

Research Status and Trends of Traditional Chinese Medicine Therapeutic Formulae for Coronary Heart Disease Scientometrics Research

Mi Zhou¹, Jieyun Li¹, Xinang Xiao¹, Jiekee Lim¹, Zhikui Tian², Dongjun Wang³, Naijin Zhang⁴, Zhaoxia Xu^{1,5}

¹College of Traditional Chinese Medicine, Shanghai University of Traditional Chinese Medicine, Shanghai, 201203, People's Republic of China; ²College of Rehabilitation Medicine, Qilu Medical University, Zibo, 255000, People's Republic of China; ³College of Traditional Chinese Medicine, North China University of Science and Technology, Tangshan, 063210, People's Republic of China; ⁴College of Public Health and Health Sciences, Tianjin University of Traditional Chinese Medicine, Tianjin, 301617, People's Republic of China; ⁵Shanghai Key Laboratory of Health Identification and Assessment, Shanghai, 201203, People's Republic of China

Correspondence: Zhaoxia Xu, Shanghai University of Traditional Chinese Medicine, 1200 Cailun Road, Pudong New Area, Shanghai, 201203, People's Republic of China, Email zhaoxia7001@shutcm.edu.cn

Aim of the Study: This study analyzes research on TCM formulae in CHD over the past 30 years, using VOSviewer and CiteSpace. It aims to highlight key trends and hotspots in the field.

Materials and Methods: The core database of Web of Science was collected, and the search time range was from the establishment of the database to the present (August 2023) for the literature related to the study of TCM prescriptions in CHD, and the information on the number of literature, countries, journals, authors, institutions, keywords were summarized by applying the software VOSviewer and CiteSpace.

Results: A total of 135 kinds of literature were included. The number of published journal papers on research on TCM therapeutic formulae for CHD showed an upward trend; China was the most prolific country in this field; the largest number of papers were published in Evid Based Complement Alternat Med, MEDICINE; the average number of citations for authors and institutional analysis revealed that Xu Hao of China Academy of Traditional Chinese Medicine, Mao Jingyuan of Tianjin University of Traditional Chinese Medicine, and Shang Hongcai of Beijing University of Traditional Chinese Medicine constituted the core team of researchers studying the study of TCM formulae for CHD; the keyword analysis suggests that there are mainly 42 specifically named TCM formulae for the treatment of CHD, which are classified into a total of 7 major categories, and the research direction is mainly in the clinical efficacy study of different TCM therapeutic formulae and other aspects.

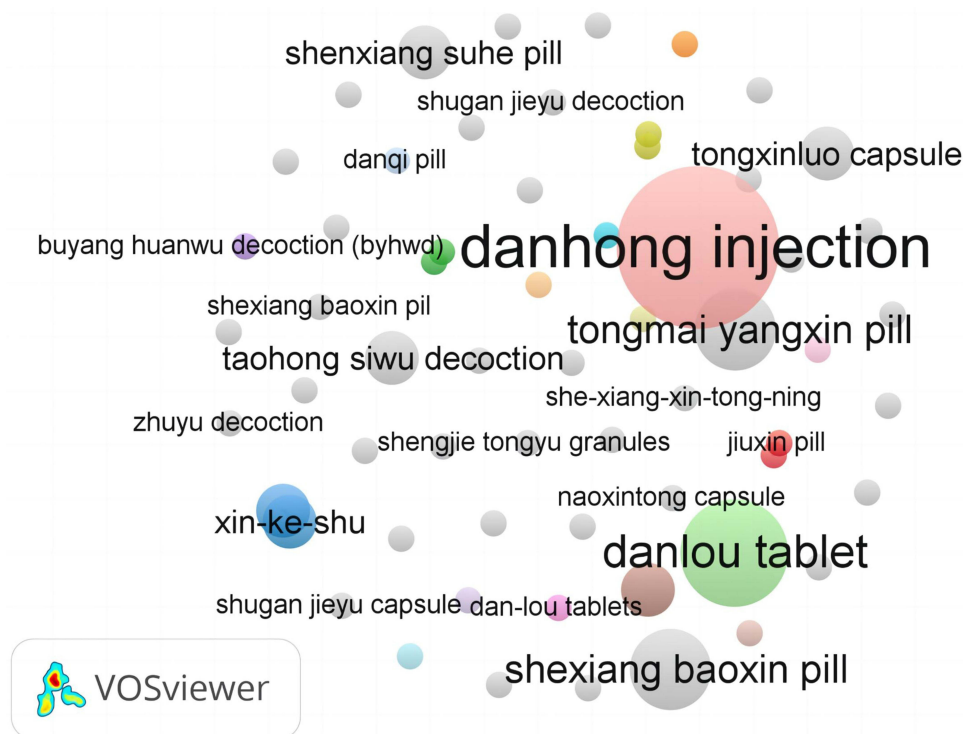
Conclusion: This study shows that there are more types of TCM therapeutic formulae for CHD, and the related research has a good prospect. It is foreseeable that more relevant research results will rely on the study of network pharmacology, signalling pathways, and action targets of TCM therapeutic formulae.

Keywords: coronary heart disease, Traditional Chinese Medicine, therapeutic formulae, scientometrics

Introduction

Coronary heart disease (CHD, abbreviated as coronary heart disease), is a heart disease that causes myocardial ischemia and hypoxia due to the obstruction of blood circulation supplying the heart as a result of the hardening of coronary arteries, which is divided into two categories: acute coronary syndromes and chronic coronary heart disease.¹ The China Cardiovascular Health and Disease Report 2020 Summary reported that the number of patients with coronary heart disease in China is now about 11.39 million, with a gradually increasing incidence rate and a trend of rejuvenation,² which has brought a heavy burden to patients and public healthcare. Despite significant improvements in treatment outcomes in recent decades, CHD remains a leading cause of morbidity and mortality worldwide. The United States spends an estimated more than \$200 billion annually on medical services, and drug losses. Much of this is attributable to

Graphical Abstract



the poor implementation of prevention strategies and the fact that many adults have uncontrolled risk factors for CHD.³ In recent years, TCM has demonstrated the advantages of evidence-based treatment and individualised treatment in the diagnosis and treatment of CHD and has achieved good clinical results.¹ Although TCM therapeutic formulae have been developed in CHD research, the literature is redundant and the overall research lacks systematic sorting, so there is an urgent need to summarise and analyse the relevant research literature in this field. Knowledge graph is an important research field of artificial intelligence, the essence is to construct and store the correlation of different types of data, using graph networks to represent knowledge and its attributes and associations, which can characterise complex knowledge structures and associations to a certain extent, and is particularly suitable for the knowledge characteristics in the field of TCM.⁴ In this study, VOSviewer (1.6.19) and CiteSpace (6.2.R4) were used to sort out the literature in the field of TCM therapeutic formulae for CHD in the past thirty years and make visual system analysis, which is conducive to a better cognition of the process of the development of the discipline and the overall structure, and provides reference and guidance for the subsequent research in this field.

Materials and Methods

Literature Search and Strategies

The Clarivate Analytics Web of Science Core Collection (WoSCC) of the Science Citation Index Expanded (SCI-Expanded, 1992-present) is one of the most authoritative and comprehensive databases across disciplines, containing a wide range of scholarly journals and literature, and is widely used as a bibliometric research data sources.⁵ This study searched the database Web of Science core database. The search subject terms TS=(“Coronary Heart Disease” OR “Coronary Diseases” OR “CHD” OR “coronary artery disease” OR “CAD”) AND (“curing” OR “observation of therapeutic effects”) were searched. To ensure accuracy and consistency, two researchers conducted independent searches from the time of library construction to the present (2nd August 2023), and a total of 22, 886 documents were retrieved.

Inclusion criteria: ①Clinical efficacy studies of TCM prescriptions using specific names for the treatment of CHD;② Complete information on clinical data. Exclusion criteria: ①animal experiments; ②literature review, experience summary, pathological mechanism category; ③no specific TCM prescription treatment, such as the use of Western medicine, acupuncture, massage, etc.; ④duplicated published literature. After the selection and preservation of publication titles, authors, keywords, citations, journals, institutions, references and other data, a total of 135 valid studies from 1993–2023 were obtained.

Data Normalisation

Export the incorporated documents in “tab-delimited file” format and name them in “savedrecs” format. If the name of an organisation has been used inconsistently at different times, normalise it to the current official name.

Research Methods

VOSviewer software version 1.6.18 was used for creating the bibliometric network; CiteSpace software (6.2.R4) was used for the timeline of keyword analysis. The collated documents were entered into the software, and the time parameter was set to 2009–2023 because the 1st document with the study of TCM therapeutic formulae for CHD was dated 2009; the thresholds of the study analysis parameters were all set to 2 because of the general period; next, data were summarised and analysed using Microsoft Excel 2019. In this study, the search features of TCM therapeutic formulae for CHD included the year of publication, country, journal core authors, institutions, and distribution of keywords. In a network visualization graph, nodes form clusters, clusters are characterized by colours, lines and numbers, different clusters have different colours, large circles indicate that the term is more important, tighter clusters indicate strong relationships, a line connecting two items indicates a connection and a thicker line indicates a stronger correlation. A free online platform (<https://www.mapchart.net/>) was used to map these countries.

Results

Overview of Annual Publication of Literature

A total of 135 articles were included in this study. Over the past 30 years, the literature on TCM therapeutic formulae for CHD has been rising in fluctuation (Figure 1), and according to the growth trend, the growth equation $y=1.593x-3203.176$, $R^2=0.648$ ($R^2<0.7$, the model fit is not high enough), which indicates that the literature growth is stable and in a linear growth pattern. Specifically, it can be divided into the following 3 stages: ①The first appearance of research literature related to TCM therapeutic formulae for CHD was in 2009, and a total of 7 articles were published during the 4

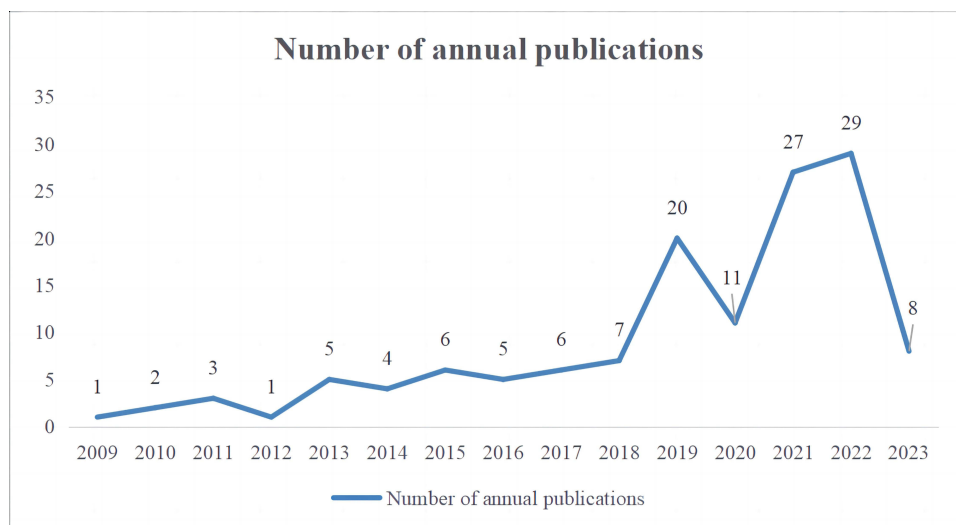


Figure 1 Number of annual publications involving research on CHD in TCM therapeutic formulae.
Abbreviation: TCM, Traditional Chinese Medicine.

years of 2009–2012, with an average of fewer than 2 articles per year, and the growth of the literature was basically in a state of stagnation; ② 33 articles were published during the 6 years of 2013–2018, with an average of 5 articles per year, and the number of published articles was in a stable growth trend, of which the largest number of articles was 7 in 2018;③from 2019 to 2023, a total of 95 documents were published during the period, with an average of 19 articles per year, showing a significant growth trend. Among them, the number of articles published in 2022 is 29 accounting for 21.5% of the total number of articles published during the past 30 years.

Global Network Analysis

We analyzed the global and regional characteristics of the research on TCM therapeutic formulae for CHD. The results showed that among the 10 countries that published articles in this field, the vast majority of papers were from China (N=129, Total citations=1025, Average citations=7.95), followed by the United States (N=10, Total citations=106, Average citations=25.10), Iran (N=3, Total citations=106, Average citations=35.33), and the highest number of citations per paper was in Australia (N=1, Total citations=77, Average citations=77). The research on TCM therapeutic formulae for CHD was mainly distributed in Asia, North America, Europe, and Australia, as shown in Figure 2.

To analyze the journals for research on TCM therapeutic formulae for CHD, the number of papers, JCR partition, IF (impact factor) and other characteristics of the journals were recorded and quantified. According to the data analysis, the literature related to the study of TCM therapeutic formulae for CHD published from 2009 to 2023 was distributed in 51 different journals, with Evid Based Complement Alternat Med (N=18) and MEDICINE (N=18) publishing the most papers in this field, as shown in Figure 3.

Author Analysis

A total of 884 authors were involved in the publication of papers on the study of TCM therapeutic formulae for CHD. Most of the most prolific authors were from China. Xu Hao ranked first with 4 papers. Meanwhile, Mao, Jingyuan has published fewer papers (N=3), but his average citation is as high as 17.67. Figure 4 shows the results of analysing the collaborative network between authors who have published at least 2 papers. The research on TCM therapeutic formulae for CHD shows dispersed characteristics and a trend of regional dispersion.

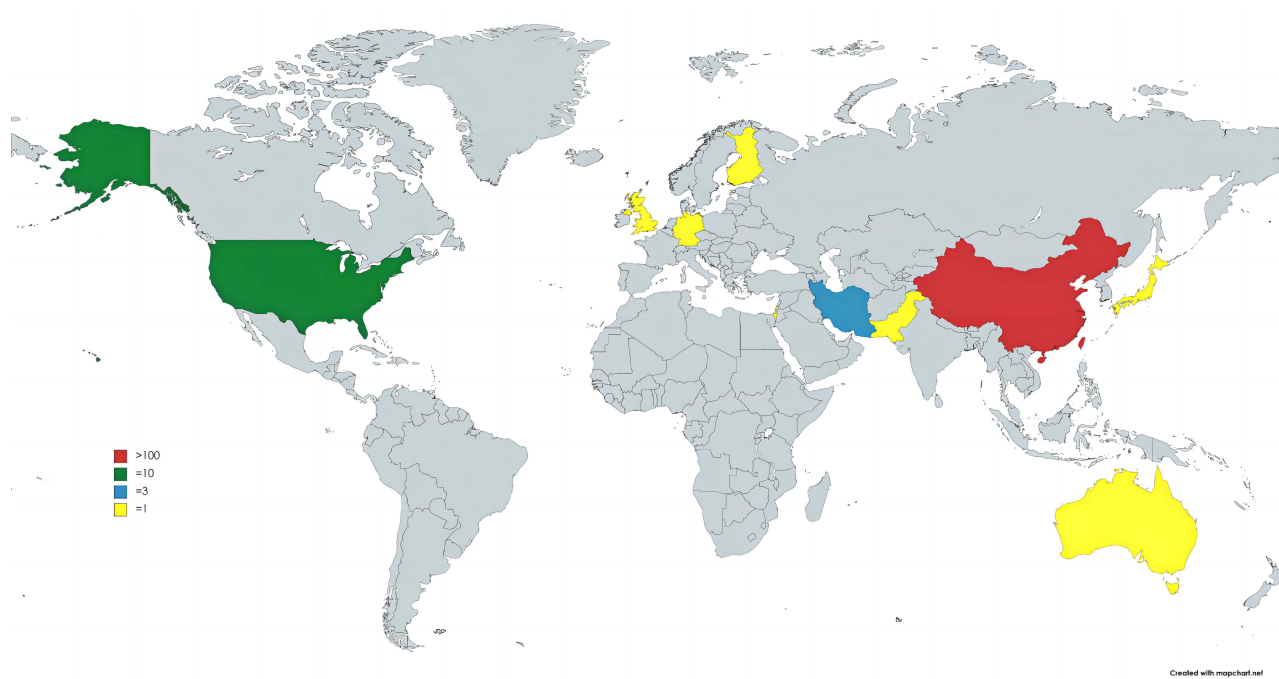


Figure 2 Global distribution of research on TCM prescriptions treatment for CHD.

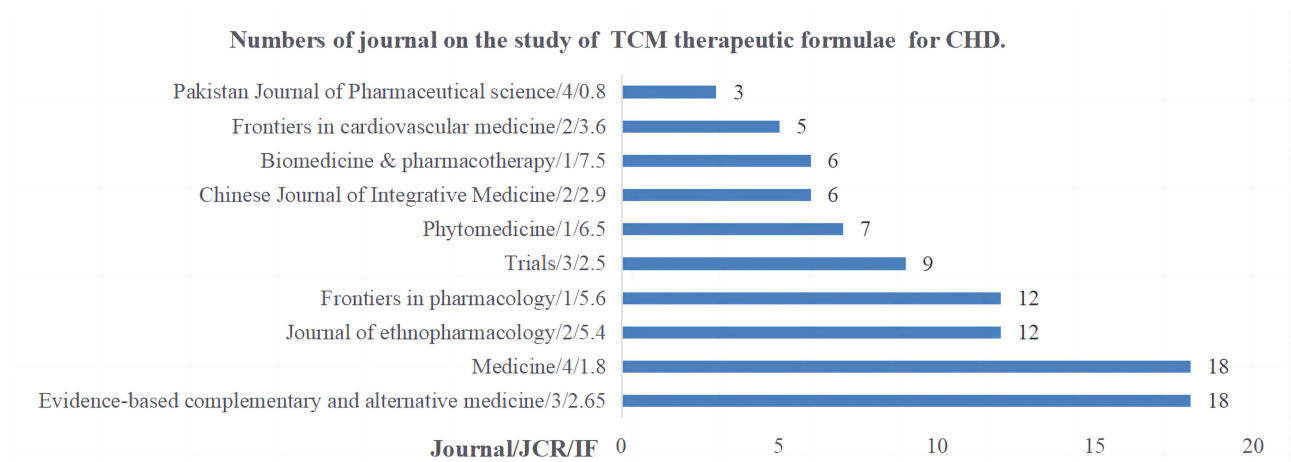


Figure 3 Numbers of journal on the study of TCM therapeutic formulae for CHD.

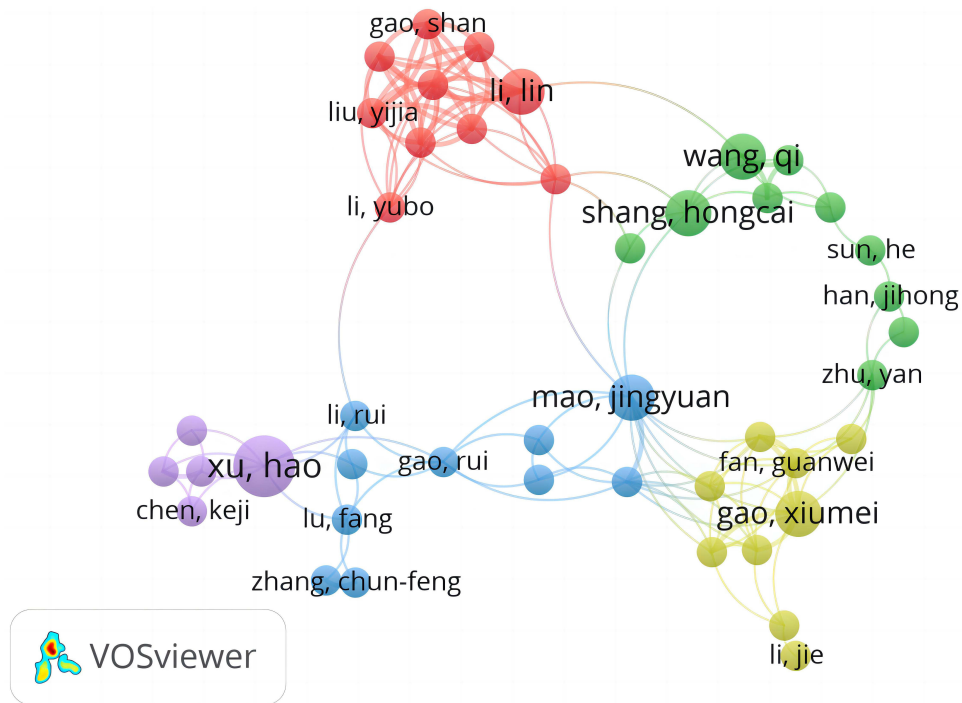


Figure 4 Visualization map of the collaborative network of authors in TCM prescriptions treatment studies of CHD.

Visual Analysis of Research Institutions' Cooperation

The mapping of institutional collaboration is shown in (Figure 5.), with a total of 205 institutions participating in the publication of research papers on TCM therapeutic formulae for CHD. Among the top 9, the institution with the highest productivity was Beijing University of Traditional Chinese Medicine(BUTCM)(N=22), followed by Tianjin University of Traditional Chinese Medicine(N=19) and China Academy of Traditional Chinese Medicine(N=15). The top 10 universities are all Chinese universities. Inter-institutional cooperation is mainly dominated by TCM universities, but there is a lack of communication and cooperation between institutions and less cooperation across geographical spaces.

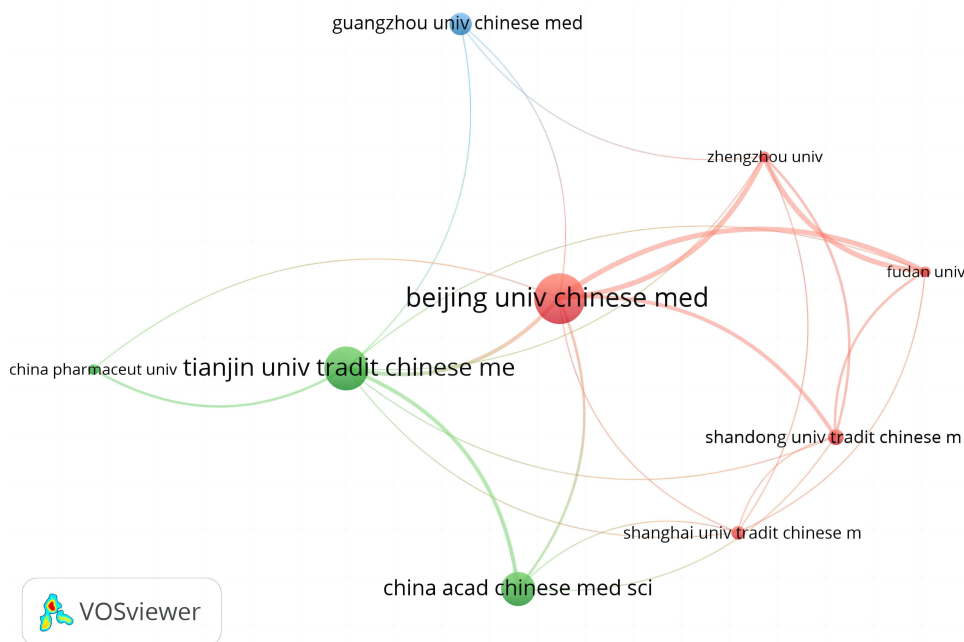


Figure 5 The organizations cooperation network related to TCM prescriptions treatment research for the CHD.

TCM Therapeutic Formulae Keywords

TCM Therapeutic Formulae Keyword Timeline Plots

Overlay visualisation timeline maps of keywords were generated using Citespace software to explore the occurrence of TCM therapeutic formulae for CHD research over time. Based on the clustering results, the historical evolution of TCM therapeutic formulae for CHD research over 30 years is visible. The horizontal coordinate of the graph is the timeline and the vertical coordinate on the right side is the cluster name. From [Figure 6](#), it can be seen that the TCM therapeutic formulae for CHD research has continued to the present day, and the main content of the research is the correlation analysis of the formulae such as “danhong injection”, “danlou tablet”, “taohong siwu decoction”, “xinkeshu” and so on.

TCM Therapeutic Formulae Keyword Clustering

Among the 744 keywords, a total of 42 specific TCM formula names with a frequency of at least 1 time were retrieved, which were classified according to their specific efficacy as shown in [Figure 7](#).

Discussion

TCM formulae have good efficacy in clinical diagnosis and treatment and play an important role in the treatment of CHD. Through dialectical treatment, not only can we judge the current disease type of the disease, but also reflect the trend of the disease, which can effectively guide the clinical use of medication, for example, cardiovascular and blood stasis and obstruction, qi stagnation and blood stasis, phlegm and turbid obstruction, cold condensation of the heart veins, qi deficiency and blood stasis, qi and yin deficiency, cardiac and renal deficiency, cardiac and renal yang deficiency, and so on, the corresponding different patterns of different TCM formulae used.⁶ In this paper, the current research status and hotspot dynamics in the research field of TCM therapeutic formulae for CHD were objectively analysed using knowledge mapping software. The results showed that the literature related to TCM therapeutic formulae for CHD began to appear in 2009. In the past 10 years, the annual increase of related literature became larger ([Figure 1](#)).

The number of publications is an important indicator of the level of relevant scientific research in a country or institution.⁷ Country analyses showed that China published the largest number of papers in the study of TCM therapeutic formulae for CHD ([Figure 2](#)), indicating that China has a great influence in this field. Determining the importance of journals provided researchers with reliable reference information and identified target journals for their literature search

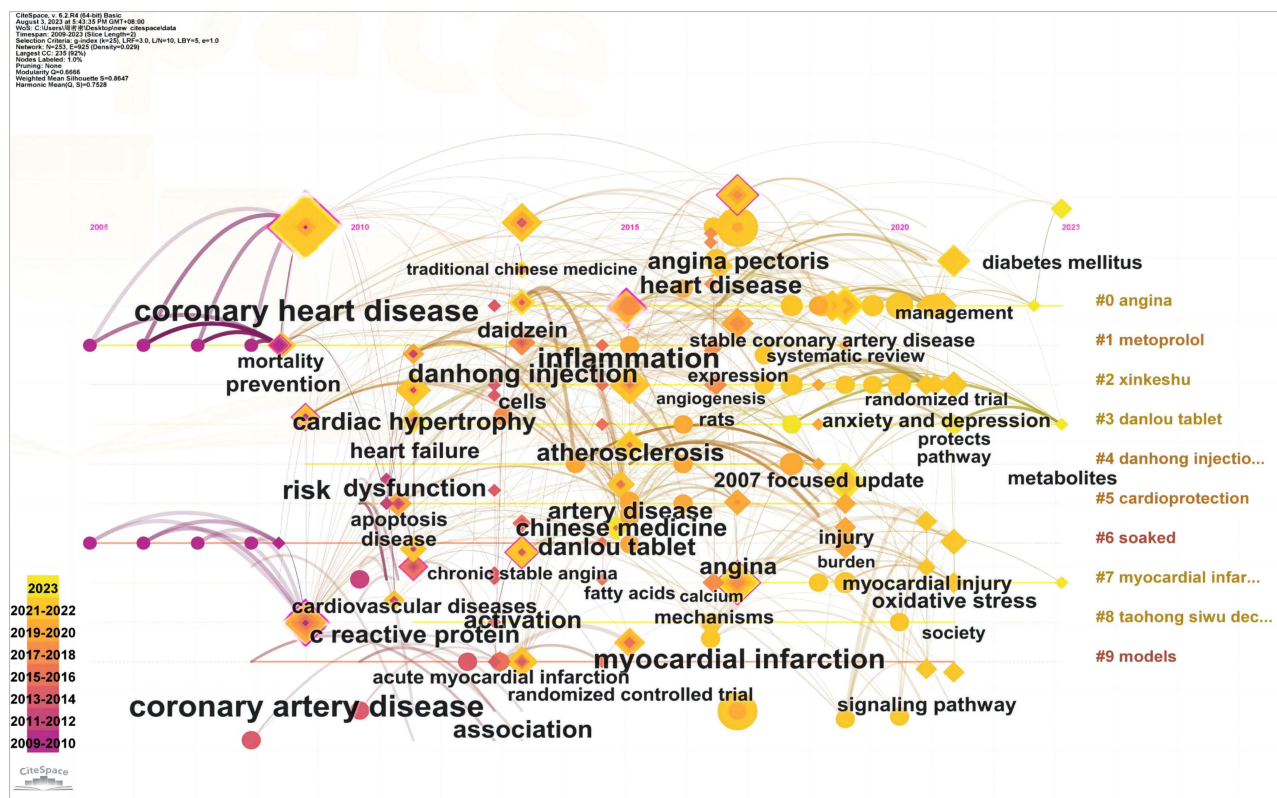


Figure 6 Network visualization map of the timeline of co-citation keywords in the field of TCM prescriptions treatment research for the CHD.

and submission.⁸ The results showed that out of the 51 journals involved in this study, most of them were in biology, TCM and pharmacology as shown in Figure 3. Our results showed that Evidence-based complementary and alternative medicine, Medicine journals published the highest number of papers, which suggests that most of the articles related to TCM therapeutic formulae for CHD will be considered for publication in this journal. In the author analysis, among the 884 authors who published papers related to TCM therapeutic formulae for CHD, Xu Hao published the most literature (Figure 4). In addition, Mao Jingyuan, Gao Xiumei, and Fan Guanwei were very closely related and published a large amount of literature on group collaboration (Figure 4).⁹ Notably, although Mao Jingyuan published less than 5 papers, they have an average of 17.67 citations, highlighting the importance of the articles in the field. Collaboration visualisation mapping shows that there are currently five representative author teams in this research area, so we believe that these top teams will publish representative papers in this field through enhanced collaboration. Xu Hao's team focused on the clinical application of TCM in CHD, for example, using a multicentre RCTs to evaluate the efficacy of Qing-Xin-Jie-Yu Granules for the treatment of stable CHD patients,¹⁰ a systematic review of Compound Danshen Dripping Pill for the treatment of CHD,¹¹ the safety of GXN tablets in combination with aspirin for the treatment of CHD,¹² and a review of oral Panax notoginseng Preparation for the treatment of CHD;¹³ Gao Shan and Li Lin's team explored to identify the molecular target and mechanism of Dan-Lou tablets (DLT) for the treatment of CHD, and explored the role of DLT in the inhibition of foam cell formation and anti-inflammatory effect of RAW 264.7 macrophages;^{14,15} Shang Hongcai's team summarised and analysed the outcome indicators of RCTs of TCM for the treatment of congestive heart failure due to CHD, and subsequently identified problems and tried to propose solutions;¹⁶ Mao Jingyuan's team, on the basis of previous research on the phlegm-heat-sludge syndrome model of CHD, further verified the effectiveness of the heat-removing and phlegm-reducing formulae in treating the phlegm-heat-sludge syndrome model of CHD;¹⁷ Gao Xiumei's team found that the combination of Compound Danshen dripping pill (CDDP) and warfarin would be a promising alternative for CHD in patients with atrial fibrillation.¹⁸

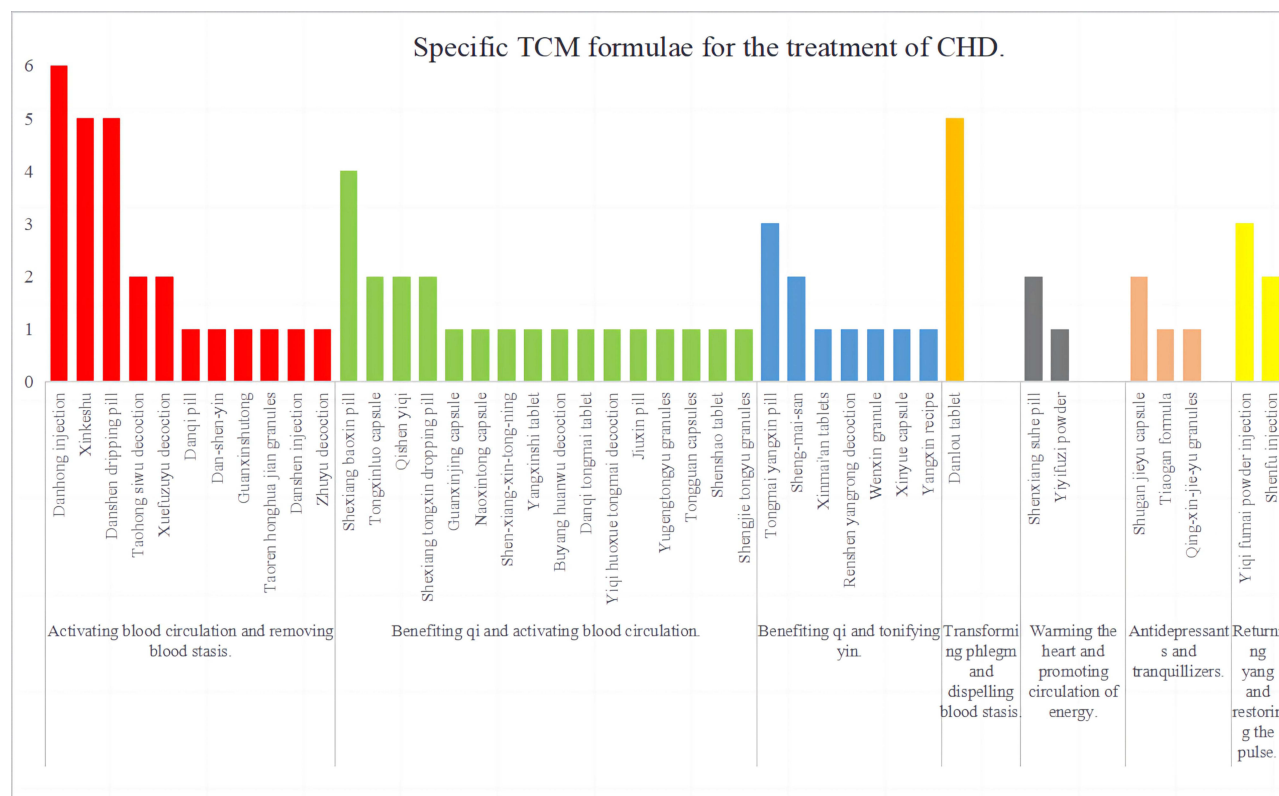


Figure 7 Specific TCM formulae for the treatment of CHD.

The top 10 research institutions were all from China and all were TCM universities. In addition, BUTCM published the most papers related to TCM formulae for CHD, with the red nodes representing BUTCM and the green nodes representing institutions with high co-citation frequency (Figure 5). Looking at the distance of the dots, we observe that the research institutions in this field are dispersed. Although the top ten institutions in terms of output are all located in China, they do not cooperate closely with each other, and more notably, they have little cooperation with foreign institutions. Therefore, Chinese academic institutions should strengthen their cooperation to achieve the goal of increasing their academic impact.

Keywords can provide up-to-date information on a specific research topic. In this analysis, we highlighted keywords with specific TCM therapeutic formulae names, as shown in graph abstract, in the centre of the network diagram are high-frequency keywords, mainly including “Danhong injection”, “Danlou tablet”, “Xinkeshu”, “Danshen dripping pill”, “Shexiang baoxin pill”, “Tongmai yangxin pill”, “Yiqi fumai powder injection”, “Tongxinluo capsule”, “Shenxiang suhe pill”, “Taohong siwu decoction”, “Qishen yiqi”, “Sheng-mai-san”, “Shugan jieyu capsule”, “Shenfu injection”, “Shexiang tongxin dropping pill”, “Xuefuzuyu decoction” and so on, totalling 42 specific TCM prescriptions. These 42 specific TCM prescriptions, analysed and summarized according to their efficacy, can be divided into 7 categories: activating blood circulation and removing blood stasis, benefiting qi and activating blood circulation, benefiting qi and tonifying yin, transforming phlegm and dispelling blood stasis, warming the heart and promoting circulation of energy, antidepressants and tranquilizers, and returning yang and restoring the pulse, as shown in Figure 7. Specific formulae included in each category and their main characteristics are as follows: Activating blood circulation and removing blood stasis. There were a total of 11 formulae, namely “Danhong injection”, “Xin Ke Shu”, “Danshen Dripping Pill”, “Taohong siwu decoction”, “Xuefuzuyu decoction”, “Danqi pill”, “Dan-shen-yin”, “Guanxinshutong”, “Taoren honghua jian granules”, “Danshen Injection”, “Zhuyu decoction”, which are mainly suitable for the cardiac and blood stasis syndromes. When analysing the constituent TCM in the 11 formulae, the commonly used medicines for invigorating and resolving blood stasis include *Salviae Miltiorrhizae*, *Safflower*, *peach kernel*, *radix et Rhizoma Paeoniae Alba*, and other

blood invigorating and removing stasis medicines. Representative formulae that appear more frequently in the category of activating blood circulation and removing blood stasis include “Danhong injection”, “Xin Ke Shu”, “Danshen Dropping Pill”, and “Taohong siwu decoction”. There are more studies on the clinical efficacy observation of Danhong injection, some scholars have found through clinical RCT studies that the early use of Danhong injection after percutaneous coronary intervention(PCI) can effectively improve the coronary microcirculation injury after PCI, and the efficacy is not inferior to statins;¹⁹ some scholars have found that Danhong injection is a TCM preparation for the treatment of CHD, and its efficacy is surely and good safety, with improvement in laboratory indexes such as Hcy (Homocysteine), Hs-CRP, NT-proBNP and so on, which is worthy of clinical application and further research;²⁰ some scholars also found that lipid peroxidation exists in elderly CHD patients and that Danhong injection can increase the serum PON1, SOD activity in elderly CHD patients and reduce MDA and improve antioxidant effect.²¹ In the study of the efficacy of Xinkeshu, some scholars have found that Xinkeshu combined with conventional Western drugs in the treatment of post-PCI dysphoria in patients with CHD has good efficacy and safety, and improves the quality of life of the patients;²² Some scholars evaluated the effect of Xinkeshu on heart rate variability (HRV) in patients with CHD, and the results showed that Xinkeshu could improve HRV and reduce angina episodes in patients with CHD.²³ For the efficacy study of “Danshen dripping pill”, some scholars used an untargeted metabolism method based on GC-MS and LC-MS to study the drug-drug interaction between clopidogrel and Fufang Danshen Dripping Pill (FDDP), and the results showed that the combination of clopidogrel and FDDP could regulate glucose metabolism, lipid metabolism and phospholipid metabolism, revealing the potential metabolic pathways it affects and providing a new way of thinking for clinical medication;²⁴ in addition, some scholars through a randomised double-blind experiment, found that Guanxin Danshen Dripping Pills(GXDS) can significantly reduce depression and anxiety, relieve angina symptoms, and improve the quality of life of post-PCI CHD patients;²⁵ some scholars have found that through the study of serum metabolomic changes in CHD patients after treatment, that small molecule metabolites such as glycerophosphorylcholine may be a potential target for anticoagulant and lipid-lowering in Taohong siwu decoction, it is also the “blood” material basis for promoting blood circulation in the treatment of CHD.²⁶

Benefiting qi and activating blood circulation. There are 16 kinds of formulae, namely, “shexiang baoxin pill”, “Tongxinluo capsule”, “Qishenqi yi”, “shexiang tongxin dropping pill”, “guanxinjing capsule”, “naoxintong capsule”, “Shen-xiang xin-tong-ning”, “Yangxinshi tablet”, “Buyang huanwu decoction”, “Danqi Tongmai tablet”, “Yiqi huoxue tongmai decoction”, “Jiuxin pills”, “Yugengtongyu granules”, “Tongguan capsules”, “Shenshao tablets”, “shengjie tongyu grandules”, which are mainly suitable for patients with qi deficiency and blood stasis, and the commonly used drugs in this kind of formula include ginseng, astragalus, musk, danshen, red peony and other drugs that tonify qi and activate blood; representative formulae that appear frequently in the category of benefiting qi and activating blood include “shexiang baoxin pill”, “Tongxinluo capsule”, “Qishenqi yi”. For the efficacy study of Shexiang baoxin pill, some scholars have found that the clinical tolerability and safety of long-term administration of Shexiang baoxin pill in patients with CHD is good,²⁷ and it can regulate the level of blood lipids and improve the echocardiographic indexes, so the clinical efficacy is obvious.²⁸ The clinical efficacy of Tongxinluo capsule was found to be effective in the treatment of angina pectoris (AP) without side effects and toxicity.²⁹ Some scholars found that Qishen Yiqi Dripping Pills (QSYQ) formula can reduce myocardial injury and protect microvascular function during elective PCI.³⁰

Benefiting qi and tonifying yin. There are 7 formulae in this category, namely “Tongmai yangyin pill”, “Sheng-mai-san”, “Xinmaian tablets”, “Renshen yangrong decoction”, “Wenxin granule”, “Xinyue capsule”, “Yangxin recipe”, which are mainly suitable for patients with deficiency of qi and yin. The main components of this category of formulas are ginseng, *Ophiopogon japonicus*, asparagus fern, *Adenophora stricta*, and other tonifying qi and yin medicines. The representative formulas of this category include “Tongmai yangyin pill”, and “Sheng-mai-san”. In the study of the efficacy of the Tongmai yangxin pill, some scholars have found that the addition of Tongmai yangxin pill to conventional treatment can intervene in the development of cardiac remodelling and cardiac dysfunction,³¹ and can reduce the levels of apolipoprotein B, endothelin 1, nuclear factor- κ B (NF- κ B), and homocysteine levels, and improve biochemical indexes in patients with CHD.³² In the study of the efficacy of sheng-mai-san, some scholars have found that this formula can improve the ejection fraction of patients with myocardial infarction, delay the thinning of the anterior wall of the left ventricle, and thus improve the cardiac function of the patients, and inhibit the progression of myocardial

fibrosis by lowering the levels of epidermal growth factor receptor (EGFR) and MAPK1, thereby delaying the onset of heart failure.³³

Returning yang and restoring the pulse. There are 2 formulae in this category, namely, “Yiqi fumai powder injection” and “Shenfu Injection”, which are mainly applicable to patients with a deficiency of yang in the heart and kidney, and the main constituent drugs include red ginseng and epiphyllum and other drugs. A prospective, randomised, multicentre, blinded, placebo-controlled trial study protocol was designed to assess the efficacy and safety of Shenfu injection loading in the treatment of patients with acute exacerbation of chronic heart failure due to CHD.³⁴ Warming the heart and promoting the circulation of energy. There are 2 formulas in this category, namely “Shenxiang suhe pill” and “Yiyifuzi powder”, which are mainly suitable for patients with cold coagulation heart pulse, and the main constituent drugs are musk, appendices, suhexiang and other drugs. Some clinical studies have demonstrated the overall efficacy of Shenxiang suhe pill in treating CHD patients, which can reduce hepatic lipid deposition and has lipid-lowering and anti-inflammatory effects.³⁵ Antidepressants and tranquillizers. There are three formulas in this category, namely “Shugan jieyu capsule”, “Tiaogan formula” and “Qing-xin-jie-yu Granules”, which are mainly suitable for patients with Qi stagnation and blood stasis syndrome, and the main constituent drugs are Angelica sinensis, Paeonia lactiflora and Perilla frutescens. The representative formula of this category is “Shugan jieyu capsule” (SGJYC), and some scholars have evaluated the efficacy and safety of SGJYC and found that the efficacy of depressive symptoms was poorer than that on the combination of anti-hypertensive drugs (AHD), but its efficacy and cardiac safety were inferior to antidepressants.³⁶ Transforming phlegm and dispelling blood stasis. This type of formula is “Danlou tablet”, which is mainly applied to patients with phlegm obstruction syndrome, and the main constituent drugs are Dan Shen, Gua Lou, Red Peony, Allium sativum and other drugs. Some scholars, through evidence-based research, found that the combination of Danlou tablet with Western drugs can enhance the efficacy of CHD without increasing adverse events.³⁷

This paper also analyses a timeline graph of keywords over time. At the top of the graph, we observe that the earliest research in the field appeared in 2009. The nodes on the left horizontal coordinate indicate the migration behaviour of research hotspots, and the lines between them indicate citations. In the middle and late stages, research articles on TCM therapeutic formulae for CHD mainly focused on the mechanism of action of different formulae for the treatment of CHD, such as “Huoxin formula” which improves arterial function and reduces inflammatory factor activity in patients with CHD;³⁸ “Jing Zhi Guan Xin Pian” for the treatment of CHD targets alanine metabolism and tyrosine metabolism, which are amino acid metabolism, and metabolomics technology can be effective in exploring potential biomarkers associated with syndromes or diseases, as well as therapeutic mechanisms of herbal formulations.³⁹ By analysing the keywords and timeline graphs, the study of network pharmacology and signalling pathways in CHD will remain a hotspot for future research, but in addition to these studies, the study of TCM formulae on the associated intestinal flora in the treatment of CHD will emerge and become a research trend in the future.

TCM insists on inheriting and developing its characteristics while maximising its advantages, and promotes the modernisation and development of TCM with the “holistic concept” and “evidence-based treatment”. The advantage of introducing TCM therapeutic formulae into the study of CHD lies in the holistic concept and the idea of evidence-based treatment, for example, foreign studies have found that the most important elements of the syndrome type of CHD are blood stasis and phlegm turbidity as targets for the action of the therapeutic formulae, which can promote the TCM therapeutic formulae for achieving a better development in the field of CHD.⁴⁰

Conclusions

This study is the first time to use knowledge mapping software VOSviewer, CiteSpace for literature visualisation and analysis of more than 30 years of literature in the research field of TCM therapeutic formulae for CHD, which demonstrates the overall structure and development history of the research in this field, and the research of TCM therapeutic formulae for CHD have been developed to a certain extent. The research in this field mainly focuses on the clinical efficacy of TCM therapeutic formulae and CHD, in which the network pharmacology, signalling pathways and targets of different therapeutic formulae may be the hotspots and trends in the future; the shortcomings of the research in this field include the lack of teamwork and cross-unit cooperation across different regions. In the future, researchers should further strengthen cross-team cooperation across regions and combine with modern high-tech means to achieve

interdisciplinary cross-fertilisation, to comprehensively explore the application of TCM therapeutic prescriptions in CHD.

Abbreviations

CHD, Coronary heart disease; TCM, traditional Chinese medicine; WoSCC, Web of Science Core Collection; SCI-Expanded, Science Citation Index Expanded; IF, impact factor; BUTCM, Beijing University of Traditional Chinese Medicine; DLT, Dan-Lou tablets; CDDP, Compound Danshen dripping pill; PCI, percutaneous coronary intervention; Hcy, Homocysteine; HRV, heart rate variability; FDDP, Fufang Danshen Dripping Pill; GXDS, Guanxin Danshen Dripping Pills; AP, angina pectoris; QSYQ, Qishen Yiqi Dripping Pills; NF- κ B, nuclear factor κ B; EGFR, epidermal growth factor receptor; SGJYC, Shugan jieyu capsule; AHD, anti-hypertensive drugs.

Data Sharing Statement

No data was used for the research described in the article.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

All authors declare no conflicts of interest in this work.

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