliometric profile of SCD on older adults in the literature is still unknown. As a result, we conducted a bibliometric visualization analysis to describe the publication trends of SCD on older adults and displayed countries, journals, authors, keywords, and most cited papers.

The bibliometric method has been established as a scientific discipline and is an integral section of research evaluation methods, especially in science and application [10]. Bibliometric analysis is a method that uses mathematical and statistical methods to analyse the quantity and quality of publications, helping researchers quickly identify research hot spots and cutting-edge disciplines [8]. The bibliometric index includes a quantity index, a quality index, and a structural index. The quantity index measures the number of publications, the quality index measures the traits of a scientific topic's citation, and the structural index indicates the relationship and connection between research areas, journals, and authors [8]. This study used all bibliometric indices to analyse SCD in older adults.

CiteSpace could provide a visualization knowledge map of authors, countries, journals, keywords, and references in the scientific literature [11]. Using CiteSpace, the software can detect the highly cited and pivotal points and emerging trends in specific fields. Based on the principle of "co-citation analysis theory", "the path-finder algorithm" can quantitatively analyse the literature in particular areas and then put forward the critical path of knowledge evolution in this field [12]. The CiteSpace visualization network comprises nodes and lines. The analysis subjects, such as authors, journals, countries, and references, are represented by nodes, and the node size means the count. The lines between nodes indicated co-occurrence, co-citation, or cooperation; the thicker the line, the closer the relationship. Hence, the study used bibliometric analysis to explore the development trends, hotspots, and structural knowledge networks related to SCD studies in older people in the past 20 years. These results would help researchers deepen their understanding of dynamic trends, identify potential scientific frontiers, and discover innovative ideas for SCD research in older adults.

2. Materials and methods

2.1. Design

Descriptive bibliometric analysis revealed the distribution and development tendency of publication years of SCD research with older adults. The articles' keywords, countries, institutions, authors, and references were analysed using visual bibliometric analysis, and the research priorities of this field were comprehensively described.

2.2. Data collection

The study selected Clarivate Analytics's Web of Science (WOS) Core Collection as a bibliometric data source, including SCI-EXPANDED, SSCI, CPCI-SSH, CPCI-S, A&HCI BKCI-S, BKCI-SSH, IC, ESCI, and CCR-EXPANDED [13]. We retrieved the studies from 30 September 2003 to 30 September 2023 and completed the literature retrieval on 5 October 2023 to avoid the variation caused by the literature update. Table 1 displays the search strategy.

The inclusion criteria for this study were: 1) studies on SCD in older adults; 2) including articles and reviews. The study did not limit reviews, including systematic review, meta-analysis, narrative review, and qualitative reviews, for a more comprehensive understanding. The study excluded editorial materials, corrections, meeting abstracts, and letters. We exported all data in total text records, including titles, abstracts, keywords, authors, institutions, countries, article types, journals, and references. Fig. 1 shows the flowchart of the research selection for SCD in older people. After excluding the records that did not meet the inclusion criteria, the study included 1,436 studies.

2.3. Ethical considerations

The study is a bibliometric analysis of existing articles and does not involve human or animal participants.

2.4. Data analysis

Descriptive analysis and visualization analysis were used. We used Microsoft Excel to analyse the frequency of published papers annually and Software CiteSpace v.6.2.R4 (64-bit) [14—16] for visualization analysis. The study utilized the data to analyse the publishing trends, countries, authors, institutions, journals, citation

Table 1
Search strategy.

Step	Search strategy	Result
#1	TS ("older adult") OR TS (elder) OR TS ("elderly people") OR TS (older) OR TS ("older adults") OR TS ("older person") OR TS ("older individuals") OR TS ("older people") OR TS ("elderly person") OR TS ("elderly individuals")	1,974,293
#2	TS ("subjective cognitive decline") OR TS ("subjective memory complaints") OR TS ("subjective cognitive loss") OR TS ("subjective memory impairment") OR TS ("subjective memory decline") OR TS ("subjective cognitive complaint") OR TS ("cognitive complaint") OR TS ("memory complaint") OR TS ("subjective cognitive impairment") OR TS ("subjective memory loss")	4,114
#3	#1 AND #2	1,502

Note: Search on 5 October 2023. Retrieval time range: 30 September 2003 to 30 September 2023. TS = topics.
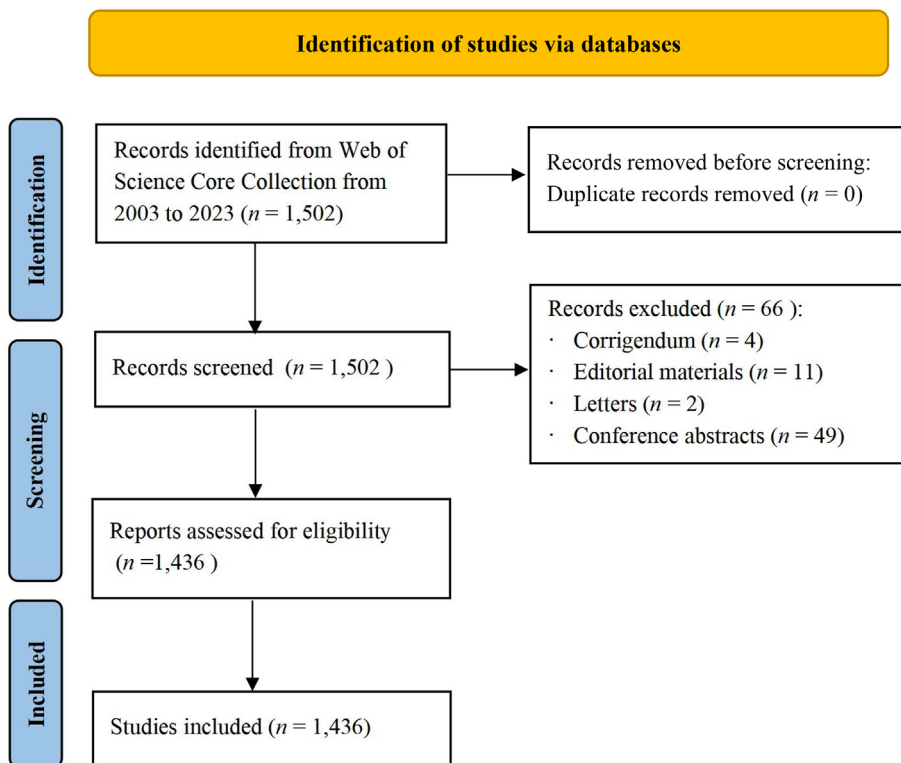
Fig. 1. Flow diagram of study selection.

characteristics, and citation bursts. In addition, the study merged synonym terms before analysis. For example, "memory complaint" and "cognitive complaint" were incorporated into "subjective cognitive decline." The study confirmed all the analyses based on quantitative data to ensure the results were reliable.

3. Results

3.1. Publication outputs and annual trend

A total of 1,436 articles on SCD in older adults met the criteria.

Annual publications ranged from 2 in 2003 to 141 in 2023. The possible reasons for the slight decrease in the number of articles in 2023 are that the study only included literature published up to September or that there is some delay in the literature included in the database (Fig. 2).

3.2. Journal analysis

Table 2 presents the top 10 journals with the most significant citation frequency. *Neurology* had the highest citation frequency (*n* = 1,051), followed by *Alzheimers & Dementia* (*n* = 1,033) and
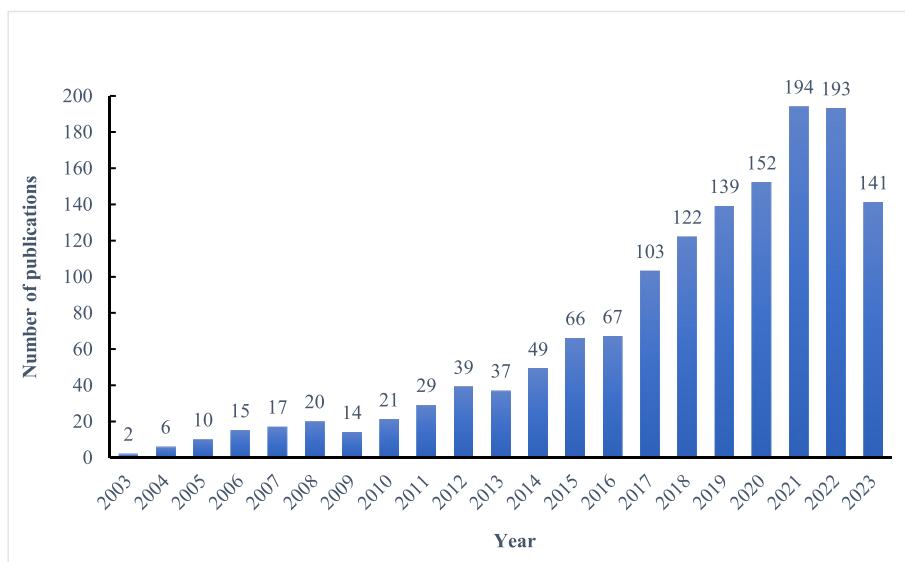

Fig. 2. Annual publication volume of research on subjective cognitive decline among older adults in Web of Science.

Table 2
Top ten journals with the most citations in research on subjective cognitive decline among older adults in Web of Science (2003−2023).

Rank	Citation frequency	Cited journal	Impact factor (2022)	Country affiliation
1	1,051	*Neurology*	10.1	The United States
2	1,033	*Alzheimers & Dementia*	14.0	The United States
3	917	*Journal of Alzheimer's disease*	4.0	Netherlands
4	821	*Journal of the American Geriatrics Society*	6.3	The United States
5	821	*International Journal of Geriatric Psychiatry*	4.0	England
6	670	*Dementia and Geriatric Cognitive Disorders*	2.4	Switzerland
7	627	*International Psychogeriatrics*	7.0	The United States
8	616	*Lancet Neurology*	48.0	England
9	615	*JAMA Neurology*	−	The United States
10	585	*American Journal of Psychiatry*	17.7	The United States

Journal of Alzheimer's Disease ($n = 917$). Six of the most highly cited ten journals were published in the United States.

3.3. Author analysis

Fig. 3 describes the authorship network. The top five authors ranked by publication numbers were Frank Jessen, Han Ying, Kathryn Ellis, Michael Wagner, and Steffen Wolfsgruber, with publication counts of 52, 27, 26, 25, and 21, respectively.

3.4. Country and institution analysis

As shown in Fig. 4, the top five countries by publication volume were the United States, China, France, England, and Australia, with publication counts of 437, 174, 153, 145, and 145, respectively. Moreover, we discovered that the largest node was the United

States, which means the United States occupied a dominant position in research on subjective cognitive decline in older adults. Fig. 5 illustrates that the University of California System, Institut National de la Sante et de la Recherche Medicale (Inserm), UDICE-French Research Universities, Helmholtz Association, German Center for Neurodegenerative Diseases (DZNE) were the top five institutions with the highest publication volume. The publication counts for these institutions were 158, 105, 83, 80, and 76, respectively.

3.5. Document co-citation analysis

Co-citation refers to the frequency with which two publications are cited together by one other [12]. Fig. 6 shows the document co-citation network. The article "A conceptual framework for research on subjective cognitive decline in preclinical Alzheimer's disease"
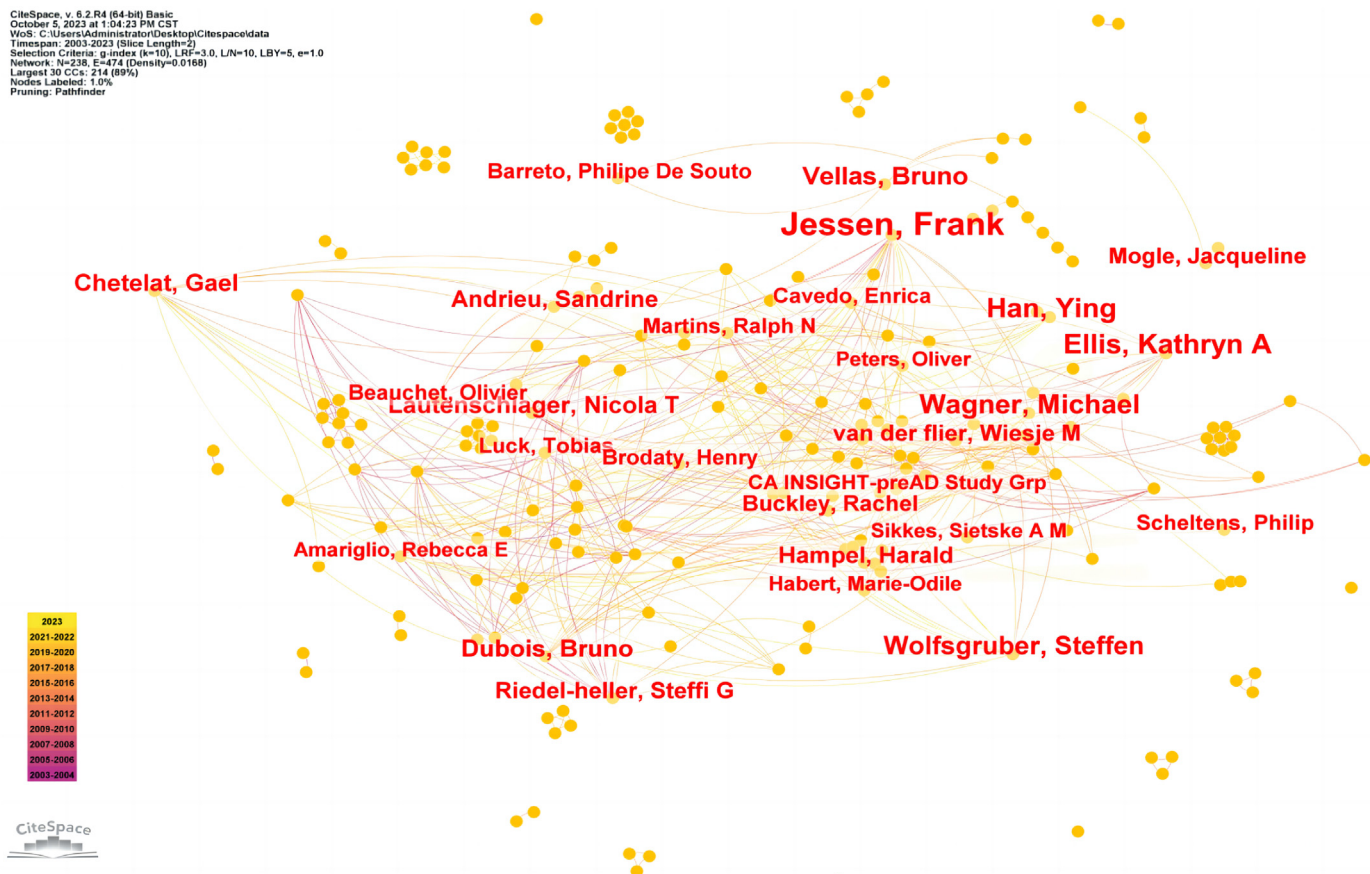

Fig. 3. The authorship network of research on subjective cognitive decline among older adults in Web of Science (2003−2023).
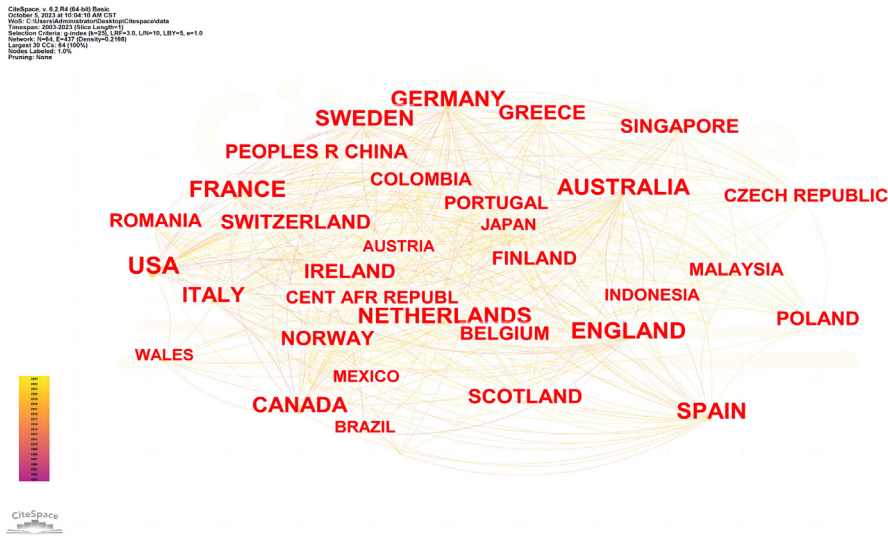
Fig. 4. Country network of research on subjective cognitive decline among older adults in Web of Science (2003−2023).

[17] had the highest intermediary centrality, indicating that the document was critical research and can act as an intermediary bridge in this field. Table 3 presents the top five cited articles.

Burst detection can exhibit frequency increases suddenly or significantly in a short time, representing this research domain's frontier. Fig. 7 displays the top 25 references with burst node detection.

3.6. Emerging trends and scientific frontiers of SCD research in older adults

3.6.1. Keywords analysis

The emerging trends in the scientific literature may indicate discoveries and breakthroughs, stimulating researchers to consider the study from a new viewpoint [11]. Fig. 8 displays the keywords
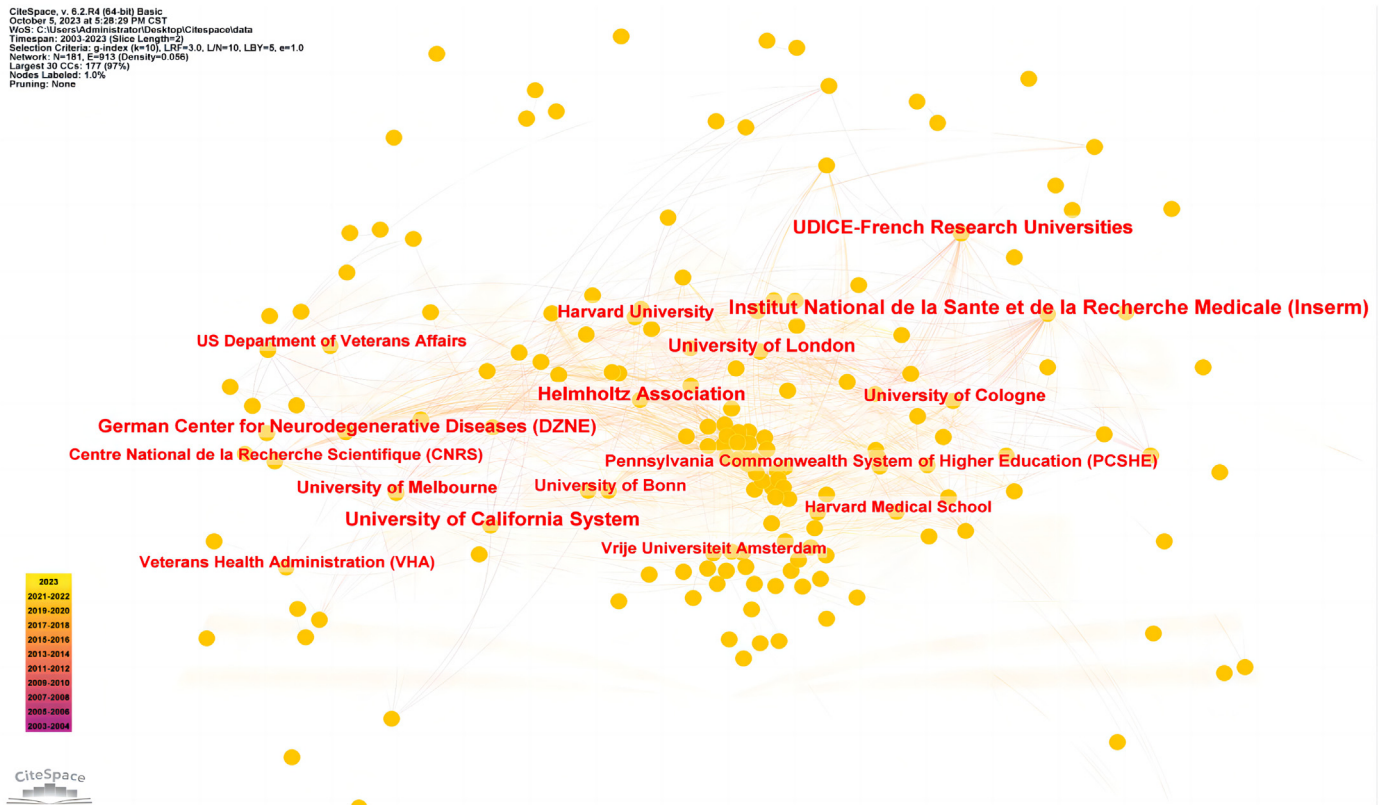

Fig. 5. Institution network of research on subjective cognitive decline among older adults in Web of Science (2003−2023).
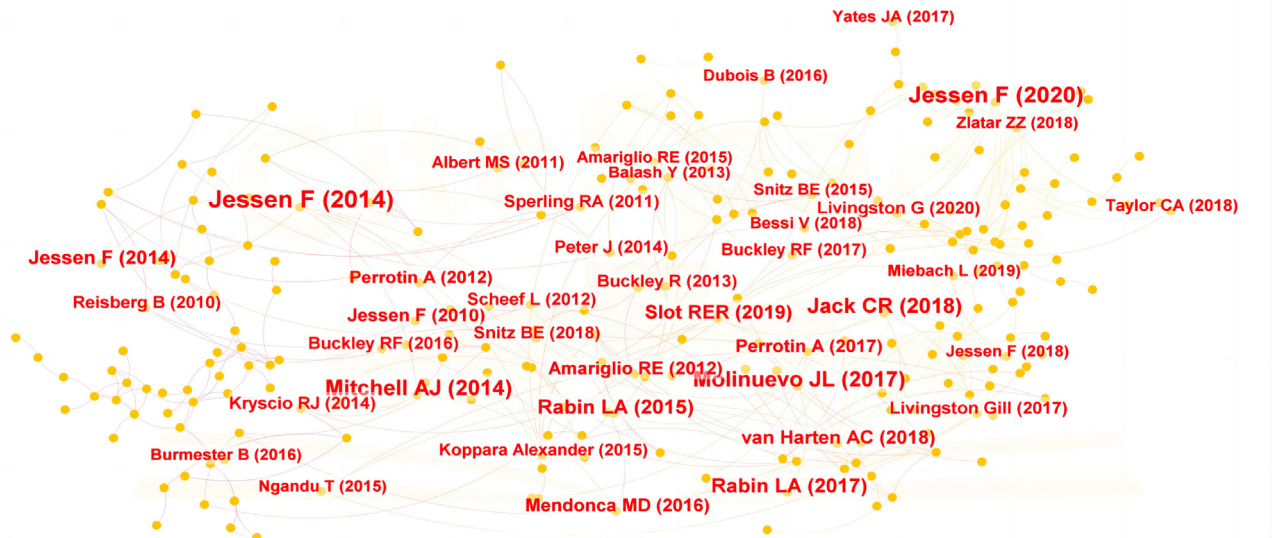
Fig. 6. Document co-citation analysis of research on subjective cognitive decline among older adults in Web of Science (2003—2023).

Table 3
Top five most cited research articles on subjective cognitive decline among older adults in Web of Science (2003—2023).

Rank	Citation frequency	First author, year	Article title	Journal
1	216	Jessen, 2014 [17]	A conceptual framework for research on subjective cognitive decline in preclinical Alzheimer's disease	*Alzheimers & Dementia*
2	154	Jessen, 2020 [18]	The characterisation of subjective cognitive decline	*Lancet Neurology*
3	126	Mitchell, 2014 [5]	Risk of dementia and mild cognitive impairment in older people with subjective memory complaints: meta-analysis	*Acta Psychiatrica Scandinavica*
4	119	Molinuevo, 2017 [4]	Implementation of subjective cognitive decline criteria in research studies	*Alzheimers & Dementia*
5	105	Jack, 2018 [19]	NIA-AA Research Framework: Toward a biological definition of Alzheimer's disease	*Alzheimers & Dementia*

analysis. Fig. 9 shows the top 25 keywords with the highest citation bursts from 2003 to 2023.

3.6.2. Keywords clustering analysis

Cluster analysis can reveal the internal characteristics of the research object and use keywords to extract nominal terms and the Log-likelihood ratio (LLR) algorithm in the study. Keywords were divided into 12 categories (Fig. 10). The weighted mean silhouette value was 0.7376, with good homogeneity.

4. Discussion

Our result showed an overall upward trend in the volume of publications on SCD in the elderly population, suggesting that the study of SCD in older adults has attracted the attention of researchers. The possible reason is that cognitive impairment diseases have become particularly prominent in a greying society. As an early stage of cognitive impairment, SCD is considered a critical window of opportunities to intervene and delay the trajectory of cognitive decline in older adults. The United States played a vital role in country cooperation from the analysis data. It contributed more significantly to SCD research on older people, followed by China and France. A possible explanation is that the United States attaches importance to neuroscience and cognitive science. For instance, in April 2013, the United States launched the BRAIN (Brain

Research through Advancing Innovative Neurotechnologies) program. It aimed to develop new technologies for neuroscience research, explore brain functions and mechanisms, and significantly advance the United States' leading position in neuroscience and cognitive science [24]. Six of the top ten journals with the highest citations were all established in the United States and supported the leading role to some extent. The top five institutions were the University of California system, Inserm, UDICE, Helmholtz Association, and DZNE. We inferred that developed countries played dominant positions in this area. It may be related to the active coping strategies adopted by these countries in response to the growth of the ageing population, such as the EU Brain Human Brain Project [25]. China's significance in this research domain is likely attributed to its aging population, which the government considers a major concern. China's National Health Commission and 14 ministries jointly issued a five-year plan on elderly care for the 2021-2025 period, further emphasizing the importance of carrying out dementia prevention and intervention to reduce the incidence of dementia at its source.

Regarding author analysis, we found a close collaboration between authors. Frank Jessen played a critical role in this relationship network, focusing on early AD detection in patients, and he led international initiatives to conceptualize subjective cognitive decline. Jessen et al. [17] reached a consensus on the terminology and conceptual framework for studying the cognitive decline in AD,

Top 25 References with the Strongest Citation Bursts

References	Year	Strength	Begin	End	2003 – 2023
Mittal VA, 2011, PSYCHIAT RES, V189, P158, DOI 10.1016/j.psychres.2011.06.006, DOI	2011	11.62	2011	2017	
Jungwirth S, 2004, J AM GERIATR SOC, V52, P263, DOI 10.1111/j.1532-5415.2004.52066.x, DOI	2004	11.09	2004	2012	
Jessen F, 2010, ARCH GEN PSYCHIAT, V67, P414, DOI 10.1001/archgenpsychiatry.2010.30, DOI	2010	27.28	2010	2017	
Reisberg B, 2010, ALZHEIMERS DEMENT, V6, P11, DOI 10.1016/j.jalz.2009.10.002, DOI	2010	20.37	2010	2017	
Sperling RA, 2011, ALZHEIMERS DEMENT, V7, P280, DOI 10.1016/j.jalz.2011.03.003, DOI	2011	17.66	2011	2017	
Reid LM, 2006, DEMENT GERIATR COGN, V22, P471, DOI 10.1159/000096295, DOI	2006	16.03	2008	2012	
Slavin MJ, 2010, AM J GERIAT PSYCHIAT, V18, P701, DOI 10.1097/JGP.0b013e3181df49fb, DOI	2010	12.15	2010	2017	
Glodzik-Sobanska L, 2007, DEMENT GERIATR COGN, V24, P177, DOI 10.1159/000105604, DOI	2007	10.57	2008	2012	
Jessen F, 2014, ALZHEIMERS DEMENT, V10, P844, DOI 10.1016/j.jalz.2014.01.001, DOI	2014	54.23	2014	2022	
Mitchell AJ, 2014, ACTA PSYCHIAT SCAND, V130, P439, DOI 10.1111/acps.12336, DOI	2014	35.04	2014	2022	
Amariglio RE, 2012, NEUROPSYCHOLOGIA, V50, P2880, DOI 10.1016/j.neuropsychologia.2012.08.011, DOI	2012	21.68	2013	2017	
Rabin LA, 2015, J ALZHEIMERS DIS, V48, PS63, DOI 10.3233/JAD-150154, DOI	2015	20.37	2015	2022	
Albert MS, 2011, ALZHEIMERS DEMENT, V7, P270, DOI 10.1016/j.jalz.2011.03.008, DOI	2011	18.55	2013	2017	
Perrotin A, 2012, ARCH NEUROL-CHICAGO, V69, P223, DOI 10.1001/archneurol.2011.666, DOI	2012	18.24	2013	2017	
Scheef L, 2012, NEUROLOGY, V79, P1332, DOI 10.1212/WNL.0b013e31826c1a8d, DOI	2012	16.95	2013	2017	
Jessen F, 2014, ALZHEIMERS DEMENT, V10, P76, DOI 10.1016/j.jalz.2012.09.017, DOI	2014	14.35	2014	2022	
Buckley R, 2013, INT PSYCHOGERIATR, V25, P1307, DOI 10.1017/S1041610213000665, DOI	2013	13.39	2013	2022	
Balash Y, 2013, ACTA NEUROL SCAND, V127, P344, DOI 10.1111/ane.12038, DOI	2013	10.97	2013	2022	
Jessen F, 2020, LANCET NEUROL, V19, P271, DOI 10.1016/S1474-4422(19)30368-0, DOI	2020	60.85	2020	2023	
Jack CR, 2018, ALZHEIMERS DEMENT, V14, P535, DOI 10.1016/j.jalz.2018.02.018, DOI	2018	20.04	2018	2023	
Rabin LA, 2017, ANNU REV CLIN PSYCHO, V13, P369, DOI 10.1146/annurev-clinpsy-032816-045136, DOI	2017	18.41	2018	2023	
Molinuevo JL, 2017, ALZHEIMERS DEMENT, V13, P296, DOI 10.1016/j.jalz.2016.09.012, DOI	2017	18.22	2018	2023	
Slot RER, 2019, ALZHEIMERS DEMENT, V15, P465, DOI 10.1016/j.jalz.2018.10.003, DOI	2019	17.5	2019	2023	
Livingston G, 2020, LANCET, V396, P413, DOI 10.1016/S0140-6736(20)30367-6, DOI	2020	17.28	2020	2023	
van Harten AC, 2018, NEUROLOGY, V91, PE300, DOI 10.1212/WNL.0000000000005863, DOI	2018	13.5	2018	2023	

Fig. 7. Top 25 references with the strongest citation bursts in Web of Science (2003−2023).

proposed the research criteria for SCD before MCI, and provided a list of core features suggested in the SCD study report. In the meantime, this article was the most cited. In 2020, Jessen et al. [18] published the paper "the characterisation of subjective cognitive decline", which gained the most potent citation bursts (strength value was 60.85), which confirmed the prominent role of Jessen F in this field.

The citation burst is an index representing the frequency increases suddenly or significantly in a short period of time, except for Jessen et al. [17,18], Jack et al. [19] also played a significant role in defining AD biologically by neuropathologic change or biomarkers. Moreover, Rabin et al. [20] focus on the progress of subjective cognitive decline. Molinuevo et al. [4] clarified the criteria of subjective cognitive decline, the other three hot papers regarding the incidence of dementia, prevention, and risk of MCI in the SCD population [21−23], which indicates that growing concern about SCD, but the field still in the early stages.

The keywords clustering were "depression", "functional connectivity", "general practice", "cognitive reserve", "cognitive function", "physical activity", "recommendations", "dementia prevention", "behavioral disorders", "primary care", "early diagnosis", and "community-based study". The keywords for higher burst strength were "physical activity", "Alzheimer's disease", "framework", "future dementia", and "late life depression". Studies based on these keywords illustrate research directions and frontiers in a given time, focusing on early screening and prevention, negative emotion, and symptom management in SCD with older

adults. SCD, as the preclinical stage, how to screen these particular populations early is of great significance. Some scholars have explored this field. However, owing to various measuring tools, the incidence rate of SCD varies in different regions [26,27], which impedes the screening of SCD people. Consequently, researchers have turned their perspective to neuroimaging biomarkers. Neuroimaging technology has gradually been used in the field of SCD since it has non-invasive and high-sensitivity advantages. More and more researchers are using neuroimaging techniques to excavate neuropathological mechanisms behind SCD associated with AD, aiming to understand the pathological mechanism of AD further and improve clinical diagnostic levels. Wang et al. [28] reviewed the neuroimaging progress in SCD and showed that patients with SCD have similar patterns of brain changes as patients with MCI and dementia caused by AD. Rolandi et al. [29] explored whether multilevel non-pharmacologic interventions can influence neuroimaging markers and functional connectivity changes in the brain of patients with SCD.

Moreover, cognitive reserve has become a hot research topic. The possible reason is that cognitive reserve can clarify individuals' pathological susceptibility to dementia; for example, Jia et al. [30] found that cognitive reserve weakens the risk of dementia associated with a decrease in SCD. Therefore, people with SCD who have a low cognitive reserve should be the target population for early screening. In addition, "general practice", "primary care", and "community-based study" are also hotspots in the field of SCD, suggesting that primary health services should be the first line of
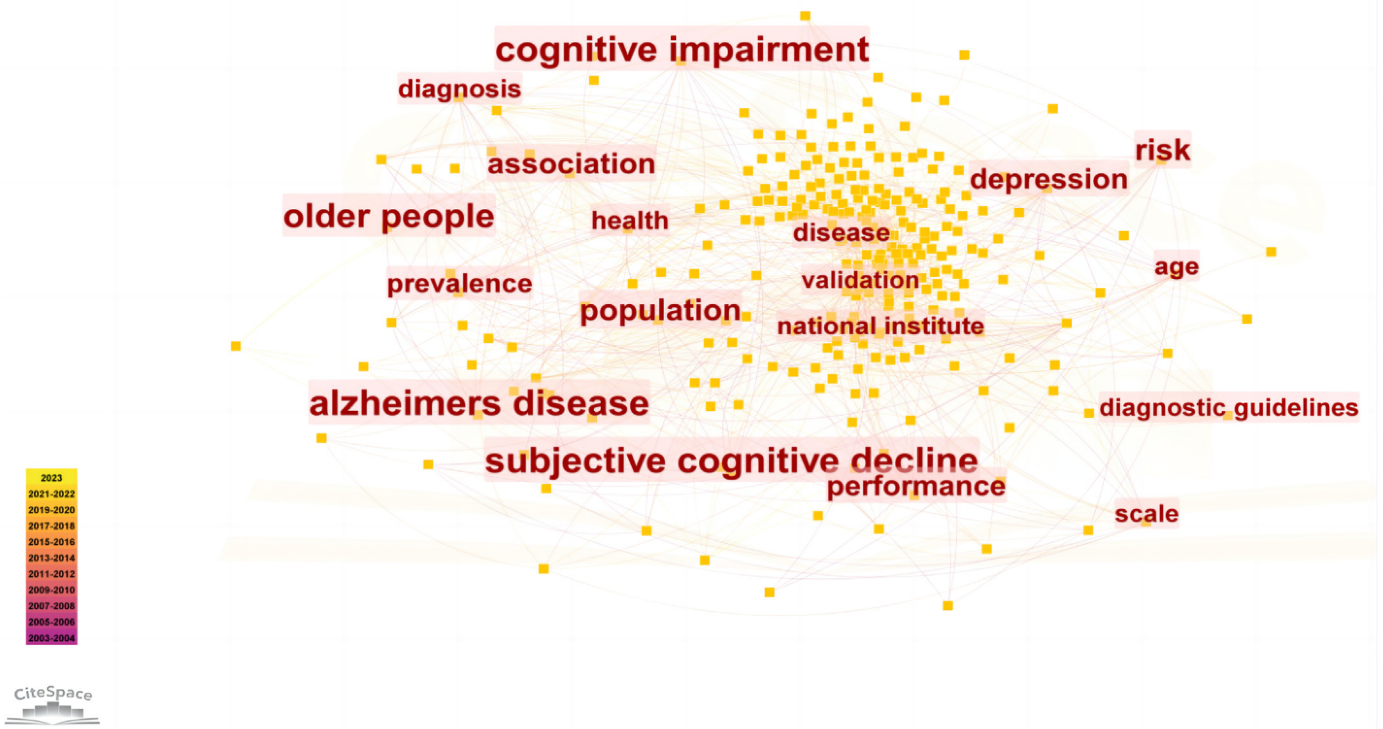
Fig. 8. Keywords analysis of research on subjective cognitive decline among older adults in Web of Science (2003−2023).

defense for older adults with SCD to develop dementia, and should actively implement joint prevention and control strategies for high-risk groups for AD.

Early prevention in the identified SCD population may delay or even reverse the process of AD. The types of interventions or strategies that are effective remain to be explored. Physical activity is considered an effective prevention strategy that may influence cognitive performance and delay the progression of memory loss to AD [31,32]. For example, one study explored whether a long-term multi-modal supervised exercise program could improve cognitive function and reduce the rate of cognitive decline in older people at different risks of developing AD [33]. However, there are various exercise regimes. Hence, the intervention effect needs to be further verified. Researchers have focused on the negative emotions of SCD in recent years. The possible explanation is that the interaction mechanism between SCD and negative emotion is unclear. For example, Zlatar et al. [34] confirmed that SCD correlated with symptoms of depression in a clinic-based sample of older people. Anxiety refers to an individual's physical and psychological anxiety symptoms. Norman et al. [35] demonstrated that anxiety mediates the fear of developing AD and SCD. Additionally, Sun et al. [36] found a negative correlation between anxiety symptom scores and right cortical surface area in SCD APOE ε4 non-carriers. However, whether there is a causal relationship between negative emotions and SCD is still unknown and requires further exploration.

Currently, research is focused on helping to manage the symptoms of SCD. Behavioral disorders are common symptoms in people with dementia, increasing the burden of care and impacting the quality of life of older adults. Several studies explore the relationship between behavioral disorders and SCD. For example, through positron emission tomography, Schroeter et al. [37] identified and analysed three neural networks for each behavioral disorder in the population of early AD, SCD, and frontotemporal lobar degeneration, and another study indicated that mild behavioral impairment was associated with progression to AD [38]. However, the potential of using behavioral changes for early detection and screening of dementia needs to be further explored.

5. Implications for nursing

The results of this study also provide some inspiration for nursing. Firstly, it is paramount for early detection and prevention of SCD as it is a critical window for delaying cognitive ageing; nurses can play an essential role in this area, especially in community health service centers. Community nurses can provide health education on cognitive ageing, screening, and preventing SCD for older adults and family members through various forms such as advertising boards, health education brochures, lectures, and electronic media. Secondly, senior nursing specialists and community nurses can focus on the early symptoms of SCD and the role of non-pharmacological interventions in improving SCD in older adults, such as alleviating negative emotions and increasing physical activity. Thirdly, the future trajectory of nursing research in this field may center on detecting SCD early, such as identifying SCD through dynamic alterations in emotions or behaviors. What is the role of cognitive reserve in SCD? What strategies can be

Top 25 Keywords with the Strongest Citation Bursts

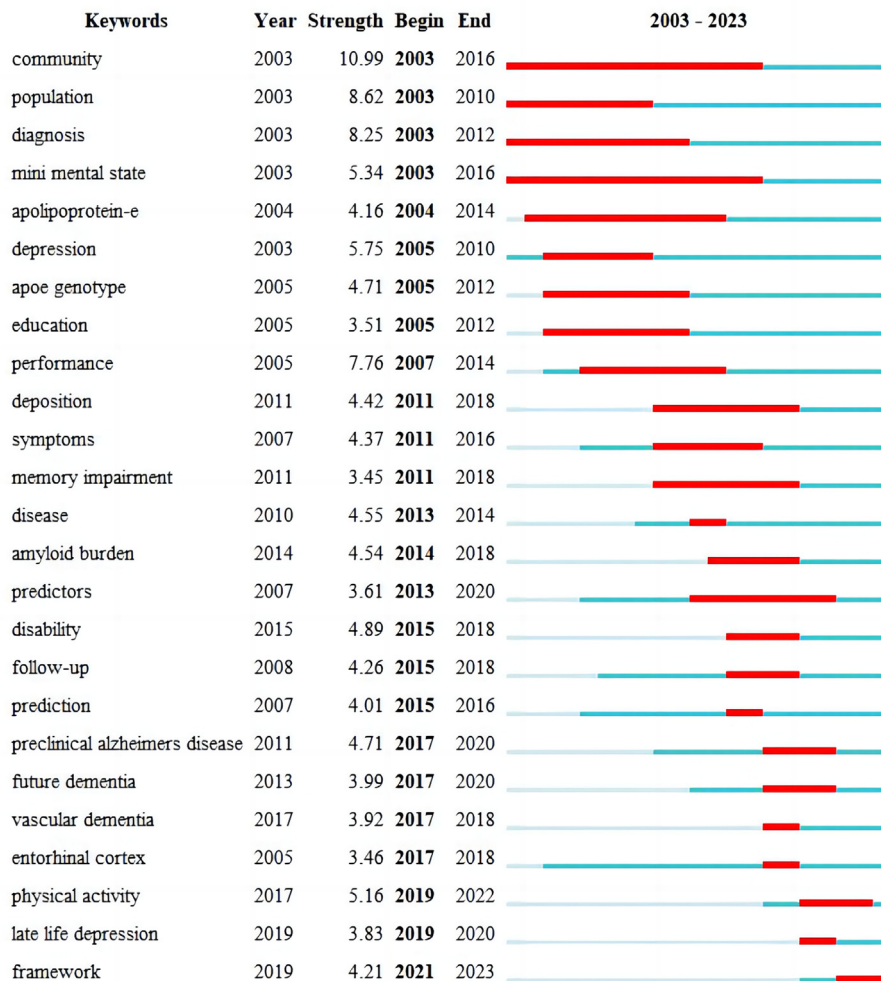| Keywords	Year	Strength	Begin	End	2003 – 2023
community	2003	10.99	**2003**	2016	
population	2003	8.62	**2003**	2010	
diagnosis	2003	8.25	**2003**	2012	
mini mental state	2003	5.34	**2003**	2016	
apolipoprotein-e	2004	4.16	**2004**	2014	
depression	2003	5.75	**2005**	2010	
apoe genotype	2005	4.71	**2005**	2012	
education	2005	3.51	**2005**	2012	
performance	2005	7.76	**2007**	2014	
deposition	2011	4.42	**2011**	2018	
symptoms	2007	4.37	**2011**	2016	
memory impairment	2011	3.45	**2011**	2018	
disease	2010	4.55	**2013**	2014	
amyloid burden	2014	4.54	**2014**	2018	
predictors	2007	3.61	**2013**	2020	
disability	2015	4.89	**2015**	2018	
follow-up	2008	4.26	**2015**	2018	
prediction	2007	4.01	**2015**	2016	
preclinical alzheimers disease	2011	4.71	**2017**	2020	
future dementia	2013	3.99	**2017**	2020	
vascular dementia	2017	3.92	**2017**	2018	
entorhinal cortex	2005	3.46	**2017**	2018	
physical activity	2017	5.16	**2019**	2022	
late life depression	2019	3.83	**2019**	2020	
framework	2019	4.21	**2021**	2023	

Fig. 9. Top 25 keywords with the highest citation bursts in Web of Science (2003–2023).

implemented to enhance the cognitive function of older adults with SCD? Lastly, nursing researchers can engage in interdisciplinary, cross-disciplinary, and cross-regional collaborations, such as conducting medical and engineering interdisciplinary studies, to better identify and prevent SCD in older individuals.

6. Limitations

Our study demonstrated a thorough understanding of SCD in older adults. However, this bibliometric research has several limitations. The study only searched the Web of Science Core Collection database; SCD in other databases was missed. Future studies could extend the search scope to include other databases. In addition, the study used bibliometric analysis based on keywords, authors, countries, and institutions, but it did not analyse the whole paper. In the future, researchers might use Python to dig into the entire text, aiming at a deeper analysis of this research topic.

7. Conclusions

Despite these limitations, the study intuitively presented development trends and hotspots of SCD in older adults between 2003 and 2023, which would help researchers deepen their understanding of this field, identify collaborative networks, and discover innovative ideas for SCD in older adults. The quantity of research on SCD has revealed an ascending trend over the past two decades. The most influential country, institution, author, and the journal were the United States, the University of California System, Frank Jessen, and Neurology, respectively. Besides, the studies covered a wide range of topics and scopes, covering early screening and prevention, negative emotion, and symptom management in SCD. Although scholars have explored SCD, this area is still in its infancy. Our study can provide novel insights into future research and offer a reference point for scholars when starting new projects.

Data availability statement

The data that support the findings of the study are available from the corresponding author upon reasonable request.

CiteSpace, v. 6.2.R4 (64-bit) Basic
October 5, 2023 at 8:23:04 PM CST
WoS: C:\Users\Administrator\Desktop\Citespace\data
Timespan: 2003-2023 (Slice Length=2)
Selection Criteria: g-index (k=8), LRF=3.0, L/N=10, LBY=5, e=1.0
Network: N=285, E=629 (Density=0.0205)
Largest 30 CCs: 285 (100%)
Nodes Labeled: 1.0%
Pruning: Pathfinder
Modularity Q=0.4932
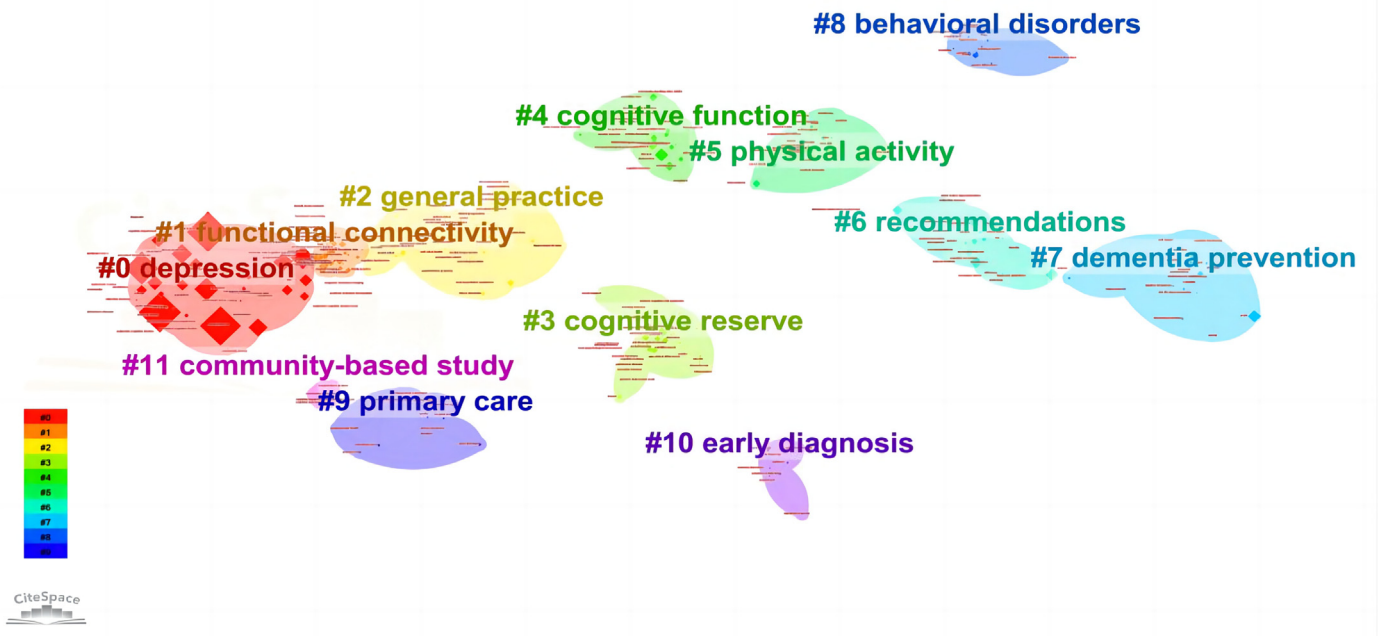Weighted Mean Silhouette S=0.7376
Harmonic Mean(Q, S)=0.5912

Fig. 10. Clustering visualization of research on subjective cognitive decline among older adults in Web of Science (2003—2023).

CRediT authorship contribution statement

Xiaotong Ding: Conceptualization, Methodology, Software, Validation, Formal analysis, Writing — original draft, Writing — review & editing. **Jiyuan Shi:** Conceptualization, Methodology, Software, Validation, Writing — review & editing. **Qing Wang:** Conceptualization, Methodology, Validation, Formal analysis, Writing — review & editing. **Hongli Chen:** Conceptualization, Methodology, Validation, Formal analysis, Writing — review & editing. **Xiuxiu Shi:** Conceptualization, Methodology, Validation, Writing — review & editing. **Zheng Li:** Conceptualization, Methodology, Validation, Writing — review & editing.

Declaration of competing interest

The authors in the study declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnss.2024.03.003.

References

[1] Ramnath U, Rauch L, Lambert EV, Kolbe-Alexander T. Efficacy of interactive video gaming in older adults with memory complaints: a cluster-randomized exercise intervention. PLoS One 2021;16(5):e0252016. https://doi.org/10.1371/journal.pone.0252016.

[2] Youn JC, Kim KW, Lee DY, Jhoo JH, Lee SB, Park JH, et al. Development of the subjective memory complaints questionnaire. Dement Geriatr Cogn Disord 2009;27(4):310—7. https://doi.org/10.1159/000205512.

[3] Cho I, Kim S, Choi JG, Shin JH. Subjective memory complaints and sensitivity of the subjective memory complaint questionnaire in post-stroke dementia patients. Dement Geriatr Cogn Disord 2020;49(3):279—85. https://doi.org/10.1159/000509083.

[4] Molinuevo JL, Rabin LA, Amariglio R, Buckley R, Dubois B, Ellis KA, et al. Implementation of subjective cognitive decline criteria in research studies. Alzheimers Dement 2017;13(3):296—311. https://doi.org/10.1016/j.jalz.2016.09.012.

[5] Mitchell AJ, Beaumont H, Ferguson D, Yadegarfar M, Stubbs B. Risk of dementia and mild cognitive impairment in older people with subjective memory complaints: meta-analysis. Acta Psychiatr Scand 2014;130(6):439—51. https://doi.org/10.1111/acps.12336.

[6] Schweizer S, Kievit RA, Emery T, Cam-Can, Henson RN. Symptoms of depression in a large healthy population cohort are related to subjective memory complaints and memory performance in negative contexts. Psychol Med 2018;48(1):104—14. https://doi.org/10.1017/S0033291717001519.

[7] Aben L, Ponds RW, Heijenbrok-Kal MH, Visser MM, Busschbach JJ, Ribbers GM. Memory complaints in chronic stroke patients are predicted by memory self-efficacy rather than memory capacity. Cerebrovasc Dis 2011;31(6):566—72. https://doi.org/10.1159/000324627.

[8] Li K, Weng L, Wang X. The state of music therapy studies in the past 20 years: a bibliometric analysis. Front Psychol 2021;12:697726. https://doi.org/10.3389/fpsyg.2021.697726.

[9] Yue L, Wang T, Wang J, Li G, Wang J, Li X, et al. Asymmetry of hippocampus and amygdala defect in subjective cognitive decline among the community dwelling Chinese. Front Psychiatr 2018;9:226. https://doi.org/10.3389/fpsyt.2018.00226.

[10] Ellegaard O, Wallin JA. The bibliometric analysis of scholarly production: how great is the impact? Scientometrics 2015;105(3):1809—31. https://doi.org/10.1007/s11192-015-1645-z.

[11] Chen C. CiteSpace II: detecting and visualizing emerging trends and transient patterns in scientific literature. J Assoc Inf Sci Technol 2006;57:359—77.

[12] Zheng K, Wang X. Publications on the association between cognitive function and pain from 2000 to 2018:A bibliometric analysis using CiteSpace. Med Sci Mon Int Med J Exp Clin Res 2019;25:8940—51. https://doi.org/10.12659/MSM.917742.

[13] Vera-Baceta MA, Thelwall M, Kousha K. Web of science and *scopus* language coverage. Scientometrics 2019;121(3):1803—13. https://doi.org/10.1007/s11192-019-03264-z.

[14] Chen C. CiteSpace: a practical guide for mapping scientific literature. 2016. ISBN: 978-1-53610-280-2.

[15] Chen C. Science mapping: a systematic review of the literature. Journal of Data and Information Science 2017;2(2):1—40. https://doi.org/10.1515/jdis-2017-0006.

[16] Chen C, Song M. Visualizing a field of research: a methodology of systematic scientometric reviews. PLoS One 2019;14(10):e0223994. https://doi.org/10.1371/journal.pone.0223994.

[17] Jessen F, Amariglio RE, van Boxtel M, Breteler M, Ceccaldi M, Chételat G, et al. A conceptual framework for research on subjective cognitive decline in

preclinical Alzheimer's disease. Alzheimers Dement 2014;10(6):844–52. https://doi.org/10.1016/j.jalz.2014.01.001.

[18] Jessen F, Amariglio RE, Buckley RF, van der Flier WM, Han Y, Molinuevo JL, et al. The characterisation of subjective cognitive decline. Lancet Neurol 2020;19(3):271–8. https://doi.org/10.1016/S1474-4422(19)30368-0.

[19] Jack Jr CR, Bennett DA, Blennow K, Carrillo MC, Dunn B, Haeberlein SB, et al. NIA-AA Research Framework: toward a biological definition of Alzheimer's disease. Alzheimers Dement 2018;14(4):535–62. https://doi.org/10.1016/j.jalz.2018.02.018.

[20] Rabin LA, Smart CM, Amariglio RE. Subjective cognitive decline in preclinical Alzheimer's disease. Annu Rev Clin Psychol 2017;13:369–96. https://doi.org/10.1146/annurev-clinpsy-032816-045136.

[21] Slot RER, Sikkes SAM, Berkhof J, Brodaty H, Buckley R, Cavedo E, et al. Subjective cognitive decline and rates of incident Alzheimer's disease and non-Alzheimer's disease dementia. Alzheimers Dement 2019;15(3):465–76. https://doi.org/10.1016/j.jalz.2018.10.003.

[22] Livingston G, Huntley J, Sommerlad A, Ames D, Ballard C, Banerjee S, et al. Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. Lancet 2020;396(10248):413–46. https://doi.org/10.1016/S0140-6736(20)30367-6.

[23] van Harten AC, Mielke MM, Swenson-Dravis DM, Hagen CE, Edwards KK, Roberts RO, et al. Subjective cognitive decline and risk of MCI: the mayo clinic study of aging. Neurology 2018;91(4):e300–12. https://doi.org/10.1212/WNL.0000000000005863.

[24] Bargmann CI, Lieberman JA. What the BRAIN Initiative means for psychiatry. Am J Psychiatry 2014;171(10):1038–40. https://doi.org/10.1176/appi.ajp.2014.14081029.

[25] The Lancet Neurology. The human brain project: mutiny on the flagship. Lancet Neurol 2014;13(9):855. https://doi.org/10.1016/S1474-4422(14)70181-4.

[26] Mewton L, Sachdev P, Anderson T, Sunderland M, Andrews G. Demographic, clinical, and lifestyle correlates of subjective memory complaints in the Australian population. Am J Geriatr Psychiatr 2014;22(11):1222–32. https://doi.org/10.1016/j.jagp.2013.04.004.

[27] Yang Y, Xiao LD, Deng L, Wang Y, Li M, Ullah S. Nurse-led cognitive screening model for older adults in primary care. Geriatr Gerontol Int 2015;15(6):721–8. https://doi.org/10.1111/ggi.12339.

[28] Wang X, Huang W, Su L, Xing Y, Jessen F, Sun Y, et al. Neuroimaging advances regarding subjective cognitive decline in preclinical Alzheimer's disease. Mol

Neurodegener 2020;15(1):55. https://doi.org/10.1186/s13024-020-00395-3.

[29] Rolandi E, Dodich A, Galluzzi S, Ferrari C, Mandelli S, Ribaldi F, et al. Randomized controlled trial on the efficacy of a multilevel non-pharmacologic intervention in older adults with subjective memory decline: design and baseline findings of the E.Mu.N.I. study. Aging Clin Exp Res 2020;32(5):817–26. https://doi.org/10.1007/s40520-019-01403-3.

[30] Jia F, Li Y, Li M, Cao F. Subjective cognitive decline, cognitive reserve indicators, and the incidence of dementia. J Am Med Dir Assoc 2021;22(7):1449. https://doi.org/10.1016/j.jamda.2020.08.005. 55.e4.

[31] Panza GA, Taylor BA, MacDonald HV, Johnson BT, Zaleski AL, Livingston J, et al. Can exercise improve cognitive symptoms of Alzheimer's disease? J Am Geriatr Soc 2018;66(3):487–95. https://doi.org/10.1111/jgs.15241.

[32] Cheng ST. Cognitive reserve and the prevention of dementia: the role of physical and cognitive activities. Curr Psychiatr Rep 2016;18(9):85. https://doi.org/10.1007/s11920-016-0721-2.

[33] Iuliano E, di Cagno A, Cristofano A, Angiolillo A, D'Aversa R, Ciccotelli S, et al. Physical exercise for prevention of dementia (EPD) study: background, design and methods. BMC Publ Health 2019;19(1):659. https://doi.org/10.1186/s12889-019-7027-3.

[34] Zlatar ZZ, Muniz M, Galasko D, Salmon DP. Subjective cognitive decline correlates with depression symptoms and not with concurrent objective cognition in a clinic-based sample of older adults. J Gerontol B Psychol Sci Soc Sci 2018;73(7):1198–202. https://doi.org/10.1093/geronb/gbw207.

[35] Norman AL, Woodard JL, Calamari JE, Gross EZ, Pontarelli N, Socha J, et al. The fear of Alzheimer's disease: mediating effects of anxiety on subjective memory complaints. Aging Ment Health 2020;24(2):308–14. https://doi.org/10.1080/13607863.2018.1534081.

[36] Sun Y, Wang X, Wang Y, Dong H, Lu J, Scheininger T, et al. Anxiety correlates with cortical surface area in subjective cognitive decline: APOE ε4 carriers versus APOE ε4 non-carriers. Alzheimer's Res Ther 2019;11(1):50. https://doi.org/10.1186/s13195-019-0505-0.

[37] Schroeter ML, Vogt B, Frisch S, Becker G, Seese A, Barthel H, et al. Dissociating behavioral disorders in early dementia-An FDG-PET study. Psychiatr Res 2011;194(3):235–44. https://doi.org/10.1016/j.pscychresns.2011.06.009.

[38] Ruthirakuhan M, Ismail Z, Herrmann N, Gallagher D, Lanctôt KL. Mild behavioral impairment is associated with progression to Alzheimer's disease: a clinicopathological study. Alzheimers Dement 2022;18(11):2199–208. https://doi.org/10.1002/alz.12519.