International academic representation of traditional Chinese medicine in the post-COVID-19 era: a corpus-based exploration

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Introduction: TCM has long been subject to international debates regarding its scientific validity, highlighted by studies of its portrayal in particularly media discourse revealing Western perceptions of TCM as "lacking evidence." The COVID-19 pandemic, however, has markedly increased global attention towards TCM, prompting a re-evaluation of its role.

Methods: Corpus-assisted discourse analysis was employed, with WordSmith 8.0 utilized, to examine perceptions of TCM within international English academic literature from 2020 to 2022 across diverse regions and disciplines.

Results: This study identified three major findings: (1) In the specific context of COVID-19, representations of TCM are consistently positive across all regions, emphasizing its historical credibility, theoretical depth, and perceived efficacy in pandemic response. (2) TCM is represented differently across geographical regions—Asian scholars frequently characterize it as "versatile, reliable, and influential," while European scholars label it a "non-scientific marginal therapy." North American and Australian perspectives portray TCM as a dual-sided coin which potentially serves as an "adjuvant alternative," whereas African scholars seem skeptical, perceiving it as a "low-end therapy." (3) Disciplinary variation is also observed, with medicine, science, engineering, agronomy and humanities displaying distinct research foci and thus representational tendencies.

Discussion: These findings underscore the complex interplay between medical systems, cultural and geographic proximity, institutional factors, status quos of TCM research and practice as well as disciplinary conventions in the international academic representation of TCM, which contribute valuable insights into its evolving global scientific status and integration into modern healthcare.

KEYWORDS

TCM, academic representation, international English academic discourse, corpus, post-COVID-19 era

1 Introduction

As a holistic healthcare system developed over millennia, traditional Chinese medicine (TCM) integrates therapeutic practices with broader cultural and philosophical conceptions, constituting an important health, economic, technological, cultural and ecological resource in China. In the international context, however, TCM has often been subject to skepticism regarding its scientific validity, portrayed as "non-scientific" or "alternative," exemplified by WHO's ICD-11 controversy (Cyranoski, 2018) and FDA's classification of herbal products as dietary supplements (U.S. Food and Drug Administration, 2022). Such perceptions have posed significant challenges

to the global dissemination and acceptance of TCM technologies and culture. Following the outbreak of COVID-19 in late 2019, TCM was soon officially incorporated into China's "Diagnosis and Treatment Protocol for Novel Pneumonia (Trial Version 3)" in January, 2020. Additionally, TCM formulations, were approved for use in several countries, including Singapore, Thailand, and Australia, as part of COVID-19 treatment regimens. TCM's integration into pandemic responses, both domestically and internationally, have brought renewed global attention, potentially shifting prior perceptions and inviting re-evaluation of its role within modern healthcare systems.

Previous research on TCM's global representation remains heavily concentrated on media discourse, with images constructed outside China and qualitative methods predominating. These studies consistently reveal regional variation: Chinese sources frame TCM positively, emphasizing scientific credibility and cultural heritage, whereas Western sources tend to portray it more cautiously, highlighting questions of evidence and regulatory oversight (Chen et al., 2022; Luo, 2024). Nevertheless, the East–West distinction is often over-simplified, and more nuanced cultural and disciplinary differences are rarely explored.

Disseminating TCM knowledge through channels such as academic literature, conferences and organizations, academia holds the natural right to speak about TCM. TCM representation can and should, undoubtedly, be examined from an academic perspective. However, almost no systematic exploration of the academic representation of TCM across different regions and disciplines has been found. In the "Guideline for the Revitalization and Development of TCM" issued by China's State Council in February, 2023, it was emphasized that the participation of TCM in international cooperation for the prevention and control of major infectious diseases should be strengthened. Therefore, a study of international academic community's representation of TCM during the post-pandemic era is of particular significance to promoting the international communication and academic development of TCM.

Applying corpus-assisted discourse analysis, this study examines the general perception of TCM and its role in COVID-19 during the post-pandemic era in international English academic discourse, and the differences in the attitudes and research focuses of scholars from various cultural and disciplinary backgrounds on TCM. By addressing these questions, it seeks to contribute new perspectives on the modernization and internationalization of TCM, offering insights into how traditional medical knowledge systems negotiate their place within global scientific discourse.

The remainder of this paper is organized as follows: Section 2 reviews the existing literature on TCM representation in various text types, corpus approaches to TCM representation research and studies of the representation of alternative medicines; Section 3 describes the research design, including data collection, corpus construction, research questions, research methods and research procedures; Section 4 presents the findings and the implications of the results; and Section 5 concludes the study.

2 Literature review

2.1 TCM representation in various text types

The representation of TCM has been investigated in media, educational, and policy texts, with most research to date conducted by Chinese scholars.

2.1.1 TCM representation in media discourse

Media discourse constitutes the most extensively explored domain in TCM representation studies. Based on corpus-assisted discourse analyses and content analyses, Pan (2024a, 2024b) demonstrated that Chinese media consistently frame TCM positively, emphasizing its scientific legitimacy, cultural heritage, and integration into modern healthcare. In contrast, Western media often adopt a cautious tone, portraying TCM as an alternative or complementary practice and occasionally highlighting concerns regarding scientific validation or regulatory oversight. Tang et al. (2025) conducted a quantitative content analysis of TCM news pieces from countries with different cultural profiles, and revealed that national cultural orientations, such as uncertainty avoidance, partly influence how TCM is framed across different countries. In addition, studies of social and online media reveal competing stances on TCM. For example, Chen et al. (2018) analyzed global social-media discussions on TCM and found that debates tend to fragment along cultural lines, with adherents forming insular "public spheres" around pro- or anti-TCM sentiments. Similarly, Wang et al. (2024) examined nearly 2,000 Zhihu (a Chinese Q&A site) posts on TCM for COVID-19 and found that most lay users expressed positive attitudes rooted in personal experience and media influence, while medical professionals were more supportive than skeptics.

2.1.2 TCM representation in educational and policy discourse

In educational and knowledge dissemination contexts, research examines platforms such as encyclopedias and public signage. Ye et al. (2020) focused on how TCM is presented in a collaborative online encyclopedia, highlighting the coexistence of cultural pride and scientific caution in framing TCM. Chinese-oriented platforms and institutional materials typically emphasize TCM's historical significance and effectiveness, whereas English-language sources present more balanced or skeptical accounts. Policy and governmental discourse analyses similarly show that Chinese governmental narratives position TCM as both a scientific achievement and a soft power instrument, aligning it with national health strategies and international diplomacy (Yang et al., 2022). In contrast, Western regulatory frameworks categorize TCM under complementary and alternative medicine, emphasizing evidence-based integration (Qu et al., 2022).

Obviously, research across various text types converges on the point that the representation of TCM is context-dependent, shaped by both cultural identity and information sources, with Chinese narratives generally conveying a supportive view.

2.2 Corpus approaches to TCM representation research

Given the discourse differences noted above, researchers have increasingly turned to corpus approaches which enable the analysis of large-scale collections of TCM-related texts to uncover recurring linguistic patterns, framing tendencies, and subtle biases that might escape manual reading. Ge and Tian (2022) constructed a corpus of English-language *China Daily* reports from 2020 to examine its messaging strategy surrounding TCM during the COVID-19 pandemic. Using WordSmith Tools to extract keywords, lexical patterns, and concordance lines, they demonstrated that the

anti-epidemic context was leveraged to construct a science-backed and heroic image of TCM. Additionally, Zhang and Luo (2023) examined the international portrayal of TCM using the News on the Web (NOW) corpus, covering English news texts from 2010 to 2020. Through collocation analysis, it was found that while TCM was frequently associated with positive descriptors, it was also occasionally linked to skeptical terms like "quackery" and "unproven." A cautious stance was also revealed in Western reporting, as evidenced by the high frequency of low-value modal verbs.

These studies suggest that corpus methods can effectively capture the evaluative framing and narrative architecture of media, providing methodological insights for the exploration of TCM representation in academic discourse in this study.

2.3 Studies of the representation of alternative medicines

The inclusion of TCM in Complementary and Alternative Medicine (CAM) discussions in many Western countries means that any stereotype might likely color perceptions of TCM as well. Therefore, understanding TCM's portrayal requires situating it within the wider context of how alternative medicines in general are represented. Research on the representation of alternative medicines primarily highlights diverse media and policy depictions.

Lavorgna and Di Ronco (2018), through discourse analysis of Italian newspaper reports, observed a hybrid framing of alternative medicines: while some articles amplified their potential, others conveyed regulatory caution, often quoting health officials. This ambivalence was argued to stem from limited scientific literacy among journalists and the scarcity of authoritative expert voices in the coverage. Koppel and Uibu (2022) conducted a qualitative media analysis on profiles of three prominent CAM doctors in Estonia. It was found that journalists initially framed these practitioners as marginal or pseudoscientific, but gradually shifted to portray them as culturally resonant and medically credible, suggesting a normalization of CAM figures in public discourse aligned with growing public interest. In the policy sphere, Danell (2018), analyzing Swedish political debates, revealed that CAM was increasingly framed not only as a therapeutic option for chronic conditions, but also as a matter of individual rights. Politicians across parties cited patient autonomy, cultural pluralism, and healthcare system flexibility as justifications for its inclusion, despite unresolved scientific debates.

In summary, three major gaps can be identified from previous research. Firstly, TCM representation research has predominantly focused on media discourse, while academic discourse where TCM's scientific status is most critically evaluated has received little attention. In addition, while geographical variation is a consistent observation across studies, these comparative analyses often simplify the East–West distinction, potentially overlooking nuanced differences within regions and disciplines. Secondly, while corpus methods are not novel in studies of image construction, current research has primarily centered on TCM represented by either Chinese or overseas media, with a dearth of cross-cultural comparisons and an over generalization of TCM "images." Thirdly, the literature of the representation of alternative medicines underscores the complexity of general Western attitudes towards CAM, but there remains space for a more focused analysis on TCM's unique position. In terms of research methods, much work is qualitative or region-specific, with a systematic corpus-assisted study of TCM representation in international academic discourse failing to receive the deserved attention.

3 Research design

In order to determine the temporal scope of this study, a preliminary analysis of publication trends from 2018 to 2023 was conducted, as shown in Figure 1.

This data-driven approach revealed a significant surge in TCM-related English academic publications included in the core collection of Web of Science (WOS) between 2020 and 2022,
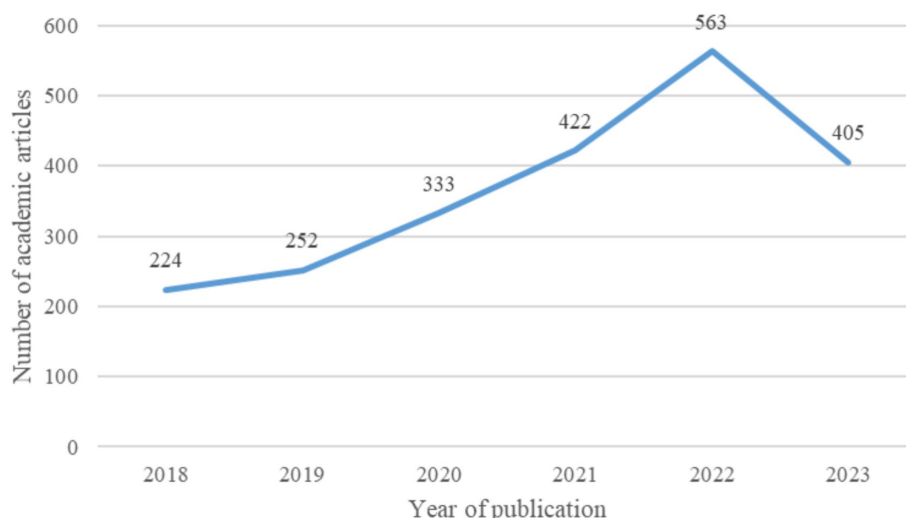

FIGURE 1
TCM-related English academic publications in the WOS core collection (2018–2023).

corresponding to the heightened international attention following the COVID-19 outbreak. Accordingly, the three-year post-pandemic period was selected for focused analysis.

3.1 Data collection

A corpus of international English academic articles on TCM was assembled, with data collected from the core collection of WOS (SCI, SSCI, A&HCI, ESCI, CPCI-S, CCR, IC) and MEDLINE®, from January 1st, 2020 to December 31st, 2022. Conventional translations of "中医药" including "(traditional) Chinese medicine*," "(T)CM*," "Chinese medicinal*," "Chinese medicinal material*," "Chinese herb*" and "Chinese herbal medicine*" were searched in the title in May, 2024 ("*" ensures the inclusion of corresponding plural forms). Selection prioritized English-language peer-reviewed articles, conference proceedings, and policy reports that explicitly discuss TCM, but excluded review articles, literature reviews and patient stories. In addition, articles that mention TCM only tangentially were also excluded to ensured TCM as a main topic, and abstracts were checked for relevance when necessary. After deduplication and filtering, 417 articles were ultimately harvested.

3.2 Corpus construction

Only the main texts (excluding metadata such as references, tables, and acknowledgments) of the above articles were retained and saved in TXT format. EmEditor was employed to batch-clean the raw data by removing non-textual elements, normalizing formatting inconsistencies (e.g., irregular spacing, paragraphing), and unifying encoding standards to ensure corpus readability and consistency. After data cleansing, a corpus of TCM-related international English academic articles (hereinafter referred to as "CTIEAA") was established. CTIEAA encompasses 1,503,157 tokens (a token refers to each occurrence of a word, number, or punctuation symbol within the corpus) across 13 disciplinary areas, including medicine, chemistry, biology, engineering, pedagogy and humanities, to name just a few. Considering the broad range of disciplines involved, CTIEAA was further classified according to the *Subject Catalog of Degree Granting and Personnel Training* issued by China's Academic Degrees Committee of the State Council and Ministry of Education, hence discipline-specific sub-corpora, namely medicine, science, engineering, agriculture and humanities, as displayed in Table 1.

3.3 Research questions

In line with aforementioned research objectives, the following three research questions are proposed:

(1) What characterizes international scholars' general perception of TCM and its role in COVID-19 during the three-year post-pandemic era?
(2) What are the differences in attitude towards TCM in international English academic discourse in various regions?
(3) What are the differences in research focus on TCM in international English academic discourse in various disciplines?

TABLE 1 Discipline-specific sub-CTIEAAs.

Discipline type	Sub-discipline	Article no.	Token no.
Medicine	/	213	694,686
Science	Chemistry	107	425,506
	Environmental science and ecology		
	Biology		
	Mathematics		
	Physics with astrophysics		
Engineering	Materials science	64	255,879
	Engineering technology		
	Computer science		
Agriculture	Agriculture and forestry sciences	20	68,027
Humanities	Pedagogy	13	59,059
	Human sciences		
	Comprehensive journals		
Total		417	1,503,157

3.4 Research methods

Corpus linguistics refers to the computer-aided study of extensive collections of transcribed utterances or written texts. Based on a large amount of detailed linguistic evidence, it helps reduce researcher subjectivity, and, when properly implemented, can enhance systematicness and credibility of research. Since traditional discourse analysis has been criticized for its fragmented linguistic data and strong subjectivity (Baker et al., 2008), corpus methods, serve as a pivotal approach in analyzing the discursive construction of images (Xu and Wei, 2024).

WordSmith 8.0 was selected as the research tool as it offers integrated functions essential for this study, including concordancing (generation of a list of all occurrences of a search term presented with its immediate textual context), wordlist generation, keyword (a word whose frequency is significantly higher in the target corpus compared to a reference corpus) extraction (with log-likelihood scoring), cluster (a contiguous sequence of words, or "n-grams," extracted from corpus data) analysis and collocation (a statistically significant co-occurrence of two or more words within a specified span) measurement (McEnery and Hardie, 2012). Compared with other corpus tools like AntConc and Sketch Engine, WordSmith provides built-in keyness calculation, transparent parameter control, and straightforward logging of search steps, facilitating replication. Its cluster function enables efficient retrieval of contiguous 2–6 word sequences, aligning closely with our research focus on clusters and evaluative patterns across regions.

In addition to quantitative measures, sentiment toward TCM was assessed based on concordance lines extracted for the most conventional translations of "中医药" (such as "TCM" and "traditional Chinese medicine," which remain to be figured out later), within a concordance window of ±20 words. Sentiment was categorized as positive endorsing efficacy, safety, or scientific validity (e.g., "TCM offers effective therapies"), negative expressing skepticism or caution (e.g., "lack of rigorous evidence for traditional Chinese medicine"), or neutral providing factual descriptions without overt evaluation (e.g., "This study compared TCM and

conventional therapies in clinical settings"). Two independent coders, including a native English-speaker and the author, initially labeled a random sample of 400 concordance lines. Inter-coder reliability was high (Cohen's $\kappa \approx 0.82$), and disagreements were resolved through discussion. Labeling of the remaining lines was completed by the author individually, following the established criteria.

3.5 Research procedures

A three-step corpus analysis procedure was employed to systematically examine international academic discourse on TCM across regions and disciplines.

First, collocation analysis was performed on the most conventional translation of "中医药," generating its significant evaluative content collocates using the log-likelihood test (LL > 3.84, $p < 0.005$). And the concordances of these collocates were utilized to investigate international scholars' overall perceptions of TCM. Pandemic-related articles in CTIEAA were further screened out, and the significant evaluative content collocates of the most conventional translation of "中医药" in these articles were generated, for a more comprehensive understanding of international scholars' perception of the connection between TCM and COVID-19.

Secondly, international scholars' general sentiments towards TCM were assessed. After the construction of region-specific sub-CTIEAAs, subject-predicate (S-P) clusters starting with the conventional translations of "中医药" as the search term were extracted via WordSmith's cluster tool, to discern the differences in attitude of scholars from each continent.

Lastly, keyword analysis compared word frequencies in each discipline-specific sub-CTIEAA against the other four sub-corpora combined as a reference corpus (detailed rationale provided in Section

4.1.4.1), using log-likelihood (LL > 3.84, $p < 0.005$) test. Selected keywords were then examined through concordance lines to investigate the respective research focus on TCM in various disciplines.

4 Results and discussion

4.1 Results

4.1.1 General perception of TCM in international English academic articles

The aforementioned conventional translations of "中医药" in academic discourse were used as search terms to examine their distributions in each discipline-specific sub-CTIEAA, as shown in Figure 2.

Figure 2 reveals that "traditional Chinese medicine," "TCM," "Chinese medicine," "CM," "Chinese medicinal," "Chinese medicinal material," "Chinese herb," "Chinese herbal medicine," along with their plural forms, are all distributed in CTIEAA. "TCM(s)" is the most frequent, far exceeding the combined frequency of other translations. Except for the agricultural sub-CTIEAA where "Chinese herb(s)" ranks the 1st, the frequency of "TCM(s)" in other discipline-specific sub-corpora is significantly higher. This indicates that "TCM(s)" is most conventionally used in international English academic discourse by various disciplines to refer to "中医药," followed by "traditional Chinese medicine(s)" and "Chinese medicine(s)."

"TCM(s)" as the node word, the top 30 evaluative content words collocated with it in CTIEAA were generated, with a span length of five words to either side and a minimum frequency of 40, as shown in Table 2.

Judging only from the context-free collocates in Table 2, the perception of TCM in international English academic articles generally displays the following eight characteristics.
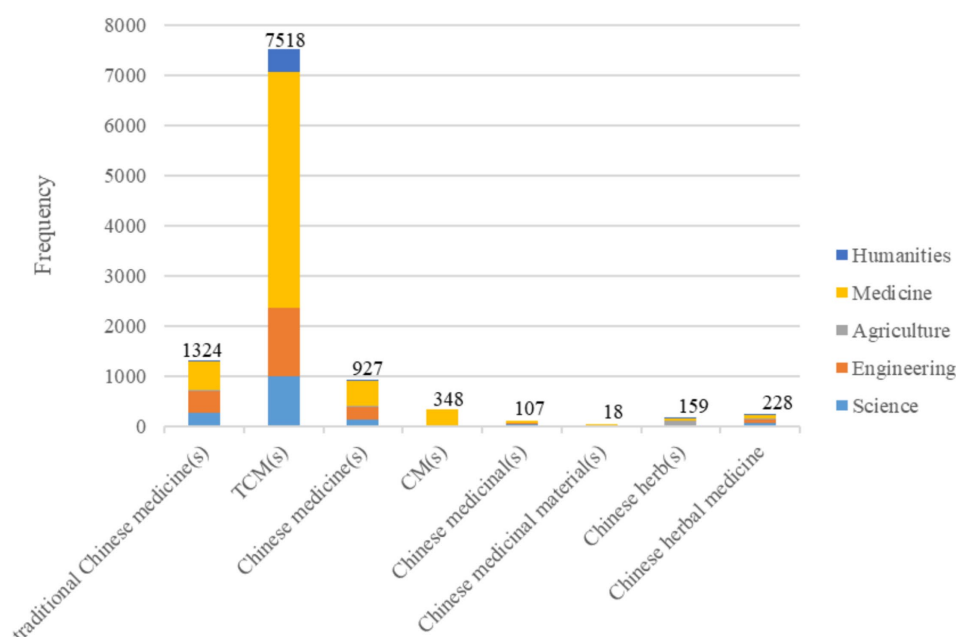

FIGURE 2
Distribution of conventional translations of "中医药" in CTIEAA.

First, diversity and individualization of diagnosis and treatment. Collocates such as *syndrome*, *differentiation*, *prescriptions* and *types* indicate that TCM attaches importance to differential diagnosis based on syndrome differentiation, follows the principle of "one prescription for one person," and provides personalized therapeutic regimens for a variety of diseases.

Second, theoretical, knowledge-based and academic nature. Collocates such as *theory*, *knowledge*, *development* and *research* imply a complete theoretical system and rich medical knowledge of TCM which stands as the object of academic research.

Third, extensive clinical application. Collocates such as *treatment* and *clinical* show that TCM has a wide range of applications in the clinical diagnosis and treatment of diseases.

Fourth, scientificity and effectiveness. Collocates such as *records*, *evidence*, *analysis*, *figure*, *quality*, *results* and *efficacy* indicate that a large number of scholars have conducted assessments of TCM effects, providing scientific evidence for its effectiveness and safety.

Fifth, systematicity and holistic view of the medical system. *Characteristics* and *system* emphasize that TCM is an independent medical system with systematic and holistic features.

Sixth, a time-honored history. Collocates such as *ancient* and *long* indicate that TCM boasts a long history and profound cultural traditions.

Seventh, integration with Western or modern medicine. Collocates such as *modern* and *combination* reflect that TCM is engaged in more scientific analysis and research through exchanges and cooperation with modern medical methods.

Last but not least, it's noteworthy that negative perceptions of TCM also present in international academic discourse. *Health*, *care* and *Western* may imply the marginal status of TCM as a health care tool as opposed to modern medicine. Collocates such as *experience*, *should* and *no*, though ranking low, may pertain to doubts and disputes about the scientificity of empirical medicine.

For deeper insights into the above findings, a typical collocate was selected for each aspect, and a further analysis of some of their concordances in CTIEAA provide specific contextual evidence for international scholars' overall perceptions of TCM in the past 3 years, as excerpted in Table 3.

In a nut shell, international scholars have a multidimensional understanding of TCM, reflecting both respect for its history and theory, and the pursuit of its modern application and scientific verification. TCM as a whole has been portrayed as a medical system with a time-honored history, rich theory, extensive clinical practice, emphasis on individualized treatment and overall health, potential for modern application in specific areas, independent system and unique features. Nevertheless, further scientific research is still needed to improve TCM's level of standardization and modernization.

4.1.2 Perception of TCM against COVID-19 in pandemic-related articles

To comprehensively understand the perception of the connection between TCM and COVID-19, and its role in combating the pandemic in international academic discourse, a multi-item search was conducted with expressions such as "COVID-19," "coronavirus," "epidemic" and "pandemic" as search terms. After a manual checking, 56 pandemic-related articles in CTIEAA were screened out. With "TCM(s)" as the node word, a span length of five words to either side and a minimum frequency of 40, the top 30 evaluative content collocates in the pandemic-related articles were generated, as shown in Table 4.

Effects, *COVID-19* and *coronavirus* rank the 9th, 12th and the 17th, respectively, in the list, indicating the keen interest of international scholars in the relationship between COVID-19 and TCM. To be specific, discussions center on the feasibility and effects of TCM in daily health care, treatment and prevention of COVID-19, and particularly the efficacy of integrated traditional Chinese and western medicine or auxiliary treatment with TCM. Researchers have also examined factors influencing the use (*use*, *application*) of TCM to prevent and treat COVID-19, and proposed suggestions for the improvement of TCM management, development, quality safety, services and clinical trials (*CTs*). Significant collocations such as *cessation*, *smoking* and *therapy* suggest increased focus on TCM smoking cessation therapy in the post-COVID-19 era. What's worth noting is that *can* and *could*, as modal verbs which can reveal authors' judgment on the possibility of propositions, rank the 13th and 20th, respectively. Therefore, by focusing on these five typical words

TABLE 2 Top 30 evaluative content words collocated with "TCM(s)" in CTIEAA.

Rank	Freq.	Likelihood	Collocate	Rank	Freq.	Likelihood	Collocate
1	565	1179.459	syndrome	16	185	80.984	research
2	211	554.561	theory	17	94	79.232	types
3	549	412.218	treatment	18	57	64.836	modern
4	400	399.233	clinical	19	85	64.39	analysis
5	285	358.602	health	20	49	63.191	figure
6	188	353.222	care	21	49	53.218	experience
7	157	315.786	differentiation	22	291	49.823	patients
8	124	279.522	records	23	105	38.024	quality
9	164	185.563	knowledge	24	62	35.903	long
10	130	166.644	western	25	95	26.768	results
11	110	151.968	prescriptions	26	117	25.473	system
12	124	138.49	evidence	27	63	18.685	should
13	144	117.647	development	28	51	18.233	efficacy
14	109	87.058	characteristics	29	51	17.034	combination
15	61	84.486	ancient	30	42	15.327	no

TABLE 3 Concordances of typical collocates of "TCM(s)" in international English academic discourse (excerpt).

Context	Typical collocates of "TCM(s)"	Context
So we intent to use rs-fMRI to research the brain function differences between Deficiency and Excess MDA patients to describe brain function mechanisms of these two TCM patterns and to provide clinical materials to support follow-up *TCM*	syndrome	differentiation and treatment of MDA.
Li-Fa-Fang-Yao is the basic	theory	of *TCM*, which illustrates the pathogenesis of the disease, the principles and methods of treatment, appropriate prescriptions and the best choice of compatibility of herbs, respectively.
With the development of modern Chinese medicine, clinical studies have been widely conducted, accumulating a large amount of	clinical	evidence for *TCM*.
Therefore, our study attempted to deeply explore and demonstrate the	efficacy	of *TCM* in the treatment of CRC based on the multi-center and large sample size.
Thus, in addition to satisfying the interest of international students in regard to learning acupuncture, TCM education should also emphasize the basic TCM theories, diagnostics and herbal remedies, as *TCM* comprises a whole	system	of medicine.
TCM has a	long	history of treating diabetes, which can trace back to the Han dynasty.
The	combination	of *TCM* and WM can reduce the side effects of radiotherapy and chemotherapy and improve patients' quality of life.
The toxicity classification of *TCM* is still based on the	experience	of the past dynasties, or the LD50 calculated from acute toxicity study.
The introduction of *TCM* to the world	should	be based on safety, effectiveness, stability and quality.
The National Health Commission of the people's Republic of China recommended…that Traditional Chinese Medicine (TCM) can also be used for different phases of COVID-19. However, there is	no	evidence to prove that *TCM* is beneficial for patients with COVID-19.

TABLE 4 Top 30 evaluative content words collocated with "TCM(s)" in pandemic-related articles.

Rank	Freq.	Likelihood	Collocate	Rank	Freq.	Likelihood	Collocate
1	192	259.653	health	16	133	93.554	treatment
2	136	244.727	care	17	63	83.47	coronavirus
3	63	178.101	intention	18	82	75.263	use
4	65	172.353	physicians	19	73	63.904	development
5	51	171.38	CTs	20	58	61.503	could
6	52	143.702	cessation	21	63	60.42	quality
7	49	131.44	therapists	22	90	48.632	prevention
8	51	122.433	smoking	23	49	22.65	syndrome
9	76	121.417	effects	24	56	21.439	medical
10	61	119.007	services	25	71	16.798	Chinese
11	52	105.426	therapy	26	60	16.363	clinical
12	69	104.026	COVID-19	27	98	15.82	western
13	66	103.943	can	28	95	15.049	application
14	78	103.496	management	29	49	14.253	study
15	53	99.513	industry	30	48	13.082	feasibility

significantly collocated with "TCM," a further analysis of some of their concordances in the pandemic-related articles from CTIEAA offer deeper insights into international scholars' perceptions on the role of TCM against COVID-19, as excerpted in Table 5.

It can be concluded through an analysis of the concordances in Table 5 that international scholars have evaluated the impact of TCM on shortening viral shedding, recognizing its unique efficacy in treating

many special diseases like SARS, COVID-19, etc. TCM is also recommended in the "Diagnosis and Treatment Protocol for Novel Pneumonia" for COVID-19 treatment, achieving satisfactory results. Moreover, the extensive publication of articles on COVID-19 treatment with TCM demonstrates that early implementation of TCM strategies can markedly relieve symptoms, shorten disease course, delay disease progression, improve cure rate and reduce mortality. Tongue diagnosis

TABLE 5 Concordances containing *effects*, *COVID-19*, *can*, *coronavirus* and *could* in pandemic-related articles (excerpt).

Context	Typical collocates of "TCM(s)"	Context
Thus, the objective of this study is to evaluate the	effects	of *TCM* on shortening viral shedding.
Plenty of clinical practice has been proved that the *TCM* has unique		on many special diseases like SARS, COVID-19, etc.
Clinical practice has proven that early adopt *TCM* scheme to treat	COVID-19	can improve cure rate, shorten disease course, delay disease progression, and reduce mortality rate.
Additionally, numerous studies related to the use of *TCM* in the management of		have already been published.
Tongue images carry special features of COVID-19 and thus	can	provide relevant references for *TCM*, which has successfully accelerated the recovery of COVID-19 patients and reduced the use of antibiotics in China.
Treatment of COVID-19 using *TCM*		result in marked improvement in symptoms and shortened disease course.
According to "Diagnosis and Treatment Protocol for Novel	coronavirus	Pneumonia" in China, *TCM* has been recommended, and the use of TCM for COVID-19 treatment has achieved satisfactory effects.
Some classic proprietary Chinese medicines such as lianhuaqingwen capsules have been demonstrated to show antiviral and anti-inflammatory activity against novel		. Cui reviewed *TCM* for COVID-19 treatment and summed up the clinical outcome, pathogenesis, and present application of TCM used to treat COVID-19.
These	could	demonstrate the effectiveness of *TCM* in treating COVID-19 to some extent.
In conclusion, *TCM* treatment		significantly promote the recovery of COVID-19 patients in the convalescent stage and its mechanism might be the overall regulations on body.

in TCM, based on the manifestation of COVID-19 in tongue images, can accelerate the recovery of patients and reduce antibiotics use. Some classic proprietary Chinese medicines, such as lianhuaqingwen capsules, have shown antiviral and anti-inflammatory effects against COVID-19. The mechanism of TCM treatment involves a holistic regulation of the body, with notable efficacy in the convalescent stage of COVID-19.

4.1.3 Attitudes towards TCM in academic discourse in different regions

This section presents the specific attitudes towards TCM of scholars from the major continents, following an analysis of their general sentiments.

4.1.3.1 Overview of international scholars' sentiments towards TCM

According to the sentiment type exceeding 50% of the labeled concordance lines, each of the 417 articles in CTIEAA was assigned an overall sentiment classification, and the distribution of international scholars' sentiments towards TCM is displayed in Figure 3. This procedure integrates localized evaluative patterns into holistic sentiment judgments, following established content analysis practices (Neuendorf, 2017).

As indicated in Figures 3, 337 articles exhibit positive sentiments towards TCM, constituting 80.8% of the total, which indicates a general optimism among international scholars regarding TCM in recent years. No obvious emotional tendencies were found in 57 articles, which account for 13.7%. The remaining 23 articles, though comprising only 5.5%, present concentrated viewpoints: despite a claim to be harmless, some Chinese herbal medicines have not been identified, with unclear pharmacological properties and questionable safety. Many known Chinese medicinals contain toxic and carcinogenic ingredients, the concentration of which is susceptible to the place of production and processing technologies. Concerns extend to the large amount of waste

FIGURE 3
International scholars' sentiments towards TCM.
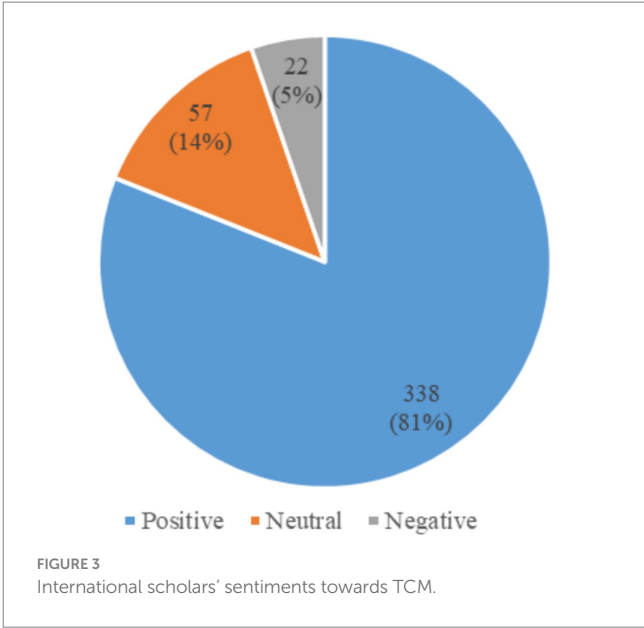
generated during the extraction of and treatment with Chinese medicinals, mainly disposed of through landfills or discharges, which poses teratogenic risks and environmental pollution. In addition, some scholars have hinted at illegal activities in the TCM market, such as the listing of unregistered Chinese medicinals, unauthorized addition of synthetic dyes, and lax supervision of drug quality and safety. The efficacy and reproducibility of TCM therapy are also questioned for lack of prospective research, with frequent side effects seen as confirmation of the uncertainty of TCM theories. The lack of accuracy in syndrome differentiation is believed to not only affect the treatment effect, but may also aggravate patients' conditions.

TABLE 6 Top 20 five-word S-P clusters containing the conventional translations of "中医药" in the Asian sub-CTIEAA.

Rank	Freq.	Range	Cluster
1	8	7	*TCM* has a long history
2	4	4	*TCM* group was significantly lower
3	4	4	*TCM* is one of the
4	3	3	*TCM* has been widely used
5	3	3	*traditional Chinese medicine* and western medicine can
6	2	2	*TCM* and western medicine are
7	2	2	*TCM* has become an important
8	2	2	*TCM* has been practiced in
9	2	2	*TCM* has been shown to
10	2	2	*TCM* has been used for
11	2	2	*TCM* has long been used
12	2	2	*TCM* has received growing interest
13	2	2	*TCM* has the potential to
14	2	2	*TCM* has unique advantages in
15	2	2	*TCM* is an alternative or
16	2	2	*TCM* is based on the
17	2	2	*TCM* is to treat diseases
18	2	2	*TCM* medical records are often
19	2	2	*TCM* offers a wealth of
20	2	2	*TCM* plays an important role

In order to further understand the differences in attitude towards TCM of scholars from each continent, we classified the 417 articles by the nationality of the first author, building region-specific sub-CTIEAAs. Clusters were generated with the conventional translations of "中医药" as the search term (repeated trials proved that five-word clusters could express complete meanings with a relatively small number of words, which are considered the best choice). S-P structures were then screened out, and, combined with the extended context of their concordances, an intuitive appraisal of TCM by scholars from different continents can be obtained.

4.1.3.2 Asian scholars' attitudes towards TCM

The Asian sub-CTIEAA, containing a total of 1,360,010 tokens, encompasses 398 articles. Both the minimum frequency and range were set to "2" to maximize the generation of analytic targets. After those of little appraisal significance filtered out, the top 20 five-word S-P clusters with the conventional translations of "中医药" as the search term in the Asian sub-CTIEAA are depicted in Table 6.

Asian scholars generally perceive TCM as a widely used practice in China and other Asian countries which boasts a history spanning thousands of years in healthcare and disease prevention and treatment. TCM is noted for its efficacy, safety and affordability. Controlled studies suggest that long-term treatment with Chinese medicinals can prolong survival time, improve remission rates, reduce recurrence, and extend recurrence-free survival periods. In Asia, TCM is regarded an important traditional medical or supportive intervention means, and the Chinese government has long been advocating the development of both traditional Chinese and Western medicine. On the other hand, as a complementary or alternative therapy in modern medical system, TCM practices have yet to be well integrated even in the primary care in many Western countries. But

Chinese medicinals can significantly rehabilitate patients in the recovery stage of COVID-19, with potential preventive and therapeutic applications. They also provide rich natural resources for pharmaceutical compounds. However, the lack of knowledge about TCM may raise efficacy concerns and thus reduce patients' willingness to adopt TCM therapies, because, after all, the toxic and side effects do exist.

4.1.3.3 European scholars' attitudes towards TCM

The European sub-CTIEAA, comprising 8 articles, totals 43,004 tokens. To accommodate the size differences among the continent-specific sub-CTIEAAs, the minimum frequency and range were adjusted to "1" as appropriate for more completed and operable results. The top 10 five-word S-P clusters with the conventional translations of "中医药" as the search term in the European sub-CTIEAA are presented in Table 7.

European scholars compare the opinions of Chinese physicians and Western doctors on the role of Chinese medicinals in different stages of COVID-19, finding a significantly higher proportion of the former who believe in the effectiveness of Chinese medicinals in the preventive and acute stages than that of the latter, though both acknowledge their contributions to COVID-19 recovery. However, some European scholars have directly questioned TCM, pointing out that judged from the perspective of the evidence in its favor, TCM can not be disqualified as non-scientific. However, because the evidence is extremely insufficient, TCM is after all "not a science." "There is nothing inherently irrational about resorting to the so-called traditional medicines in cultural contexts where science-based medicine is historically absent. The usage of TCM becomes unreasonable contrastively when compared to other clinical practices." (de Felipe, 2021, p. 1367).

4.1.3.4 African scholars' attitudes towards TCM

The total token count of the African sub-CTIEAA is 31,757, with 8 articles included. The minimum frequency and range kept at "1," the top 10 five-word S-P clusters with the conventional translations of "中医药" as the search term in the African sub-CTIEAA are displayed in Table 8.

Chinese herbal medicines are widely used in Africa to treat diseases during pregnancy, partly due to their exemption from prescriptions, accessibility, affordability, perceived safety during pregnancy, and effectiveness compared with conventional medical treatments. African scholars consider Chinese medicinals as a potential COVID-19 inhibitor, bringing great hope for curing it. Furthermore, scholars from Ethiopia, Tanzania and other African countries have also examined the factors influencing the use of Chinese herbal medicines, pointing out a negative correlation between their usage on the one hand, and patients' monthly income and education level on the other.

4.1.3.5 North American and Australian scholars' attitudes towards TCM

Given the relatively small number of TCM-related articles by North American and Australian scholars during COVID-19, the two were combined for analysis. The North American and Australian sub-CTIEAA includes only 3 articles, totaling 18,568 tokens. The minimum frequency and range kept at "1," the top 10 five-word S-P clusters with the conventional translations of "中医药" as the search term in the North American and Australian sub-CTIEAA are illustrated in Table 9.

North American and Australian scholars point out that Chinese medicinal foods can be used to treat diabetes and other diseases. American scholars have designed a TCM + biomedicine-based nutrition curriculum, demonstrating its effectiveness in improving attitudes and dietary habits of Chinese Americans with type 2 diabetes. On the other hand, Australian scholars have found there is a disconnect identified by TCM acupuncturists between their clinical practice and the design of clinical trials, which may be attributed to the historical conflicts between the theoretical frameworks of biomedicine and TCM.

Close text reading indicates that, except for Australian scholars who maintain a relatively neutral position, those from other continents generally exhibit positive views on TCM, and this sentimental orientation is basically consistent with the findings of the above cluster-based attitude analysis.

4.1.4 Research focuses on TCM in academic discourse in different disciplines

Keywords are regarded as directional and visible "probes" that facilitate the detection of the subject content style and stance of a text (He and Guo, 2020). Keyword lists of discipline-specific sub-CTIEAAs can effectively reveal the differences in theme and focus on TCM in international English academic discourse across various disciplines.

4.1.4.1 Research focus of medical academic discourse on TCM

Two points need to be made clear. First, due to the generic commonalities in academic discourse, keyword overlaps across sub-CTIEAAs with general English as a reference are expected. Second, compared with other parts of speech, nouns, indicative of

TABLE 7 Top 10 five-word S-P clusters containing the conventional translations of "中医药" in the European sub-CTIEAA.

Rank	Freq.	Range	Cluster
1	3	1	*TCM had a role to*
2	3	1	*TCM is not a scientific*
3	3	1	*TCM is defined as a*
4	2	1	*traditional Chinese medicine is used to treat*
5	2	1	*TCM is related to the*
6	2	1	*TCM therapists and physicians consulted*
7	2	1	*TCMs are used against civilization*
8	2	1	*TCM can not be disqualified*
9	1	1	*TCM and not WM would*
10	1	1	*TCM becomes unreasonable contrastively when*

TABLE 8 Top 10 five-word S-P clusters containing the conventional translations of "中医药" in the African sub-CTIEAA.

Rank	Freq.	Range	Cluster
1	6	3	*Chinese herbal medicine is used among pregnant*
2	3	1	*Chinese herbal medicines are accessible without prescription*
3	2	1	*Chinese herbal medicine is more likely to*
4	2	1	*Chinese herbal medicines are effective in treating*
5	2	1	*Chinese herbal medicines are not covered by*
6	2	1	*Chinese herbal medicines have fewer side effects*
7	2	1	*Chinese herbs were natural and safer*
8	1	1	*TCM compounds were suggested to*
9	1	1	*TCM is a reflection of*
10	1	1	*Traditional Chinese medicine is an ethnomedicine that*

TABLE 9 Top 10 five-word S-P clusters containing the conventional translations of "中医药" in the North American and Australian sub-CTIEAA.

Rank	Freq.	Range	Cluster
1	2	1	*Chinese medicinal foods were developed for*
2	1	1	*Chinese medicine was still inextricably*
3	1	1	*CM diagnosis is dynamic and*
4	1	1	*CM shows promise for positive*
5	1	1	*TCM becomes marginalized in favor*
6	1	1	*TCM is "largely incompatible" with*
7	1	1	*TCM is viewed in terms*
8	1	1	*TCM practitioners have historically identified*
9	1	1	*TCM showed its usefulness during*
10	1	1	*TCM was not only successful*

discourse's "field," provide a more direct reflection of the topic. Therefore, to reveal thematic differences as much as possible, with the other four combined as a reference corpus, a keyword list was generated for each observed sub-CTIEAA, in order to, after the

TABLE 10 Top 30 key nouns in the medical sub-CTIEAA.

Rank	Freq.	Keyness	Key noun	Rank	Freq.	Keyness	Key noun
1	2,825	2081.25	patients	16	239	347.5	pregnancy
2	877	1070.38	deficiency	17	376	340.58	kidney
3	2,506	841	treatment	18	761	317.42	cancer
4	1,326	748.85	syndrome	19	425	308.43	diabetes
5	2,202	694.42	group	20	427	304.29	yang
6	1,187	645.06	blood	21	175	285.88	CRC
7	2,576	591.72	study	22	450	269.55	participants
8	558	564.05	yin	23	217	252.44	respondents
9	389	530.28	women	24	427	250.98	syndromes
10	3,828	509.02	TCM	25	278	245.83	subjects
11	729	488.08	qi	26	535	234.18	patient
12	527	475.39	age	27	218	227.66	therapy
13	741	407.29	liver	28	244	225.74	phlegm
14	554	364.46	evidence	29	1,603	225	P
15	1,118	359.46	disease	30	317	224.79	stasis

TABLE 11 Top 20 key nouns in the scientific sub-CTIEAA.

Rank	Freq.	Keyness	Key noun	Rank	Freq.	Keyness	Key noun
1	1714	707.33	C	11	728	298.77	samples
2	219	535.71	DobHLH	12	121	295.96	MSTN
3	727	502.53	MS	13	383	292.45	O
4	198	484.33	AgNPs	14	139	288.69	Fe
5	647	475.3	mg	15	975	284.29	h
6	209	421.3	pesticides	16	113	276.4	eEF
7	731	363.79	compounds	17	126	269.22	pesticide
8	245	354.52	ion	18	108	264.16	bHLH
9	838	338.74	ml	19	109	247.98	Fritillaria
10	694	307.03	min	20	101	247.04	GN

non-nouns were eliminated, shed light upon the differences in research focus in a precise manner. The top 30 key nouns in the medical sub-CTIEAA are listed in Table 10.

Words like *patients* and *treatment* rank high in the list, indicating significant concern among international medical scholars regarding the role of TCM in maintaining patient health and treating diseases. Women's health issues (*women*), especially the application of TCM in *pregnancy* and infertility treatment, have drawn notable attention. Numerous studies discuss various TCM *syndrome*s, for instance, the correlation between *deficiency* syndromes (deficiency of both *qi* and *blood*, deficiency of *yin* / *yang*) and *phlegm-statis* constitution on the one hand, and disease course, severity and observation indexes on the other, aiming to offer personalized treatment for patients with different constitutions. The diseases primarily treated by TCM include common tumors such as *liver cancer*, *kidney cancer* and colorectal cancer (*CRC*) as well as diabetes. Many clinical trials (*participants*, *respondents*, *subjects*), mainly utilizing multiple *group*s with *age*,

gender, etc. as parameters, investigate TCM's influence on disease cure rates or survival rate. Additionally, there is growing interest in exploring the adjuvant and combination *therapy* of TCM as opposed to modern medicine among medical scholars who are generally convinced of their apparent advantages or potential over single traditional therapy.

4.1.4.2 Research focus of scientific academic discourse on TCM

Given the varied sizes of the discipline-specific sub-CTIEAAs, the scope of keywords to be examined was adjusted as appropriate. The top 20 key nouns in the scientific sub-CTIEAA are presented in Table 11.

A scientific portion of the academic articles on TCM adopt a perspective of environmental protection and sustainable development. They attempt to establish methods (*MS*, *ion*) to identify toxic or carcinogenic components in Chinese herbal medicines in chemical, biological and other fields, and quantify the content of

TABLE 12 Top 20 key nouns in the engineering sub-CTIEAA.

Rank	Freq.	Keyness	Key noun	Rank	Freq.	Keyness	Key noun
1	367	692.12	layer	11	616	427.18	network
2	449	681.44	learning	12	228	405.78	input
3	949	678.7	model	13	274	342.22	feature
4	313	654.53	color	14	108	317.75	cloud
5	416	646.4	tongue	15	249	313.63	images
6	1,255	547.52	data	16	195	309.34	node
7	238	524.07	entity	17	264	304.78	paper
8	205	514.34	teaching	18	171	273.17	graph
9	182	482.43	massage	19	166	269.86	text
10	331	452.94	algorithm	20	490	268.43	information

TABLE 13 Top 20 key nouns in the agricultural sub-CTIEAA.

Rank	Freq.	Keyness	Key noun	Rank	Freq.	Keyness	Key noun
1	95	579.91	hairy	11	145	332.01	root
2	156	454.75	Cd	12	74	329.64	milk
3	92	436.76	CFs	13	57	324.38	larvae
4	70	427.28	CCHMA	14	51	311.29	colostrum
5	69	421.17	calves	15	48	292.97	roller
6	70	416.86	dogs	16	45	247.34	indigotica
7	65	396.75	ghost	17	168	243.79	concentration
8	62	378.44	Hozen	18	117	240.6	extracts
9	69	358.17	flavonoids	19	39	238.04	geese
10	56	341.81	moth	20	43	235.48	stalk

pesticide residues (*pesticides*) and other toxins in *samples* through empirical research (*°C*, *mg*, *ml*, *min*, *h*). Exploration extends the application of new materials (*O*, *Fe*) in increasing the yield and active ingredient proportion in TCM, as well as low-cost and green synthesis strategies for medicinal ingredients (*AgNPs*) with Chinese medicinal decoctions and residues. Another area of focus is the compound screening (*compounds*) for specific prescriptions (*GN*) or medicinal materials (*Fritillaria*) as a pharmacological basis for disease treatment via integrated Chinese and Western medicine. In addition, the potence of Chinese herb extracts or genes (*DobHLH*, *bHLH*) in acting on potential targets for disease treatment (*MSTN*, *eEF*) is also evaluated.

4.1.4.3 Research focus of engineering academic discourse on TCM

The top 20 key nouns in the engineering sub-CTIEAA are listed in Table 12.

The high frequency of such terms as *layer*, *input* and *feature* indicates that engineering discourse mainly concern the development of *model*s or *algorithm*s based on the branches of artificial intelligence technology to address TCM-related challenges with the aid of *information technology*, especially *big data*. Examples include how to use *neural network* for *text* generation and *deep learning* for TCM prescription recommendation; how to use machine learning for TCM prescription classification, and data

mining, topic models and other technologies to analyze prescription ingredients. Computer-assisted technology has been increasingly used for tasks such as correcting *color* differences and processing *tongue images* (*graph*) etc. in tongue diagnosis. The application of artificial intelligence has also been discussed in TCM *entity* identification, mixed *teaching* models of TCM, as well as massage devices that emulate TCM techniques.

4.1.4.4 Research focus of agricultural academic discourse on TCM

The top 20 key nouns in the agricultural sub-CTIEAA are listed in Table 13.

Starting from the practical problems of limited resources and ever-rising prices of and an increasing demand for wild medicinal plants, agricultural academic articles primarily explore methods (*hairy root production*) for large-scale artificial cultivation and optimization of compound extraction (*CFs*, *flavonoids*, *extracts*) of Chinese medicinals, as well as the impact of environmental pollution (*concentrations of Cd*) on their growth and active ingredients. Attention has also been paid to the role of Chinese herbal medicines (*Hozen*, *indigotica*) as feed additives (*CCHMA*) and veterinary drugs in enhancing livestock immunity (*calves*, *dogs*, *geese*), treating animal diseases, and improving the quality of animals and their products (*milk*, *colostrum*). Moreover, there are also studies focusing on the mechanisms of action of animal-based Chinese medicinals (*ghost*

TABLE 14 Top 20 key nouns in the humanistic sub-CTIEAA.

Rank	Freq.	Keyness	Key noun	Rank	Freq.	Keyness	Key noun
1	641	823.89	TCM	11	36	208.56	attitudes
2	110	740.35	learners	12	60	205.19	science
3	137	559.22	words	13	53	202.18	attitude
4	92	387.98	students	14	27	198.43	Weibo
5	199	372.07	health	15	81	189.4	theory
6	96	340.77	word	16	29	184.99	DEA
7	68	320.25	English	17	36	181.59	translation
8	73	300	hospitals	18	23	169.03	CMTZ
9	38	240.75	expectation	19	56	168.3	experts
10	67	210.1	efficiency	20	26	167.73	sentiment

moth, *larvae*) and the design and testing of Chinese herb harvesters (*roller*, *stalk*).

4.1.4.5 Research focus of humanistic academic discourse on TCM

The top 20 key nouns in the humanistic sub-CTIEAA are listed in Table 14.

Humanistic academic articles predominantly investigate learners' understanding and mastery of TCM terminology from a language teaching perspective (*TCM*, *learners*, *words*, *students*). Scholars are also concerned about the methods and standards for the English translation of terminology (*English*, *translation*) in specific fields of TCM (*CMTZ*). Keywords such as *health*, *hospitals*, *expectation*, *efficiency* and *DEA* indicate that research also extends to the rationality of the allocation of TCM health resources and the effectiveness of services provided to patients in China. In discourse studies, particular attention has been paid to TCM evaluation. To be specific, *attitudes* and *sentiments* of people from all walks of life towards TCM are obtained through social platforms (*Weibo*), expert consultations (*experts*) and other channels. Nevertheless, it's noteworthy that the word *science* signifies ongoing controversies in humanities regarding TCM's classification as a science.

4.2 Discussion

Between 2020 and 2022, there was a substantial increase in the number of academic institutions, journals, publications and disciplines related to TCM research. Although neutral or even extreme negative perceptions still exist, scholars from various regions generally hold a positive attitude towards TCM, particularly recognizing its invisible role in response to COVID-19. This finding, compared with those from previous TCM representation research in media discourse, presents a more optimistic picture. And continent-specific explorations of TCM academic articles provide a more nuanced perspective beyond the conventional East–West dichotomy commonly used in previous comparative studies. Moreover, scholars worldwide of major disciplines have all paid extensive attention to TCM, proposing distinctive focuses in their respective research fields. The observed variations in the academic framing of TCM across different regions and disciplines may be understood against the backdrop of

medical systems, cultural and geographic proximity, institutional factors, status quos of TCM research and practice as well as disciplinary conventions.

4.2.1 Medical systems

Medical systems appear to play a crucial role in TCM representation. For example, China's medical system has always been committed to promoting the coordinated development of TCM and Western medicine, and incorporating it into the national medical and health system through the formulation of relevant policies and regulations. In contrast, Japan and Korea maintain a relatively cautious stance, partly attributed to the later development of their independent traditional medical systems, albeit influenced by Chinese culture and medicine.

4.2.2 Cultural and geographic proximity

While medical systems form an important framework for understanding national stances, cultural and geographic proximity may also help account for variation in TCM's academic representation. Countries within the Sinosphere—such as Japan and South Korea—have historically maintained close cultural ties with China. Although these countries have later developed independent systems (Kampo and Hanbang), they initially incorporated elements of TCM, and their shared philosophical foundations have arguably fostered greater acceptance. As reflected in this study, academic publications from East Asian regions tend to portray TCM more favorably than those from Europe or North America, where biomedical epistemologies dominate and traditional medicine is often marginalized.

4.2.3 Institutional factors

Furthermore, institutional and geopolitical factors may shape evaluative patterns, which can be exemplified by the complex perceptions of TCM in Australia and the United States. Australia mandated scientific validation for all Chinese medicinals promoted for COVID-19 infection, but allowed doctors and patients autonomy in choosing TCM treatment. The United States initially approved clinical trials of some Chinese medicinals. However, TCM has failed to be popularized to fight against the pandemic because of the FDA's later statement regarding the insufficiency of scientific data to support its efficacy.

4.2.4 Status quos of TCM research and practice

The uneven advancement of TCM theory and clinical practice across regions has contributed to varied academic discourse patterns. Originating in China, TCM with its unique theoretical system has long provided a set of solutions for Chinese people's health. Nevertheless, of European countries, with the exception of the UK which encouraged the integration of traditional Chinese and Western medicine in the treatment of COVID-19, others advocated for further research, though convinced of TCM's potential. This stems from the fact that TCM is not prevalent in Europe and thus is yet to be verified and recognized. African scholars' attitudes vary by country. Due to limitations in medical resources and cultural beliefs, some African countries exhibit an insufficient awareness of TCM, and may be more inclined to local traditional medical solutions, hence a relatively low level of acceptance.

4.2.5 Disciplinary conventions

Although not a primary factor, disciplinary conventions may also influence the representation of TCM. For instance, fields such as clinical medicine and pharmacology exhibit a strong preference for evidence-based paradigms and systematic validation procedures, often requiring randomized controlled trials to substantiate claims. This helps explain the significance of *participants*, *respondents*, *subjects*, *groups* and *age* in the key noun list of the medical sub-CTIEAA.

5 Conclusion

Needless to say, in face of internal limitations in modernization and standardization, as well as external barriers in international market access, there is still a long way to go to enhance the international TCM academic image. To promote the global dissemination of TCM knowledge and culture, it's imperative to enrich TCM theories, conduct in-depth research on the medication rules and mechanisms of Chinese medicinals before ensuring and proving their safety and effectiveness, develop green recycling strategies for residues, and strengthen the protection of wild species. Efforts should also be made to enhance research innovation and international cooperations for an all-round medical system. It's also a must to strengthen international education, publicity and research publication, so as to improve international scholars' understanding of TCM.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

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