

Mapping Research Trends in Traditional Chinese Medicine Exercises for Anxiety Intervention Using a Knowledge Approach

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Objective: This study aims to analyze the current status of Traditional Chinese Medicine (TCM) exercises in the intervention of anxiety, identifying research hotspots and future development trends.

Methods: The Web of Science database was utilized to conduct a literature review, focusing on studies related to TCM exercises and anxiety from 1991 to 2024. Data analysis was performed using bibliometric software, including CiteSpace, VOSviewer, and R, to visualize insights from selected publications, countries, institutions, as well as highly cited and co-cited references.

Results: The number of published papers has shown a consistent year-on-year increase. China is the most prolific country in this research area, with Wayne Peter M being identified as the leading author. The institution with the highest publication count is Beijing University of Chinese Medicine. The most frequently occurring keyword is “Taiji”, with prominent terms in the field including “Traditional Chinese Medicine”, “Tai Chi”, “psychoeducational nursing”, and “drug treatment”.

Conclusion: This bibliometric analysis demonstrates that traditional Chinese mind-body exercises—particularly Tai Chi, Baduanjin, and Wuqinxi—are increasingly utilized in the prevention and treatment of anxiety disorders. Among these, Tai Chi has consistently emerged as the most extensively studied and cited intervention, underscoring its dominant role in both academic research and clinical application. However, the current research landscape is characterized by limited international collaboration, methodological inconsistency, and insufficient integration of contemporary evidence-based evaluation frameworks. To enhance the scientific rigor and global impact of TCM exercise therapies in mental health care, future studies should emphasize the development of standardized intervention protocols, the conduct of high-quality randomized controlled trials, and the promotion of interdisciplinary collaboration.

Keywords: TCM exercises, anxiety, mapping, intervention, knowledge graph approach

Introduction

Anxiety is an unpleasant and complex emotional state characterized by feelings of nervousness, restlessness, apprehension, and annoyance, often triggered by impending situations that may pose a threat.¹ The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) classifies anxiety disorders into several categories, including separation anxiety disorder, selective mutism, specific phobias, social anxiety disorder (social phobia), panic disorder, agoraphobia, and generalized anxiety disorder.² TCM exercises may exhibit differential effects on specific subtypes: Tai Chi has shown promise in reducing panic disorder's physical symptoms (eg, palpitations) via autonomic regulation, while group-based Baduanjin may alleviate social anxiety through self-efficacy enhancement.^{3,4} As a non-pharmacological treatment, TCM exercises emphasize the integration of mind and body. Through conscious breathing and mindful movements, these practices promote mental relaxation and improve mood, helping individuals better manage stress and build resilience. Research indicates that practitioners of TCM exercises frequently experience enhanced psychological comfort and

greater emotional stability. Notably, TCM exercises such as Tai Chi, Wufowl Opera, Baduanjin, Yijin Jing, Liuzi Jue, Qigong, and Dawu are gaining increasing attention in the treatment of anxiety.³

Globally, TCM exercises have emerged as validated complementary interventions for anxiety, with notable dissemination in North America, Europe, and Oceania. The American College of Physicians recommends Tai Chi as a first-line anxiety intervention,⁵ while the UK's National Institute for Health and Care Excellence (NICE) highlights its efficacy in reducing generalized anxiety symptoms. In Australia, 41% of surveyed mental health hospitals integrate Tai Chi into treatment protocols.⁶ This global adoption is mirrored in research output: between 1991–2024, 2,347 international collaborative papers were published, with the US (1,644 articles), Australia (245 articles), and the UK (211 articles) as top non-Chinese contributors. However, only 12% of these studies explore TCM-specific mechanisms (eg, meridian regulation), indicating a gap in culturally adapted research. Clinically, TCM exercises are increasingly combined with conventional therapies—for example, a Canadian trial showed that Baduanjin augmented CBT efficacy by 29% in generalized anxiety disorder patients.⁷

Currently, there is a growing body of research on the use of TCM exercises for anxiety intervention. However, there remains a significant gap in comprehensive literature analyses that utilize big data and quantitative approaches in this area. This paper addresses this gap by employing the Web of Science (WOS) database to identify relevant literature on TCM exercise interventions for anxiety. Using R and VOSviewer, a thematic analysis was conducted, examining the number of publications per year, countries, institutions, authors, journals, references, and keywords.⁸ Through data visualization, this study reveals the research hotspots in the field and offers valuable insights for further exploration of TCM's role in the intervention and treatment of anxiety.

Literature Search

The literature was sourced from the WOS using the following search terms: TS = ((Traditional Chinese Medicine Health Preservation Techniques) OR (Traditional Chinese Medicine Techniques) OR (Traditional Chinese Medicine Qigong) OR (Tai Chi) OR (Taijiquan) OR (Shadowboxing) OR (Baduanjin) OR (Five Animal Play) OR (Six Character Formula) OR (Yi Jin Jing) OR (Qigong) OR (Da Wu)) AND (anxiety)).

Data Sources and Time Frame

Articles were retrieved exclusively from the WOS Core Collection. This database was selected due to its broad coverage of high-impact, peer-reviewed journals across disciplines, standardized citation indexing, and high compatibility with bibliometric visualization tools such as CiteSpace, VOSviewer, and Bibliometrix-R. WOS provides structured metadata, robust author disambiguation, and reliable citation tracking, which are essential for generating accurate co-citation networks and keyword clustering results. While databases like Scopus, PubMed, and CNKI also contain relevant literature, they present challenges in data export, metadata consistency, and cross-platform compatibility, which may compromise the integrity of large-scale bibliometric analysis. Therefore, WoS was deemed the most suitable and methodologically consistent choice for this study.

Regarding the time frame, literature published between 1991 and 2024 was included. The starting point of 1991 corresponds to the first indexed clinical trial exploring Tai Chi's effects on psychological stress, which marked a foundational step in the empirical study of TCM exercises for anxiety. This period also reflects the growing evidence-based orientation in TCM research, with a notable increase in interdisciplinary studies and international collaboration from the early 2000s onward. Furthermore, the past three decades saw an exponential rise in TCM-related publications indexed in international databases. Therefore, the selected time span ensures historical completeness, thematic richness, and comprehensive trend analysis of TCM exercise interventions in anxiety research.

Inclusion Criteria

1) The intervention involved traditional Chinese exercise therapies, such as Tai Chi, Baduanjin, or Five Animal Play (Wuqinxi), either alone or in combination with other modalities, where the exercise component was clearly defined and constituted a core part of the intervention strategy; 2) The study population consisted of individuals with clinically diagnosed anxiety or those evaluated with standardized anxiety assessment tools.

Exclusion Criteria

1) Studies unrelated to traditional Chinese exercises or not targeting anxiety-related outcomes; 2) Duplicated publications, including multiple reports of the same trial; 3) Studies involving animal models or non-human subjects; 4) Conference abstracts or proceedings lacking complete methodological or outcome data; 5) Studies with incomplete or unclear abstracts, duplications, or reports lacking essential methodological information.

Data Conversion

The initial step in a bibliometric study involves collecting data, which is subsequently analyzed using bibliometric techniques and statistical methods. For this study, data were retrieved from the K1 English Core Collection of the Web of Science database. The search results were exported as “plain text files”, with each record including the “full record and cited references.” These files were labeled “download_XXX.txt.” Duplicate records were removed using the “remove duplicates” feature in the data-processing utilities module of CiteSpace software, after which the preprocessed data were analyzed. The exported files from the WOS search were labeled “download1-23”, and each record contained details such as authors, titles, abstracts, keywords, and author affiliations. A total of 8,134 records were retrieved across the 23 text files, which were then merged into a single text file using command-line operations. This merged file was imported into the R-bibliometrix tool to identify the top 100 globally cited papers, which were downloaded to create a smaller database. The R-bibliometrix tool was also employed to filter and analyze the keywords.

Analytical Methods

A combination of three bibliometric tools was employed to conduct the analysis: R (version 4.3.1) with the Bibliometrix package, CiteSpace, and VOSviewer (version 1.6.19). R-Bibliometrix was used to quantify general publication metrics, including annual publication trends, average citations per article, and geographical/institutional contributions. Thematic maps and keyword trend plots were generated to visualize research evolution. VOSviewer was applied to construct and visualize co-authorship, co-citation, and keyword co-occurrence networks. Text mining was used to detect high-frequency terms and collaboration patterns among countries (≥ 5 publications) and institutions (≥ 5 publications). CiteSpace was used to identify and validate knowledge clusters, analyze temporal dynamics, and detect emerging topics. CiteSpace validated cluster significance (modularity $Q=0.69$, silhouette $S=0.8912$) and temporal trends, Burst detection was applied to identify keywords and references with sudden citation growth over time. This multi-tool integration allowed for both quantitative measurement and network-based visualization of the research landscape concerning TCM exercise interventions for anxiety.

Results

Basic Information of Published Articles

Table 1

Publication volume of relevant thematic literature.

Table 1 Table of Information Related to Source Data Analysis

Refer	Results
Time span	1991–2024
Sources	2644
File	8076
Annual growth rate%	1.48%
Average age of documents	8.54
The average number of references per document	21.71
	230244

To observe the annual publication trends of literature related to the use of TCM practices in anxiety intervention, this study utilized the R-bibliometrix tool (version R 4.3.1). The relevant results are presented in Figures 1–3.

The data were analyzed using the R-bibliometrix tool (version R 4.3.1). As illustrated in Figure 1, the number of publications related to TCM practices in anxiety intervention has steadily increased from 1991 to 2024. A consistent upward trend in publication volume began in 2002, with a particularly notable surge occurring between 2014 and 2023. In 2022 alone, the number of published articles reached a peak of 773. Figure 2 presents statistics from the top ten relevant journals, highlighting *Evidence-Based Complementary and Alternative Medicine* as the most prominent source in this field, contributing 196 articles. Additionally, the *Journal of Ethnopharmacology* has published 113 related articles. Figure 3 showcases the top ten affiliated institutions based on publication counts. Harvard University leads with 446 articles, followed by Harvard Medical School with 246 publications. The University of California system ranks third, contributing 210 articles.

To examine the top ten sources of data from 1991 to 2024, this study utilized the R-bibliometrix tool (version R4.3.1). The relevant results are presented in Table 2.

Table 2: Top 10 Journals in TCM Exercises to Intervene in Anxiety Research

The data presented in the table indicates that the journal *Evidence-Based Complementary and Alternative Medicine* leads with the highest number of publications and citations, featuring 196 articles and 57,878 citations. Following closely, the *Journal of Ethnopharmacology* ranks second, with 113 articles and 4,129 citations. Additionally, the journal *Medicine* has published 117 articles, accumulating a total of 6,442 citations.

Country of Corresponding Author

To analyze the countries of origin of corresponding authors in literature on the use of TCM practices for anxiety intervention, this study was conducted using the R-bibliometrix tool (version R4.3.1). The relevant results are presented in Table 3.

As shown in Table 3, a total of 3,819 papers on relevant topics have corresponding authors from China, surpassing those from the United States, Australia, and the United Kingdom. To analyze the distribution of co-authors' countries for these papers, this study employed three metrics: MCP (multi-country publications), SCP (single-country publications),

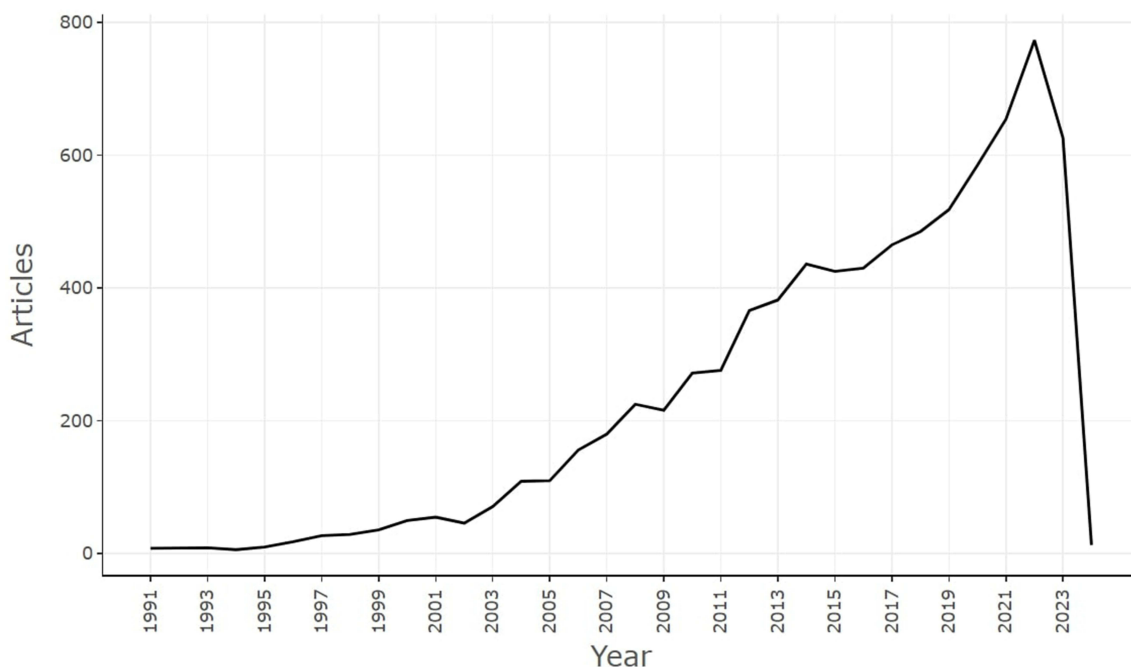


Figure 1 Annual number of publications.

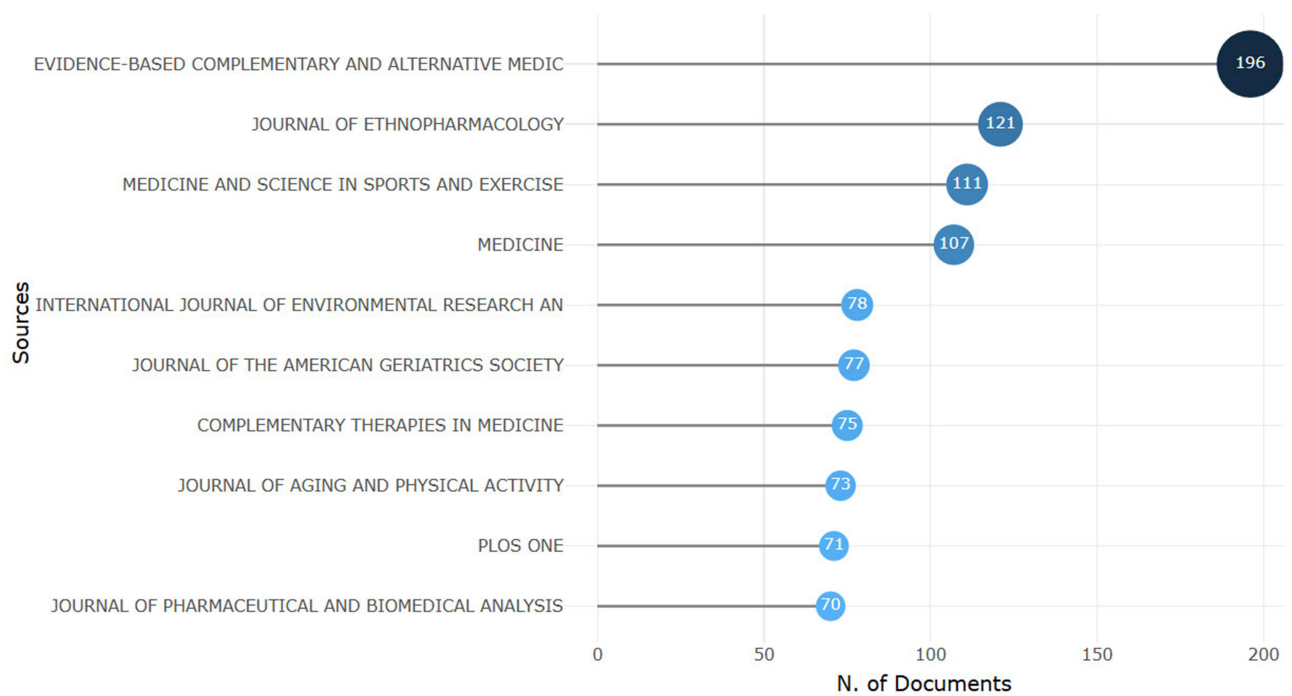


Figure 2 Key sources of related articles.

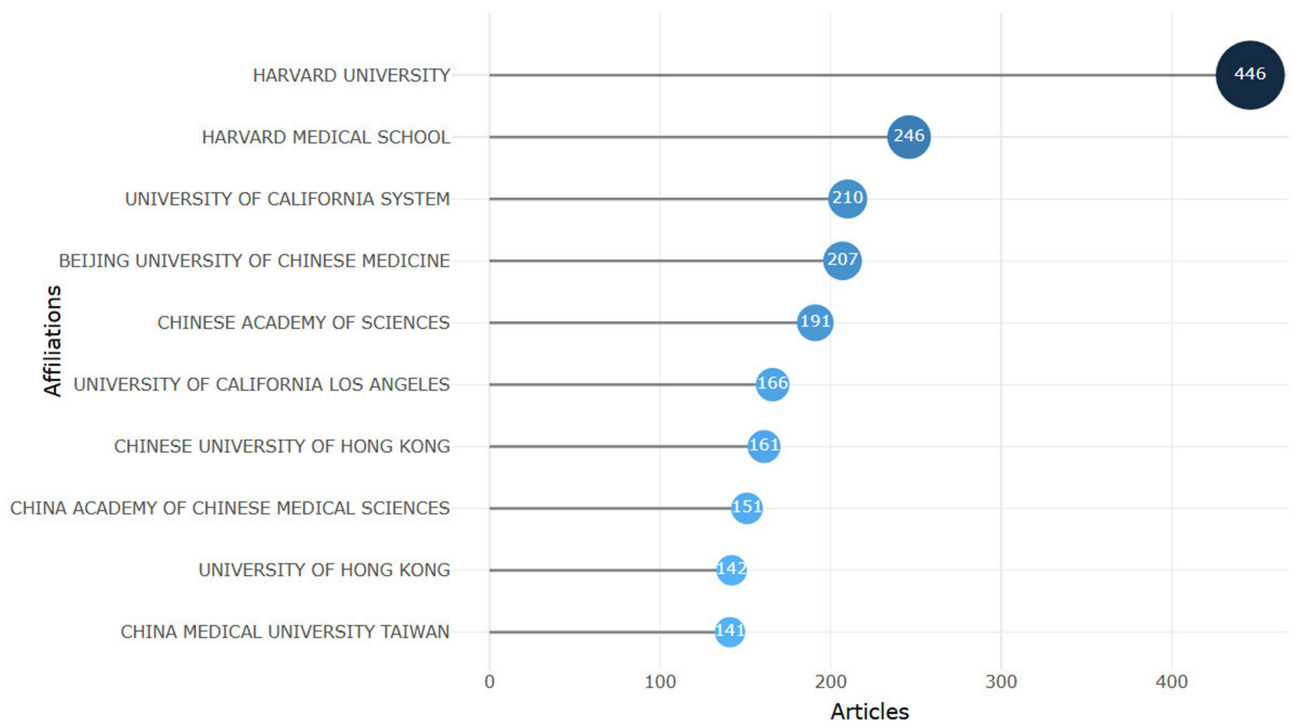


Figure 3 Most relevant sources based on the number of publications.

and MCP Ratio (the ratio of multi-country to total publications). The results indicate that China dominates both MCP and SCP, with 553 multi-country publications and 3,266 single-country publications, respectively. The United States ranks second in both categories, with 180 multi-country publications and 1,464 single-country publications.

Table 2 Top 10 Journals in TCM Exercises to Intervene in Anxiety Research

Journal	Publications	Journal Editor Number	Type	Citation	IF2023
(Evidence-Based Complementary and Alternative Medicine)	1196	1741-427X	Integrative and Complementary Medical Sciences (Q3)	57878	1.124
(Journal Of Ethnopharmacology)	1113	0378-8741	Biological and pharmacological effects (Q1)	4129	4.8
(Medicine and Science In Sport and Exercise)	111	0195-9131	Medicine and Exercise Sciences (Q2)	6442	4.1
(Medicine)	107	0025-7974	Pharmacy & General Medicine (Q2)	29165	1.3
(International Journal Of Environmental Research)	78	1661-7827	Public health and environmental health and occupational hygiene (Q4)	4129	2.6
(Journal Of The American Geriatrics Society)	77	0002-8614	Medicine and Geriatrics (Q1)	43914	4.3
(Complementary Therapies In Medicine)	75	0965-2299	Medicine and General Practice Complementary Medicine (Q1)	1786	3.3
(Journal Of Aging And Physical Activity)	73	1063-8652	Medical Geriatrics (Q4)	38030	1.4
(PLOS One)	71	1932-6203	Biology and Biology (Q3)	43656	2.8
(Journal Of Pharmaceutical And Biomedical Analysis)	70	0731-7085	Medical Analytical Chemistry (Q3)	81733	3.1

Table 3 Top 10 Corresponding Author Countries in TCM Exercises to Intervene in Anxiety Research

Nation	Articles	SCP	MCP	Frequency	MCP-Ratio
China	3819	3266	553	0.047	0.145
America	1644	1246	180	0.052	0.109
Australia	245	156	89	0.030	0.363
Britain	211	138	73	0.026	0.346
Canada	169	114	55	0.021	0.325
Germany	164	126	38	0.020	0.232
Brazil	132	111	21	0.016	0.159
Republic of Korea	117	86	31	0.014	0.265
Spain	112	84	28	0.014	0.250
Japan	91	80	11	0.011	0.121

Notes: MCP (denotes the number of papers co-authored with other countries); SCP (indicates the number of papers co-authored by authors of the same nationality); MCP_Ratio (represents the ratio of the number of international publications to the total number of publications of different nationalities).

As shown in Table 4, China leads other countries in total publications, SCP, MCP, and MCP Ratio, indicating that Chinese scholars have a significant focus and involvement in research on TCM practices for anxiety intervention. Collaboration and communication between different countries and institutions are crucial for advancing the role of TCM practices in anxiety intervention.

Analysis of Highly Cited Articles

When citing articles, researchers typically highlight documents that are beneficial to both their field of study and the general public, with the most cited articles reflecting a greater impact. Based on this analysis, this study identifies the ten most cited articles related to the topic in Table 4, aiming to showcase those with the most significant international influence. The most cited article is titled “Physical Activity Interventions for People with Mental Illness: A Systematic Review and Meta-Analysis”, which has garnered 454 citations. This study aims to evaluate the effects of physical activity

Table 4 Top 10 Citations in the Study of TCM Exercises to Intervene in Anxiety

Document	Identifier (doi)	Total Citations	Annual TC	Normalized TC
Rosenbaum et al 2014 ⁹	10.4088/JCP.13r08765	454	41.27	18.61
Mishra et al 2012 ¹⁰	10.1002/14651858.CD007566.pub2	432	33.23	11.59
Wang et al 2004 ¹¹	10.1001/archinte.164.5.493	315	15.00	6.06
Jin 1992 ¹²	10.1016/0022-3999(92)90072-A	229	6.94	4.76
Windle et al 2010 ¹³	10.1080/13607861003713232	189	12.6	6.85
Wang et al 2014 ¹⁴	10.1007/s12529-013-9351-9	182	16.55	7.64
Wang et al 2010 ⁷	10.1186/1472-6882-10-23	173	11.53	6.27
Tsai et al 2003 ¹⁵	10.1089/107,555,303,322,524,599	165	7.50	4.99
Lavretsky et al 2011 ⁴	10.1097/JGP.0b013e31820ee9ef	153	10.93	2.96
Rogers et al 2009 ¹⁶	10.1177/0193945908327529	131	8.19	3.79

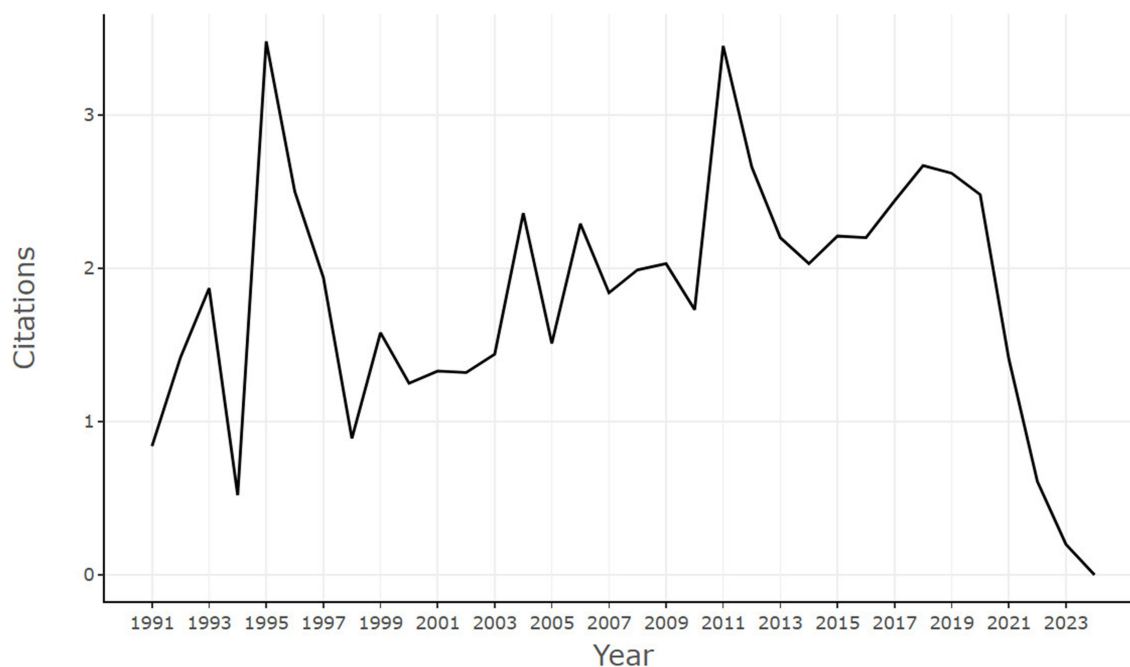
on depressive symptoms (the primary objective), as well as on Ischizophrenia symptoms, anthropometrics, aerobic capacity, and quality of life (secondary objectives) in patients with psychiatric disorders.⁹

To examine citation information related to articles on the use of TCM practices for anxiety intervention, this study was conducted using the R-bibliometrix tool (version R4.3.1). The relevant results are presented in Table 4. The number of citations of relevant literature in a journal in an annual year.

The Number of Citations of Relevant Literature in a Journal in an Annual Year

To assess the landscape of highly cited journals, the annual citation counts of relevant literature were utilized as the measurement standard. The R-literature ometrix (R4.3.1) tool was employed to analyze the results, as presented in Figures 4–6.

As shown in Figure 4, the average number of citations per year was 0.9 in 1991, increasing to 1.3 in 1993 before rapidly dropping to 0.5 in 1994. The first citation peak occurred in 1995, reaching 3.6, followed by a second peak in 2011 at 3.7. Figure 5 presents further analysis to scientifically assess the data, identifying the top 10 most cited sources. The *Journal of the American Geriatrics Society* emerged as the most cited journal, with 6,534 citations and an impact factor

**Figure 4** Average number of article citations per year.

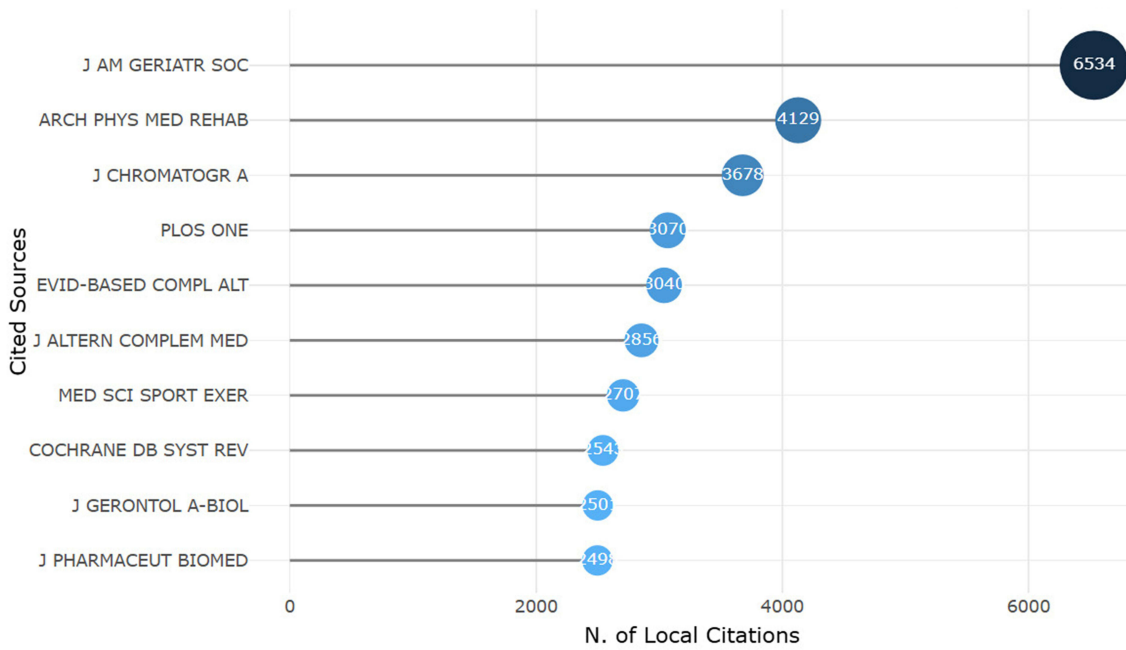


Figure 5 Top Ten Cited Journals (Current Literature Collection).

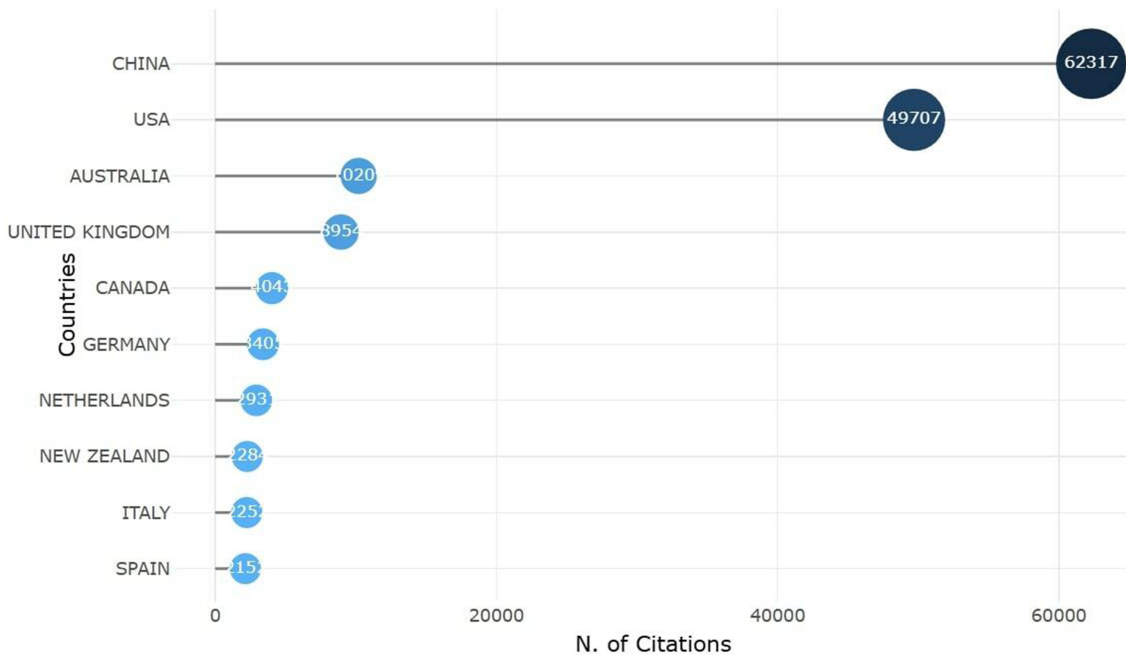


Figure 6 Top 10 Highly Cited Countries and Citations.

of 10.4. In comparison, the second most cited source was the *Archives of Physical Medicine and Rehabilitation*, with 4,129 citations. Figure 6 illustrates that China ranked first among the top 10 countries with the highest number of citations, totaling 62,317. The United States followed in second place with 49,757 citations, while Australia ranked third with 19,707 citations.

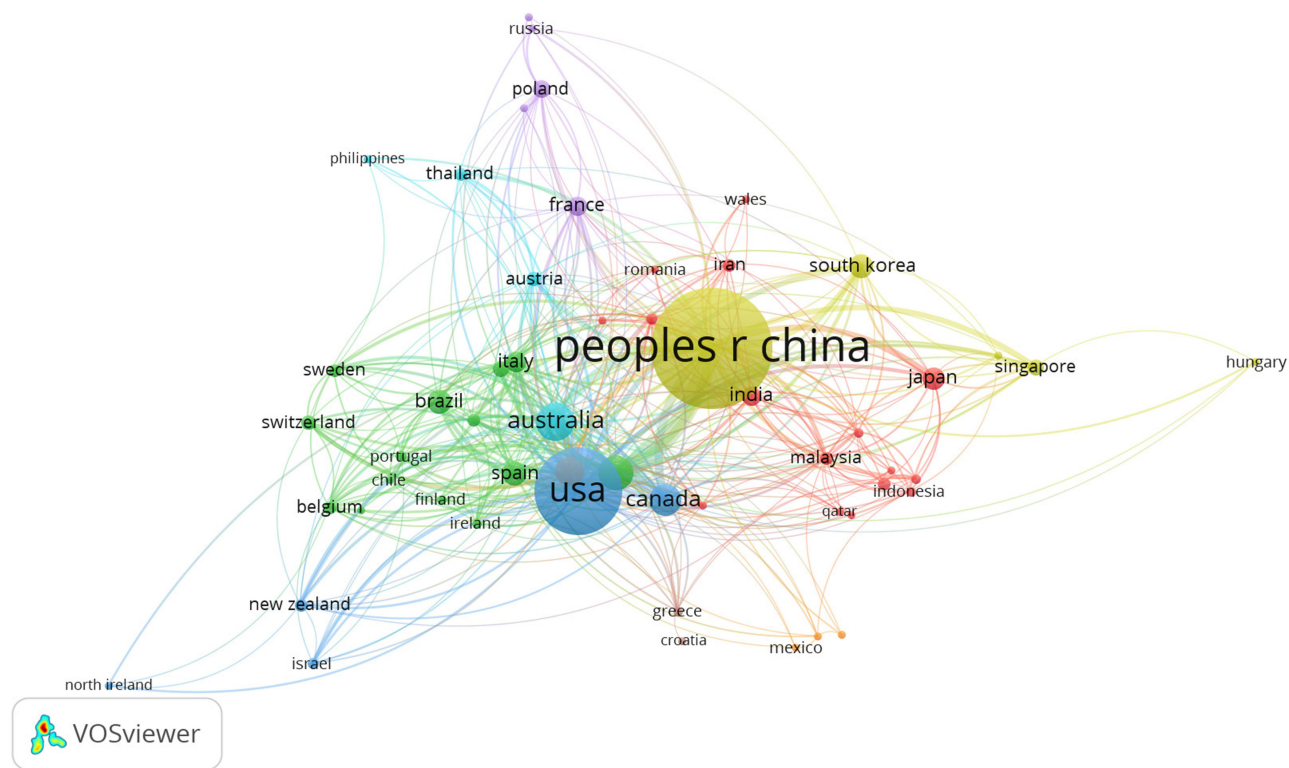


Figure 7 Network visualization of cooperation between countries.

Visual Analysis of Cooperation Between Countries

Citation data were analyzed using VOS Viewer software to explore the interconnections among different countries and organizations. As illustrated in Figure 7, the analysis included a total of 99 countries, with a minimum requirement of 5 collaborative articles. Among these, 57 countries met the criteria. China ranked first with an impressive 3,639 articles, followed by the United States with 1,962 articles and Australia with 377. The data clearly indicate that the frequency of collaboration between Chinese co-authors and other countries is the highest, with the United States and Australia following in terms of collaboration.

Visualization of the Network of Each Partner Institution

As illustrated in Figure 8, the clustering of cooperative community groups reveals that 613 institutions have collaboratively published more than five articles. The primary collaborating institutions include Beijing University of Chinese Medicine, the Chinese Academy of Sciences, and the Chinese University of Hong Kong. These findings indicate that leading research institutions in China are giving significant attention to and conducting in-depth studies on the intervention of TCM exercises in anxiety.

Keyword Analysis

Keyword Data Co-Occurrence Analysis

Keywords provide a concise summary of the content,¹⁷ highlighting key points, facilitating quick reviews, and enabling rapid indexing. Their frequency of occurrence can reflect the hot topics of interest among scholars in a particular field. The data analyzed using R-bibliometrix (version 4.3.1) revealed the most frequently occurring keywords. As shown in Figure 9–11 “Tai Chi” was identified as the most frequently occurring keyword.

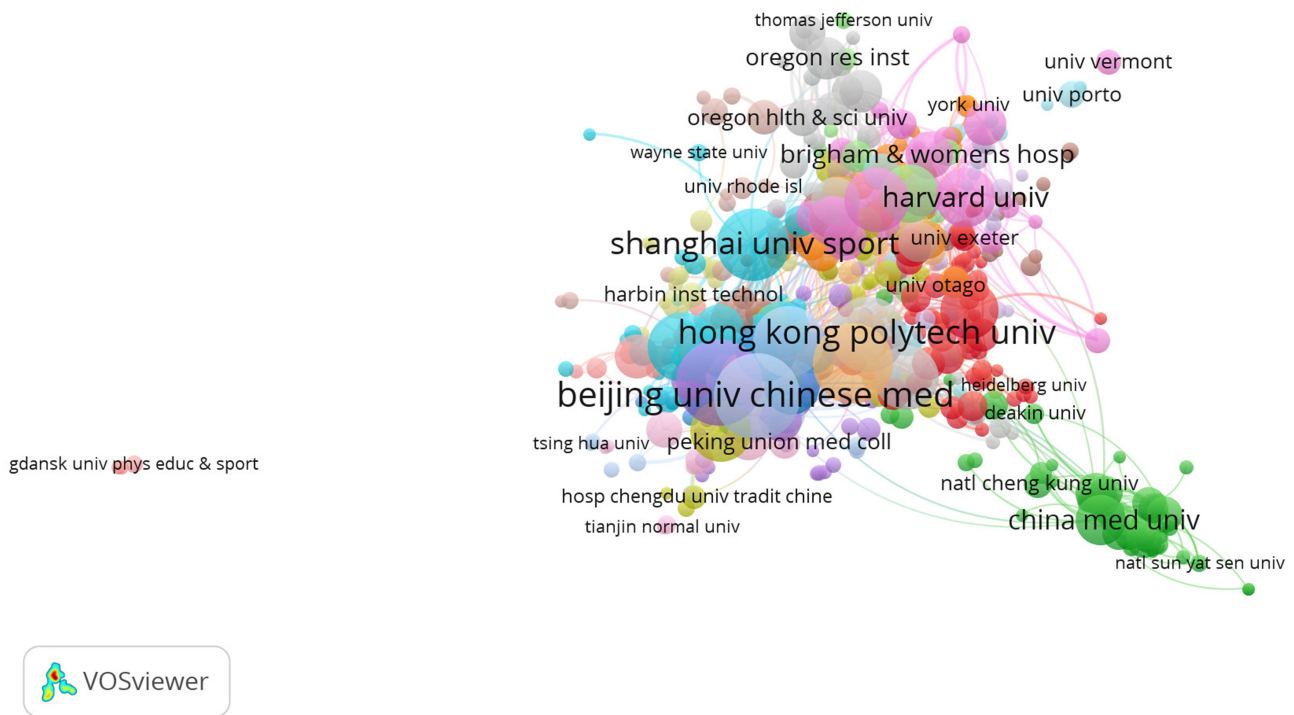


Figure 8 Visualization of the network of each partner institution.

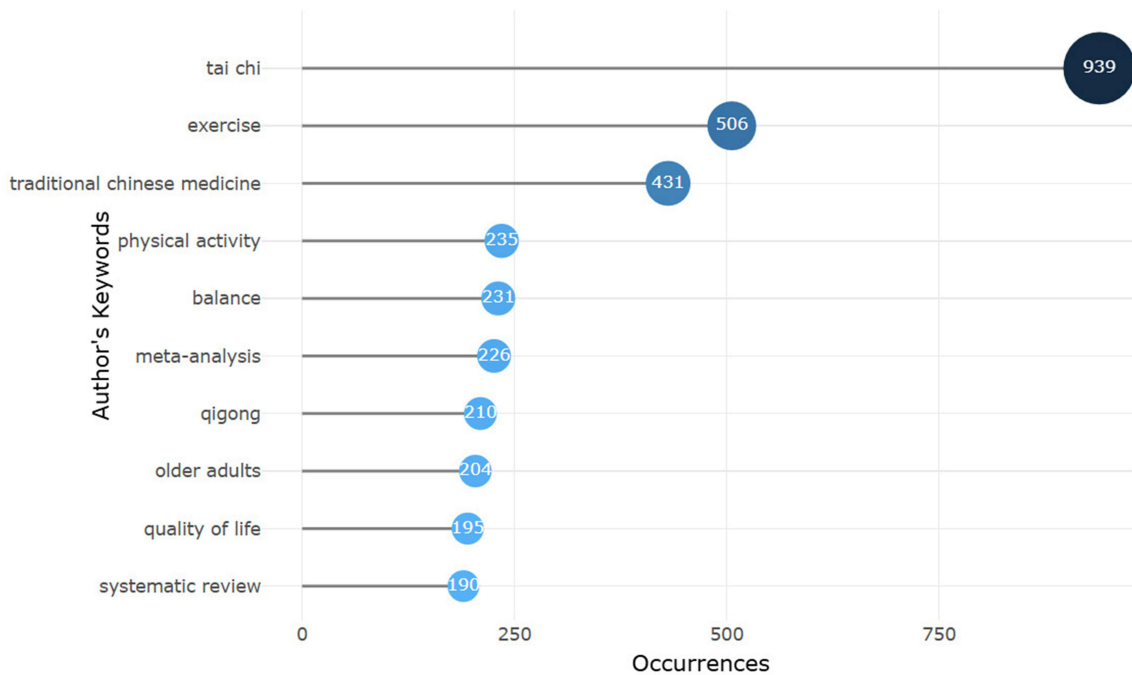


Figure 9 Most relevant terms from “Author Keywords”.

Figure 9–11 employs R-literature ometrix (R4.3.1) software to analyze the author’s keywords, title keywords, and abstract keywords. As illustrated in Figure 9, the term “Tai Chi” appeared 939 times; in Figure 10, “TAI” appeared 2,150 times, while “CHI” appeared 2,030 times; and in Figure 11, “TAI” was noted 7,703 times. These results indicate that “TAICHI” is the core keyword within the dataset of this study.

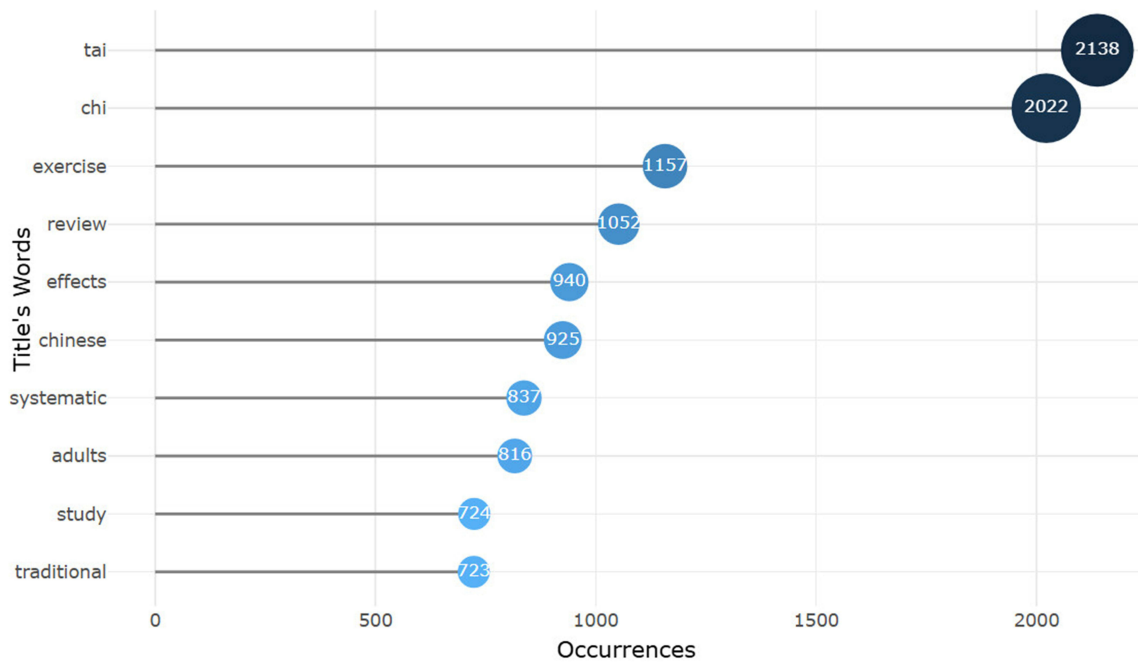


Figure 10 Most relevant terms extracted from titles.

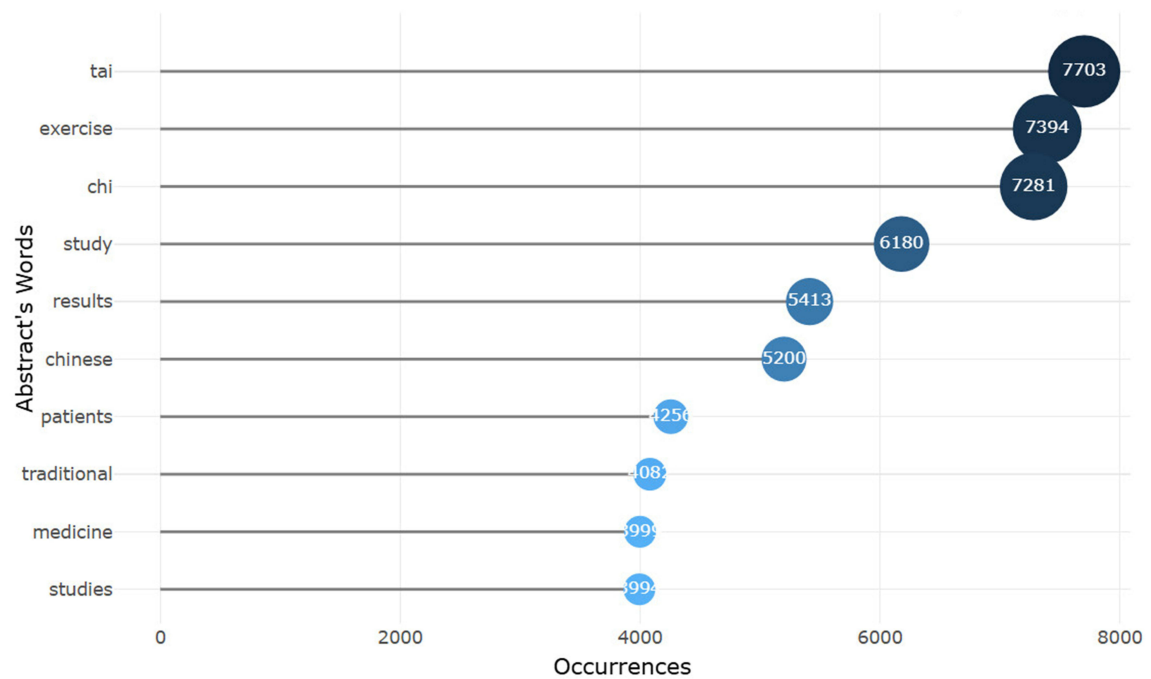


Figure 11 Most relevant terms extracted from abstracts.

Figure 12: Network Co-Occurrence Map Displaying All Keywords Analysis

VOSviewer excels at visualizing co-authorship, co-citation, and keyword co-occurrence networks, allowing users to directly grasp the interrelationships among these elements. Using VOSviewer, a co-occurrence analysis of the source data was conducted, retrieving all highlighted keywords. The relevant results are presented in Figure 12.

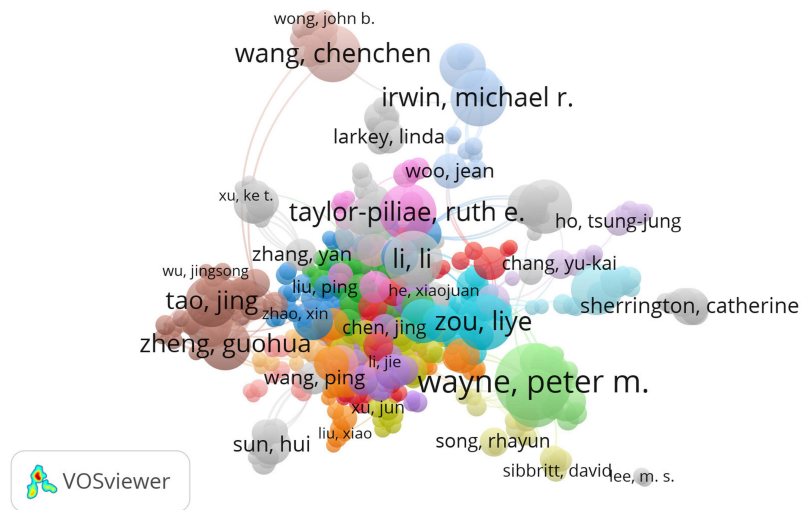


Figure 13 Co-author keyword co-occurrence analysis.

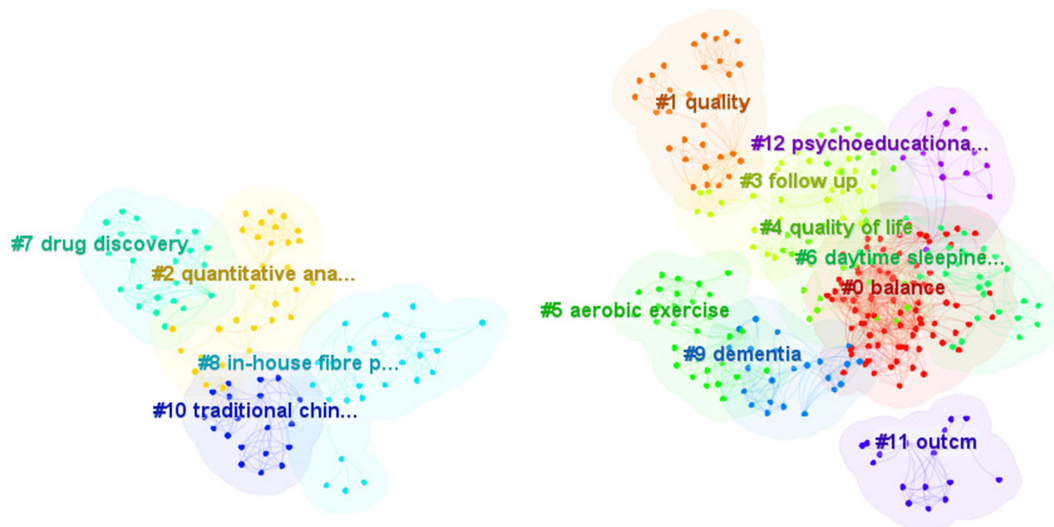


Figure 14 Keyword clustering visualization map.

Keyword Time Series Graph

Figure 15 illustrates that Cluster #0 (Balance) emerged in 1995, while Clusters #1, #4, #5, #6, and #10 appeared within a relatively short time span. This suggests that TCM techniques became a research hotspot in the early 20th century, particularly regarding sleep quality, drug quality analysis, aerobic exercise, and daytime sleepiness in the elderly. In contrast, Clusters #3, #7, #9, and #11 exhibit a longer time span, all commencing after 2010. This indicates that the trend of using TCM for disease intervention has consistently attracted researchers' attention.

Discussion

This study employed bibliometric software to visually analyze the included literature, encompassing publication volume, authors, keywords, and institutions. The findings reveal that the annual publication volume of TCM anxiety intervention practices is generally on the rise, indicating a growing interest in this topic. International collaborative research is rapidly developing, with numerous core authors emerging in this field. Each team's research topic is unique and in-depth, characterized by close communication and collaboration, primarily focusing on Tai Chi. Regarding research institutions,

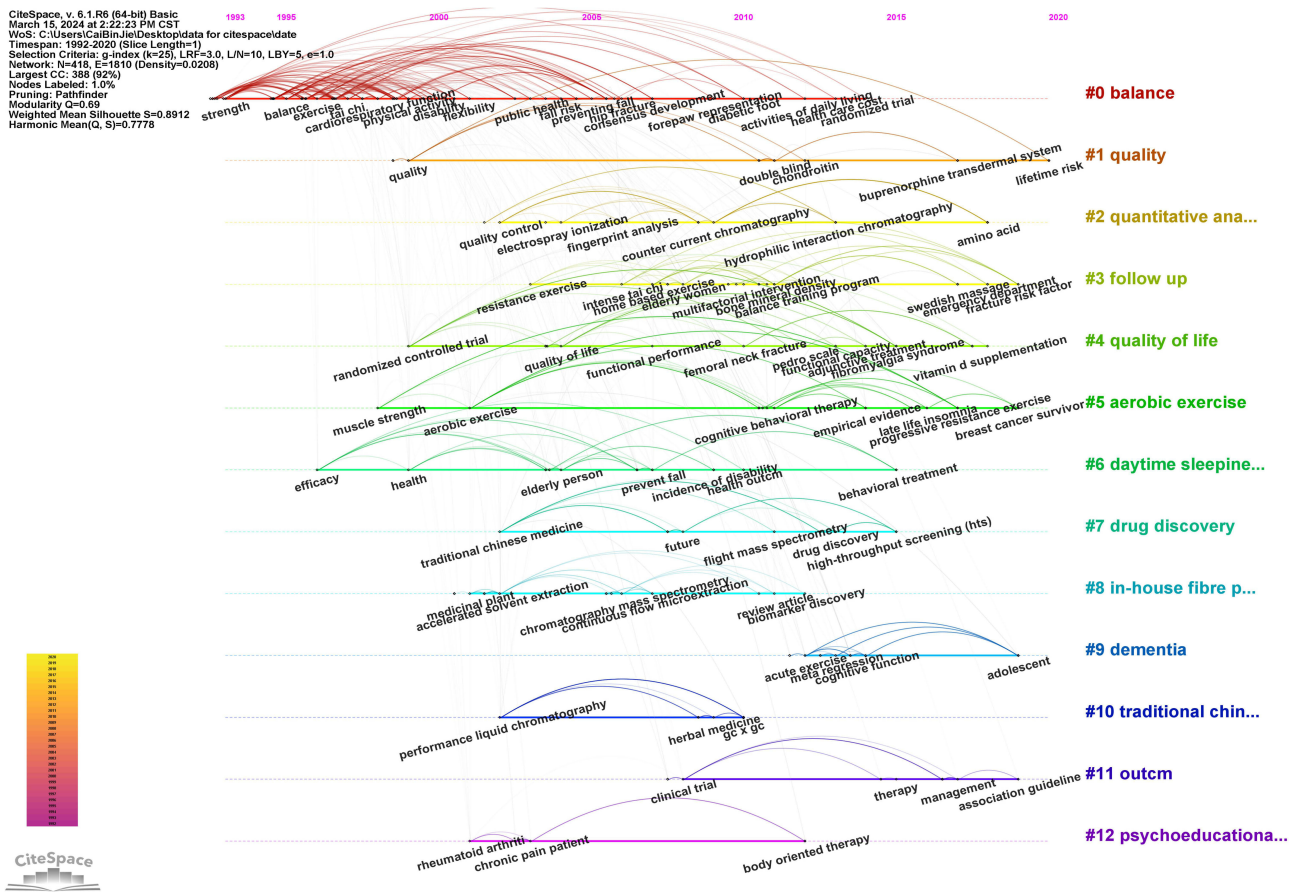


Figure 15 Keyword Time Series Graph.

there is close communication with national research institutions and personnel, yet multinational institutions are loosely distributed and exhibit weak cooperation awareness. Therefore, communication and cooperation between different regions of the world should be strengthened.

Clinical Scope and Comparative Advantages of TCM Exercise Intervention for Anxiety Disorders

In the research trend of TCM techniques for anxiety intervention, the volume of published literature has consistently increased year by year, maintaining a high annual output. Most existing studies involving TCM exercise interventions for anxiety focus predominantly on generalized anxiety disorder (GAD), subthreshold anxiety, or comorbid symptoms in populations with aging-related or chronic health conditions.¹⁹ These populations may particularly benefit from meditative movement-based practices such as Tai Chi and Qigong, which integrate attentional focus, breath regulation, and somatic awareness. Such practices have been shown to influence autonomic balance and emotional regulation pathways, making them suitable for anxiety management in vulnerable or elderly cohorts.

Compared to pharmacological treatments, particularly selective serotonin reuptake inhibitors (SSRIs) and benzodiazepines—which are associated with side effects, dependency risks, and limited patient adherence—TCM exercises offer several advantages.²⁰ These include minimal adverse effects, enhanced psychological self-efficacy, and strong cultural compatibility. Moreover, growing clinical endorsement of nonpharmacologic therapies in international treatment guidelines further supports the expanding integration of TCM-based interventions in both clinical and community settings. After 2005, the focus of research shifted from pharmaceutical interventions to TCM techniques, particularly emphasizing Tai Chi. With the growth of the Chinese economy in the early 21st century, there has been a greater emphasis on international exchanges and the dissemination of traditional Chinese

culture, which has gradually fostered acceptance of TCM techniques for anxiety management among foreign audiences.

The Mechanism of Anti Anxiety Effects of TCM Exercise

In recent years, a growing body of neurobiological and physiological research has begun to elucidate the mechanisms by which traditional Chinese mind–body practices—such as Tai Chi, Baduanjin, and Wuqinxi—exert anxiolytic effects. Biomechanically, the slow, coordinated, and intentional movements inherent in these exercises facilitate sensorimotor integration and improve postural control, which are associated with increased parasympathetic tone and vagal afferent activity—mechanisms closely tied to emotional regulation and anxiety relief.^{21,22} Moreover, regular engagement in these exercises has been shown to reduce oxidative stress biomarkers and pro-inflammatory cytokines, indicating potential neuroprotective effects against inflammation-related affective disturbances.^{23,24} Alterations in endocrine and metabolic profiles—such as decreased cortisol levels and improved lipid metabolism—also point to the regulation of the hypothalamic–pituitary–adrenal (HPA) axis as a possible mechanism of action.²⁵ Oxidative stress, a known contributor to anxiety and neuroinflammation, is also attenuated by traditional exercises. Studies demonstrate that long-term Baduanjin engagement increases antioxidant enzyme activity (eg, superoxide dismutase) and reduces malondialdehyde levels, contributing to improved redox homeostasis.²⁵ Collectively, these findings support the hypothesis that TCM exercises alleviate anxiety through a multisystemic mechanism involving neurological, endocrine, immune, and autonomic pathways.

Keyword Visualization and Intervention Plan

Keyword visualization analysis reveals that the terms “Chinese medicine”, “acupuncture and moxibustion”, “exercise”, and “Tai Chi” frequently appear in the literature, with “Tai Chi” being the most prevalent keyword. This indicates that Tai Chi is the preferred TCM technique for anxiety intervention. The prominence of Tai Chi can be attributed to its long history and its recommendation during the global dissemination of TCM culture. Known for its simple movements, ease of learning and practice, and enduring benefits, Tai Chi effectively promotes psychological regulation through physical activity and controlled breathing, making it a valuable tool for anxiety management.²⁶

This study systematically reviews existing clinical research to propose specific TCM exercise intervention programs, and provides personalized treatment guidelines based on physiological mechanisms, offering evidence-based recommendations for the frequency, intensity, and duration of interventions. Additionally, when recommending specific TCM interventions, patient characteristics such as anxiety subtypes (eg, generalized anxiety disorder [GAD] or social anxiety disorder [SAD]) should be considered. Tai Chi has been proven effective in patients with GAD and stress-induced anxiety. Through slow movements and deep breathing, it helps alleviate anxiety symptoms. As a low-impact physical and psychological therapy, Tai Chi is suitable for patients seeking to relieve anxiety and improve mental health. Studies by consistently show reduced anxiety symptoms, improved autonomic nervous system regulation, and normalized cortisol levels.^{27,28} Baduanjin (Eight-Section Brocade), emphasizing self-efficacy and respiratory regulation, is particularly effective in relieving SAD. Existing evidence indicates that Baduanjin significantly improves social confidence and emotional regulation, making it an optimal choice for patients with SAD. It is recommended for treating social anxiety or phobia, with studies by^{28,29} demonstrating improvements in social confidence and emotional regulation. Acupuncture, targeting specific meridians, helps restore nervous system balance and alleviate anxiety, especially for individuals unresponsive to psychotherapy or pharmacological interventions. According to clinical trials, the optimal treatment regimen is 8–12 weeks with 3–5 sessions per week; for long-term maintenance, reducing the frequency to 1–2 sessions weekly is recommended.^{30,31} These TCM exercise interventions effectively regulate the autonomic nervous system, reduce cortisol levels, and enhance emotional regulation, demonstrating positive clinical effects in anxiety patients. Translating these interventions into specific clinical protocols provides more comprehensive and personalized treatment options for individuals with anxiety disorders.

Research Challenges and Future Directions

In the study of TCM interventions for anxiety, it has been noted that some international scholars express skepticism regarding their efficacy. While cultural divergence and varying levels of familiarity with TCM outside China contribute to this skepticism, these factors alone do not fully account for the differences in findings. As Saeed et al argued, Tai Chi and Qigong have not demonstrated consistent efficacy in treating anxiety and depression, which may be partly attributed to methodological heterogeneity across studies.³² For example, many trials differ in intervention protocols, outcome measures, population characteristics, and research settings factors that can influence the consistency and reproducibility of outcomes in cross cultural contexts. Moreover, Western medical paradigms often emphasize evidence from large-scale randomized controlled trials (RCTs) and standardized meta-analyses, whereas TCM studies, especially those conducted in China, may employ different evaluation frameworks or emphasize clinical efficacy and traditional diagnostic principles. These differences reflect not a lack of rigor, but rather the coexistence of diverse research traditions and evidentiary standards. However, numerous studies conducted in China have reported significant improvements in anxiety symptoms following TCM interventions.^{33–36} Such as Tai Chi,³⁶ Baduanjin, Qigong,³⁷ Wuqinxi, and Yijinjing. Meta-analyses have also provided supportive evidence, indicating that Tai Chi can positively influence mental health outcomes, particularly among individuals with chronic conditions. Two meta-analysis articles, “The Impact of Tai Chi on Health Outcomes in People with Chronic Diseases: A Systematic Review” and “Tai Chi on Mental Health: A Systematic Review and Meta-Analysis”, both concluded that Tai Chi can effectively enhance mental health. Therefore, future research should aim to promote methodological alignment, encourage cross-cultural collaboration, and facilitate mutual recognition of evidence standards, in order to enhance the global credibility and applicability of TCM-based interventions.

Shortcomings and Prospects

The intervention of TCM in anxiety still requires further development: (1) Among the 8,076 English articles published from 1991 to 2024, about two-thirds were authored by Chinese researchers, highlighting the need for enhanced dissemination of TCM interventions for anxiety globally. (2) While a core network of influential authors and research institutions has emerged in China, collaboration with international partners remains limited, and the number of participating institutions is relatively small. (3) More efforts are necessary to strengthen research on anxiety intervention using TCM techniques. Keyword co-occurrence analysis and clustering indicate that most studies primarily focus on Tai Chi and the elderly, suggesting that research on TCM interventions for anxiety—particularly multi-method and multi-group studies—remains in its early stages and lacks depth. (4) Although TCM techniques can effectively address anxiety, there is currently no unified international standard for the degree and duration of intervention. These challenges have restricted the broader application and promotion of TCM techniques. Additionally, cultural differences across countries further limit the acceptance and popularity of TCM interventions for anxiety. Finally, although the WOS database has fulfilled the core needs of this study, future research may consider incorporating supplementary analyses from additional databases—such as PubMed, CNKI, and Embase—to further enhance the comprehensiveness of the findings.

Future research on traditional Chinese medicine (TCM) interventions for anxiety can focus on the following aspects: (1) Strengthening Collaboration: Enhance cooperation between domestic and international institutions by actively conducting large-scale, multicenter controlled trials, with an emphasis on research institutions in cities such as Beijing, Shanghai, and Zhejiang. (2) Combining TCM Techniques: Actively explore the integration of TCM techniques with other specific therapies to diversify interventions for anxiety, promoting a broader range of TCM practices. (3) Promoting TCM Culture: Advance the dissemination of TCM culture to foster the development of TCM techniques for anxiety intervention. TCM, rooted in ancient Chinese culture, has been preserved over time and has gradually become an effective localized approach for addressing anxiety in China. Due to cultural influences, Chinese people generally have a high level of recognition and acceptance of TCM. As the culture of TCM spreads, its techniques for anxiety intervention have begun to reach other countries. In further developing TCM interventions, it is essential to consider the diverse regional cultures of different nations, allowing for greater integration and adaptation to enhance the effectiveness and relevance of these interventions.

Data Sharing Statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethical Review

This article is a review and analysis of published literature and does not require ethical review.

Author Contributions

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

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Disclosure

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