

Visualization Analysis of Research Hotspots and Development Trends of The Integration of Medical Care in China Based on Citespace

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Abstract: Objective This study analyzes, summarizes and summarizes the hot spots and trends of integrated medical and nursing care in China, and provides theoretical basis for the future related scientific research. Methods The CiteSpace Knowledge Graph visualization and analysis tool was used to conduct a basic statistical analysis of the literature on the theme of "health care integration" collected in the China Knowledge Network (CNKI) database from 2005 to 2022, to understand the annual publication volume and trends, research institutions and authors, high frequency keyword co-occurrences analysis. Results A total of 3534 articles were included. The analysis shows an explosive growth in the number of articles published each year after 2013. High-frequency keywords include medical and health care integration, elderly care services and elderly care models. Conclusion In recent years, the hot research fields of the combination of medical and nursing care in China include elderly care service, smart community home care model, and research on the elderly and disabled elderly. This paper predicts that the research field of the combination of medical and nursing care will continue to expand, and the research on the combination of medical and nursing care will develop toward the trend of diversification.

1 INTRODUCTION

With the rapid socio-economic development in China, population aging has become an extremely serious social phenomenon in China at present. As of 2020, the total number of elderly people aged 60 and above in mainland China is 264 million, which has accounted for 18.7% of the total population of the country (National Bureau of Statistics of the People's Republic of China, 2021). The growing number of the elderly population is becoming increasingly prominent in terms of support, access to medical care, and health care (Wang and Dong, 2022). In order to cope with the basic situation of China's aging population and to meet the diversified health needs of the elderly, the new model of "integration of medical care" has attracted widespread attention from the society and academia. In order to systematically and comprehensively summarize the current research status of China's health care integration, this paper will use CiteSpace software system to visualize and analyze the hotspots and trends of China's health care integration research, so as to deeply study the hotspots and problems related to health care integration and provide important references for the future development of China's health care integration research field.

2 MATERIALS & METHODS

2.1 Data Sources

In this study, the Chinese Academic Journal Publishing Database (hereinafter referred to as CNKI database) was used as the data source, and the search strategy was to conduct an advanced search with the theme of "medical and health care integration", and the first literature related to medical and health care integration was published in 2005, so the time span = "2005-2022", with the publication period from March 31, 2005 to March 31, 2022 as the search date. As a result, a total of 4974 documents were retrieved, and in order to ensure the authority and accessibility of the data, relevant reports, conference articles, and unrelated literature to the topic were manually removed, and a total of 3534 documents were finally identified as the research subjects of this paper.

2.2 Research Tools

CiteSpace software, by Dr. Chaomei Chen (2004) on the visualization of information on the Java platform. This software is a visualization tool that analyzes a large amount of information using a visualization language

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such as diversified, time-phased, and dynamic citation analysis to depict an information map of the research development in the field, and to reveal and identify the information that will panorama the research progress and development frontier directions of the field (Chen and Chen and Liu, 2015).

2.3 Research Methodology

In this study, CiteSpace 5.8.R3 software visual data analysis tool was used to analyze the knowledge mapping data of the literature about the fields related to medical and health care integration in the CNKI database of China Knowledge Network in recent years, which mainly includes exploring the literature research authors, research institutions and keywords. The specific parameters: the time window is set to 2005-2022, the time partition (Years Per Slice) is "1"; the Node Types are "Author", "Institution", and "Keywords". "Institution", "Keyword"; N is the total number of nodes, E is the total number of links in the graph, indicating the cooperative relationship; network density indicates the closeness of interconnection between nodes.

3 RESULTS

3.1 Literature Search Results

According to the search strategy, a total of 4974

documents were obtained, and the author manually excluded 1440 related reports, conference articles and documents not related to the topic, and finally identified a total of 3534 valid documents for the study. (See Figure 1)

3.2 Annual Volume and Trend of Publications

In this paper, based on the visualization function that comes with the CNKI database of China Knowledge Network, we searched the research literature in the field of medicine and health care combination for the annual publication volume based on the time span of 2005-2022 (see Figure 1). The first research literature in the field of medical integration was published in 2005, and the number of annual publications was very small before 2005-2013, with a total of 10 articles published. However, after 2013, under the guidance of national policies, the number of publications in the field of medicine and health care combination exploded and peaked at 909 articles/year in 2019. Since 2019, the number of publications has shown a trend of relative decrease in quantity but relative innovative expansion in the field, and with the aggravation of aging trend in China, it is foreseeable that the number of publications in the field of health care integration will continue to rise in the future.

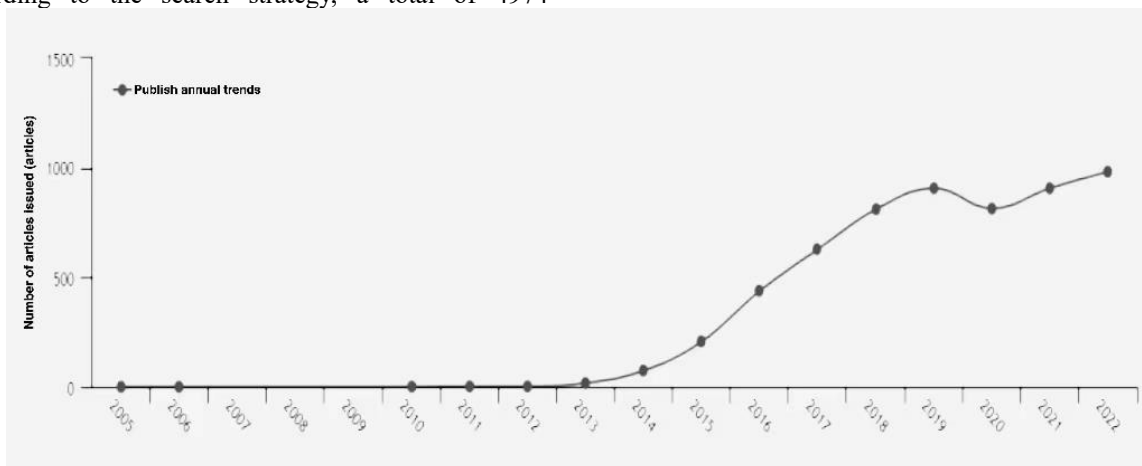


Figure 1. Annual publication trend

3.3 Research Institution and Author Co-Occurrence Analysis

The size of the nodes indicates the academic status of the research institution or author, and the thickness of the connecting line indicates the strength of the connection between the research institution or author. The larger the number of nodes, the greater the number of articles issued by research institutions and authors. As shown in Table 1 and Figure 2 the larger node authors are Li Changyuan, Han Xu, Hua Mingming, Guo Qing, Yu Weihua, ShiBo, Zhang Xinyue, and Zhang Xie; the institutions are Hospital of Nanjing University of Traditional Chinese Medicine, School of Public

Administration of Gansu University of Political Science and Law, Heilongjiang University of Traditional Chinese Medicine, School of Marxism of Anyang Normal University, School of Public Health of Gansu University of Traditional Chinese Medicine, School of Economics and Management of Northwestern University, and School of Management of Shanghai University of Engineering and Technology College of Management of Shanghai University of Engineering and Technology (see Tab. 2). In terms of the partnership situation, the figure refers only to the partnership networks between Chen Yaping and Heilongjiang University of Traditional Chinese Medicine, and Hua Mingming and Han Xu and the hospital affiliated with Nanjing University of

Traditional Chinese Medicine. The basic lack of connection between these nodes indicates that the current research in the field of health care integration is

relatively fragmented, and the cooperation objects between authors are relatively fixed, and the communication between them is relatively limited.

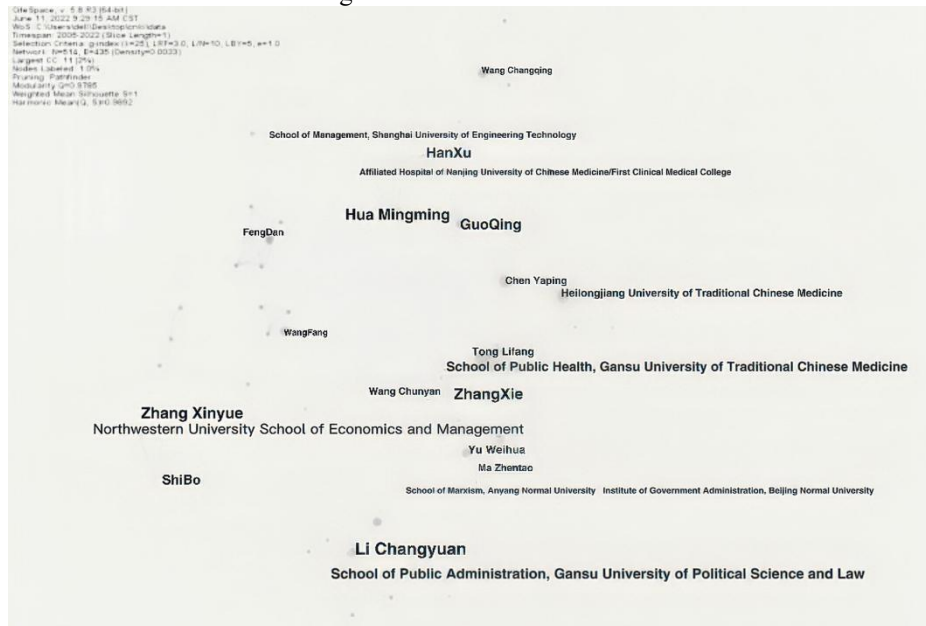


Figure 2. Co-presence analysis mapping of research institutions and authors

Table 1 Research institutions with ≥ 10 publications

Serial number	Institution	Number of articles issued (articles)
1	Nanjing Affiliated Hospital of Traditional Chinese Medicine	12
2	School of Public Administration, Gansu University of Political Science and Law	12
3	Heilongjiang University of Traditional Chinese Medicine	11
4	School of Marxism, Anyang Normal University	11
5	School of Public Health, Gansu University of Traditional Chinese Medicine	10
6	School of Economics and Management, Northwestern University	10
7	School of Management, Shanghai University of Engineering and Technology	10

Table 2 Authors of studies with ≥ 10 publications

Serial number	Author	Number of articles issued (articles)
1	Li Changyuan	19
2	Han Xu	12
3	Hua Mingming	11
4	Guo Qing	11
5	Yu Weihua	10
6	Shi Bo	10
7	Zhang Xinyue	10
8	Zhang Xie	10

3.4 High Frequency Keyword Word Frequency Statistics and Centrality Analysis

Among the 3534 valid documents, the keywords with a frequency of not less than 50 were selected for data analysis, which can intuitively show the hot topics of

research in the field of medical and health care integration in China. Among them, "health care integration" appeared 2941 times (ranked first), "elderly service" appeared 364 times (ranked second), and "elderly care model" appeared 347 times (ranked third). From the keyword frequency and centrality statistics table, we can see that the keywords with centrality ≥ 0.1

include "medical care integration", "elderly", "elderly services" and "elderly care institutions". "elderly care service", "elderly care institutions", "elderly care institutions", "aging", "elderly care model".

Table 3 Frequency and centrality of keywords

Serial number	Keyword	Frequency	Keyword	Centrality
1	Medical and Health Integration	2941	Medical Care Integration	0.86
2	Aging Services	364	Older people	0.22
3	Senior Care Model	347	Senior Care	0.21
4	Elderly care institutions	311	Elderly care institutions	0.17
5	Older people	256	Aging	0.11
6	Aging	210	Elderly care model	0.1
7	Ageing	113	Institutionalized Aging	0.09
8	Community Aging	113	Disabled elderly	0.09
9	Institutionalized Aging	90	Elderly care	0.08
10	Home Care	89	Community Aging	0.07
11	Countermeasures	87	Home Care	0.07
12	Influencing Factors	80	Influencing Factors	0.04
13	Demand	60	Needs	0.04
14	Healthy China	59	Countermeasures	0.03
15	Elderly with Disabilities	59	Healthy China	0.03
16	Community	52	Community	0.03

3.5 High Frequency Keyword Clustering Analysis

In CiteSpace.v.5.8.R3 software, the parameter selection (Selection Criteria) topN (N=50) threshold setting method, the run time is April 6, 2022, the time span is from March 31, 2005 to March 31, 2022, with 1 year as the time slice, in the Pruning column, select Pathfinder and Pruning sliced networks are clustered for high-frequency keywords to generate a clustered view of high-frequency keywords from 2005-2022, and the nodes indicate the frequency of keywords cited in the domain. The size of the node font indicates the centrality, and the larger the keyword font the stronger

the centrality. From the clustering and centrality of high-frequency keywords, there are 11 clusters, 601 nodes and 1277 connected lines, and "medical care integration", "elderly care model", "elderly care institution" "elderly care services," and "elderly" all appear in the center of the clusters and show high centrality. The clustering module value (Q value) of this theme keyword clustering is equal to 0.5693, and the average profile value (S value) of clustering is equal to 0.8292, where Q value > 0.3 and S value > 0.5 indicate that the clustering results of this keyword mapping are convincing and can represent the hot topics and development trend of medical and nursing care integration research in China (Liu and Xu and Xia, 2016).

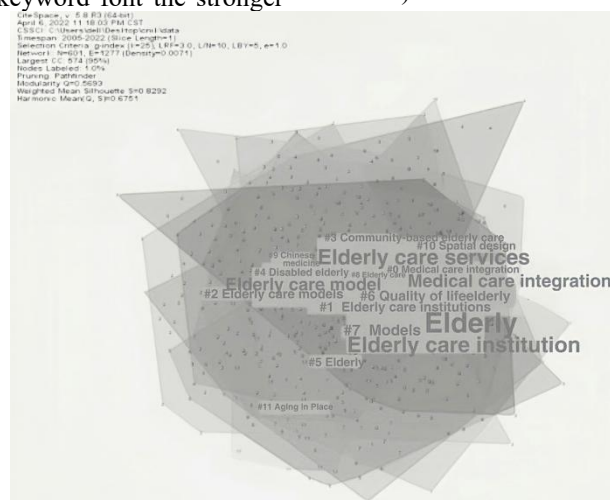


Figure 3. Keyword clustering map

3.6 Timeline Distribution of Keywords

On the basis of the keyword clustering of medical and

health care, this paper enters the layout interface through the control panel of CiteSpace.v.5.8.R3 software for 3534 selected documents and selects the "Timeline

4 DISCUSSION

4.1 The Volume of Literature Published in Medical and Health Care Integration

The research results show that the number of literature published in the field of medical and health care integration in China from 2013 to 2019 generally showed a rapid growth trend. Especially since 2013, the increase in the number of literature has been significantly accelerated, and research results have been emerging, indicating that the field of combined medical and health care research has begun to attract widespread attention from the academic community and has entered the stage of rapid development of in-depth research. The number of publications has reached 4974 as of March 31, 2022. It is fully proved that the government is an important factor to promote the progress of combined medical and health care research, and a good policy introduction can promote the rapid and healthy growth of China's elderly care industry. However, at present, the core academic papers on China's medical and health care integration research are not very important, and the depth of research content and quality still need to be enhanced.

4.2 Distribution of Authors and Institutions in The Literature of Medical and Health Care Integration

By drawing the co-occurrence mapping of research institutions and authors in Figure 2, it is found that there are relatively few cooperative relationships between scholars and research organizations on the integration of health care, and some of the cooperative objects are relatively fixed, so the communication between them is somewhat limited. The research literature on the integration of health care is mostly concentrated in higher education institutions and medical science research institutions, and the regional division is mainly concentrated in Nanjing and other important economic development regions, and the research is relatively scattered, and no systematic scientific research system is established among organizations, and there is a lack of active participation of social organizations and administrative organs, which is not conducive to the development of the integration of health care.

4.3 Analysis of Hot Topics of Research in The Field of Health Care Integration in China

From the keyword frequency statistics and centrality, cluster analysis and emergent words, "elderly service", "elderly care model" and "elderly and disabled elderly" are the research hot topics in the field of health care integration. The hot issues in the field of health care integration

4.3.1. Innovative diversified elderly care services

In the high-frequency keyword frequency statistics and centrality in Table 3, "elderly service" appears 364 times, ranking second in the frequency of high-frequency keywords, indicating that elderly service is one of the hot topics of research in the field of health care integration. In recent years, scholars from all walks of life have focused on the innovation and development of diversified elderly service models, exploring how to organically combine the intelligent model with the elderly industry (Meng, 2022), making the elderly product design age-appropriate, how to enhance the participation of intelligent elderly service subjects (Hu and Liu and Gong, 2022), and reducing the impact of home elderly service on the quality of life of the elderly, which has certain practical significance. Dr. Wang Xianju (2018) pointed out the structural problems of the supply side of senior care services in China, and with the help of the theory of supply-side structural reform, optimizing the allocation of factors on the supply side of senior care services and moderately expanding the scale of supply can meet the growing demand of the elderly population, optimize the structure of senior care service supply, and provide effective supply (Wang, 2018).

4.3.2. Smart Community Aging-in-Place Model

In Figure 5, among the 15 strongest emergent words in the field of combined health care in China, "community-based elderly care" and "smart elderly care" account for Top2 and Top11 respectively. The emergence of the new elderly care model makes the "smart community and home" elderly care model one of the future trends of elderly care in China (Li and Lv and Li and Sun and Zhang, 2020, Wan and Zhu, 2020, Zhi and Ji and Hu, 2021). At present, most of the elderly people choose to age in their familiar homes, while a few of them choose to age in communities and institutions (Yu and Bao, 2018). With the development of social economy and the miniaturization of family structure, there are potential dangers of home aging as most young family members cannot always take care of the elderly at home due to work. However, institutional elderly care is far from home and the specialization of services is questioned and is not favored by the elderly population (He, 2019). Therefore, smart community home care will be the future direction of the elderly service system, which can promote the interconnection of health care and elderly care information in all regions and improve efficiency and level (Liu and Hu, 2020). Gao and Zhang (2020) pointed out that the intelligent community home care model is mainly oriented to the community, using modern intelligent means such as the Internet and big data, integrating various social resources, meeting the needs of the elderly with low-cost, efficient and convenient services, providing convenient, fast and scientific services, creating a "health service ecosystem" to improve the efficiency and quality of elderly services (Gao and Zhang, 2021).

4.3.3. Demand for long-term care for the disabled elderly

In the frequency and centrality of high-frequency keywords in Table 3, "elderly" and "disabled elderly" with centrality of 0.22 and 0.09, respectively, became high-frequency keywords, which shows that the research on the integration of medical care for the elderly or disabled elderly has become the focus of scholars in related fields (Sun and Qiu and Gao, 2018, Wang and Yang and He, 2018, Chen and Wang, 2019). By analyzing the differences in health needs of elderly groups, scholars have launched a series of studies on the integration of medical care, and their attention has been focused on two aspects: first, they have studied the current situation and countermeasures of the elderly or disabled elderly on the integrated medical care service model (Liu and Zhou and Zhang, 2022). Wang Yijing and other scholars (2022) pointed out that with the help of resources from various social organizations, such as volunteers and volunteers' public welfare door-to-door services, diversified personalized service packages are developed to meet the needs of the disabled elderly for healthy aging and improve the happiness index of the disabled elderly (Wang and He, 2022). Another study is about the long-term care and social assistance system for the disabled elderly. Xiong Ying et al. (2021) used the long-term care insurance system for the elderly in Jingmen City as an example to show that the long-term health insurance system can properly solve the financing problem of old-age pensions under the health insurance system for the disabled elderly, with special emphasis on the fair distribution of financial mechanisms and safeguards (Xiong and Jang and Xu, 1999).

4.4 Evolutionary Path of Research Development in The Field of Medical and Health Care Integration in China

From the keyword timeline diagram, China's research on the integration of health care can be roughly divided into three development stages (see Figure 4). First, the budding exploration stage (2005-2013), in 2005, Guo Dong and Li Huiyou scholars first proposed the introduction of the concept of "combined medical and nursing care and continuous care" to solve the aforementioned problems caused by the aging population at the present stage, which can reduce the burden of family children and make them better serve the society and contribute more (Guo and Li and Li, 2005). The key words in this phase include aging industry, medical care integration, healthy China, and gerontology. Second, the implementation phase (2013-2016). The key words appearing in this phase are medical care, long-term care, institutional elderly care, elderly care model, disabled elderly, etc. Since 2013, the General Office of the State Council and relevant central ministries and commissions have issued several relevant government documents on the integration of medical care and elderly care, proposing to fully understand the importance of promoting the integration of medical and health care and elderly care services, actively guiding

the cooperation between elderly care service organizations and medical institutions, and jointly promoting the comprehensive development. Third is the development and perfection stage (2019 to present). The key words appearing in this stage are medical association, intelligent elderly care, elderly services, development path, policy suggestions, social services, etc. In this stage, relevant government departments clarify the tasks and important instructions of medical care integration, and must further reform and improve the policies and measures of medical care integration to promote high-quality development, in addition, relevant scholars put forward innovative ideas, and wisdom elderly care gradually appears in the public view (Wu and Tang, 2021, Huang and Zhu and Chen, 2022, Sun, 2021).

5 CONCLUSIONS

Based on the above research analysis, it is found that the current research hotspots of medical integration in China, although relatively rich, but lack of system and comprehensiveness. And the cooperation between research institutions and research authors is also relatively scattered, and there is no core research system about medical integration among them, which is more unfavorable to the future sustainable development of medical integration field. Therefore, research authors and research institutions should cooperate and communicate with each other more, further broaden the research field and research perspective, create a communication platform that is conducive to the integration of health care, and continuously promote the diversified and sustainable development of health care integration. In addition, it is recommended to strengthen the depth of research content and improve the quality of research content. Finally, elderly care model and elderly care service, elderly and disabled elderly, and community home care and intelligent elderly care are the hot spots and development trends in the field of medical and health care integration in the future, which should be studied in depth. At the same time, the papers selected by the author were only searched from CNKI database of China Knowledge Network, which is relatively incomplete and lacks comparison with foreign research fields on health care integration, and should be further supplemented and improved in future scientific research in order to have a more comprehensive understanding of the field of health care integration and provide reference for future research scholars.

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