



# Visual Analysis of Knowledge Map of Chinese Medicine Health Culture Literacy Based on CiteSpace

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**Abstract:** Objective: To use the information visualization analysis software Citespace, based on the CNKI database, to carry out the knowledge map visualization analysis on the literature of Chinese medicine health cultural literacy, and explore the research status of Chinese medicine health cultural literacy. Methods: Relevant literature on Chinese medicine health cultural literacy from 2013 to 2022 was retrieved on CNKI, and the knowledge map of authors, institutions and keywords was drawn and analyzed by using CiteSpace 6.1.R3 software. Results: There were 315 researchers, represented by Tan Wei and others. There are 256 research institutions, represented by the School of Management of Beijing University of Traditional Chinese Medicine. The key words are 343, and the first three are Chinese medicine, health literacy, and health education; The cluster shows that the research in the field of Chinese medicine health cultural literacy in China shows the direction of Chinese medicine thinking improvement, training and curriculum ideological and political application, dissemination of health culture, information literacy and humanistic quality cultivation. Conclusion: The atlas shows the development vein, research hotspots and frontier trends of this field, and provides research direction for scientific researchers.

**Keywords:** Citespace, knowledge map, traditional Chinese medicine, health literacy

## 1. Introduction

In today's society, people's living standards have been greatly improved. Scientific and healthy lifestyle has become increasingly valued by individuals. The World Health Organization (WHO) has pointed out that health literacy plays an important role in evaluating individual health level [1]. The World Health Organization (WHO) believes that health literacy represents people's cognitive and social skills, which determine that individuals have the motivation and ability to acquire, understand and use health information, and can promote and maintain health through these channels. In 2014, the National Health and Family Planning Commission proposed to promote the health care work of traditional Chinese medicine, and jointly issued the "Chinese citizens' health care literacy of traditional Chinese medicine" with the State Administration of Traditional Chinese Medicine [2]. In October 2016, the Central Committee of the Communist Party of China and the State Council issued the "Healthy China 2030" Planning Outline, which proposed "health literacy" seven times. The State Administration of Traditional Chinese Medicine defines the health cultural literacy of traditional Chinese medicine as the ability of individuals to understand and master the concepts and knowledge of traditional Chinese medicine, the common sense of traditional Chinese medicine culture, the healthy lifestyle of traditional Chinese medicine, and the appropriate methods of traditional Chinese medicine family, and to use these information to maintain and promote their own health and improve their cultural quality. It can be seen that China attaches special importance to citizens' health literacy of traditional Chinese medicine. Therefore, based on the method of bibliometrics, this paper applies the Citespace software to draw a knowledge map of the literature related to the health cultural literacy of traditional Chinese medicine from 2013 to 2022, systematically sort out the research status, research hotspots and research trends in this field, and provide reference and reference for subsequent research.

## 2. Data sources and research methods

### 2.1 Data source

In order to ensure that the original data are comprehensive and accurate and have a high degree of interpretation, authenticity and credibility, this paper takes CNKI Chinese academic journal (online edition), which has the largest amount of literature and the most comprehensive coverage, as the sample data source. In order to collect more relevant documents on the scope of health cultural literacy of traditional Chinese medicine, "traditional Chinese medicine" and "health literacy" or "health culture" or "cultural literacy" or "literacy" were selected as the search term, and "journal" was used as the search method. The search method was selected as advanced search. The search time span was 2013-2022. Only Chinese literature

was selected, and a total of 983 documents were obtained. The retrieval results were repeatedly checked and sorted out, and irrelevant items such as conference notice, conference draft, newspaper report, and achievement introduction were deleted. A total of 653 valid sample documents were obtained. Each document contained information such as author, organization, keywords, abstract, and publication date. The retrieval time was October 30, 2022. All documents were exported to Citespace software for processing in refworks format.

## 2.2 Research methods

At present, the tools for drawing knowledge map in academic circles mainly include Citespace, SPSS, Ucinet, VOSviewer, etc. Citespace software is the most commonly used tool. The main function of Citespace software is to display and analyze the evolution trend and knowledge association status of the discipline frontier through keyword co-occurrence, organization distribution, author cooperation, document coupling and other visualization functions. Citespace software can format and transform the data exported from the CNKI database, draw various knowledge maps, and display the time zone layout and hotspot trends in the research field through the size of nodes, network connectivity and other factors. Because of its simple operation and clear visualization, the analysis tool has attracted wide attention and application in China. In the parameter setting, the time span is from 2013 to 2022, and the time slice is 1 year. The information visualization tool used in this paper is Citespace software, with the version of 6.1.R3.64-bit updated on October 28, 2022

## 3. Statistics and analysis

### 3.1 Visual analysis of literature authors

By using CiteSpace software to analyze the co-occurrence of the authors of the research literature on the health and cultural literacy of traditional Chinese medicine, the authors' cooperative relationship map (Figure 1) was drawn, including 315 nodes, 263 connections, and the network density of 0.0053. Tan Wei posted the highest number of articles, and 10 authors with more than 5 articles (Table 1). From the analysis and visualization of co-occurrence of authors, we can see that the distribution structure of authors in this research field is relatively loose as a whole, and there is no systematic cooperation network of authors. The research is mainly conducted by some teams, and the cooperation within the team is close, but the cooperation between different teams is relatively weak. For example, the connections between Tan Wei and Liu Qian, Wang Ranyu, Du Yirong, Guo Ying and Lu Yiming, Zhang Zhizhong, Kang Guorong, as well as between Wang Suzhen, Zhu Yao and Zhang Jiameng are relatively thick, which means that the number of cooperation is more. At the same time, the scattered independent nodes in the map show that some scholars conduct scientific research independently, and some scholars conduct research in the way of pairwise cooperation. In addition, Tan Wei began to publish in 2018 and Wang Suzhen began to publish in 2020.

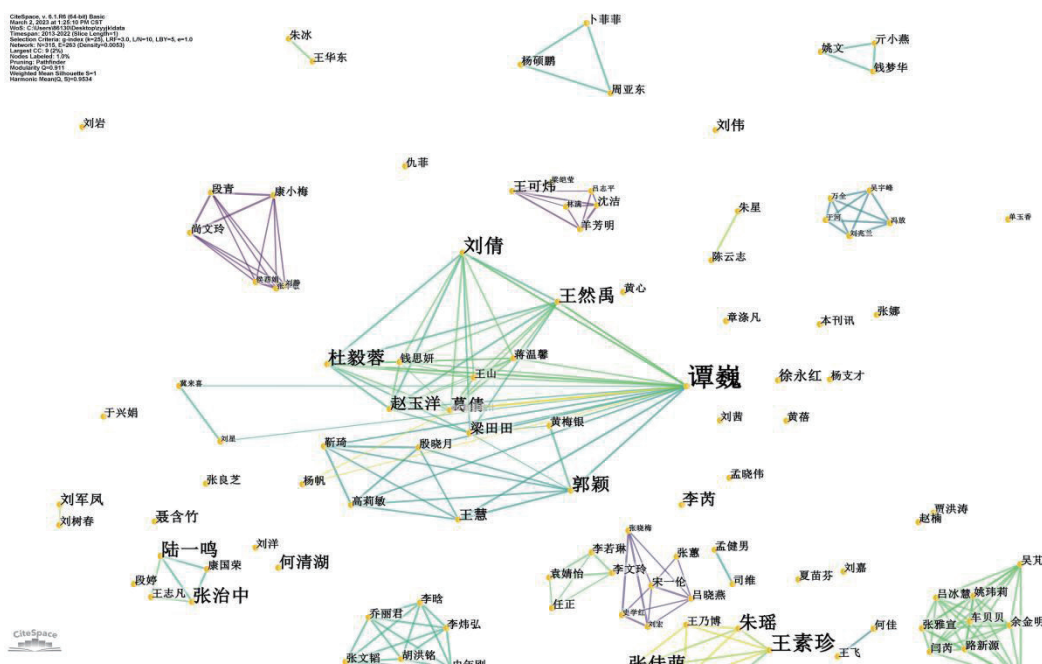


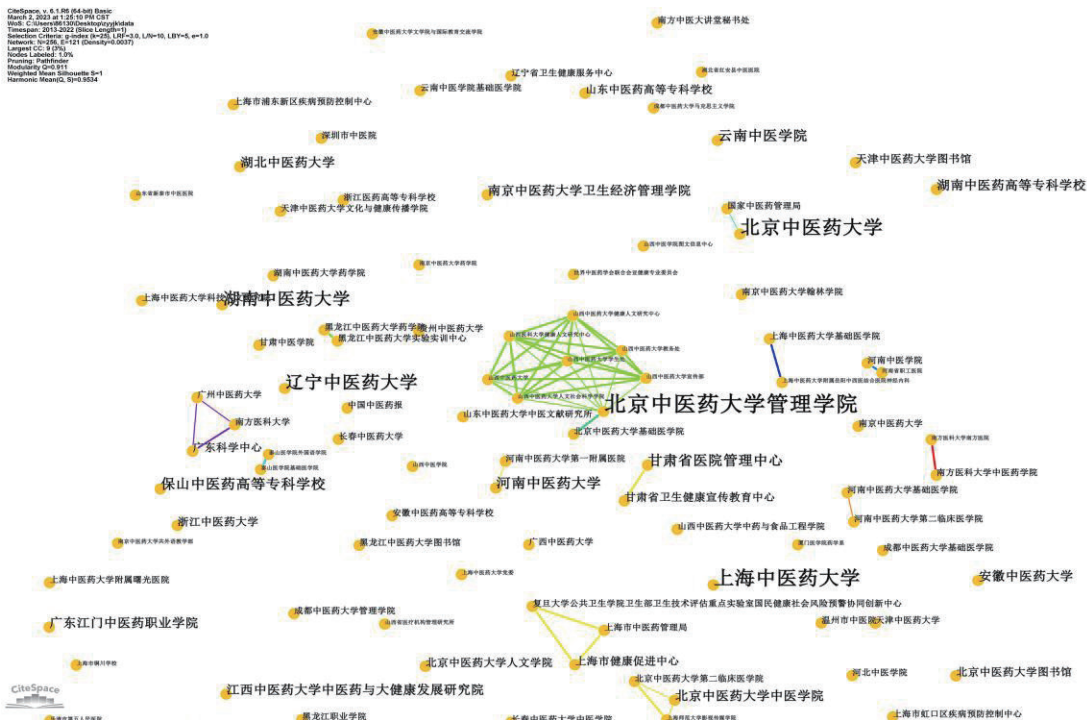
Figure 1. The co-presentation of the authors of the health culture literacy of traditional Chinese medicine

**Table 1. List of high-yield authors of the research on health cultural literacy of traditional Chinese medicine**

| Order number | Author         | Number of documents issued | Order number | Author        | Number of documents issued |
|--------------|----------------|----------------------------|--------------|---------------|----------------------------|
| 1            | Tan Wei        | 13                         | 6            | Guo Ying      | 5                          |
| 2            | Wang Suzhen    | 7                          | 7            | Zhu Yao       | 5                          |
| 3            | Liu Qian       | 6                          | 8            | Zhang Jiameng | 5                          |
| 4            | Zhang Zhizhong | 5                          | 9            | Du Yirong     | 5                          |
| 5            | Lu Yiming      | 5                          | 10           | Wang Ranyu    | 5                          |

### 3.2 Visual analysis of the issuing organization

Scientific research institutions play a vital role in improving the innovation of national scientific research level. By analyzing the papers published by different scientific research institutions [3], we can understand the distribution of research forces in TCM health literacy. First of all, the 1050 documents included have the same meaning in the institutions or departments of higher education institutions. The atlas of "Chinese medicine health culture literacy" literature research institutions generated by CiteSpace. The size of each concentric ring in the map represents the amount of documents issued by the institution. The larger the ring, the more documents issued. The thickness of the connection between nodes represents the strength of cooperation between institutions. It includes 256 nodes, 121 connections, and the network density is 0.0037, the cooperation trend of literature research institutions of "Chinese medicine health cultural literacy" was presented. The research institutions are generally dominated by local universities of traditional Chinese medicine, forming a stable internal research team. The figure shows that the research institutions are relatively independent, and the cooperation between the research institutions is relatively small. The research institution with the largest number of publications is the School of Management of Beijing University of Traditional Chinese Medicine, followed by Shanghai University of Traditional Chinese Medicine, but its centrality is zero, which indicates that there are few cooperation and exchanges in the research field and there are certain academic barriers.



**Figure 2. Co-occurrence diagram of the issuing institutions of TCM health cultural literacy**

**Table 2. List of high-yield institutions for research on health cultural literacy of traditional Chinese medicine**

| Order number | Organization name  | Number of documents issued |
|--------------|--|----------------------------|
| 1            | School of Management, Beijing University of Traditional Chinese Medicine | 16                         |
| 2            | Shanghai University of Traditional Chinese Medicine                      | 12                         |
| 3            | Beijing University of Traditional Chinese Medicine                       | 11                         |
| 4            | Heilongjiang University of Traditional Chinese Medicine                  | 9                          |
| 5            | Liaoning University of Traditional Chinese Medicine                      | 9                          |
| 6            | Hunan University of Traditional Chinese Medicine                         | 8                          |
| 7            | Yunnan College of Traditional Chinese Medicine                           | 5                          |
| 8            | Baoshan College of Traditional Chinese Medicine                          | 5                          |
| 9            | Gansu Provincial Hospital Management Center                              | 5                          |
| 10           | Henan University of Traditional Chinese Medicine                         | 5                          |

### 3.3 Co-occurrence analysis of keywords

Key words can reveal the main direction and core ideas of the content of the article. Frequent keywords are often related to research hotspots in the field, and prominent keywords are often related to research trends in the field. Therefore, the co-occurrence frequency and prominence detection of the keywords in the relevant literature in the field of TCM health cultural literacy can intuitively present the research hotspots, research trends and knowledge structure of the development of TCM health cultural literacy. In order to make the keyword co-occurrence map more typical and authentic, keywords with similar meanings in the literature are sorted out. For example, combine "traditional Chinese medicine", "traditional Chinese medicine", "traditional Chinese medicine" and "traditional Chinese medicine" into "traditional Chinese medicine", and combine "health education" and "traditional Chinese medicine education" into "health education".

Use CiteSpace to draw the keyword co-occurrence map (see Figure 3), use the keyword path calculation method in the software to calculate the co-occurrence frequency and centrality of keywords, and draw the keyword knowledge map. The time span of the database is set to 2013-2022, with 1 year as the time slice and keywords as the network nodes. The first 50 highly cited keywords in each time slice are selected. The atlas contains 343 nodes and 328 lines. The modular Q value of clustering=0.8659, and the average contour S value (Mean Silhouette)=0.9674, indicating that the atlas reflects the hot spots of literature research is convincing [4]. The larger the node is, the higher the frequency of keyword occurrence is. The more connections are, the more times the two keywords occur together. The thicker the connection is, the stronger the connection is. According to word frequency ranking statistics, the top 10 key words are extracted, as shown in Table 3. The statistical results showed that the keywords such as traditional Chinese medicine, health cultural literacy, health education, curriculum ideology and politics, students, talent cultivation, influencing factors, information literacy, residents, and colleges of traditional Chinese medicine appeared most frequently. From the perspective of high-frequency keyword distribution, health education, curriculum ideological and political education, and talent training are mainly important means to improve the health cultural literacy of traditional Chinese medicine. Students and residents are the main objects, and the exploration of influencing factors focuses on information literacy.

Intermediary centrality is an important indicator to measure the information exchange ability of nodes in the network. By calculating the intermediate centrality of high-frequency keywords, all high-frequency keyword centrality is zero (less than 0.1). The weak correlation between nodes represents the current situation of low attention, shallow research, no systematic research system and low influence of research hotspots in the field of Chinese medicine health cultural literacy. It can be seen that the research in this field is relatively immature. See Table 1

CiteSpace v. 5.10.R3 (64-bit)  
 October 30, 2022 at 07:21:51 CST  
 Mod: C (m=100, p=0.01, q=0.05)  
 Timespan: 2013-2022 (Slice Length=1)  
 Selection Criteria: Pfinder (p=0.1, LF=0.2, LB=0.16, LB1=0.1, LB2=0.1)  
 Network: W=143, E=328 (Density=0.0096)  
 Largest CC: 238 (85%)  
 Nodes Labeled: 1.07%  
 Pruning Pathfinder  
 Modularity Q=0.9934  
 Weighted Mean Silhouette S=0.9674  
 Harmonic Mean Q-S=0.9804

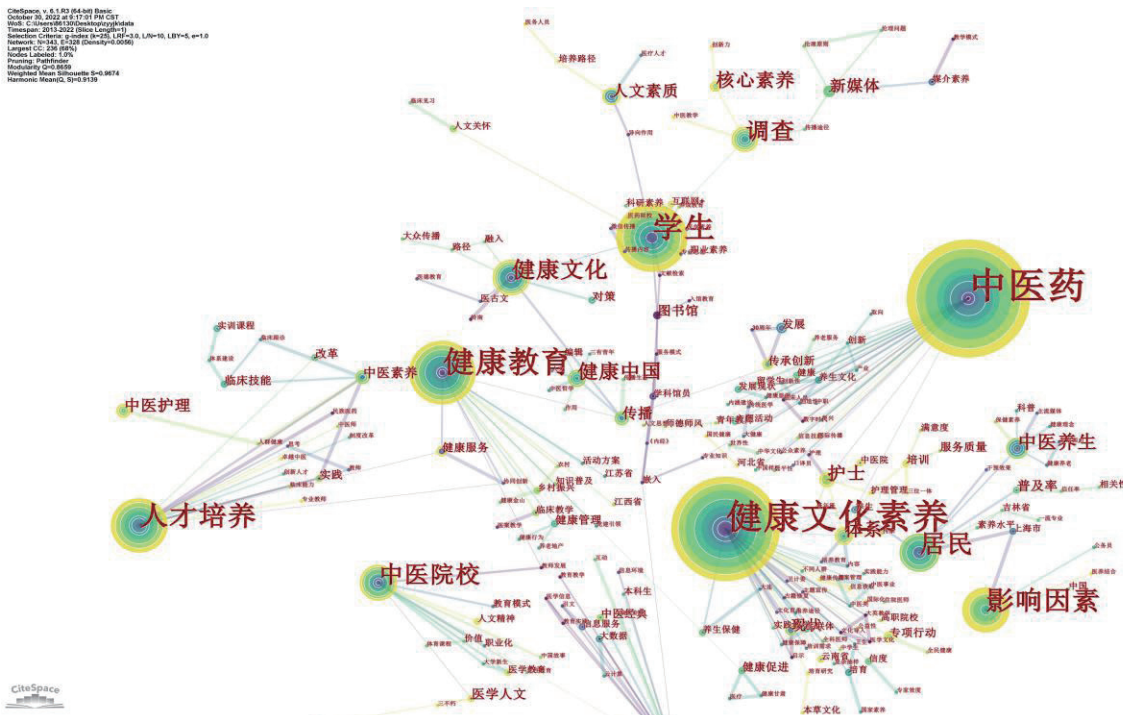


Figure 3. Keyword co-occurrence of Chinese medicine health cultural literacy

Table 3. List of high-frequency keywords of Chinese medicine health culture literacy (frequency≥6)

| Order number | Key words   | Frequency | Centrality |
|--------------|---|-----------|------------|
| 1            | Traditional Chinese medicine                        | 122       | 0          |
| 2            | Health literacy                                     | 97        | 0          |
| 3            | Health Education                                    | 47        | 0          |
| 4            | Curriculum ideological and political                | 45        | 0          |
| 5            | students  | 45        | 0          |
| 6            | personnel training                                  | 33        | 0          |
| 7            | influence factor                                    | 30        | 0          |
| 8            | Information literacy                                | 29        | 0          |
| 9            | resident  | 22        | 0          |
| 10           | College of Traditional Chinese Medicine             | 20        | 0          |
| 11           | investigate   | 18        | 0          |
| 12           | Health culture                                      | 16        | 0          |
| 13           | reform in education                                 | 15        | 0          |
| 14           | Healthy China                                       | 11        | 0          |
| 15           | Core quality  | 9         | 0          |
| 16           | Health preservation of traditional Chinese medicine | 9         | 0          |
| 17           | nurse   | 8         | 0          |
| 18           | system  | 8         | 0          |
| 19           | new media   | 6         | 0          |
| 20           | Humanistic quality                                  | 6         | 0          |
| 21           | Traditional Chinese medicine nursing                | 6         | 0          |

3.4 Emergence analysis of key words

The degree of emergence of key words can reflect the research hotspots in a certain period. Emergent words refer to words that appear more frequently or are used more frequently in a relatively short time. According to the change of word

frequency of emergent words, the research frontiers and trends of Chinese medicine health culture can be displayed. As shown in Figure 4, the research on health cultural literacy of traditional Chinese medicine has five salient words: curriculum ideological and political, information literacy, health education, influencing factors, and residents. "Information literacy" is mainly reflected in 2013-2019, "residents" are mainly reflected in 2015-2016, "health education" is mainly reflected in 2017-2018, "influencing factors" is mainly reflected in 2019-2022, and "curriculum ideological and political" is mainly reflected in 2020-22, which to some extent shows that, at present, the research focus of TCM health cultural literacy is mainly reflected in the fields of residents' information literacy, health education, influencing factors and curriculum ideological and political. Since 2019, the research on the influencing factors has been carried out and has continued to date. It can be seen that the research on the influencing factors has gradually become the mainstream, and the research content is also gradually deepening. The influencing factors and curriculum ideology are expected to become the forefront of the research, leading the development of the improvement of the residents' health and cultural literacy of traditional Chinese medicine.

**Top 10 Keywords with the Strongest Citation Bursts**

| Keywords                          | Year | Strength | Begin | End  | 2013 - 2022 |
|-----------------------------------|------|----------|-------|------|-------------|
| Ideological and political courses | 2020 | 10.02    | 2020  | 2022 |             |
| Information literacy              | 2013 | 3.86     | 2013  | 2019 |             |
| Health Education                  | 2013 | 2.87     | 2017  | 2018 |             |
| influence factor                  | 2014 | 2.72     | 2019  | 2022 |             |
| resident                          | 2014 | 2.58     | 2015  | 2016 |             |

Figure 4. Analysis of key words in the study of Chinese medicine health cultural literacy

### 3.5 Cluster analysis of keywords

Keyword clustering is to classify the keywords in the data article into topics, so as to understand the internal logical relationship of the keywords in the sample data more clearly. The average contour value in the table is 0.9697. The contour value in the table can measure the homogeneity of the whole cluster members. Therefore, the subjects of the research related to the health cultural literacy of traditional Chinese medicine are relatively concentrated and have high credibility [5].

The keyword clustering knowledge map generated by Citespace software is shown in Figure 5. It can be seen from Figure 5 that there are 11 clusters in this cluster: # 0 health literacy, # 1 traditional Chinese medicine, # 2 humanistic quality, # 3 residents, # 4 traditional Chinese medicine thinking, # 5 health culture, # 6 communication, # 7 information literacy, # 8 training, # 9 curriculum ideology, and # 10 traditional Chinese medicine colleges.

The highest citation frequency is # 0 health literacy, with a citation frequency of 41. The second is traditional Chinese medicine, with a citation frequency of 36. The first two clusters are the key words of the study. The third is the research relationship between the health cultural quality of traditional Chinese medicine and # 2 humanistic quality, with a citation frequency of 25. The fourth is that the research object of Chinese medicine health culture literacy is mainly # 3 residents, and the frequency of citation is 21. The fifth is the research relationship between TCM health cultural literacy and # 4 TCM thinking. The frequency of citation is 19. The sixth is the research relationship between TCM health cultural literacy and # 5 communication, with a citation frequency of 16. The seventh is the high-frequency words with # 6 health culture as the research theme, with a citation frequency of 16. The eighth is the research relationship between TCM health cultural literacy and # 7 information literacy, with a citation frequency of 13. The ninth is the research relationship between TCM health cultural literacy and # 8 training, with a citation frequency of 13. The tenth is the research relationship between traditional Chinese medicine health cultural literacy and # 8 curriculum ideological and political education, with a citation frequency of 13.

It can be concluded from the analysis that the health cultural literacy of traditional Chinese medicine mainly focuses on the research of residents, and the humanistic quality, information literacy, and thinking of traditional Chinese medicine are important factors of the health cultural literacy of traditional Chinese medicine. The promotion and realization of the health cultural literacy depends on the dissemination of health culture, the development of curriculum ideological and political education, and the training of relevant personnel. Therefore, the improvement of residents' health cultural literacy of traditional Chinese medicine needs to focus on the development of each element and clarify the synergy between the elements.

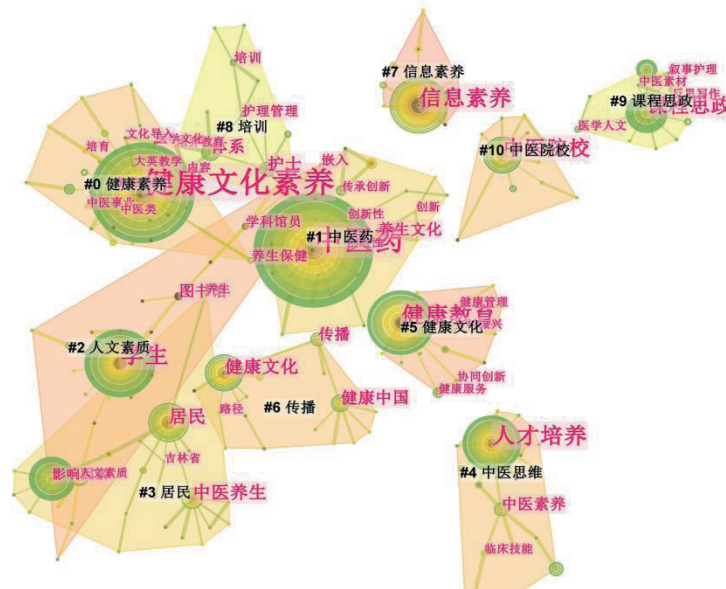


Figure 5. Cluster analysis of Chinese medicine health cultural literacy

Table 4. Top 10 details of Chinese medicine health culture quality cluster

| Cluster number | Literature volume | Contour value | year | Cluster label (research topic)    |
|----------------|-------------------|---------------|------|-----------------------------------|
| #0             | 41                | 0.955         | 2017 | Health literacy                   |
| #1             | 36                | 1             | 2017 | Traditional Chinese medicine      |
| #2             | 25                | 0.947         | 2016 | Humanistic quality                |
| #3             | 21                | 0.976         | 2017 | resident                          |
| #4             | 19                | 1             | 2017 | TCM thinking                      |
| #5             | 16                | 0.985         | 2017 | disseminate                       |
| #6             | 16                | 0.961         | 2017 | Health culture                    |
| #7             | 13                | 0.988         | 2015 | Information literacy              |
| #8             | 13                | 0.961         | 2018 | cultivate                         |
| #9             | 12                | 0.924         | 2019 | Ideological and political courses |

#### 4. Conclusion and deficiency

From the perspective of research institutions and authors, research institutions are mainly concentrated in the universities of traditional Chinese medicine in various regions, and there is a lack of academic cooperation between the authors of various institutions; From the perspective of high-frequency keywords, the research hotspots can be summarized into five topics: research on the influencing factors of TCM health culture literacy, research on the improvement of TCM thinking, research on the application of training and curriculum ideological and political, research on the dissemination of health culture, research on the improvement of information literacy and humanistic quality; From the perspective of development trend, the improvement of Chinese medicine health cultural literacy will comprehensively improve the residents' information literacy and humanistic quality in the future in the ideological and political direction of the curriculum. There are also shortcomings in this study: only the CNKI database is searched, and the literature of other domestic databases is not included in the study, which may make the final conclusion less convincing due to the lack of relevant literature; In addition, this study only summarizes the current research situation of Chinese medicine health culture literacy in China, and lacks comparative research with foreign countries, which is the direction for further improvement in future research.

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