

Combination of Traditional Chinese Medicine and Transarterial Chemoembolization for Hepatocellular Carcinoma: A Bibliometric Analysis

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Background: Increasingly, studies have indicated that traditional Chinese medicine (TCM) plus transarterial chemoembolization (TACE) has better efficacy and lower side effects for hepatocellular carcinoma (HCC) patients. However, there is a notable absence of visual evidence within the field of TCM plus TACE in HCC. Therefore, this study aimed to utilize bibliometric technology to visualize the research knowledge structure and identify emerging hotspots of TCM combined with TACE in HCC.

Methods: The publications relating to TCM plus TACE on HCC published up to October 17, 2025 were obtained from the Web of Science Core Collection (WoSCC) database. Bibliometric analysis was conducted using VOSviewer, CiteSpace, and the R-bibliometrix.

Results: A total of 399 publications were included in the analysis. The number of related publications and citations has steadily increased. China has established itself as the leading contributor to the literature in this field, with significant contributions also emanating from Japan and the USA. Among institutional contributors, the Sun Yat Sen University has demonstrated particular prominence in publication output. *World Journal of Gastroenterology* is the leading journal in this field. Cluster analysis indicated that current research hotspots include the systematic review and meta-analysis of TCM plus TACE on HCC, clinical prognosis, and pharmacological mechanisms. Trend analysis revealed that AI-based systems for diagnosis and management represent an emerging research frontier in this field.

Conclusion: This work serves as a framework for understanding the evolution and frontiers of the field, thereby paving the way for further scientific and clinical advances in the application of TCM with TACE for HCC. Consequently, more HCC patients can benefit from the methods of TCM plus TACE.

Keywords: traditional Chinese medicine, transarterial chemoembolization, hepatocellular carcinoma, bibliometric analysis

Introduction

Liver cancer ranks as the third leading cause of cancer death, and the sixth most commonly diagnosed cancer in 2022.¹ Hepatocellular carcinoma (HCC) is the most common form of liver cancer, accounting for around 75–85% of the cases,¹ with hepatitis B virus (HBV) or hepatitis C virus (HCV) chronic infection responsible for 21% to 55% of HCC worldwide.^{2,3} For early-stage HCC patients, curative treatment includes surgical resection, radiofrequency ablation, and liver transplantation.⁴ However, most patients are diagnosed at middle or later stages. Transarterial chemoembolization (TACE) is the standard of care for patients with intermediate HCC according to the Barcelona Clinic Liver Cancer staging system.⁵ TACE's advantages include a small wound surface, an obvious tumor vascular embolization effect, and high local chemotherapy drug concentration. TACE often causes adverse reactions such as poor appetite, nausea, vomiting, liver function damage, and immune system damage, which affect the quality of life of patients. While combination drug therapy can reduce side effects, the resulting

damage may still worsen a patient's condition, compromise long-term care, and even force treatment to be suspended.⁶ Therefore, the long-term efficacy of this treatment is not satisfactory, and the 5-year survival rate is lower than 10%.⁷

Increasingly, studies have indicated that traditional Chinese medicine (TCM) plus TACE had better efficacy and lower side effects for HCC patients, compared to TACE treatment alone. For example, Chen et al demonstrated that the combination of TCM with TACE significantly improved overall response rate, disease control rate, and overall survival rate, while also reducing the incidence of adverse events.⁸ Besides, Xu et al reported similar findings.⁹ TCM perceives HCC as a systemic disease, asserting that “for pathogenic factors to invade, the Qi must be deficient first”. HCC occurs mainly due to the deficiency of healthy Qi. From the perspective of TCM, drug toxicity from TACE can impair the body's healthy Qi. The subsequent struggle between this weakened healthy Qi and pathogenic Qi may manifest as fever. Additionally, the procedure itself, through the use of embolic agents and chemotherapy drugs, can cause liver pain.¹⁰ In current TCM practice, the management of postoperative sequelae in HCC patients is guided by the principle of reinforcing healthy Qi (supplementing Qi), countering pathogenic factors (resolving toxins), and promoting circulation (dispelling stasis).⁶ Modern research has shown that TCM not only possesses antitumor effects and regulates immune function, but also alleviates side effects of TACE to effectively improve the quality of life and survival rates of patients, offering a complementary treatment option for HCC patients.^{11,12} Over the years, TCM plus TACE has gained significant traction in the treatment of HCC due to its distinctive theoretical basis and clinical practices, with many reports indicating positive outcomes.⁶

Although individual clinical trials and experimental studies have gradually accumulated, the existing evidence remains fragmented across diverse topics from specific herbal formulas and pharmacological pathways to clinical efficacy and safety profiles, which lacks systematic bibliometric and visual analyses of the overall intellectual landscape. While systematic reviews and meta-analyses provide focused syntheses of TCM plus TACE for HCC,^{8,9} a holistic, systematic assessment of the field's overall trajectory remains less commonly addressed. This study fills that gap by offering a meta-perspective on the entire body of literature, mapping its structural and evolutionary patterns to complement existing focused syntheses.

Bibliometrics is an emerging discipline that utilizes mathematical and statistical methods to provide a comprehensive understanding of research trajectories, key contributors, collaborative networks, and emerging frontiers in this field. Moreover, this method can facilitate a comprehensive and rapid understanding of the research situation in any field. Bibliometric analysis has been used in the field of TCM in breast cancer, diabetic nephropathy, and skin disease. However, there is a notable absence of systematic bibliometric and visual analyses in the field of TCM plus TACE in HCC. Therefore, this study aimed to adopt bibliometric technology to visualize the research knowledge structure and identify emerging hotspots of TCM plus TACE in HCC.

Materials and Methods

Data Collection

We searched the Web of Science Core Collection (SCI-EXPANDED) on October 17, 2025, using the following query: TS = (hepatocellular carcinoma) AND TS = (traditional Chinese medicine) AND TS = (Transarterial chemoembolization). A detailed search strategy is provided in the [Supplementary Material 1](#). Article types were limited to “reviews” and “articles” in English only. Full records and cited references were exported in plain text. A total of 399 publications (320 articles and 79 reviews, 1991–2025) were included in the analysis ([Figure 1](#)).

Data Analysis

In our study, the Bibliometrix package in R software (version 4.4.1), VOSviewer (version 1.6.20), and CiteSpace (version 6.3.R1) were used to visualize the data analysis and construct a scientific knowledge map.

Specifically, the Bibliometrix R package was mainly used to analyze annual production and citation, local impact of sources and authors. VOSviewer software was employed to visualize country/institution/author collaboration networks, source and author co-citation analysis, and keyword co-occurrence analysis. CiteSpace software was applied to map keywords with the strongest citation bursts to explore the frontiers topics.

In addition, journal quartiles and impact factors (IFs) were extracted from the 2024 Journal Citation Report (JCR). In this study, the H-index of each author was obtained from WoSCC.

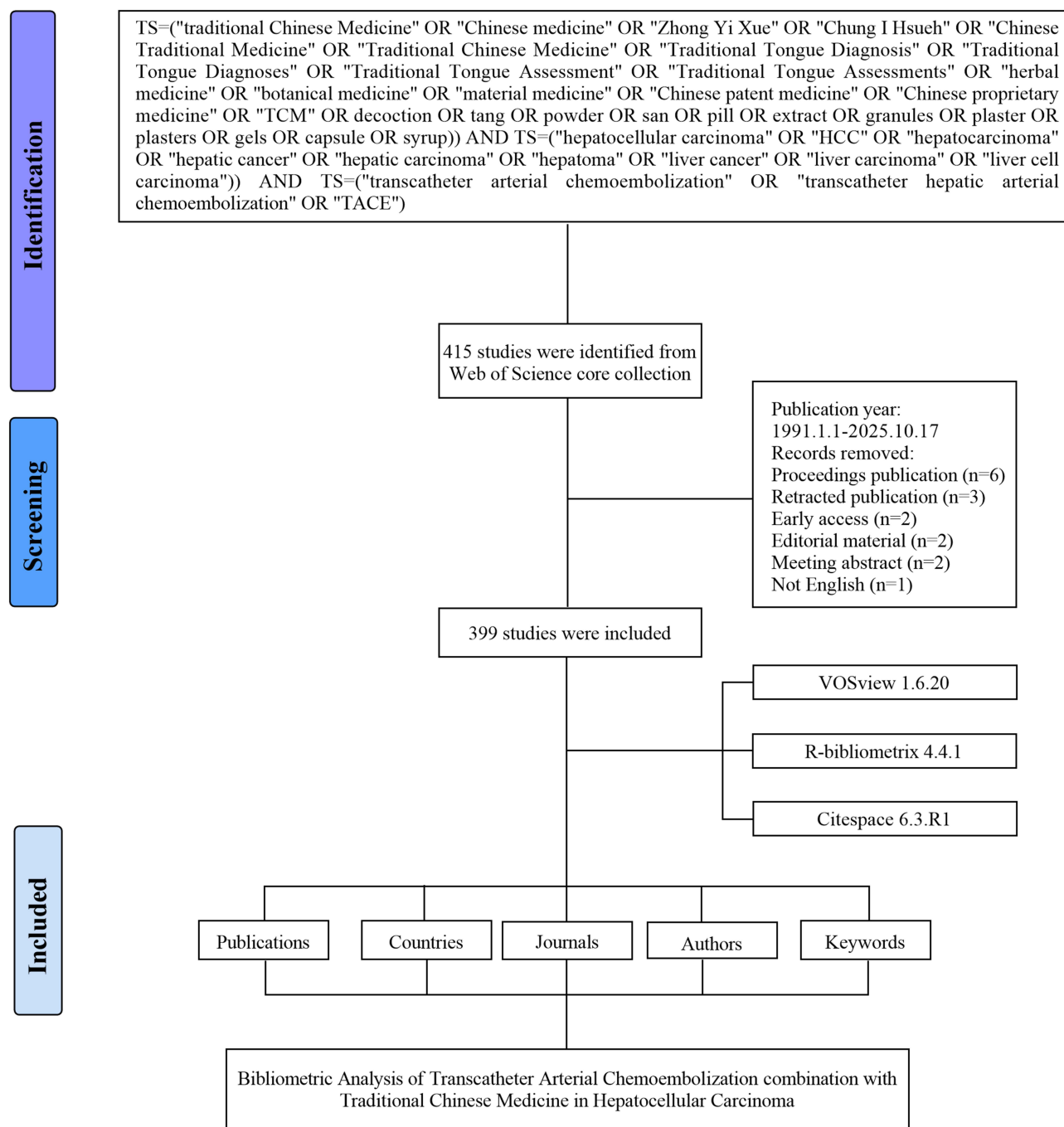


Figure 1 Flowchart depicting the article selection process.

Results

Overall Analysis of Publications

This study included 399 publications. Our investigation showed that 2,390 authors from 1,385 institutions contributed to the production of 320 articles and 79 reviews in this study. These works were published in 187 journals, citing 11,954 references. According to [Figure 2](#), the trend of publications and citations has increased steadily each year in the field of TCM plus TACE in HCC. Regarding publications, from 1991 to 2020, the number of relevant publications increased gradually. From 2021 to 2024, the number of publications increased rapidly and peaked in 2021 with 45. In terms of

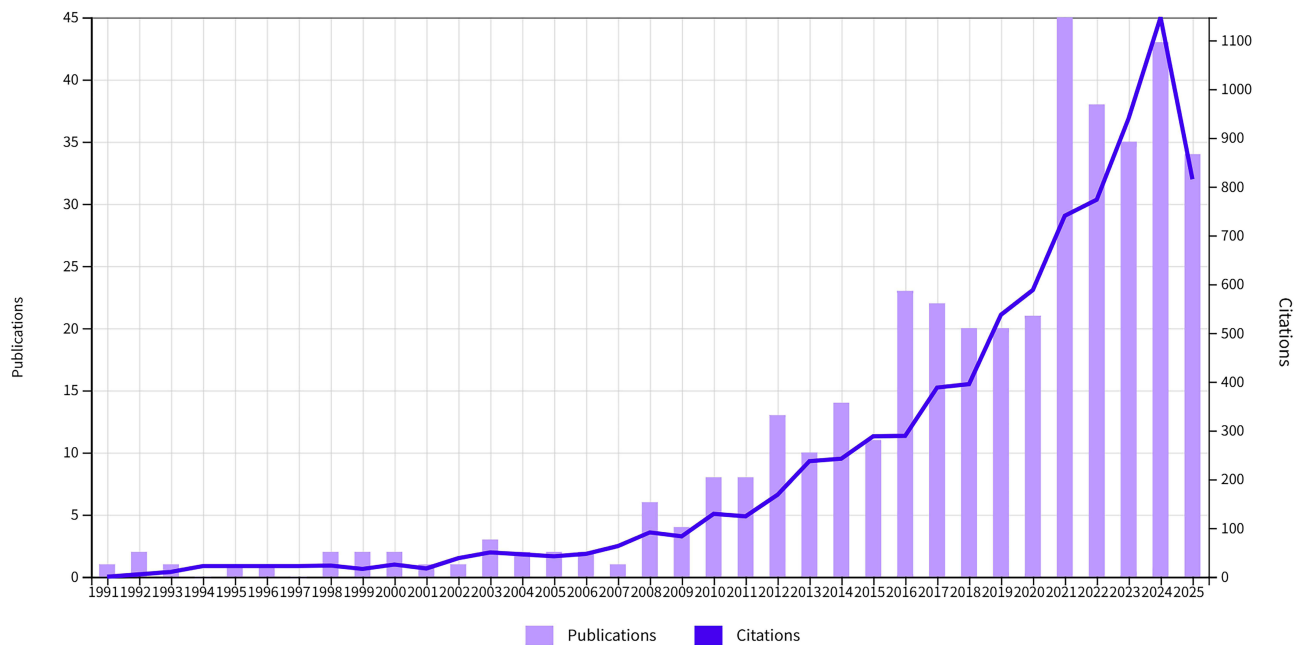


Figure 2 Annual number of publications and citations from 1991 to 2025.

citations, the number of citations is more than 500 from 2019 to 2024. It has grown rapidly in the recent 5 years and peaked in 2024 with 1,147.

Regions/Countries and Institutions

The five highest-output countries/regions were ranked according to the number of publications (NP) of all authors (Table 1). China published the most papers (NP=265, 66.4%), followed by Japan (NP=57, 14.3%), and the USA (NP=21, 5.3%). The total number of citations (TC) was 4,630 for China, followed by the USA (TC=1,172). However, the average article citations of the USA were 40.6, followed by Japan with 21.3. China was only 17.0. Figure 3A and B show a further analysis of the collaboration among countries and regions. The most frequent collaboration was between China and Japan (frequency = 138), followed by China and Australia (frequency=134), China and Korea (frequency=127), and China and Malaysia (frequency=109). Among the top 10 collaborations, except for three relationships between Canada and Austria, Canada and Switzerland, and Canada and the USA, all international collaborations involved China.

Figure 4A depicts the top 10 institutions with the highest number of articles published. All leading institutions are based in China. Sun Yat Sen University demonstrated the highest publication output (NP=52), followed by Fudan University (NP=46), Naval Medical University (NP=44), and Huazhong University of Science and Technology (NP=42). The top three institutions, considering the total link strength (TLS), were Second Military Medical University (TLS=24),

Table 1 Publication and Citation Profiles of Leading Countries

Country	NP	TC	Average Article Citations
China	265	4630	17
Japan	57	1172	21.3
USA	21	528	40.6
South Korea	16	357	29.8
Italy	12	674	56.2

Abbreviations: NP, Number of Publication; TC, Total Citations. Average article Citations, The average number of citations per publication.

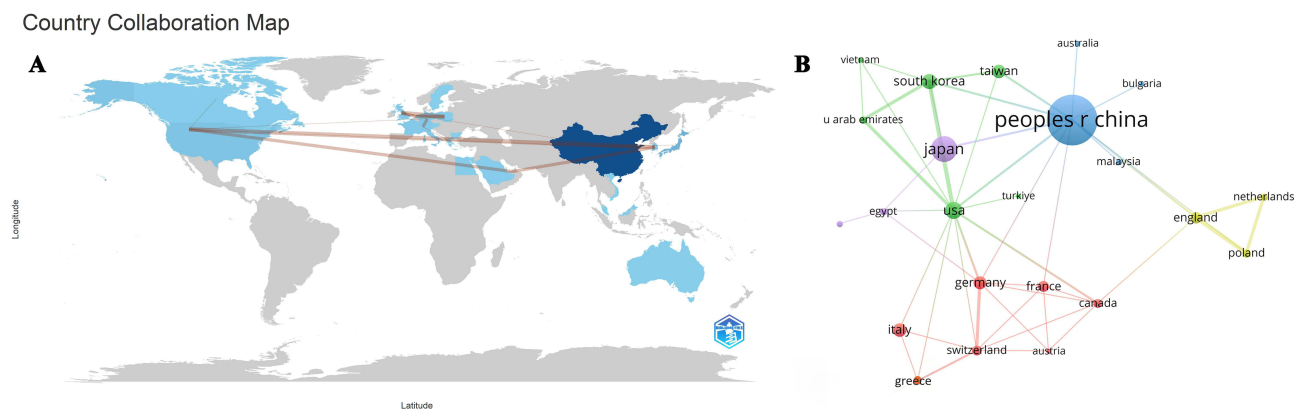


Figure 3 (A) Visual map of country/region collaboration. (B) Visualization network of country/regions collaboration. Lines connecting nodes denote collaborative relationships between countries. Line thickness reflects the intensity of collaboration, with thicker lines representing a higher number of co-authored publications between the respective countries.

Zhejiang University (TLS=21), and Fudan University (TLS=19). As shown in Figure 4B, there was close cooperation between Second Military Medical University, Fudan University, and Sun Yat Sen University.

Authors and Co-Cited Authors

The top 10 productive authors in the field of TCM plus TACE on HCC are listed in Table 2. Zheng CS had the highest publications (NP=11, H-index=7) and Ling CQ (NP=10, H-index=7). Figure 5A illustrates the collaboration among various authors. There is also active cooperation between different authors, such as the close collaboration between Zheng CS, Yang XL, and Zhao YB.

Among the co-cited authors (Table 2), LLovert JM has the highest number of citations (n=267), followed by Bruix J (n=166), and Kudo M (n=164). The co-citation network shown in Figure 5B, demonstrated active collaboration among various co-cited authors, including LLovert JM (TLS=1,817), Kudo M (TLS=1,476), and Bruix J (TLS=1,176).

Journals and Co-Cited Journals

As shown in Table 3, among the top ten journals by publication volume, *Medicine* had the highest number of publications (NP=15, IF=1.4, JCR=Q2), followed by *World Journal of Gastroenterology* (NP=14, IF=5.4, JCR=Q1), *Frontiers in Oncology* (NP=13, IF=3.3, JCR=Q2), and *Cardiovascular and Interventional Radiology* (NP=13, IF=2.9, JCR=Q2). The collaboration network was presented in Figure 6A. Our study found some journals had very close citation relationships, such as *World Journal of Gastroenterology* and *Hepatology Research*, *Hepato-Gastroenterology*, *BMC Cancer*, and *Medicine and Evidence-based Complementary and Alternative Medicine*.

From Table 3, it can be seen that among the top co-cited journals, two journals have been cited more than 500 times, with *Hepatology* being the most cited journal (n=557), followed by *Journal of Hepatology* (n=542), and *Radiology* (n=441). The collaboration network plot (Figure 6B) shows that *Journal of Hepatology* (TLS=19,295), *Hepatology* (TLS=19,771), and *World Journal of Gastroenterology* (TLS=11,731) have very close co-citation relationships.

Keywords and Keyword Bursts

In the keyword co-occurrence network (Figure 7A), four clusters were identified in the field of the TCM plus TACE on HCC. The primary cluster (red, 36 items) encompasses terms associated with the systemic review and meta-analysis, with keywords such as “meta-analysis” (n=27, TLS=29), “network meta-analysis” (n=8, TLS=15), “systematic review” (n=7, TLS=23), and “review” (n=3, TLS=12). Cluster 2, shown in green, focused on clinical prognosis, with keywords such as “prognosis” (n=16, TLS=37), “survival” (n=11, TLS=29), “combination therapy” (n=8, TLS=26), “immunotherapy” (n=5, TLS=8), and “targeted therapy” (n=3, TLS=5). The blue cluster was related to pharmacological mechanisms, with keywords such as “cisplatin” (n=22, TLS=53), “toxicity” (n=3, TLS=4), “miriplatin” (n=3, TLS=9),

Table 2 The Top 10 Most Productive Authors and the Top 10 Co-Cited Authors

Authors	NP	H_Index	Co-Cited Author	Citations	Total Link Strength
Ling CQ	10	7	Llovet JM	267	1817
Zheng CS	11	7	Bruix J	166	1176
Li B	6	6	Kudo M	164	1476
Li L	6	6	Lencioni R	130	951
Wang H	7	6	European Association Study	77	561
Xu L	9	6	Forner A	55	416
Yang XL	7	6	Takayasu K	49	303
Zhai XF	9	6	Sung H	48	320
Zhang J	10	6	Raoul JL	42	272
Zhao YB	7	6	Mazzaferro V	40	266

Abbreviation: NP, Number of Publication.

“pharmacokinetics” (n=3, TLS=5), and “antitumor immune response” (n=3, TLS=14). The yellow cluster was mainly related to artificial intelligence (AI) applications, with keywords such as “deep learning” (n=5, TLS=11) and “machine learning” (n=4, TLS=11). In addition, a topic evolution diagram was created to predict future trends in this field. The trend topic map in [Figure 7B](#) also highlights that the application of AI in this field may represent the frontiers of this research area, with the keywords “deep learning (2023–2024)”.

The top 25 keywords with citation bursts were identified using CiteSpace software ([Figure 7C](#)). The analysis indicated that the keyword “embolization” had the longest burst duration, appearing from 1993 to 2013, with the strongest burst intensity of 7.41. In addition, the keywords of “recurrence” and “microvascular invasion” emerged as the strong keywords, with a burst intensity of 5.38 (2019–2021) and 4.00 (2019–2022), respectively, suggesting these are current areas of active research and significant contributions to the literature. The ongoing citation bursts for the keyword “system (2023–2025)” pointed towards the integration of all this knowledge into structured guidelines and intelligent systems for optimal patient management.

Discussion

Overview

This study analyzed a total of 399 articles and reviews published between 1991 and 2025. The data revealed an overall upward trend in publications and citations related to the TCM plus TACE on HCC. China is the leading country in this field. Also, Chinese researchers and institutions have played a leading role in this field primarily due to the historical, cultural, and policy-driven foundations of TCM. TCM is a millennia-old system of medicine deeply embedded in Chinese culture and history. China holds the foundational texts, the historical records, and the uninterrupted practice of TCM. This provides a vast repository of theoretical knowledge and empirical evidence (in the form of classical formulas and treatment principles) that serves as the starting point for modern research. There is a high level of familiarity and acceptance of TCM among both the Chinese public and the medical community. This creates a built-in patient population willing to participate in clinical studies and a clinical environment where TCM is often integrated into standard care, making research more feasible. In addition, the Chinese government has actively promoted TCM as a national strategic priority. For example, the “Healthy China 2030” initiative explicitly integrates TCM into the public health system. The government views TCM not just as medicine but as a source of national pride and “soft power.” Chinese national and provincial grant agencies (like the National Natural Science Foundation of China - NSFC) dedicate significant funding streams specifically for TCM research, including its application in oncology. This financial support is the lifeblood of large-scale clinical trials and sophisticated laboratory studies. China has a vast network of specialized TCM universities, research institutes, and TCM departments within major Western-style hospitals. This creates a dedicated ecosystem of researchers, clinicians, and PhD students focused exclusively on TCM.

Among the 187 journals, high-impact journals such as *World Journal of Gastroenterology*, *Frontiers in Oncology*, *Journal of Vascular and Interventional Radiology*, and *Hepatology Research* contributed significantly to the field due to

Table 3 The Top 10 Most Productive Journals and the Top 10 Co-Cited Journals

Journal	NP	H_Index	IF	JCR	Co-Cited Journal	Citations	Total Link Strength
World Journal of Gastroenterology	14	11	5.4	Q1	Hepatology	557	19295
Frontiers in Oncology	13	8	3.3	Q2	Journal of hepatology	542	19771
Oncotarget	8	8	–	–	Radiology	441	14103
Cardiovascular and Interventional Radiology	13	7	2.9	Q2	World Journal of Gastroenterology	288	11731
Medicine	15	7	1.4	Q2	Journal of Vascular and Interventional Radiology	257	7257
European Radiology	6	6	4.7	Q1	Cancer: A Journal of the American Cancer Society	241	8142
Evidence-base Complementary and Alternative Medicine	7	6	–	–	Cardiovascular and Interventional Radiology	240	7127
Journal of Vascular and Interventional Radiology	6	6	2.6	Q2	Lancet	231	8391
Hepato-Gastroenterology	7	5	–	–	European Radiology	220	9628
Hepatology Research	7	5	3.4	Q2	Hepatology Research	207	8075

Notes: JCR, the quartile ranking of the journal in the Journal Citation Reports (Q1: top 25%, Q2: 25%-50%, Q3: 50%-75%, Q4: bottom 25%).

Abbreviations: NP, Number of Publication; IF, Impact Factor.

its high volume of published articles and citations, indicating its central role in the dissemination of TCM plus TACE on HCC. This journal's significant influence highlights its importance in academic discussions, particularly regarding the mechanisms of TCM.^{13–15} For example, calculus bovis (CB), used in TCM, mediates inhibition of M2-TAM polarization through the Wnt/ β -catenin pathway, contributing to the suppression of liver cancer growth.¹³

Research Hotspots and Trends

Through a comprehensive analysis of keyword clustering, theme evolution, and keyword burst, the main research hotspots and frontiers of TCM plus TACE on HCC have been identified.

Systematic Review and Meta-Analysis

Among the included studies, 46 meta-analyses were conducted in this field, mainly focusing on the comparison of the efficacy and safety between TCM plus TACE and other treatments (eg., TACE alone). Early clinical observation and the cultural acceptance of TCM in China led to the hypothesis that combining it with TACE could be beneficial. The foundational keywords (embolization, TACE, doxorubicin) and the early burst of traditional Chinese medicine (2016–2020) mark the beginning of testing this hypothesis in formal studies.^{16,17} Notably, the strong bursts for randomized controlled trials (RCTs) (2006–2016) generated a critical mass of individual studies,^{18–20} which in turn necessitated the subsequent surge in systematic reviews and meta-analyses to synthesize the accumulating evidence. These individual trials compared TCM plus TACE vs. TACE alone on outcomes like tumor response, survival, and side effects. Their consistent focus confirms that the primary goal was to definitively answer: “Is the TCM plus TACE combination superior to TACE alone?” Wang et al performed a meta-analysis and found that TCM plus TACE had better overall survival and liver function than TACE alone.²¹ Furthermore, a network meta-analysis reported that TCM plus TACE significantly enhances the efficacy and safety of HCC treatment, improving the overall response rate, disease control rate, and overall survival rate.⁸ The emergence of systematic reviews and meta-analysis as a distinct cluster aligns with the field's methodological maturation. The rise of this cluster reflects a natural progression from primary research to secondary synthesis, wherein systematic reviews and meta-analysis serve to aggregate, harmonize, and critically evaluate the accumulated evidence. However, other studies thought that more high-quality RCTs are needed before TCM plus TACE can be recommended routinely.²²

Clinical Prognosis

The benefits can be categorized into several key prognostic areas, which align with the evolving research hotspots. First, studies indicated that TCM plus TACE had a higher objective response rate (ORR), improved the 1-year, 2-year, and 3-year survival rates, and prolonged median survival time.^{17,23,24} This is because TCM could enhance the anti-tumor effect of TACE. TCM formulas may help sensitize cancer cells to chemotherapy, inhibit tumor angiogenesis, and induce apoptosis. Second, a significant reduction in tumor recurrence rates is a major current research hotspot. TCM is believed to alter the tumor microenvironment, inhibit epithelial-mesenchymal transition (EMT), and target high-risk factors like

microvascular invasion, thereby reducing post-treatment recurrence. Chen et al⁸ also presented that TCM plus TACE on HCC can postpone tumor recurrence and metastasis. Third, increasing research reported better preservation of liver function and immune response.^{22,25} TACE can damage healthy liver tissue. TCM, based on the “Fu Zheng Gu Ben” (fortify the healthy and root the essence) principle, helps protect hepatocytes and improve the functional reserve of the cirrhotic liver, which is crucial for long-term prognosis. In addition, benefits included a significant reduction in TACE-related side effects, improved performance status (eg., KPS score), and reduced fatigue and improved appetite.^{26–28}

Pharmacological Mechanisms

The pharmacological mechanisms by which TCM improves the prognosis of HCC when combined with TACE are multifaceted and represent a key area of modern scientific investigation. TCM does not merely alleviate symptoms; it actively interacts with the biology of the tumor and the patient’s response to treatment. TCM can direct enhancement of TACE’s anti-tumor efficacy.^{29,30} Studies found that some TCM compounds can reverse multidrug resistance in cancer cells. For example, they may inhibit drug-efflux pumps like P-glycoprotein, allowing chemotherapeutic agents (like doxorubicin) to accumulate inside the cancer cells at higher concentrations, thereby increasing their cytotoxic effect.^{31,32} In addition, TCM can inhibit epithelial-mesenchymal transition (EMT).^{33,34} EMT is a critical process where cancer cells lose their adhesion and become mobile, leading to invasion and metastasis. Active components in TCM can suppress the molecular drivers of EMT, such as TGF- β and Snail, effectively “locking” the cancer cells in place. Additionally, recent findings indicate that TCM can reverse the immunosuppressive tumor microenvironment (TME) in HCC through multiple mechanisms.³⁵ These include immunomodulation that strengthens antitumor immunity and reduces regulatory cell populations; stromal remodeling that curbs fibroblast activation and excessive matrix deposition; and antiangiogenic activity that limits tumor blood vessel formation, potentially enhancing efficacy while mitigating adverse effects. Therefore, it has received increased attention in tumor research and has become an important research direction and hotspot in the treatment of cancer.

AI Application

The application of AI in the context of TCM plus TACE for HCC represents the next frontier of precision medicine, directly addressing the emerging hotspots. AI acts as a powerful tool to decode the complexity of both TCM and HCC, moving from a “one-size-fits-all” approach to a highly personalized strategy. Machine learning can analyze vast databases of patient records, including their TCM syndromes (eg., “Liver Qi Stagnation,” “Damp-Heat”), symptoms, and treatment outcomes. The AI can then recommend the most effective classical or modern TCM formula for a new patient with a similar profile undergoing TACE. For example, Miao et al³⁶ adopted an image recognition of TCM based on deep learning to increase the use of effective therapeutic methods for patients. Chen et al³⁷ also used a screening model based on a multi-scale convolutional neural network model and a genetic algorithm to enhance the efficacy of TCM on liver cancer. Furthermore, network pharmacology studies identify which herbs and compounds target which pathways.³⁸ AI can supercharge this by analyzing complex networks to identify synergistic herb combinations that most effectively target HCC pathways disrupted by TACE, leading to the development of optimized, evidence-based formulas. Network pharmacology (NP) has introduced a paradigm shift in the comprehension of traditional medicine by adopting a holistic, systems-level approach. This has, in turn, catalyzed the emergence of specialized frontiers such as Traditional Chinese Medicine Network Pharmacology (TCM-NP).^{38,39}

Strengths and Limitations

This study employed a bibliometric analysis of the relevant literature, utilizing systematic retrieval and quantitative statistical methods to provide a more comprehensive overview than a traditional narrative review. Trend analysis provided new research directions for scholars in this field.

However, several limitations should be noted in this study. First, the articles from different databases (eg., CNKI and PubMed) cannot be integrated due to limitations in the current mainstream bibliometric software. In addition, only English-language publications retrieved from the WoSCC were analyzed. Language bias may exist in our study due to the exclusion of non-English language publications. Therefore, future research should incorporate additional Chinese databases to analyze data using bibliometric technology. Finally, a known limitation of our systematic retrieval process is its inherent challenge in achieving perfect precision and recall. Despite optimized search strings, some irrelevant records were retrieved, and it is

possible that some pertinent studies with ambiguously worded titles were not captured. Despite these limitations, our study provided insights into the characteristics of research and citations in the field of TCM plus TACE on HCC.

In addition to these methodological considerations, our bibliometric findings also illuminate several conceptual gaps within the current research landscape. The literature exhibits a reductionist orientation, with most investigations focusing on single compounds or simplified formulas, which diverges from the holistic, individualized principles of TCM practice. Furthermore, although artificial intelligence and network pharmacology have emerged as frontier topics, their application remains largely exploratory, with limited integration into clinical decision-making. Addressing these imbalances will be essential to advance the field from efficacy validation toward a more mechanistic, integrative, and translationally oriented research paradigm.

Conclusion

The present study revealed a steady increase in research concerning TCM plus TACE on HCC. China has established itself as the leading contributor to the literature in this field, with significant contributions also emanating from Japan and the USA. Among institutional contributors, the Sun Yat Sen University has demonstrated particular prominence in publication output. Current research hotspots include the systematic review and meta-analysis of TCM plus TACE on HCC, clinical prognosis, and pharmacological mechanisms. In addition, AI-based systems for diagnosis and management represent an emerging research frontier. These findings provide a data-driven foundation to guide future research priorities, foster targeted collaborations, and accelerate the rational integration of TCM with conventional therapies for HCC.

Abbreviations

TCM, Traditional Chinese Medicine; TACE, Transarterial Chemoembolization; HCC, Hepatocellular Carcinoma; WoSCC, Web of Science Core Collection; HBV, Hepatitis B Virus; HCV, Hepatitis C Virus; NP, Number of Publications; TC, the Total of Citations; TLS, the Total Link Strength; AI, the Artificial Intelligence; RCTs, Randomized Controlled Trials; ORR, Objective Response Rate; EMT, Epithelial-Mesenchymal Transition.

Data Sharing Statement

All data generated or analyzed during this study are included in this published 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

The authors declare that they have no competing interests.

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