

Traditional Chinese Medicine on the World Stage: Bridging Insights through Bibliometrics and OpenAI Queries

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Abstract— The global acceptance of Traditional Chinese Medicine (TCM) stands as a multifaceted phenomenon of growing importance in global healthcare and academia. This study presents an interdisciplinary approach to evaluate TCM's international development by integrating bibliometric analysis with OpenAI-generated questions. The study began by delving into the rich history and significance of TCM, emphasizing the need for a thorough understanding of its widespread acceptance. Through bibliometric analysis, it examined an extensive range of academic publications, elucidating key trends and international activities in TCM research. Concurrently, OpenAI was utilized to probe the international developmental status of TCM through asking designed questions in accordance with the bibliometric analysis. AI-generated questions shed light on the perceptions and inquiries surrounding TCM within the global community. This dual methodology allowed for the collection of a comprehensive viewpoint of TCM research, encompassing quantitative bibliometric data and qualitative AI insights. The findings reveal critical insights into TCM's global prominence. By combining these two approaches, this study offers a nuanced examination of TCM's international recognition and underscores the significance of TCM on the world stage and the unique capabilities of interdisciplinary research methods. It holds implications for practitioners, policymakers, and researchers aiming to further TCM's global integration and understanding.

Keywords— Traditional Chinese Medicine | Global Acceptance | Bibliometrics | OpenAI | ChatGPT.

I. INTRODUCTION

Traditional Chinese medicine (TCM) exists as one of the oldest medicine systems, serving to cure diseases and maintain internal balance AKA yin-yang in Chinese (Encyclopaedia Britannica, 2019). It has been practiced for more than 3,000 years (Zhou Dynasty) and records about medical herbs can be traced back in very ancient books such as "The Book of Changes" and "The Book of Songs" (Gu & Pei, 2017). Nowadays, TCM seems to have emerged as a unique field following researchers' in-depth exploration. There are currently more than 4,600 hospitals in China specializing in treatments with TCM, and the ones focusing on research with private ownerships have been doubled within six years before 2021, reflecting a considerable increase in the interest and importance of this area (Wenyi Zhang, 2023).

Yet TCM has been globally unrecognized in the long run. A big argument might be that TCMS are not well regulated and they sometimes even cause people to get sick rather than be cured, resulting in little recognition worldwide. For instance, a team led by Megan Coghlan of Murdoch University in Australia reported that DNA sequences of vulnerable or endangered animal species were found in 15 samples of traditional remedies in the form of powders, pills, capsules, bile flakes, and herbal teas (Coghlan et al., 2012). Further, according to a more recent study, after examining 487 TCMS which could be consumed by ill people, researchers have found that those medicines contain 1,234 concealed substances, including permitted and prohibited Western medications, pharmacological mimics, and animal thyroid tissues (Scientific American, 2019). Therefore, it has been

concerned that TCM application would potentially deteriorate the environment, wild animals, and the patients' health.

The proponents of TCM have been working tirelessly to make it one of the mainstays in the global treatment of disease. Scientists and doctors from China have put their efforts to increase the global influence of TCM. According to the World Health Organization (WHO), the concept of TCM has expanded to more than 100 countries and has evolved into a worldwide enterprise since 2014 (World Health Organization, 2013). However, a quick data query on the topic TCM in PubMed shows that over 97% of search results for all the years are actually affiliated with China and only less than 3% are independent studies from other countries, indicating little recognition of TCM internationally in terms of scientific research. Hence, it is imperative to acquire a deep understanding of the state of international status of the TCM research, as it serves as a crucial compass for shaping future endeavors. International recognition holds the potential to promote scientific advancement, innovation and discovery, elevate the standards of quality control in TCM research, enhance the scope of clinical research and practice, and facilitate the global proliferation and utilization of TCM.

For this purpose, traditional bibliometric analysis would be performed to evaluate the developmental status and international activities in the TCM research. Nowadays, artificial intelligence (AI) stands as a compelling and contentious subject of widespread discussion among the public, and it has been gradually employed into the scientific research areas. In the context of this study, AI would be also utilized to explore pertinent questions, examining its potential contributions to academic scholarship and research in the field of Chinese medicine. This examination aims to discern

whether AI can effectively enhance the study and understanding of Chinese medicine.

II. MATERIALS AND METHODS

2.1. Bibliometric Data Collection & Analyses

The web crawler software Octopus (<https://www.bazhuayu.com/>) was utilized to collect publication information from PubMed (<https://pubmed.ncbi.nlm.nih.gov/>) with the keyword “Chinese

Medicine” in either title or abstract (**Figure 1**). The collected data were downloaded as Excel files in batch for following data analyses. First, the number of relative papers published in different years from 1904 to 2023 was counted. The affiliations of these papers were named and the countries publishing the top number of papers were listed to evaluate whether they have been devoting relatively more energy to the TCM research.

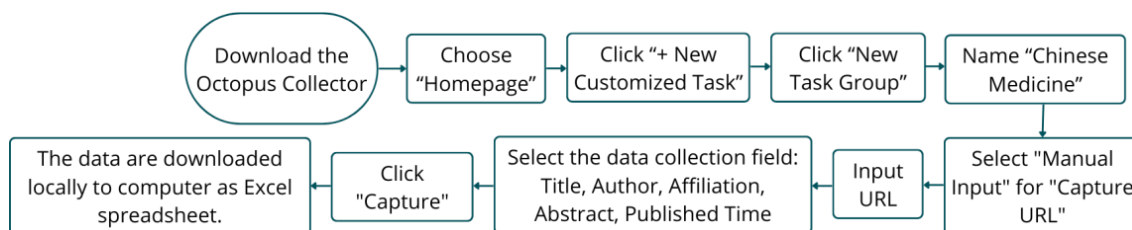


Figure 1: The procedure of data collection using the Octopus web crawler in this study

2.2. OpenAI Queries

ChatGPT is an OpenAI public utility, being launched on November 30, 2022, with Generative Pre-trained Transformer (GPT) as its underlying technology. It is a highly sophisticated chatbot capable of fulfilling a wide range of text-based requests; from answering simple questions to completing more advanced tasks (Liu et al., 2021). In this study, the global developmental status of Chinese medicine in relation to the above bibliometric analysis was inquired in ChatGPT with the following questions.

- ❖ How many years is the history of Chinese medicine in total?
- ❖ How is the current recognition of Chinese medicine in the world?
- ❖ What are some reasons causing the sudden increase in the number of research papers of Chinese medicine in 1999?
- ❖ What are some reasons causing the sudden increase in the number of research papers on Chinese medicine in 2019?
- ❖ Which countries have done the most research in Chinese medicine, in descending order of quantity?
- ❖ Do Asian countries collaborate more on Chinese medicine?

III. RESULTS AND DISCUSSION

3.1. Historical Development in TCM Research

A total of 39,078 TCM-related articles were published in the period of 1904 to 2023 by the time of this study (September 20, 2023). The publication trend had two critical milestones since 1999 as shown on the chart (Figure 2) - from 1999 to 2000 and 2019 to 2020. After 1999, the number of publications had been increasing significantly, and especially there had been a quantum leap from 2019 to 2022.

In 1999, China entered a phase of increased trade liberalization as a result of accession to WTO and the membership conditions imposed on it (Boden, 2012).

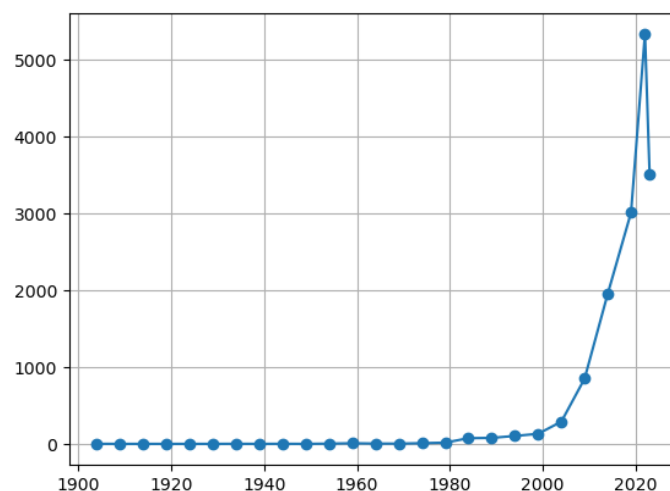


Figure 2: The number of TCM publications overtime

The entry into WTO might be one of the major factors causing the blossoming number of published papers in the field of Chinese medicine. It is plausible to argue that after China joined the world village, not only did the commercial transactions increase but also affected the cultural exchanges internationally, and Chinese medicine was highly possible to catch foreigners’ attention, thus increasing the understanding and collaborative research of Chinese medicine in the world. Regarding the cause driving the publication surge at the second critical time point, it could be closely related to the Coronavirus Disease (COVID-19) pandemics. At the end of 2019, COVID-19 outbreaks rapidly expanded their spread worldwide, resulting in a global pandemic (Ciotti et al., 2020). In the past, Chinese medicine has been used for a long time to treat diseases such as plague: The earliest application of TCM in prevention of infectious disease outbreaks could be traced back to very ancient practice, being mentioned in Huangdi’s Internal Classic (Huang Di Nei Jing) where preventative benefits were noted (Luo et al., 2020). Also, TCM has played a positive role in the treatment of previous coronavirus

pneumonia epidemics, such as the SARS outbreak in 2003 and Middle East Respiratory Syndrome (MERS) first reported in 2012. In the recent COVID-19 pandemics, China's National Health Commission has recommended TCM as one of the treatment strategies. In its guidelines for combating COVID-19, several Chinese medicines have been recommended, including Jinhua Qinggan granules, Lianhua Qingwen capsules, XueBijing injections, a Qingfei Paidu decoction, a

Huashi Baidu decoction, and a Xuanfei Baidu decoction. Based on the results so far, TCM has shown some efficacy in combating COVID-19 (Lyu et al., 2021; Wang & Qi, 2020). To view the research trend more clearly, the data were further divided into four time ranges: 1904-1948, 1949-1975, 1976-1999, and 2000-2023 (Figure 3), and making this division was based on the chronology of a number of historically significant events in China.

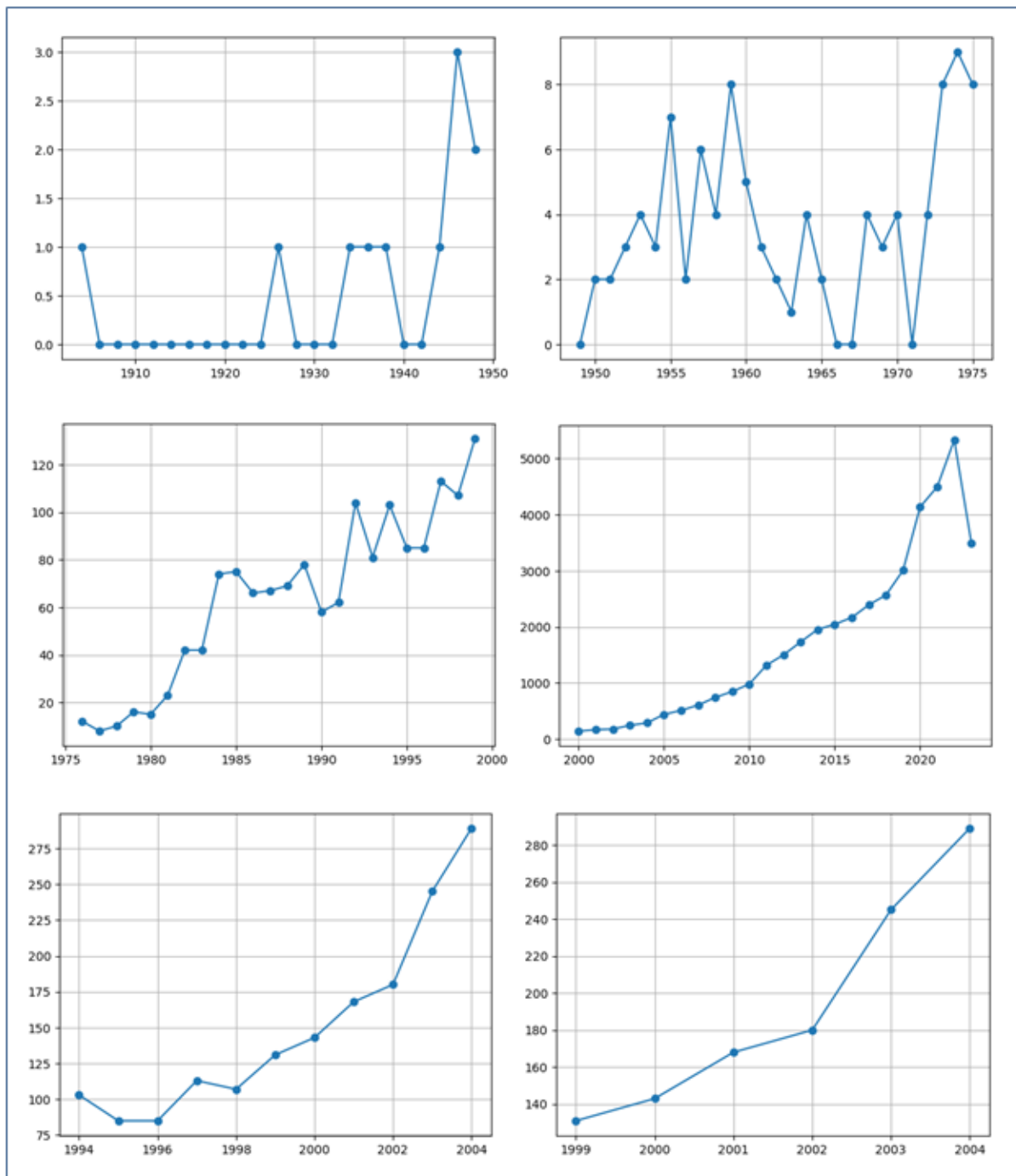


Figure 3: Number of TCM publication historically.

Within the years from 1904 to 1948, almost no papers about Chinese medicine have been published, and the search results

in PubMed only contained 11 records. Within the following 26 years from 1949-1975, the number of published papers was

moderately stabilized in a range of lower than 10 annually. After 1975, more attention began to be paid on the TCM research, causing an uptrend in the number of relative papers published. This trend has been going up continually since then, and a sharp increase appeared after 2020. However, the uptrend seems paused in 2023. The number of published papers about Chinese medicine in 2023 was much lower than that in 2022, despite three quarters having virtually elapsed at the time (the middle of September) of data collection in this study. Considering that the coronavirus epidemic has basically ended, it could be strongly assumed that the surge of relevant research articles from 2019 to 2022 was mostly attributed to the coronavirus epidemic.

3.2. Research Reactivity in TCM

The total number of publications can be used as a first indicator of a country's response to an area of research. In the field of traditional Chinese medicine, it is determined that the global research reactivity in TCM can be evaluated from the number of published articles in six countries (Figure 4), namely China, the United States, the United Kingdom, Japan, Australia, and Singapore. This is based on the consideration of both the number of published articles in these countries and their development relationship of various aspects with China. Although the number of articles published in the United Kingdom is slightly lower than that in Germany and Canada, it is worth analyzing as one of the earliest countries for the spread of TCM (Fu et al., 2022). A review of the literature data published by Cheung in 2011 also supports the above recommendation (Cheung, 2011).

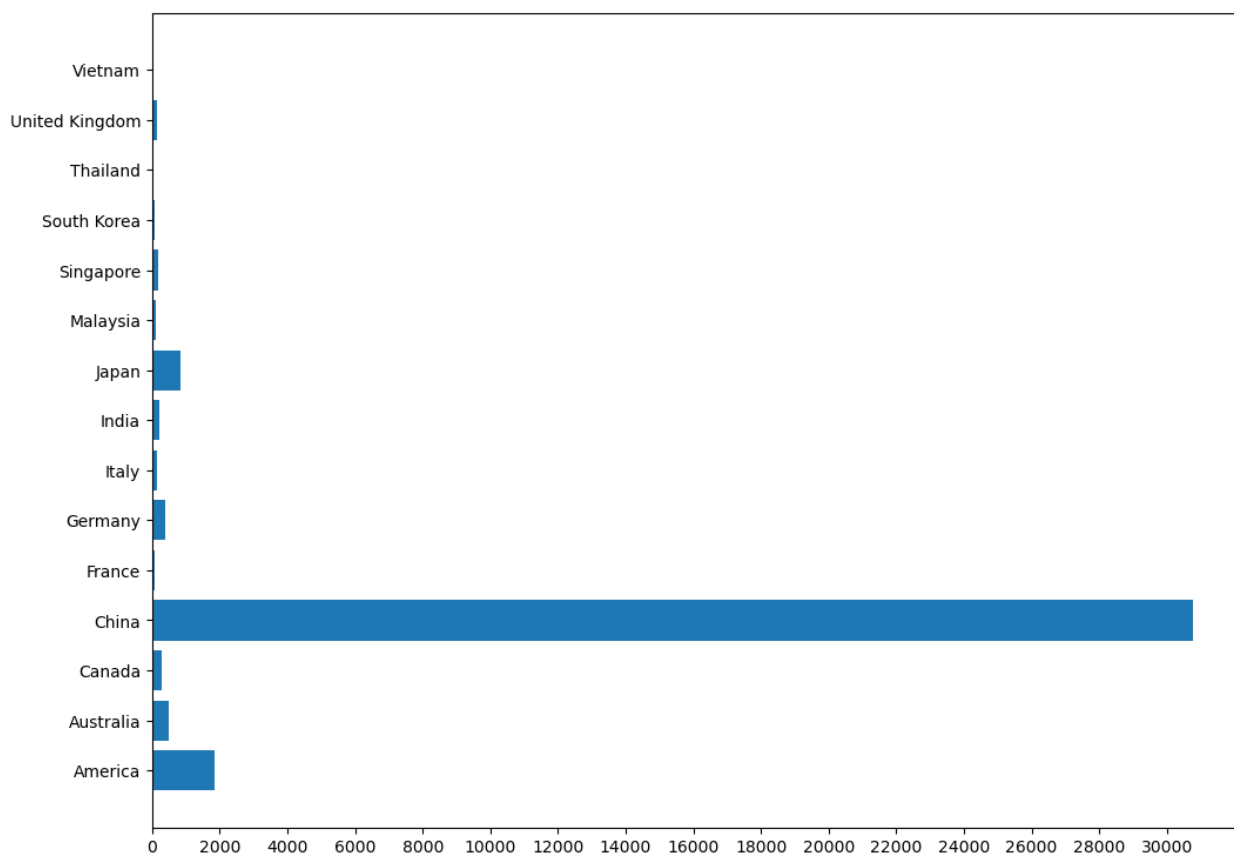
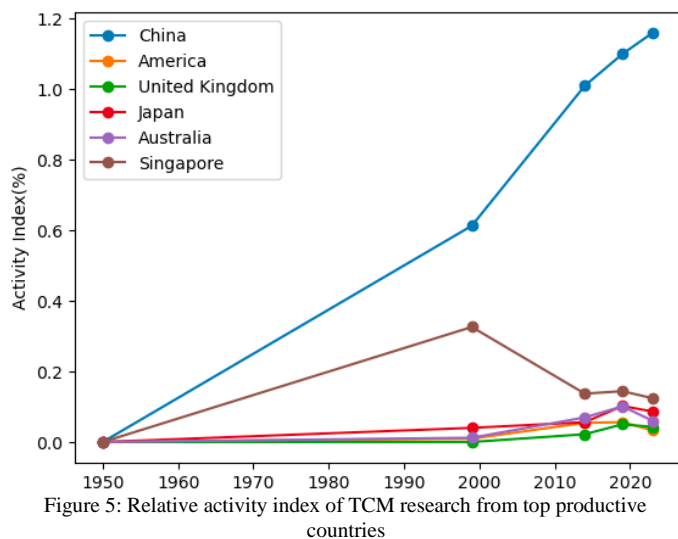


Figure 4: The number of TCM publications from top productive countries

In order to gain a historical perspective on the TCM weight in these countries overtime, activity indices were calculated to compare their relative research engagement in the topic of Chinese medicine. Generally, even in highly developed countries like the United States, the United Kingdom, Japan, and Australia, research related to traditional Chinese medicine consistently represents a relatively small proportion of their overall research activities throughout the years. Singapore, on the other hand, emerges as an exception. Despite its lower total number of publications compared to

these developed nations, Singapore consistently maintains a relatively high activity index in the TCM research. This observation underscores the collaborative and research intensive nature of Singapore's engagement with the field of TCM (Figure 5). As the origin of traditional Chinese medicine, China has the largest number of related publications, and the index of research and activity invested in the field of traditional Chinese medicine is getting higher and higher every year. Among the dozen countries surveyed, only Japan, Singapore, and India in Asia have a relatively high

number of TCM-related publications. However, when compared to Western countries, apart from Japan, there is a significant disparity in the amount of research dedicated to Chinese medicine. Therefore, the proximity of Asian countries to China geographically does not necessarily correlate with a higher level of TCM research activity.



3.3. OpenAI Responses to Inquiries on TCM Research

3.3.1. Prompt: How many years is the history of Chinese medicine in total?

Response: “The history of Chinese medicine spans over thousands of years. Traditional Chinese Medicine (TCM) has its roots in ancient China and has evolved and developed over a long period. The recorded history of Chinese medicine dates back to around 200 BCE, but its practice and knowledge are believed to have originated even earlier.

The foundational text of Chinese medicine, the *Huangdi Neijing* (Yellow Emperor’s Inner Canon), was compiled during the Han Dynasty (206 BCE - 220 CE). This text, along with other ancient medical classics, laid the groundwork for the principles and theories of Chinese medicine.

Throughout history, Chinese medicine continued to evolve and incorporate new knowledge and practices. It drew influences from various sources, including Taoism, Buddhism, and regional folk medicine. Over time, different schools of thought and specialized branches of Chinese medicine emerged, such as acupuncture, herbal medicine, qigong, and tui na.

Chinese medicine has been continuously practiced and refined throughout the centuries, adapting to changing societal, cultural, and scientific contexts. Today, it remains an integral part of healthcare in China and is recognized and practiced in various parts of the world.

Given its long and rich history, the development and evolution of Chinese medicine have occurred over thousands of years, making it one of the oldest and most enduring medical systems in the world.”

3.3.2. Prompt: How is the current recognition of Chinese medicine in the world?

Response: “As of my knowledge cutoff in September 2021, Chinese medicine has gained recognition and popularity in

various parts of the world. Traditional Chinese Medicine (TCM) is a comprehensive medical system that includes practices such as acupuncture, herbal medicine, massage (tui na), exercise (qigong), and dietary therapy.

The acceptance and recognition of Chinese medicine vary in different countries and regions. In many Asian countries, especially China and its neighboring countries, TCM is deeply rooted in their healthcare systems and is widely practiced alongside Western medicine. Chinese herbal medicine and acupuncture are commonly used treatments in these regions.

In recent years, there has been an increasing interest in Chinese medicine in Western countries as well. Many people are seeking alternative and complementary treatments, and Chinese medicine offers a holistic approach to health and well-being. Acupuncture, in particular, has gained recognition and is now practiced by licensed practitioners in various Western countries.

However, it’s important to note that the recognition and acceptance of Chinese medicine in the world are not universal, and there are ongoing debates and discussions regarding its efficacy and scientific basis. While some studies suggest positive effects of certain Chinese herbal medicines and acupuncture, others call for more rigorous scientific research and evidence-based practice. Regulatory frameworks and licensing requirements for practitioners also vary across different countries.

It’s advisable to consult with qualified healthcare professionals or licensed practitioners who have expertise in Chinese medicine to understand its potential benefits and limitations based on the most up-to-date information available in your region.”

3.3.3. Prompt: What are some reasons causing the sudden increase in number of research paper of Chinese medicine in 1999?

Response: “The year 1999 marked a significant increase in the number of research papers on Chinese medicine for several reasons:

1. Integration of Traditional Chinese Medicine (TCM) into the Chinese healthcare system: In the late 1990s, the Chinese government made efforts to integrate TCM into the national healthcare system. This led to increased funding and support for research in Chinese medicine, resulting in a surge of scientific studies.

2. Rising global interest in complementary and alternative medicine: The late 1990s witnessed a growing interest in complementary and alternative medicine (CAM) worldwide. Chinese medicine, with its holistic approach and long-standing history, attracted attention as a potential alternative to conventional Western medicine. This increased interest prompted more research into Chinese medicine.

3. Recognition of Chinese medicine by the World Health Organization (WHO): In 1999, the WHO published its “Traditional Medicine Strategy,” which acknowledged the importance of traditional medicine, including Chinese medicine, and emphasized the need for scientific research and regulation. This recognition by a global health authority likely influenced the increased research efforts in Chinese medicine.

4. *Access to electronic databases and improved research infrastructure:* The advent of the internet and electronic databases made it easier for researchers to access and disseminate scientific information. This improved access to research articles and facilitated collaboration among researchers, leading to a higher number of published papers.

5. *Increased international collaboration:* The late 1990s witnessed increased collaboration between Chinese researchers and their counterparts in other countries. Joint research projects and exchange programs allowed for the sharing of knowledge and resources, leading to a broader range of research papers on Chinese medicine.

It's important to note that the specific reasons for the surge in research papers on Chinese medicine in 1999 may vary depending on the region and context. The factors mentioned above provide a general understanding of the trends during that time."

3.3.4. Prompt: What are some reasons causing the sudden increase in number of research paper of Chinese medicine in 2019?

Response: *"As of my knowledge cutoff in September 2021, I don't have specific information on the sudden increase in the number of research papers on Chinese medicine in 2019. However, I can speculate on some possible reasons based on general trends in the field:*

1. *Growing interest in integrative medicine:* Integrative medicine, which combines conventional Western medicine with complementary and alternative approaches, has been gaining recognition and interest worldwide. Chinese medicine, with its holistic principles and long-standing history, is often included in integrative medicine approaches. The increasing interest in integrative medicine may have contributed to a higher number of research papers on Chinese medicine in 2019.

2. *Expanded research funding and support:* Governments, research institutions, and private foundations have been increasingly investing in research on complementary and alternative medicine, including Chinese medicine. This increased funding and support provide researchers with resources and opportunities to conduct studies, leading to a rise in the number of research papers.

3. *Advancements in research methodologies:* Scientific research on Chinese medicine has evolved over the years, with improved methodologies and study designs. This enhances the rigor and quality of research papers, making them more valuable and increasing their publication rate.

4. *Increased collaboration and exchange:* International collaboration and exchange programs between researchers from different countries and institutions have become more prevalent. Such collaborations allow for the sharing of expertise, resources, and data. The resulting research papers contribute to the overall increase in publications on Chinese medicine.

5. *Recognition of evidence-based practice:* There has been a growing emphasis on evidence-based practice in healthcare. As a result, researchers and practitioners in Chinese medicine have been working towards generating more robust evidence to support its efficacy and safety. This focus on evidence-

based practice may have led to an increase in research papers in 2019.

It's important to note that these reasons are speculative, and specific factors influencing the increase in research papers on Chinese medicine in 2019 may vary. To obtain a more accurate understanding, it would be necessary to refer to specific studies and developments in the field during that time."

3.3.5. Prompt: Which countries have done the most research in Chinese medicine, in descending order of quantity?

Response: *"Determining the exact quantity and ranking of research publications in Chinese medicine by country can be challenging due to the vast amount of published literature and variations in data sources. However, based on general trends and available information, the following countries are often recognized for their significant research contributions in Chinese medicine:*

China: As the birthplace and stronghold of Chinese medicine, China is considered a leading country in terms of research output. Chinese research institutions and universities have been actively conducting studies on various aspects of Chinese medicine, including herbal medicine, acupuncture, and clinical trials.

United States: The United States has shown significant interest in Chinese medicine research, with numerous academic institutions and research centers focusing on the field. Universities, such as Harvard Medical School and the University of California, have established centers and programs dedicated to studying Chinese medicine.

Japan: Japanese researchers have a long history of studying and incorporating aspects of Chinese medicine into their healthcare practices. There are several research institutions and universities in Japan that contribute to the study of Chinese medicine, particularly in areas such as Kampo medicine (the Japanese adaptation of Chinese herbal medicine).

South Korea: South Korea has also made substantial contributions to Chinese medicine research. Korean researchers have conducted studies on various aspects of Chinese medicine, including clinical trials and herbal medicine. The Korea Institute of Oriental Medicine (KIOM) is a prominent research institution in the field.

Germany: Germany has a strong interest in complementary and alternative medicine, including Chinese medicine. Several research institutions and universities in Germany have been actively involved in studying Chinese medicine, especially acupuncture and herbal medicine.

United Kingdom: The United Kingdom has shown a growing interest in Chinese medicine research, with universities and research centers conducting studies and clinical trials on acupuncture and herbal medicine. The University of Westminster and the University of Southampton are among the institutions known for their Chinese medicine research.

It's important to note that the research output and rankings can vary over time, and there may be other countries actively contributing to Chinese medicine research as well. Additionally, collaborations and international research

projects can influence the distribution of research publications in the field.”

3.3.6. Prompt: Will there be more cooperation in TCM between Asian countries and China than other Western countries?

Response*: “China is a key player in the TCM market, and it has been actively promoting cooperation with other Asian countries. In the past few years, China has signed a number of cooperation agreements with countries such as Japan, South Korea, and India. These agreements aim to promote the exchange of TCM knowledge and technology, and to facilitate the development of TCM products.” * Neither the ChatGPT nor the GDP-4 responds to the Prompt 6. Eventually another AI Generator, Google -PaLM, answered the question.

The response from the AI in section 3.3.1 aligns well with the research background of this study, underscoring the long-standing development of Traditional Chinese Medicine in China over thousands of years. It notably references the 'Huangdi Neijing,' which serves as the foundational text of Chinese medicine. This acknowledgment by the AI bolsters the historical context of TCM's significance. In section 3.3.2, the AI offers a relatively neutral stance, acknowledging the ongoing debate regarding the recognition of Chinese medicine. This response reflects the complexity and diversity of opinions within the field. However, the AI's responses in sections 3.3.3 and 3.3.4 are somewhat vague, lacking specific insights into the underlying factors at play. These sections require a more in-depth exploration of the issues at hand to provide a comprehensive understanding. In contrast, the AI's response in section 3.3.5, where it ranks countries based on the number of publications related to Chinese medicine in descending order, closely mirrors the bibliometric results obtained in this study. While there are minor discrepancies concerning Australia and Canada, overall, the AI's response underscores the potential of artificial intelligence as an efficient tool for conducting preliminary background research. It effectively references relevant information, although it may fall short in delivering precise quantitative evidence. In conclusion, the AI's responses highlight its capacity to assist in gathering general background information effectively. It demonstrates a commendable depth of knowledge, although it may require further refinement to offer more nuanced and quantitative insights. Nonetheless, its alignment with the research findings in ranking countries based on publication papers illustrates its potential as a valuable research tool, albeit with occasional variations.

IV. CONCLUSION

Traditional Chinese Medicine offers unique insights and holistic approaches to health and well-being, which have the potential to enrich the global healthcare landscape. This study employs a dual methodology, combining bibliometric analysis and AI-generated questions, to shed light on the state of TCM's international acceptance. The results unequivocally demonstrate that the journey toward worldwide recognition of TCM is far from complete, demanding concerted efforts to cultivate a more inclusive and collaborative environment. The bibliometric analysis has revealed both promising trends and

enduring challenges. While TCM research is undeniably expanding in terms of volume and visibility, it is equally evident that TCM encounters obstacles in achieving widespread global acceptance. International publications and engagement serve as critical indicators of recognition and influence, and the analysis presented here underscores the substantial room for growth in these domains. The documented low global acceptance of TCM, as corroborated by the bibliometric analysis, underscores the imperative for collaborative action from researchers, practitioners, policymakers, and educational institutions. Such efforts have proven essential for the long-term vitality of TCM research. For instance, an illustrative example is the issuance of the 'Special Provisions on the Registration and Administration of Chinese Medicines' by the State Drug Administration of China on February 10, 2023. These provisions mandate the promotion of the integration of Chinese medicine theory, empirical knowledge, and clinical trials - a significant step in establishing a review and approval system with Chinese medicine characteristics. This reform initiative underscores new concepts in the registration and management of traditional Chinese medicines, reinforcing the focus on practicality. Subsequently, the pace of listing new Chinese medicines has accelerated significantly. Building upon the findings of this study, it serves as a call to action. An analysis of international acceptance can undoubtedly inform national scientific research policies in guiding TCM development and offer expansive insights for research and development enterprises in the market. It urges the implementation of programs designed to bridge cultural divides, advance rigorous scientific validation, and enhance the accessibility and safety of TCM practices. In essence, this study encourages sustained research, open dialogue, and international collaboration to elevate TCM's global stature. While the journey toward global recognition may be lengthy, it is a path well worth pursuing for the betterment of individuals, communities, and societies worldwide.

REFERENCES

1. Boden G. China's accession to the WTO: economic benefits. 2012, digitalcommons.iwu.edu /cgi/viewcontent.cgi?article=1364&context=parkplace.
2. Cheung, F. TCM: Made in China. *Nature*, 2011, 480: S82-S83.
3. Ciotti M., Angeletti S., Minieri M., Giovannetti M., Benvenuto D., Pascarella S., Sagnelli C., Bianchi M., Bernardini S. and Ciccozzi M. COVID-19 outbreak: an overview. *Chemotherapy*, 2020, 64: 1-9.
4. Coghlan M.L., Haile J., Houston J., Murray D.C., White N.E., Moolhuijzen P., Bellgard M.I. and Bunce M. Deep sequencing of plant and animal DNA contained within traditional Chinese medicines reveals legality issues and health safety concerns. *PLoS Genetics*, 2012, 8: e1002657.
5. Encyclopaedia Britannica. Traditional Chinese Medicine | Description, History, & Facts. Encyclopædia Britannica, 2019, <http://www.britannica.com/science/traditional-Chinese-medicine>.
6. Fu M., Meng X. and Li Z. Analysis the characteristics of traditional Chinese medicine in English literature development in modern history. *Annals of Palliative Medicine*, 2021, 10: 9251258-9259258.
7. Gu S. and Pei J. Innovating Chinese herbal medicine: from traditional health practice to scientific drug discovery. *Frontiers in Pharmacology*, 2017, 8: 381.
8. Liu X., Zheng Y., Du Z., Ding M., Qian Y., Yang Z. and Tang J. GPT understands, too. *AI Open*, 2023.



9. Luo H., Tang Q., Shang Y., Liang S., Yang M. Robinson N., and Liu J. Can Chinese medicine be used for prevention of corona virus disease 2019 (COVID-19)? A review of historical classics, research evidence and current prevention programs. *Chinese Journal of Integrative Medicine*, 2020, 26: 243-250.
10. Lyu M., Fan G., Xiao G., Wang T., Xu D., Gao J., Ge S., Li Q., Ma Y., Zhang H. and Wang J. Traditional Chinese medicine in COVID-19. *Acta Pharmaceutica Sinica B*, 2021, 11: 3337-3363.
11. Scientific American. The world health organization gives the nod to traditional Chinese medicine. Bad idea. *Scientific American*. 2019, 320, <https://doi.org/10.1038/scientificamerican0419-6>.
12. Wang J. and Qi F. Traditional Chinese medicine to treat COVID-19: The importance of evidence-based research. *Drug Discoveries & Therapeutics*, 2020, 14: 149-150.
13. Zhang W. Number of traditional Chinese medicine hospitals in China from 2015 to 2021, by Type of Ownership. *Statista*, 2023, Feb 1.
14. World Health Organization. WHO traditional medicine strategy: 2014-2023. 2013, <http://apps.who.int/iris/bitstream/handle/10665/92455/9786167697581-tha.pdf>.