

Analysis of Hot Spots and Trends of Medicinal Diet Management Research in China Based on Citespace

Chen Zhou^a, Suzhen Wang^{b,*}, Jun Yan^c, Yao Zhu^d
^ae-mail: 1623076573@qq.com, ^{*}corresponding author: 294108671@qq.com

^ce-mail: 236490624@qq.com, ^de-mail: 294108671@qq.com

Institute of Traditional Chinese Medicine and Health Development, Jiangxi University of Chinese Medicine, New District, Nanchang, Jiangxi Province, China

Abstract: CiteSpace software is used to visually analyze the literature related to medicinal diet management in CNKI, Wanfang and WeiPu to judge the current status, hot spots and trends in the field of medicinal diet management in China. It is found that there is a multidisciplinary research perspective in the field of medicinal diet management in China, and the breadth and depth of research content will change with time. In order to improve the promotion effect of medicinal diet on public health, it is recommended to strengthen the transformation of the results of medicinal diet management research, strengthen the identification of suitable groups of medicinal diet, and establish and improve the publicity and education of medicinal diet, so as to promote the healthy development of the medicinal diet industry.

Keywords: medicated diet management, CiteSpace, hot spot

1. Introduction

Traditional Chinese medicine diet refers to a special diet with unique color, fragrance, taste, shape and effect, which is prepared by combining different foods and drugs (traditional Chinese medicine) under the guidance of the theory of traditional Chinese medicine, using traditional and modern processing technologies, and is used for disease prevention and conditioning^[1]. It was mentioned in the Basic Requirements for the Preparation and Qualification of Chinese Medicinal Diet issued by the Chinese Medicinal Diet Research Association in 2010 that with the rapid development of the medical diet industry at home and abroad, there were confusion and irregularities in the preparation, operation and use of the medical diet industry market, which caused a great response from the society, and the relevant management departments were required to strengthen management^[2]. With the improvement of people's quality of life, people's concept of health care has been deepened, and their attention to medicated diet has also increased. In recent years, the number of articles about medicated diet has increased year by year, but no literature has been reviewed. In view of this, this paper mainly uses CiteSpace software to sort out and analyze the literatures related to medicated diet management in the databases of HowNet, Wanfang and WeiPu, and focus on the literatures related to medicated diet management, so as to provide reference for in-depth research in the field of medicated diet management in China.

2. Materials and Methods

2.1 Data sources

The data sources are CNKI, Wanfang and WeiPu. The CNKI search term is SU=medicated diet * (management+safety+cooking+medication), the Wanfang database search term is 'subject: ("medicated diet") and ("management" or "safety" or "cooking" or "medication") ', and the WeiPu search term is 'M=medicated diet AND (management OR safety OR cooking OR medication)'. The time range is from 2001 to September 30, 2022. A total of 839 articles in the Chinese general library were retrieved, In order to ensure the accuracy and effectiveness of the data, 161 valid journals were finally obtained by screening out conference papers, newspapers, documents that are obviously inconsistent with the theme and non authored documents.

2.2 Research method

CiteSpace is a bibliometric modeling software developed by Chinese scholar Dr. Chen Chao-mei. The structure, rule and distribution of the discipline knowledge field are presented by means of visualization, and the visualization graph obtained through analysis is called "scientific knowledge map" ^[3]. It is used to explore research hotspots, research frontiers, main authors and institutions in a certain field, and help predict the future development trend of a certain field. Export 161 retrieved Chinese documents in Refworks format, name them "download_.txt", import them into CiteSpaceV5.8.R3 software for data analysis and conversion, set the time parameter span from January 2001 to September 2022, set the time slice as one year, and select the default setting for other modules.

3. Results

3.1 Statistics of historical document volume

The change relationship between the number of papers published in a research direction and time is an important indicator to measure the development trend of the discipline, which is of great significance to analyze its future development trends and trends ^[4]. It can be seen from **Figure 1** that the number of sample documents presents a wave like change and an overall upward trend; Between 2001 and 2019, the number of documents fluctuated slightly, but the trend was unstable, indicating that the research was still in the stage of knowledge accumulation; In addition, from 2020 to 2021, the growth rate was the largest, and it was in the outbreak period of the study. It may be affected by the COVID-19. The use of traditional Chinese medicine diet was concerned by people, so scholars began to pay more attention to the management of medicine diet.

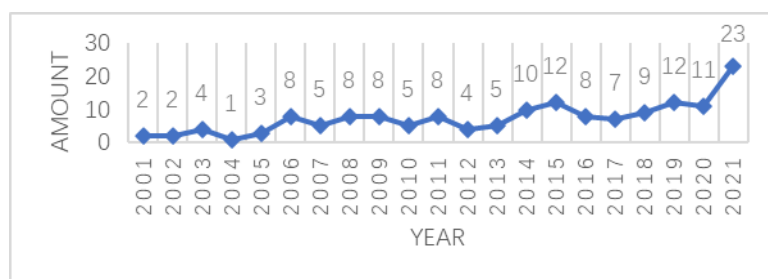


Figure 1 Distribution of document issuing time

3.2 Analysis of core authors and sending organizations

Through visual analysis of the author's sending, it is found that there are 198 nodes and 134 connections, which shows that the cooperation between authors is frequent. According to Price's Law, the formula for calculating the minimum number of documents issued by core authors is: $M_p = 0.749 \times N_{pmax}^{1/2}$, (M_p is the minimum number of papers published by core authors, and N_{pmax} is the number of papers published by the most prolific authors) [5]. The maximum number of papers published in the sample literature is 5, that is, $N_{pmax} = 5$, so $M_p \approx 1.67$ can be obtained. Therefore, the core authors are those with 2 or more papers. After calculation, the total number of core authors is less than half of the total number of all documents, and the core author group has not yet formed, indicating that the research level of scholars in this area is still insufficient.

Visual analysis of the sending agencies shows that there are 107 nodes and 20 connections, which shows that the cooperation between agencies is sparse. The five research institutions of the amount of papers issued are Hunan University of Traditional Chinese Medicine (10), Beijing University of Traditional Chinese Medicine (5), Nanjing University of Traditional Chinese Medicine (3), Chengdu University of Traditional Chinese Medicine (3) and Yangzhou University (3). It can be seen from the distribution of the number of sending institutions that most of the research institutions are schools and are located in cities with relatively developed economic levels in China.

3.3 Key word frequency statistics and its centrality

Keywords are highly generalized words of the article content. The higher the frequency and centrality of keywords, the more attention this node is paid to in the research field. CiteSpaceV software is used to draw the knowledge map of keywords in sample literature. The results show (visualization) that the visualized map contains 131 nodes and 253 lines. In order to more clearly show the research theme in the field of Chinese medicated diet management, this paper counts the top 10 high-frequency keywords and their centrality on the basis of the keyword knowledge map (see **Table 1**). Mediation centrality (CB) indicates the importance of nodes in the network, and $CB > 0.1$ indicates that the keyword is significant in the network [6]. The key words of $CB > 0.1$ are: medicated diet, prevention of disease and application.

Table 1 Key word frequency and its centrality statistics

Serialnumber	Keywords	Frequency	Centrality	Year
1	medicated food	12	0.55	2006
2	preventive treatment of disease	5	0.32	2015
3	traditional Chinese medicine diet	5	0.07	2009
4	law of medication	3	0.08	2021
5	application	2	0.30	2006
6	nutrition	2	0.07	2006
7	chronic disease	2	0.05	2019
8	health preservation	2	0.04	2018
9	medicated diet and dietotherapy	2	0.02	2012
10	traditional Chinese medicine	2	0.01	2021

3.4 Research hotspots

CiteSpace software was used for keyword co occurrence clustering to screen out the top 6 clusters. Cluster numbers are # 0 - # 5 (see **Figure 2**). Among them, the cluster tag number is inversely proportional to the cluster size, and the smaller the cluster tag is, the larger the cluster is ^[7]. According to the statistical results of keyword frequency and clustering in the previous article, combined with the content of relevant literature, this paper believes that the main research topics related to medicated diet management can be classified into four categories.

3.4.1 Research on current situation of medicated diet management

By studying the current situation of medicated diet management, we can understand the problems in the field of medicated diet management, so that scholars can put forward feasible suggestions in the field of medicated diet management, which can better promote the development of medicated diet industry. At present, the research on the current situation of medicated diet management in the existing literature includes the research on the preparation of medicated diet, medicated diet market and medicated diet management system. Sun Huijuan ^[8] investigated and analyzed the current situation of the steamed vegetable resources in Bozhou, providing reference for the steaming process and the quality standard of mint steamed vegetables. The investigation of the current situation of medicated diet market can understand the problems existing in the development of medicated diet industry. Xia Xinbin et al. ^[9] believed that there was no clear quality standard for the Chinese medicine diet industry, and pointed out that it was necessary to draw on the current world food and drug certification system to develop a certification system that was consistent with the Chinese medicine theory. Ding Xingxing et al. ^[10] investigated the cognition and demand of 320 elderly patients with chronic diseases for medicated diet therapy, and found that elderly patients with chronic diseases have a strong interest in traditional Chinese medicine diet therapy, a high degree of acceptance, and a wide range of needs. The construction of medicated diet management system is inseparable from the training of talents. Liu Yan et al. ^[11] believed that the teaching reform of medicated diet course for cuisine majors could consolidate students' basic theoretical knowledge, enable stu-

dents to quickly master the characteristics and application methods of medicated diet raw materials, which is conducive to the combination of theoretical knowledge and practice.

3.4.2 Management of medicated diet and medication

Medicated diet is different from ordinary diet. When applying it, we should pay attention to the nature and taste of Chinese medicine, and the principles of material selection, compatibility, processing, cooking and application of medicated diet. The important characteristics of medicated diet are dialectical treatment, diet based on syndrome, and emphasis on time, place and person. The research results of Luo Lijuan ^[12] show that dialectical diet combined with self-management can improve the situation of malnutrition patients with hepatitis B cirrhosis of liver kidney yin deficiency type. Xiang Ming et al. ^[13] summarized the common irrational use of medicine in Wenli medicated diet, and proposed suggestions on collocation taboos, dietary taboos, material selection and appropriate dosage of Wenli medicated diet. Hua Bichun ^[14] elaborated on the characteristics of safe and rational use of traditional Chinese medicine diet, and summarized and understood the safe and rational use of different types of medicine diet, such as table medicine diet, heat clearing medicine diet, and dampness removing medicine diet.

3.4.3 Medicated diet management based on prevention of disease

With the development of economy, the public's demand for life is no longer just for food and clothing, but also for prevention and health care. To prevent disease is to take preventive or therapeutic measures to prevent the occurrence of disease. Li Jiachuan et al. ^[15] reviewed the way in which Chinese medicine was applied to the diagnosis and treatment of COVID-19 in various regions, and summarized the law of preventive drug use. Wu Chengqi ^[16] believed that medicated diet nutrition and dietotherapy had great potential for disease prevention, and there were many things to pay attention to in the process of medicated diet from farmland to table. Wang Chunling ^[17] believed that the application of authentic medicinal materials to prevent disease has the advantages of high nutritional value, good clinical effect and few adverse reactions. Wang Jingqi et al. ^[18] studied the rule of cough medicated diet on the basis of objective data based on the idea of preventing disease, established a database of traditional Chinese medicine medicated diet, and standardized the treatment of cough medicated diet.

3.4.4 Construction of medicated diet management system

With the rapid development of Internet plus, the informatization of medicated diet management is also gradually improving. The medicated diet management platform based on Internet plus technology has a broad development prospect. In the aspect of traditional Chinese medicine diet management, more and more scholars have studied how to use the network design information platform to reasonably intervene the diet of patients and the general population. Some studies have shown that TCM dietotherapy management information system can effectively improve the BMI and nutritional status of patients after surgery ^[19], and improve the health level of the public. Jiang Huijuan et al. ^[20] used the Internet technology to build the detailed process of medicated diet prescription map database, providing data support and technical guidance for in-depth research on medicated diet prescriptions. Zhou Zhou et al. ^[21], based on the nine kinds of constitution questionnaires of people, made the public deeply understand and correctly use medicated diet through games. Yang Daimei ^[22], Liu Hao ^[23] and

others have built a TCM nutrition diet management system in combination with the Internet of Things to provide users with health knowledge services.



Figure 2 High frequency keyword clustering analysis

3.5 Research frontier

Use the "timeline view" function to get the keyword clustering knowledge map as shown in **Figure 3**. The vertical axis is the cluster number, and the horizontal axis is the year when the literature was published. The map can show the start and end time of a cluster theme and the keywords contained in a cluster. According to the clustering results in **Figure 3** and the policies issued by the state, the research trends in the field of medicated diet management in China mainly include the following aspects:

(1) Medication management of medicated diet and dietotherapy. Most of the raw materials in medicated diet come from the list of homologous substances of medicine and food stipulated by the state. The General Rules for the Standards of Medicinal Diet with Medicinal and Food Sources issued in 2016 put forward the application principles and taboos of medical diet with medical and food sources, further standardized the product classification of common medical and food sources, integrated and improved some existing standards, and defined the concept category of medical diet with medical and food sources. With the national regulation of medicated diet, many documents will mention the regulation and support of medicated diet. This research direction is gradually concerned by scholars and will become the mainstream of future development. (2) Medicated diet for prevention of disease and health preservation can improve the quality of life. With the progress of modern society and the development of economy, people have higher requirements for the quality of life. Some scholars have studied how to improve people's quality of life and prevent diseases through health care medicated diet. It will also become a new trend for the development of medicated diet management industry to strengthen the management of medicated diet and health preserving medicated diet for the prevention of disease, so as to improve the quality of life of the public. (3) Research on Internet medicated diet management platform. "Internet plus health care" is widely concerned in the field of public health. Many scholars use data analysis and Internet technology to design medicated diet health care platform, which can not only meet the health care needs of the public, but also contribute to the spread of traditional Chinese medicine diet.

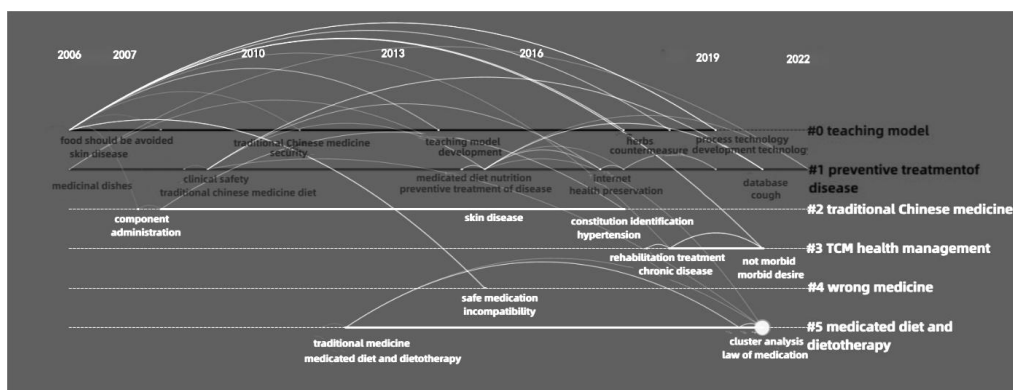


Figure 3 Time atlas of high-frequency keyword

4. Conclusions

From the time of issuance, the number of documents related to the management of medicated diet in China is generally on the rise. The continuous increase in the number of documents may be due to the influence of the continuous updating of the Catalogue of Materials that are traditionally both food and traditional Chinese medicine. The continuous updating of the catalogue also proves that the country attaches great importance to the management of materials from the same source of medicine and food and medicated diet. However, in terms of the overall number of documents issued, the number of documents issued is still small, which proves that the field is still in the exploration stage and there is still room for exploration and development.

Combating the research hotspots and research trends of medicated diet management in China through visual knowledge atlas can provide corresponding enlightenment for the research of medicated diet management in China: from a macro perspective, there is a research trend of multidisciplinary integration in the research field of medicated diet management in China, such as integration with medicine, psychology, economics, sociology, management, etc., which provides a multi-dimensional perspective for the field of medicated diet management in China, Promote the development of medicated diet industry in China. From a micro perspective, the research on medicated diet management in China tends to be empirical research, and the research content will change with the change of policies and the development of society, which can further meet the needs of people for the use of medicated diet.

4.1 Suggestions

4.1.1 Strengthen the transformation of research results of medicated diet management to ensure the safety of medicated diet for the public

In 2016, the State Council issued the Outline of the Strategic Plan for the Development of Traditional Chinese Medicine (2016-2030) [24], which clearly proposed to systematically carry out the research and formulation of the standards for the prevention of disease, the standards for the preparation of medicated meals and the standards for health care products of traditional Chinese medicine, so as to ensure the safety of the public. Therefore, we should build a sound

regulatory system for medicated diet, strengthen the administration of medicated diet medication, standardize the business environment of related industries, and ensure the safety of medicated diet medication for the public. From the above analysis, it can be concluded that the transformation of research achievements in medicated diet management is insufficient, and there are relatively few policies related to medicated diet management at present. It is suggested that the relevant government regulatory departments should improve the transformation rate of scientific research achievements and apply the scientific research achievements to practice.

4.1.2 Strengthen the research on the population suitable for medicated diet and improve the health promotion effect of medicated diet

Constitution, to a certain extent, reflects the rise and fall of the healthy and evil qi in the body, and is the fundamental reason for the occurrence of disease and the various differences in the course of disease. Different biased constitutions can be adjusted with corresponding biased traditional Chinese medicine, which is called deviation correction. Different people with different constitutions correspond to different suitable medicated diets. Therefore, the preparation of medicated diets must be determined according to the drug properties and physical characteristics of the human body. If improperly eaten, it will not only fail to correct the constitutional bias, but also be counterproductive. It can be concluded from the previous analysis that the number of research literature on medicated diet suitable for people with different physiques is small at present, and the research on medicated diet suitable for people with different physiques can be strengthened in the future to improve the health promotion effect of medicated diet.

4.1.3 Establish and improve the publicity and education of medicated diet to promote the healthy development of medicated diet industry

With the increasing attention of the public to medicated diet, there are many medicated diet products on the market, but the public has no ability to distinguish medicated diet products. It is suggested to organize public welfare activities to publicize common sense of medicated diet; Set up medicated diet and dietotherapy courses, strengthen the basic theory research and popularization of medicated diet core content, and cultivate professional medicated diet practitioners; Pass on the reasonable concept of diet and medicated diet to the public through a variety of new media channels, improve the public's awareness of diet and medicated diet, guide the public to accept and correctly eat medicated diet, strengthen the public's consumption behavior on medicated diet, and publicize the health concept; Improve the compilation and translation quality of medicated diet related books, guide foreign people to understand the concept of traditional Chinese medicine health preservation, make medicated diet health preservation culture enter the international market, and boost the healthy development of medicated diet industry.

Acknowledgments

Innovation and Entrepreneurship Training Program for College Students of Jiangxi University of Traditional Chinese Medicine (202210412552)

References

- [1] Xie Mengzhou Traditional Chinese Medicine and Diet [M] Traditional Chinese Medicine and Diet, 2013
- [2] Chinese Medical Diet Research Association [EB/OL] [2022/9/16].<https://www.chinayaoshan.com.cn/article.html?id=1359160075940982785>.
- [3] Chen Yue, Chen Chaomei, Liu Zeyuan, et al Methodological functions of CiteSpace knowledge map [J] Science of Science Research, 2015, 33 (02): 242-253
- [4] Li Nan, Huang Wei, Guo Mengying, et al A comparative study on the combination of medical care and nursing care at home and abroad - knowledge map analysis based on literature from 2010 to 2019 [J] Modern Chinese Medicine, 2020, 22 (05): 795-799
- [5] Zhang Ziting, Zheng Yanning, Yuan Fang Research on multi index core author identification method [J] Modern Intelligence, 2020, 40 (07): 144-151
- [6] Kadirya Nasir, Gulibahar Kader, Guo Zhilong, etc Qualitative investigation on the change of health service utilization of grassroots medical institutions in rural Xinjiang under the background of "targeted assistance" [J] Occupational and Health, 2021,37 (07): 975-979
- [7] Tao Min CiteSpace based review of China's smart elderly care research [J] Science and Technology Entrepreneurship Monthly, 2022,35 (02): 157-162
- [8] Sun Huijuan Preliminary Study on the Processing Technology and Quality Standard of Medicinal Diet Mint Steamed Vegetable [D] Anhui University of Traditional Chinese Medicine, 2020
- [9] Xia Xinbin, Yang Yong, Wu Yubing, et al Discussion on the current situation of certification management of traditional Chinese medicine diet food [J] Food and Machinery, 2018, 34 (08): 207-210
- [10] Ding Xingxing, Dong Xiaoyue, Yang Huanzan Investigation on cognition and demand of traditional Chinese medicine diet and dietotherapy for elderly patients with chronic diseases and analysis on management countermeasures [J] Journal of Traditional Chinese Medicine Management, 2022,30 (03): 63-65
- [11] Liu Yan, Yang Jianting Teaching reform of medicated diet course for cuisine majors in application-oriented colleges and universities [J] Education and Teaching Forum, 2014 (09): 34-35
- [12] Luo Lijuan Observation on the effect of syndrome differentiation diet combined with self-management on malnutrition patients with hepatitis B cirrhosis due to liver kidney yin deficiency [D] Hunan University of Traditional Chinese Medicine, 2021
- [13] Xiang Ming, Xie Mengzhou, Zhang Shuihan, et al On the edible safety of Wenli medicated diet [J] Journal of Hunan University of Traditional Chinese Medicine, 2015,35 (12): 34-35
- [14] Huabichun on the Safety and Rational Application of Traditional Chinese Medicine Diet [J] Guangming Traditional Chinese Medicine, 2009, 24 (02): 339-341
- [15] Li Jiachuan, Li Siying, Gu Jian, et al Review and thinking on the prevention of novel coronavirus pneumonia by traditional Chinese medicine based on the theory of "prevention of disease" [J] Traditional Chinese Medicine, 2021,44 (04): 1021-1030
- [16] Wu Chengqi Analysis on the development prospect of "authentic medicinal materials" used in medicated diet nutrition to "prevent disease" [J] China Modern Drug Application, 2014,8 (09): 223
- [17] Wang Chunling Analysis on the application prospect of "authentic medicinal materials" in the "prevention of disease" of medicated diet nutrition [J] Strait Pharmacy, 2015,27 (06): 210-211
- [18] Wang Jingqi, Zhang Yajun, Li Chen, et al Based on the theory of "preventing disease", explore the rule of drug use of traditional Chinese medicine diet in treating cough [J] Journal of Inner Mongolia Medical University, 2021,43 (05): 471-475

- [19] Zhu Xinjia, Chen Ying, Tao Yaping Application of TCM dietotherapy management information system in postoperative rehabilitation [J] Journal of Traditional Chinese Medicine Management, 2021,29 (20): 187-188
- [20] Jiang Huijuan, Guo Wenlong Design and optimization of medicated diet diagram database based on Neo4j [J] Journal of Central University for Nationalities (Natural Science Edition), 2019, 28 (03): 48-55
- [21] Zhou Zhou, Cai Yufei, Yan Mengying, et al Design and Development of Medicated Diet Health Science Popularization System Based on Android [J] Wireless Internet Technology, 2019, 16 (21): 32-35
- [22] Yang Daimei, Qiu Jia Design of three-dimensional health care intervention service platform based on the Internet of Things [J] Enterprise Science and Technology and Development, 2020 (01): 51-52
- [23] Liu Hao, Zhang Hong, Liu Kunjing Construction and Practice of TCM Nutritional Diet Management System [J] Chinese Journal of Health Information Management, 2021,18 (06): 769-773
- [24] Chen Huiling, Cai Li, Li Ning, et al Experience and enlightenment of food emergency management in Wuhan under the novel coronavirus pneumonia epidemic -- analysis based on contingency theory [J] Journal of Zhejiang Agriculture, 2021,33 (05): 923-931