

Visualization Analysis and Quality Evaluation of the International Communication of TCM Classics

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Abstract. The international communication of TCM classics can better enable the international community to recognize China's excellent traditional medicine culture, promote the integration of TCM into the international medicine system, and gain more shares of international discourse. This paper uses CiteSpace to scientifically analyse the number, keywords, institutions, and authors of the literature published from 2000 to 2022 on the China National Knowledge Infrastructure (CNKI) and Web of Science (WOS) for the international communication of TCM classics and utilizes AMSTAR2, a quality evaluation tool for interpretation. In this paper, several measures are proposed to solve the problems in the international communication of TCM classics, such as broadening research fields, focusing on theory construction, strengthening interdisciplinary cooperation, enhancing academic cooperation and improving translation quality.

Keywords: TCM, International Communication, Visualization Analysis, Quality Evaluation

1. Introduction

From the 15th and 17th centuries, Western pharmacists and missionaries spread Chinese herbal medicine to the West. From the mid-17th century to the end of the 18th century, TCM began to spread gradually to Europe, but only 19 TCM classics were published in Europe during this period. From the end of the 18th century to the end of the 19th century, TCM spread further, during which 137 TCM classics translations were published^[2]. From the beginning of the 20th century to 1948, when exchanges between China and the West in the field of medicine became more frequent, 200 books and journals on TCM were published during this period^[2]. From 1948 to 1975, due to political factors, communication between China and the West decreased, but research on TCM translation was not interrupted. After the reform and opening up, the international communication of TCM greatly accelerated.

How about the current situation of international communication of TCM? This paper uses bibliometrics, CiteSpace, and AMSTAR2 for the visualization analysis and scientific evaluation of the literature about the international communication of TCM classics published in CNKI and WOS during 2000-2022 to reveal the development trends, research highlights, and research subjects of the research on the international communication of TCM classics. This paper aims to explore some limitations and shortcomings in international communication and to promote the international communication of TCM classics.

2. Literature Review

In the overseas communication of TCM classics, researchers mainly tend to explore how to improve the quality of translations through translation methods and techniques, focusing on the fidelity of the translations. As an information transmission method closely related to language behavior, translation has been a communication activity of definite purpose^[9]. The ultimate purpose of English translation of TCM classics is to promote the translation, introduction and communication of TCM overseas and to improve the awareness of TCM theories among overseas audiences. Research on audience adaptation and acceptance of TCM theory will enable TCM to "go out" better and thus enhance its international influence. Therefore, translation research on the international communication of TCM classics should not be limited to simple text analysis but should also turn to the five aspects of "translation subject", "translation content", "translation approach", "translation audience" and "translation effect" in the process of communication^[7]. With the rise of interdisciplinary research and the advent of the big data era, international communication and translation research on TCM classics breaks through the limitations of traditional translation and qualitative research. Wen Juan (2015) used statistical methods to objectively compare the four translations of the Huangdi Neijing and scientifically calculated the satisfaction of overseas audiences with the translations^[8].

3. Research Design

3.1 Data mining tools and database selection

CiteSpace 6.1. R6, an information visualization program, is used in this paper to search and analyse the authors, keywords, and institutions of the literature published from January 1, 2000, to December 22, 2022, in CNKI, a Chinese academic literature database, and WOS, a large, comprehensive, multidisciplinary core journal citation index database, to visually present the knowledge correlation, hot spots and evolution process of the international communication of TCM. Meanwhile, AMSTAR 2 is used for scientific and systematic quality evaluation.

3.2 Data mining qualification setting

The literature mining principles are as follows: the subject words contain "TCM classic" or related classics names; the research object is the TCM classic, and the research content includes classic research, translation research, or communication research; and the following three conditions were not included in the statistics: non-Chinese and English literature; repeatedly published literature; and literature with no relevant data or incomplete data. The keywords are set in the "Advanced Search" option of CNKI and WOS as the Chinese characters of "international communication of TCM Classic" and the English characters of "TCM Classic", respectively. The time span is set from January 1, 2000, to December 22, 2022. The literature type is set as "journal papers". After retrieval, documents including meeting notices, indexes, results, books, dissertations and others were manually deleted from the retrieval results. Finally, 639 valid Chinese studies and 818 English studies were obtained.

4. Presentation and Analysis of Data Results

From the quantitative analysis of effective literature retrieved by year, it can be seen that the number of published studies on the international communication of TCM classics in the past twenty years has the following significant characteristics: the period from 2000 to 2008 is the initial stage of researching the international communication of TCM classics; the period from 2009 to 2016 is its stable development stage; and the period from 2017 to 2022 is its high-speed development stage. The research remains an upwards trend on the whole, as shown in Figure 1.

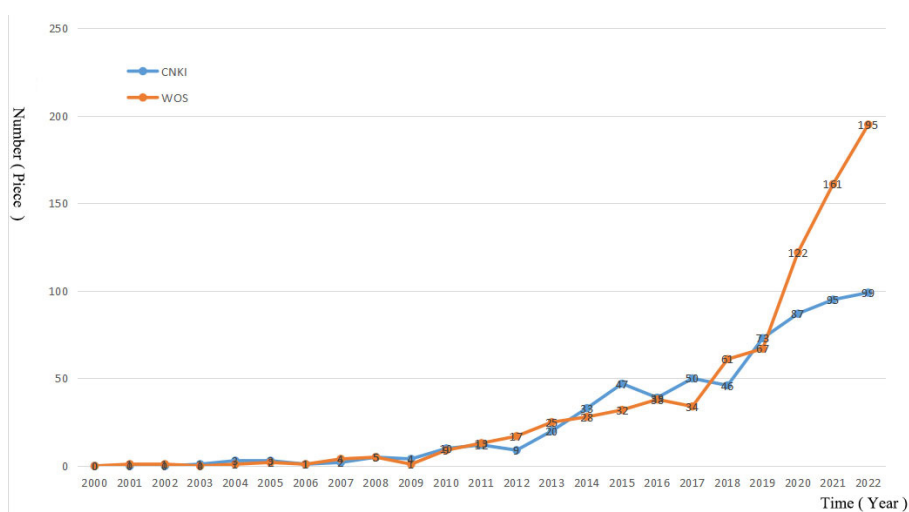


Fig. 1. Curve Graph of the Number of Literature Published in CNKI

Before 2009, there were relatively few Chinese and English studies about the international communication of Chinese medicine classics, and the international influence of TCM was relatively weak. On May 7, 2009, the document Opinions of the State Council of the CPC Central Committee on Promoting the Inheritance and Innovative Development of Traditional Chinese Medicine was officially issued, emphasizing that the inheritance and innovative development of TCM is conducive to enhancing national and cultural self-confidence and promoting TCM culture to the outside world^[1]. At the beginning of 2010, the number of studies on the international communication of TCM increased. Since the outbreak of coronavirus disease 2019 (COVID-19), the scientific nature of TCM has gradually been accepted by the international community, with a surging number of international studies on TCM. In the following sections, this paper will conduct the quantitative analysis at the level of "keywords", "institutions" and "authors".

4.1 Co-occurrence analysis of keywords

Keywords can directly reflect the central idea and main content of a paper. "Centrality" is a key indicator used to analyse the importance of keywords.

Table 1. High-frequency Keyword Statistics of the Literature in the CNKI Database

Keywords	Frequency	Centrality	Keywords	Frequency	Centrality
C-E Translation	103	0.34	Cultural Default	16	0.07
Translation	71	0.3	Translation Methods	13	0.05
Translation Strategy	60	0.31	TCM Culture	12	0.04
TCM	48	0.2	Corpus	12	0.02
TCM Translation	46	0.15	Skopos	12	0.03
<i>Huangdi Neijing</i>	44	1.15	Medio-translatology	11	0.03
C-E Translation of TCM	42	0.17	Foreignization	11	0.02
TCM Terminology	33	0.06	<i>Shanghan Lun</i>	11	0.03
TCM Classics	33	0.1	Metaphor	10	0.01
Chinese Medicine	24	0.02	Translation Principle	10	0.02

Table 2. High-frequency Keyword Statistics of the Literature in the WOS Database

Keywords	Frequency	Centrality	Keywords	Frequency	Centrality
TCM	133	0.18	Rat	38	0.04
Expression	79	0.06	Pathway	38	0.04
Cell	54	0.09	Identification	37	0.08
Activation	53	0.12	Mice	36	0.08
Mechanism	48	0.12	Extract	34	0.09
Apoptosis	47	0.21	Medicine	32	0.09
Inflammation	46	0.02	Oxidative Stress	30	0.09
Network Pharmacology	43	0.03	Inhibition	26	0.04
Model	40	0.08	Constituent	25	0.08
In Vitro	38	0.05	Chemical Constitute	24	0.03

Table 1 indicates that the keywords "translation strategy" and "Huangdi Neijing" have a strong influence in this field and that the study of TCM classics has become one of the hot spots in translation research on TCM. Among the keywords counted, except for Huangdi Neijing (56 times), only *Treatise on Febrile Diseases* (11 times) and *Synopsis of the Golden Chamber* (3 times) appeared in the literature. Table 2 indicates that the hot spots of international research are mainly about "activation", "mechanism" and "apoptosis", but the keywords about translation do not appear, showing that the functions of TCM are given more attention.

4.2 Analysis of publishing institutions

As shown in Figure 2, the distribution of each important node is relatively scattered, with relatively weak cooperation among research institutions across geographical areas. The studies published by the first and second institution account for 41.7% of the number of studies published by the top 10 institutions. This indicates that research on the international communication of TCM classics has not attracted enough attention from domestic scholars, leading to the relative concentration of publishing institutions. Perhaps due to professional limitations, few scholars of other institutions in China engaged in English translation and international communication specialized in research on English translation and international communication of TCM classics.



Fig. 2. The Collaboration Network of Publishing Institutions in the CNKI Database

Figure 3 indicates that the publishing institutions in the field of international communication of TCM classics are dominated by Chinese universities of TCM and that transnational collaborations are still lacking, showing that the international influence and discourse of TCM is still relatively weak. Therefore, the international cooperation and communication of TCM research urgently needs to be strengthened, not limited to cooperation between universities and academic communities but also to form a huge communication pattern formed by all people.



Fig. 3. The Collaboration Network of Publishing Institutions in the WOS Database

4.3 Analysis of author groups

An academic group is a collaborative relationship that exists between the authors. The collaboration network of authors of Chinese literature (Figure 4) shows that several core teams are initially formed in the research field, and the research teams are usually composed of authors from the same institution, but the ties between teams and between authors are very weak.

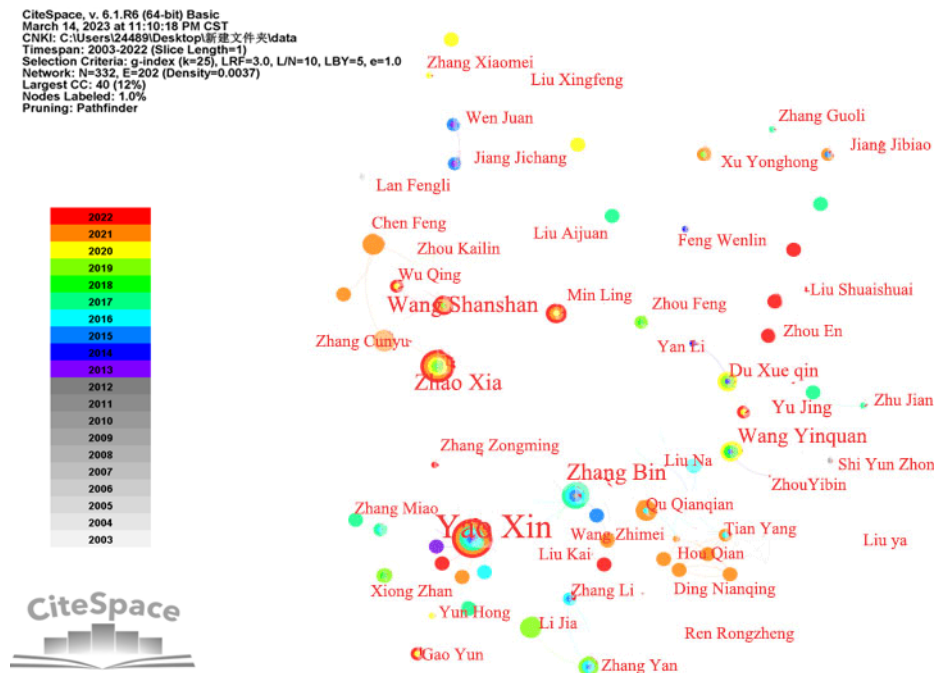


Fig. 4. The Collaboration Network of the Authors of Chinese Literature

The collaboration network of authors of English literature (Figure 5) shows that core teams and core author groups have not been formed. The top ten authors of English literature are all from China, and few foreign scholars have published articles about TCM classics. This indicates that Chinese scholars still dominate the study of TCM classics, and the acceptance of TCM by foreign scholars is relatively low, which is extremely unfavorable to the international communication of TCM.



Fig. 5. The Collaboration Network of the Authors of English Literature

5. Quality Evaluation

This paper follows the AMSTAR2 evaluation checklist to analyse the scientific nature of the study design. Considering the specificity of research on the international communication of TCM classics, five evaluation standards in the evaluation checklist [4] are selected as the key to evaluate the systematic validity. The following are the results, as shown in Table 3.

First, the data of the paper are rigorous. The literature screening and data extraction were tested by a second person, and this study provided criteria for literature exclusion to ensure the objectivity of the results.

Second, the literature search strategy of the paper is relatively comprehensive, ensuring the comprehensiveness of the paper's data, credible evidence, and scientific validity.

Table 3. The Key Evaluation Checklist of AMSTAR2

Item	Content	Result
	Does the author use a comprehensive literature search strategy?	

1	<p>①The author uses at least 2 databases related to the research, provides search terms and/or search strategies, and provides a reasonable explanation of search restrictions.</p> <p>②Adding to the first condition, the authors also searches the included references, clinical trials or research registration platforms, consulting experts, and grey literature, and completes the systematic review within 24 months.</p> <p>③The author only uses a single database, and/or does not provide search terms and search strategies, and/or does not give a reasonable explanation of language and time constraints.</p>	<p>Part <input checked="" type="checkbox"/></p> <p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>
2	<p>Is the literature screened by two researchers independently?</p> <p>① At least two researchers complete the literature screening independently, and the disputes are solved with discussions. Or one researcher completes the literature screening independently, and the second researcher conducts the sampling inspection on the included studies where the consistency is greater or equal to 0.8.</p> <p>②The literature screening is done by one researcher independently, or the literature screening process was not described in the paper.</p>	<p>Part <input type="checkbox"/></p> <p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
3	<p>Is the data extracted by two researchers independently?</p> <p>①At least 2 researchers independently complete the data extraction, or one researcher independently completes the data extraction, and the second researcher should conduct the verification of the extracted data where the consistency is greater or equal to 0.8.</p> <p>②Data acquisition was done independently by one researcher, or the process of data extraction was not described in the paper.</p>	<p>Part <input type="checkbox"/></p> <p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
4	<p>Does the author describe the basic features of the included study in detail?</p> <p>①The authors describes the basic characteristics of the subjects, intervention measures, control measures, outcome measures, type of study design, etc.</p> <p>② The authors describes in detail the subjects, intervention/control measures (including relevant dose), study setting, outcome measures, study design, follow-up time, etc.</p> <p>③The authors does not fully describe the basic characteristics of the included study.</p>	<p>Part <input checked="" type="checkbox"/></p> <p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>
5	<p>Does the author explain or discuss the heterogeneity in the results of the systematic review?</p> <p>①There is no significant heterogeneity in the results of the systematic review.</p> <p>②The sources of heterogeneity in the results are investigated and its impact is discussed.</p> <p>③The sources of heterogeneity in the results are not investigated and/or its impact is not discussed.</p>	<p>Part <input checked="" type="checkbox"/></p> <p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>

As seen from Table 3, the overall design of this study is of relatively high quality and has certain reference significance. It is true that in the past two decades, scholars have shifted from the initial focus on the value of texts to the uniqueness, complexity and richness of the international communication activities of TCM classics. However, these studies still focus on the international communication history of a single classic translation or the evaluation of translation quality, but there is a lack of deeper information exploration, analysis, and interpretation in the process of international communication and translation of TCM classics.

6. Conclusions and Suggestions

The overall research on the international communication of TCM classics has shown a steady development trend in the last decade, but there are still some problems that need to be solved. First, the scope of research is narrow. Most studies are limited to the Huangdi Neijing and do not focus on other classics. Second, although research on the translation of ethnic minority medicine is an important part of TCM, ethnic minority medicine has been a weak link in translation research in China^[3]. Third, the key task the researchers of TCM translation face is to "seriously and systematically summarize the long-term practice of TCM translation to establish and improve the theory, principles and methods of TCM translation as soon as possible" ^[5]. However, the current theoretical construction still lags behind. Fourth, there is relatively little international cooperation in this research field.

Our research group believes that measures should be taken to improve the effectiveness of the international communication of TCM classics from the following aspects:

The first is to broaden the research field of international communication and bring minority medicine classics and more TCM classics into the research to expand the material selection.

The second is to focus on theoretical construction. Scholars should summarize the historical experience of TCM translation to establish a theoretical system of TCM translation and to lay a solid theoretical foundation for the international communication of TCM classics.

The third is to strengthen international academic cooperation. The key to the acceptance of TCM theory by Western society lies in its popularity, which must rely on communication^[6]. Through international academic cooperation, we can demonstrate the practical efficacy of TCM to the word and minimize the resistance of Western audiences.

Finally, the translations of TCM classics must follow the translation principle of "beauty and harmony" to reduce barriers and understand errors in communication. Strongly forcing the discourse of translation on the target audience will only make them resist translation and hinder the internationalization of TCM ^[10]. Especially for Chinese cultural words with rich cultural connotations, it is important to respect the freedom of our own discourse and take into account the information needs and psychological feelings of Western audiences.

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