Visual Analysis of Research Hotspots and Trends in Music Therapy for Older Adults Using CiteSpace and VOSviewer

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Abstract: Music therapy is increasingly applied as a non-pharmacological intervention to improve the health and well-being of older adults; however, comprehensive bibliometric analyses integrating Chinese- and English-language literature remain limited. This study aimed to map the knowledge structure, research hotspots, and development trends in music therapy for older adults. Publications were retrieved from CNKI and the Web of Science Core Collection (1991–2024). CiteSpace and VOSviewer were used to analyze publication trends, thematic clusters, collaboration networks, and keyword co-occurrence patterns, and Excel was applied for descriptive statistical analysis. A total of 791 publications were included. The United States, China, and the United Kingdom were the leading contributors. High-frequency keywords in English-language literature focused on dementia, depression, anxiety, and quality of life, whereas Chinese-language literature emphasized depression, anxiety, nursing, and sleep disorders. Overall, research output has steadily increased, with international studies concentrating on neurocognitive disorders and domestic studies focusing on symptom management and clinical practice.
***Keywords*:** music therapy; older adults; VOSviewer; CiteSpace; visualization analysis

1. Introduction

At present, China's population aging process is characterized by a large scale, rapid growth, and significant regional differences, which poses serious challenges to the national health service system [1–3]. In this context, promoting active aging has become a preferred strategy for addressing population aging. The key lies in enhancing older adults' social participation and improving their ability for health self-management, thereby promoting their physical and mental health and quality of life [4]. In recent years, music therapy, as a non-pharmacological intervention, has received increasing attention in the management of chronic diseases and health promotion among older adults [5]. Studies have shown that music therapy has positive effects in improving dementia [6–8], hypertension [9–11], coronary heart disease [9], sleep disorders [12–14], anxiety and depression [15–17], and cognitive function [18–20], and it can serve as an effective complement to traditional pharmacological treatments [21–22].

At present, review studies on music therapy in the field of older adults, both domestically and internationally, mainly focus on summarizing clinical efficacy and mechanisms of action. However, systematic visual analyses of research status and development trends in this field remain limited. Therefore, this study employs CiteSpace and VOSviewer to conduct quantitative analysis and content interpretation of Chinese- and English-language literature. The aim is to explore research hotspots, collaboration networks, and development trends in music therapy for older adults, in order to provide references for future research.

2. Materials and Methods

2.1 Data Sources and Search Strategy

The data for this study were obtained from the China National Knowledge Infrastructure (CNKI) and the Web of Science Core Collection (WoS). The search period was set from January 1, 1991 to December 31, 2024.

Search strategy: In CNKI, advanced search was conducted by dividing the subject terms into "music therapy" and "older adults." The search formula was:SU%= (music therapy + music therapy approaches + music healing) × (older adults + elderly + elderly diseases + elderly care + aged care + hospice care + geriatric nursing), with the document type limited to "academic journals."For the WoS database, the Core Collection was selected, and the citation indexes "SCI" and "SSCI" were included. Advanced search was applied using the following query:TS = "music therapy" AND (TS = "older adults" OR TS = old).Document types other than "Article" and "Review Article" were excluded. Publication years after 2024 (excluding 2024) were removed after selecting "final publication year." Languages other than English were excluded.

2.2 Research Methods

CiteSpace and VOSviewer were used to perform visual analysis of the included literature. Excel 2021 was applied for

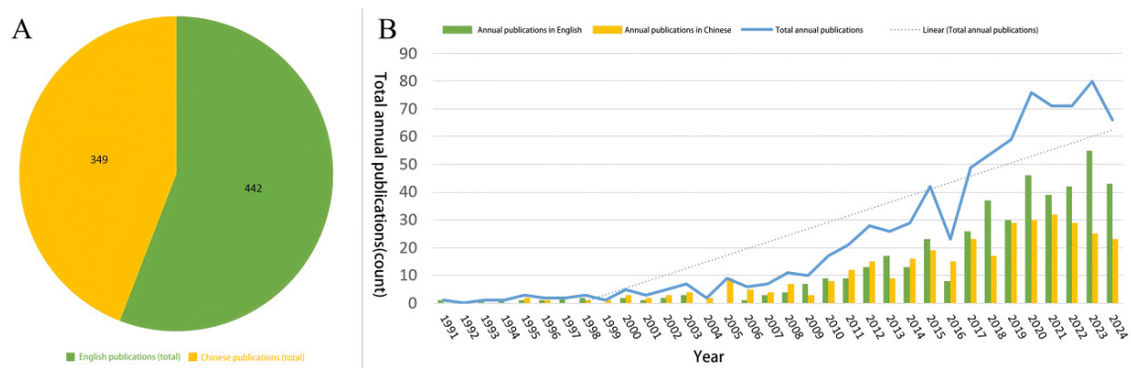
bibliometric statistics to support the analysis of publication trends and country distribution.

3. Results

3.1 Analysis of Publication Trends

A total of 791 publications related to music therapy for older adults were included in this study, including 349 Chinese-language articles (44.12%) and 442 English-language articles (55.88%) (Figure 1-A).

As shown in Figure 1-B, the annual publication output in the field of music therapy for older adults, in both Chinese- and English-language literature, can be divided into three stages. From 1991 to 2010, the annual number of publications in both languages was fewer than 10, representing a period of slow development. Between 2011 and 2020, except for a slight decline in 2016, the overall trend showed an increase, reaching a peak annual output of 80 publications in 2021. From 2021 to 2024, the total number of publications declined slightly, and the gap between Chinese- and English-language publications gradually became more apparent. In 2023, the English-language literature reached its peak annual output (55 publications). Overall, despite fluctuations in certain years, the number of publications in this field shows a steady upward trend.



A: Percentage of publications; B:Annual publication trend.

Figure 1. Annual Publication Output in Music Therapy for Older Adults (1991–2024)

3.2 Country Visualization Analysis

The results show that 56 countries have contributed to research on music therapy for older adults. The top four countries in terms of publication output were the United States (116 publications), China (67 publications), the United Kingdom (58 publications), and Australia (56 publications). The country collaboration network indicates cooperative relationships among the United States, China, the United Kingdom, Australia, and other countries. Geographically, research on music therapy for older adults is mainly concentrated in developed countries and some research-active developing countries (Figure 2).

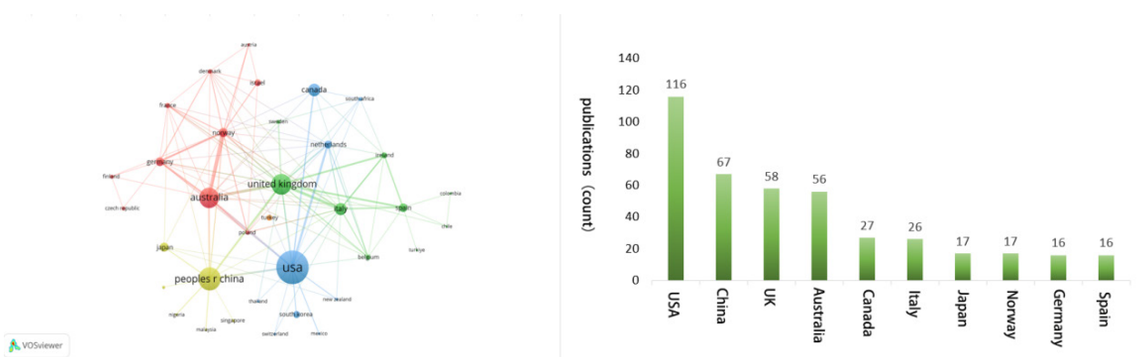


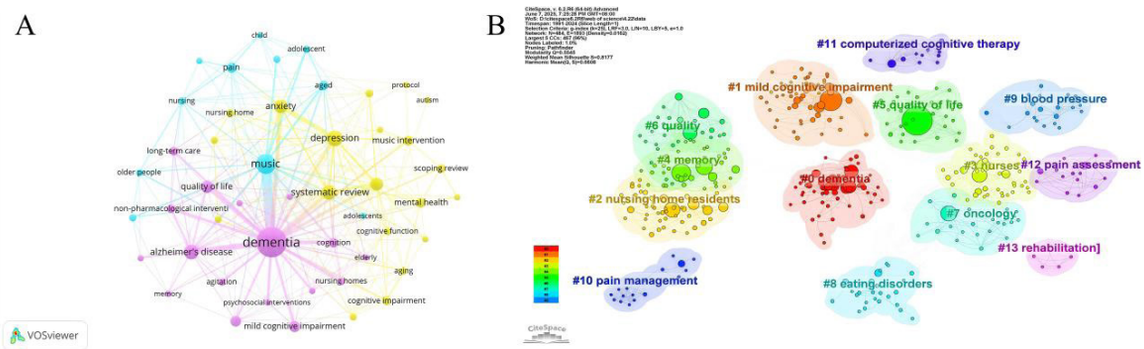
Figure 2. Country Collaboration Network and Distribution of Major Research Countries in the Field of Music Therapy for Older Adults

3.3 Keyword Analysis

3.3.1 Keyword Analysis of English-Language Literature

The keyword co-occurrence network of the English-language literature generated 51 nodes (Figure 3-A). After excluding the subject terms “music therapy” and “older adults,” the high-frequency keywords included dementia, Alzheimer’s disease, depression, anxiety, and quality of life.The keyword clustering map (Figure 3-B) grouped the keywords into 14 clusters:#0

dementia, #1 mild cognitive impairment, #2 nursing home resident, #3 nurses, #4 memory, #5 quality of life, #6 quality, #7 oncology, #8 eating disorders, #9 blood pressure, #10 pain management, #11 computerized cognitive therapy, #12 pain assessment, and #13 rehabilitation.The keyword burst detection map (Figure 3-C) shows that early research in this field focused for a long period on residents. In recent years, research frontiers have shifted toward scoping review, physical, music intervention, and validation.



C

Top 20 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	1991 - 2024
residents	1997	2.16	1997	2014	
agitated behaviors	2010	3.98	2010	2018	
elderly persons	2011	3.31	2011	2019	
intervention	1997	2.79	2011	2014	
randomized controlled trial	2012	2.35	2012	2013	
older people	2013	4.08	2013	2018	
preferred music	2013	2.73	2013	2018	
prevalence	2015	3.08	2015	2018	
efficacy	2013	2.4	2015	2020	
nursing home residents	2009	2	2015	2017	
neuropsychiatric symptoms	2016	4.53	2016	2019	
alzheimer disease	2017	2.09	2017	2018	
pain	2001	2.14	2019	2022	
quality	2007	2.11	2019	2022	
cognition	2020	2.05	2020	2021	
cognitive function	2014	3.16	2021	2022	
scoping review	2021	2.42	2021	2024	
physical activity	2020	2.99	2022	2024	
music intervention	2022	2.73	2022	2024	
validation	2019	2.69	2022	2024	

A. Keyword co-occurrence map; B. Keyword clustering network map; C. Keyword burst detection

Figure 3. Keyword Maps of English-Language Literature

3.3.2 Keyword Analysis of Chinese-Language Literature

The keyword co-occurrence network of the Chinese-language literature generated 39 nodes. After excluding the subject terms “music therapy” and “older adults,” the main high-frequency keywords included depression, anxiety, review, nursing, and sleep disorders .The keyword clustering map grouped the keywords into 10 clusters:#0 older adults, #1 music therapy approach, #2 music therapy, #3 review, #4 anxiety, #5 hospice care, #6 sleep quality, #7 quality of life, #8 music, and #9 hypertension.The keyword burst detection map (Figure 4) shows that early research in this field focused on hypertension and insomnia. In recent years, research has gradually expanded to areas such as cognitive function.

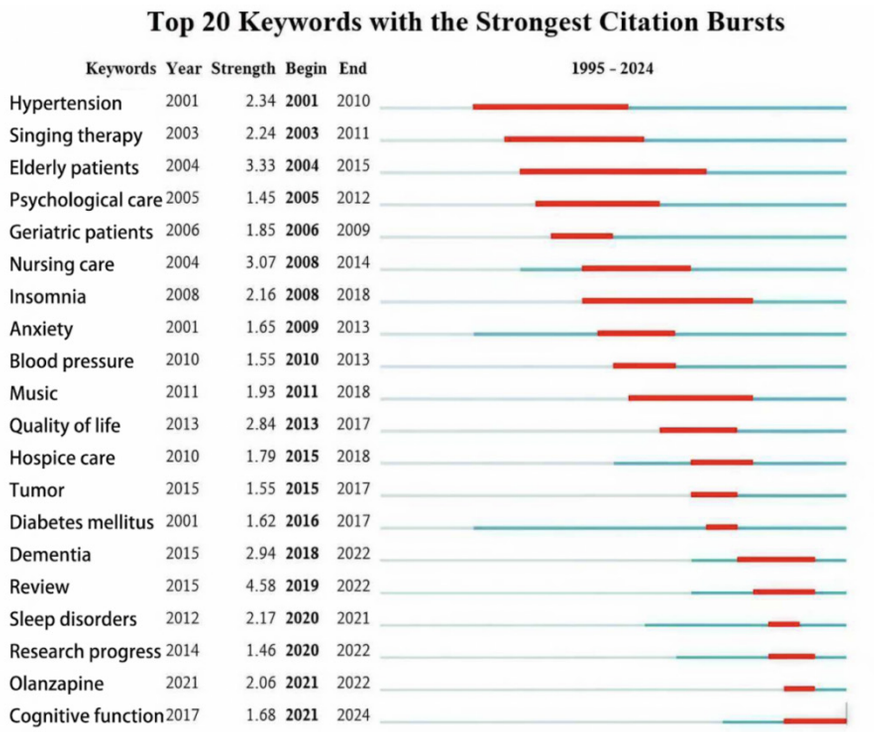


Figure 4. Keyword Burst Detection Map of Chinese-Language Literature

4. Discussion

4.1 Current Status of the Research Field

The publication results show that from 1991 to 2024, although there were fluctuations in certain years, the annual number of publications related to music therapy for older adults has shown a steady growth trend. Since the first English-language publication appeared in 1991 and the first Chinese-language publication appeared in 1995, the number of publications in the early stage of this field was relatively small, with fewer than 10 articles per year on average. After 2010, driven by the increasing demands of population aging and technological development, music therapy for older adults entered a period of rapid development, and research output increased significantly.

An analysis of publication output by country indicates that, in most periods, the number of English-language publications was higher than that of Chinese-language publications. European countries, where music therapy developed relatively early as a discipline, have accumulated substantial experience in both theoretical research and practical application. Represented by the geriatric music therapy research team at Temple University, interdisciplinary research has expanded the application value of music therapy in clinical medicine [23], rehabilitation therapy [24], psychology [25], and neuroscience [26].

4.2 Research Hotspots

An analysis of keywords in both Chinese- and English-language literature shows that “depression” and “anxiety” are high-frequency co-occurring keywords, indicating a shared concern for emotional health among older adults. For example, studies by Feng X [27] and Zhang Weijia [28] reported that music therapy regulates cellular function by enhancing excitability in the prefrontal cortex, thereby effectively improving anxiety, depression, and fear. Studies by Lorber M [9] and Zhou Lulu [29] also showed that music therapy helps reduce depressive symptoms.

In addition, research in the field of music therapy for older adults abroad shows characteristics of multi-condition integration. The English-language literature indicates that research focuses include neurocognitive disorders (dementia [30], mild cognitive impairment), physiological symptom management (blood pressure, pain management) [31], and applications in specific settings (nursing home residents, rehabilitation). Music therapy has shown significant effects in improving behavioral and psychological symptoms in patients with dementia [32]. Music interventions can enhance cognitive function in older adults with mild cognitive impairment and dementia [33]. For older adults with dementia living in nursing homes, music therapy may serve as an effective alternative to pharmacological treatment [34].

Domestic research focuses more on traditional symptom management. Keyword co-occurrence in the Chinese-language

literature shows research topics oriented toward clinical practice, such as “nursing” and “sleep disorders.” This characteristic is reflected in specific studies. For example, Otago exercise intervention combined with music therapy has shown positive effects in the clinical nursing of older stroke patients [35]. Receptive soothing music has been found to improve sleep among older adults with mild cognitive impairment [36]. However, issues such as the selection of therapeutic music and standardized control of intervention protocols in relation to sleep disorders require further investigation. The integration of technology remains at the stage of preliminary verification of intervention effects.

4.3 Research Trends

The burst detection map shows that after 2019, “scoping review” emerged as a burst keyword in the English-language literature and has continued through 2024. At the same time, in the Chinese-language literature, “review” showed the highest burst intensity (4.58) between 2019 and 2022. However, English-language review studies place greater emphasis on methodological rigor and systematic integration of evidence. For example, Kim SJ et al. conducted a scoping review to systematically explore the application prospects of music-based interventions for swallowing difficulties in older adults, establishing clear inclusion and analysis criteria [37]. Dhippayom T et al. used network meta-analysis to compare the effects of different music interventions on depression in older adults [38], reflecting methodological innovation in international research.

Early English-language studies (before 2014) mainly focused on residents in long-term care institutions, with research subjects often involving dementia, pain, or behavioral disorders. Milos D et al. reported that music therapy can serve as an effective strategy for improving psychological well-being among older adults in institutional care [39]. Schneible BK et al. explored the role of music therapy in the transition of older adults to long-term care and preliminarily developed a related conceptual framework [40].

After 2019, research attention gradually shifted toward evidence verification and mechanism exploration. Burst keywords such as “cognition” and “validation” indicate increasing efforts to evaluate the effects of music therapy on cognitive function and overall health in older adults through systematic research and scientific methods. For instance, Domínguez-Chávez CJ et al. confirmed through experimental research that neurologic music therapy can improve cognition and gait parameters in older adults with mild cognitive impairment [41]. Moreira SV et al. verified the effects of structured music therapy on episodic memory in older adults with dementia through a double-blind trial [42]. Sydney Jacobs et al., using a dual-task walking paradigm combined with functional near-infrared spectroscopy, examined the role of music-making in maintaining cognitive function in healthy older adults [43]. These findings suggest that international research has gradually progressed from confirming clinical effectiveness to systematically exploring the underlying neurophysiological and cognitive mechanisms.

In the Chinese-language literature, the burst detection map shows that before 2015, research mainly focused on auxiliary interventions for physical symptoms such as hypertension and insomnia. Since 2019, research dimensions have expanded from single symptom control to multidimensional health domains, including cognitive function, quality of life, and sleep quality, reflecting a shift toward psychological health and life-cycle care.

5. Conclusion

This study systematically analyzed Chinese- and English-language literature on music therapy for older adults from 1991 to 2024 using CiteSpace, VOSviewer, and Excel. The results indicate that: (1) global research shows a continuous growth trend, although development stages and patterns differ; (2) anxiety and depression are common research focuses in both domestic and international studies. International research covers multiple conditions such as dementia and pain management, whereas domestic research emphasizes combined interventions for traditional symptoms such as sleep disorders and hypertension; (3) both Chinese- and English-language literature show a trend toward evidence integration and systematization of knowledge. International research demonstrates a progression from clinical practice to mechanism exploration, while domestic research is shifting from single symptom management to multidimensional health domains.

This study has certain limitations. First, due to the retrieval function limitations of CiteSpace, Chinese-language literature was limited to the CNKI database, which may have resulted in incomplete coverage. Second, specific forms of music intervention and dosage parameters were not analyzed in depth. Future review studies may include more diverse data sources and adopt more rigorous analytical methods to provide stronger theoretical support and practical guidance for the development of music therapy for older adults.

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