

Visualization Analysis of Research Literature on Cupping Therapy for Cough and Related Respiratory Disorders Based on CNKI

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Abstract: *Objective:* To analyze the research status, hotspots, and development trends of cupping therapy for cough and related respiratory disorders. *Methods:* Literature on cupping therapy for cough and related respiratory disorders published from January 1, 1990, to September 1, 2026, was retrieved from the China National Knowledge Infrastructure (CNKI). Statistical analysis was performed on publication volume, authors, institutions, journals, and keywords, and keyword co-occurrence, clustering, timeline, and burst detection analyses were conducted. Semantic topic identification was performed using titles and abstracts, while keywords were analyzed separately for frequency, co-occurrence, and temporal evolution. *Results:* A total of 341 articles were included. The period from 2013 to 2018 was the most active, with the annual publication volume peaking at 28 articles in 2015. Zhao Li was the most prolific author (9 articles), and Hebei Provincial Hospital of Traditional Chinese Medicine was the most productive institution (23 articles). After standardization, 504 keywords were obtained, among which “cupping”, “cough”, “asthma”, “pneumonia”, “bronchitis”, “children” and “chronic obstructive pulmonary disease (COPD)” were the main high-frequency keywords. The expansion of the disease spectrum, combined therapies, pediatric populations, and the objectification of outcome indicators were the research hotspots. Research topics expanded from asthma, bronchitis, and basic cupping application in the early stage to cough, children, and pneumonia, and have shifted to COPD, pulmonary function, pulmonary rehabilitation, and inflammatory factors in recent years. *Conclusion:* Research on cupping therapy for cough and related respiratory disorders has reached a considerable scale, with combined therapies and the objectification of outcome indicators as current hotspots. The independent efficacy and underlying mechanisms of cupping remain to be further verified by standardized, multicenter, and high-quality clinical studies.

Keywords: cupping therapy; cough; respiratory disorders; chronic obstructive pulmonary disease; bibliometric analysis

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1. Introduction

Cupping therapy is a traditional Chinese medicine (TCM) technique based on meridian theory, in which negative pressure generated by combustion or suction attaches cups to specific body surface areas, thereby regulating qi and blood and dredging the meridians^[1]. Featuring simple operation, low cost, and favorable safety, cupping has been widely used in the treatment and rehabilitation of respiratory diseases such as cough, asthma, bronchitis, pneumonia, and chronic obstructive pulmonary disease (COPD), and has become one of the commonly used non-pharmacological interventions in clinical practice^[2]. Policy documents such as the Strategic Plan for the Development of Traditional Chinese Medicine (2016–2030) have explicitly incorporated appropriate TCM techniques, including cupping, into the national promotion agenda, providing policy support for its clinical popularization. With expanding clinical application, cupping interventions have diversified from traditional fire cupping into various forms such as balance fire cupping, blood-letting puncture and cupping, flash cupping, moving cupping and acupoint cupping, and are frequently combined with acupuncture, acupoint application, tuina, Chinese herbal medicine and nursing interventions. However, research in this field has so far been scattered across different diseases, populations, and clinical departments, and individual studies can hardly reflect the overall knowledge structure and development trends of the field; systematic and objective quantitative analyses of research hotspots and frontiers remain lacking. By quantitatively characterizing publication volume, research actors, and their knowledge linkages, bibliometrics is able to reveal the evolutionary trajectory and frontier directions of a research field^[3]. Therefore, this study conducted a visualization analysis of literature on cupping therapy for cough and related respiratory disorders indexed in CNKI, aiming to delineate the research status, development context, and hot topics of this field and to provide a reference for subsequent clinical practice and research topic selection.

2. Materials and methods

2.1. Data sources and search strategy

Literature on cupping therapy for cough and related respiratory disorders was retrieved from the CNKI journal database. The search covered the period from January 1, 1990, to September 1, 2026, and all searches and data export were completed on the same day to minimize the influence of database updates. A subject-field search was performed with the following search formula: SU = ('cupping' OR 'cupping therapy' OR 'fire cupping' OR 'wet cupping' OR 'dry cupping' OR 'blood-letting puncture and cupping' OR 'moving cupping' OR 'flash cupping' OR 'retained cupping' OR 'medicated cupping') AND ('cough' OR 'asthma' OR 'bronchitis' OR 'bronchiolitis' OR 'pneumonia' OR 'COPD' OR 'chronic obstructive pulmonary disease' OR 'feizhang' OR 'wheezing' OR 'dyspnea' OR 'expectoration' OR 'airway inflammation' OR 'pulmonary function' OR 'respiratory system'). (The search was conducted in Chinese; the English terms above are translations of the Chinese search terms.)

2.2. Literature screening criteria

The inclusion criteria were as follows: the research topic was cupping therapy for cough or related respiratory disorders such as asthma, pneumonia, bronchitis, and COPD, with no restrictions on patient populations or specific cupping modalities; and the fields of publication year, authors, institutions, and keywords were complete. The exclusion criteria were as follows: for duplicate publications of the same study, only the most complete one was retained; non-research items such as conference notices, calls for papers, patents,

newspaper articles and popular science works; animal experimental studies; and records judged irrelevant to the research topic based on titles, keywords and abstracts.

2.3. Data processing

The screening workflow was deterministic and auditable. After duplicate removal, 646 records remained. Deterministic rule-based screening excluded 69 records without a cupping intervention and 10 records without a respiratory or cough-related topic. The remaining 567 records entered the assisted title-and-abstract screening queue; 60 records were excluded, 8 were left uncertain, and 499 records passed the topic-candidate screen. A completeness filter then required publication year, keywords, abstract, authors, and institutions to be complete, which excluded 158 records and yielded the final 341 records. Keywords were split, deduplicated, and normalized for synonymous expressions; author, institution, and journal names were statistically standardized; and department, address, and postal code information was removed from institution names. The same cleaned dataset was used for annual trends, research actors, keyword networks and topic evolution.

3. Data analysis

Statistical analysis and visualization were performed for publication volume, authors, institutions and journals. Co-occurrence was defined as two keywords appearing in the same article, based on which author collaboration networks, institution collaboration networks, and the keyword co-occurrence network were constructed. Community detection was performed using the Louvain algorithm, and the quality of community structure was evaluated by modularity Q ; the complete 576-node, 2052-edge keyword network is shown in Figure 5 without Pathfinder pruning. Burst detection was performed using the Kleinberg burst detection algorithm^[4] to identify keywords whose frequency rose rapidly within specific periods, with burst strength and start and end years recorded. Static semantic topic analysis adopted the latent Dirichlet allocation (LDA) topic model, taking abstracts as the main input text (titles were used when abstracts were unavailable); the number of candidate topics was set from 2 to 20, and the final static model contained 9 topics based on the lowest model perplexity. The dynamic-topic visualization used the sequential topic output and consolidated it into two major research trajectories. For temporal analysis, the study period was divided into four stages: 1990–2005, 2006–2012, 2013–2018, and 2019–2026. As the year 2026 has not ended, data for that year are presented as interim results only and are not used to judge the publication trend of a complete year.

4. Results

A total of 650 records were initially retrieved from CNKI. After removing 4 duplicate records, 646 records remained. Deterministic screening then excluded 69 records without a cupping intervention and 10 records without a respiratory or cough-related topic, leaving 567 records in the assisted screening queue. Assisted title-and-abstract screening excluded 60 records and marked 8 as uncertain, yielding a topic candidate set of 499 articles; a further 158 articles were excluded for incomplete fields such as publication year, keywords, abstract, authors, or institutions. Finally, 341 articles published between 1990 and 2026 were included.

4.1. Temporal distribution of publications

The temporal distribution of publications on cupping therapy for cough and related respiratory disorders from 1990 to 2026 is shown in Figure 1. The publication volume showed an overall stage-wise upward trend. From 1990 to 2005, 46 articles (13.5%) were published, fewer than 3 per year on average, indicating a stage of slow accumulation; from 2006 to 2012, 50 articles (14.7%) were published, with a slightly expanded scale; from 2013 to 2018, 151 articles (44.3%) were published, constituting the most active period, with the annual publication volume peaking at 28 articles in 2015; from 2019 to 2026, 94 articles (27.6%) were published, a decline from the previous stage, although topics such as COPD and pulmonary function remained active, indicating that the field had entered a stage of thematic adjustment. **(Figure 1)**

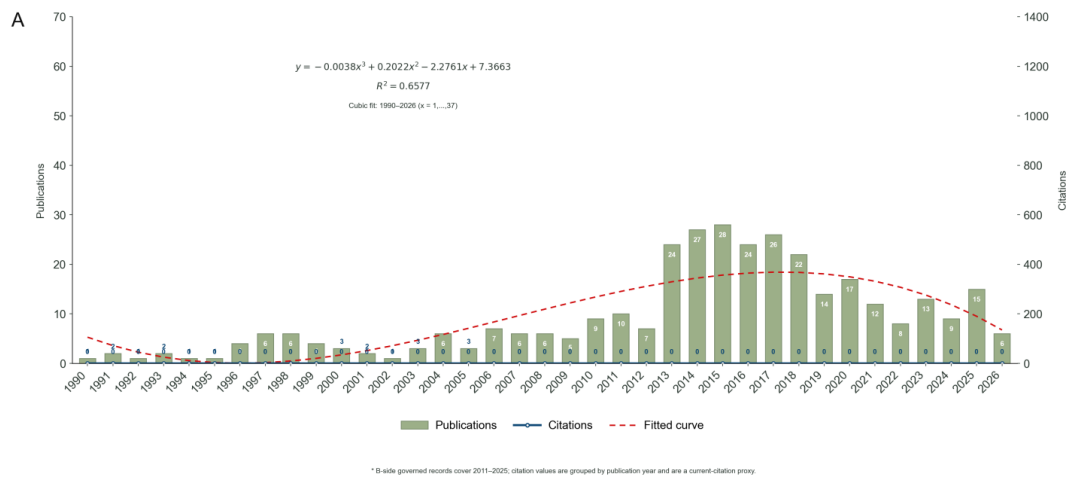


Figure 1. Temporal distribution of the 341 publications on cupping therapy for cough and related respiratory disorders.

4.2. Authors

The 341 articles involved 754 authors with 921 author signatures in total, approximately 2.7 authors per article, indicating that most studies were completed by small teams. The most prolific author was Zhao Li (9 articles), followed by Yuan Jun (6 articles); Lin Yan, Geng Shaoyi, Guo Yinan, Chen Yingfang, and Gao Guosheng each published 5 articles. The author collaboration network contained 653 nodes and 1245 links, with 163 Louvain communities. **(Figure 2)**

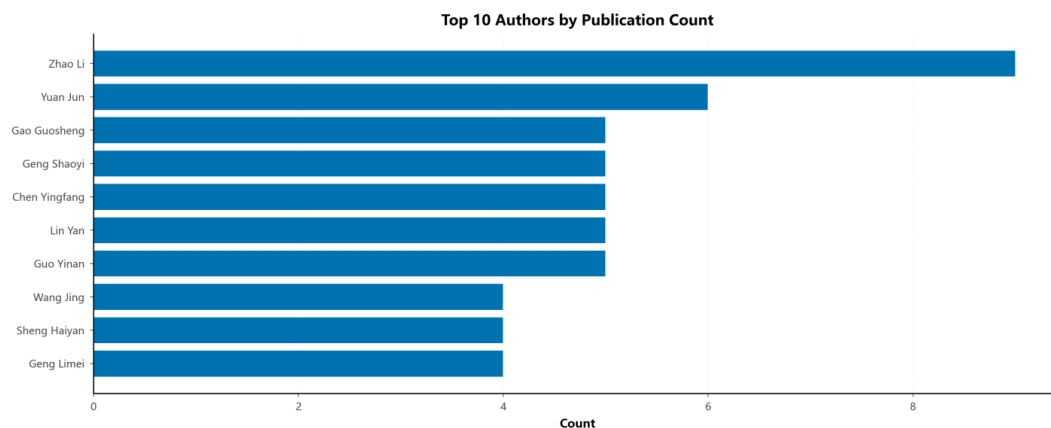


Figure 2. Distribution of productive authors of the 341 publications on cupping therapy for cough and related respiratory disorders.

4.3. Institutions and journals

The included literature involved 355 standardized institutional entities and 141 journals, with 477 institutional signatures in total. The top 15 institutions by publication volume are shown in Table 1. The most productive institution was Hebei Provincial Hospital of Traditional Chinese Medicine (23 articles), followed by the Affiliated Hospital of Changchun University of Chinese Medicine (8 articles) and Changchun University of Chinese Medicine (7 articles); from the fourth place onward, no institution published more than 6 articles, showing a marked head-concentration pattern in the distribution of institutional output. The institution collaboration network contained 179 nodes and 156 links, with a modularity Q of 0.9071. In terms of institution type, the research actors were mainly TCM hospitals and universities of Chinese medicine and their affiliated hospitals. Journals with relatively high publication volumes included Hebei Journal of Traditional Chinese Medicine (13 articles), Shanghai Journal of Acupuncture and Moxibustion (11 articles), Chinese Medicine Modern Distance Education of China (11 articles), Inner Mongolia Journal of Traditional Chinese Medicine (11 articles), Journal of External Therapy of Traditional Chinese Medicine (10 articles), and Chinese Acupuncture & Moxibustion (9 articles), most of which are journals of TCM, acupuncture and moxibustion, or integrated traditional and Western medicine, indicating a strong clinical application background in this field. (Table 1) (Figure 3 and 4)

Table 1. Top 15 productive institutions of the 341 publications on cupping therapy for cough and related respiratory disorders

No.	Institution	Publications
1	Hebei Provincial Hospital of Traditional Chinese Medicine	23
2	Affiliated Hospital of Changchun University of Chinese Medicine	8
3	Changchun University of Chinese Medicine	7
4	Nantong Hospital of Traditional Chinese Medicine	6
5	Ningde Hospital of Traditional Chinese Medicine	6
6	First Affiliated Hospital of Guangxi University of Chinese Medicine	5
7	Xinle Hospital of Traditional Chinese Medicine, Hebei	4
8	Affiliated Hospital of Liaoning University of Traditional Chinese Medicine	4
9	Lianyungang Affiliated Hospital of Nanjing University of Chinese Medicine	4
10	Fengnan District Center for Disease Control and Prevention, Tangshan, Hebei	3
11	Inner Mongolia Medical University	3
12	Jiangsu Province Hospital of Chinese Medicine	3
13	Shenzhen Hospital of Guangzhou University of Chinese Medicine	3
14	Haikou Hospital of Traditional Chinese Medicine	3
15	Fengnan District Hospital of Traditional Chinese Medicine, Tangshan, Hebei	3

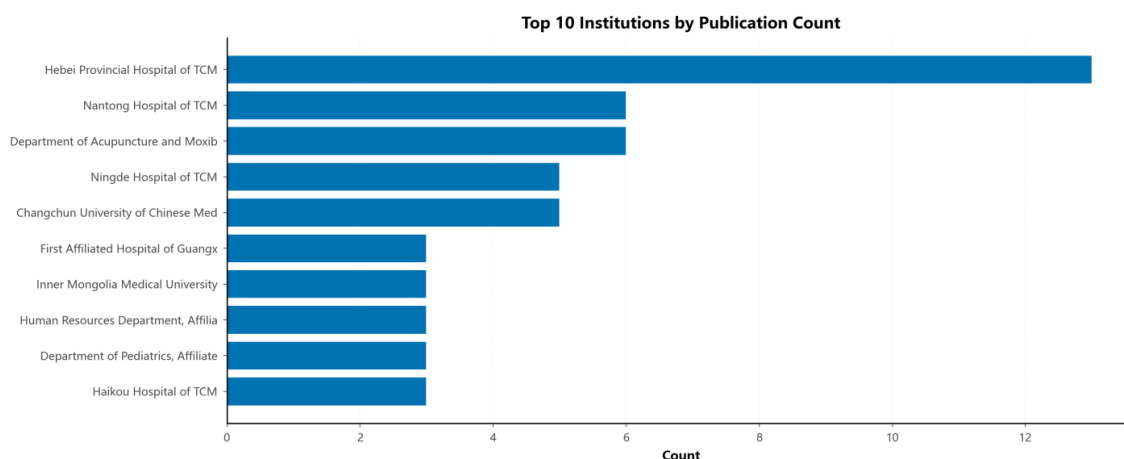


Figure 3. Distribution of productive institutions of the 341 publications on cupping therapy for cough and related respiratory disorders

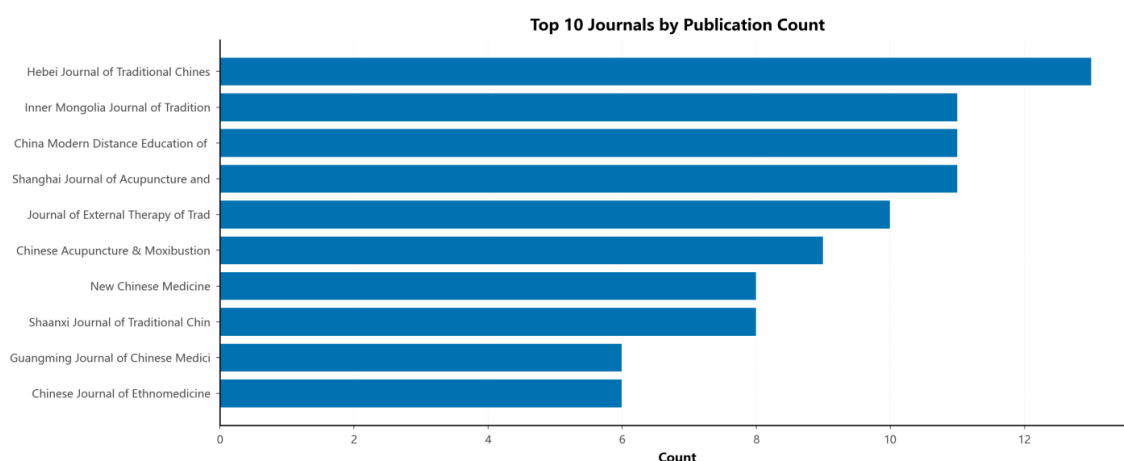


Figure 4. Distribution of major journals publishing the 341 articles on cupping therapy for cough and related respiratory disorders

4.4. Keywords

4.4.1. Co-occurrence analysis

After standardization, 577 keywords were included, appearing 1385 times in total. The keyword co-occurrence network is shown in Figure 5, containing 576 nodes and 2052 links. Community detection based on the Louvain algorithm identified 22 thematic communities with a modularity Q of 0.4865, indicating a clear community structure in the network, albeit with close inter-community connections. The top 16 high-frequency keywords are shown in Table 2. As a search term, “cupping” had the highest frequency (267 times) and occupied the central position of the co-occurrence network, followed by disorder keywords such as “asthma”, “cough” and “COPD”, which frequently co-occurred with other research topics and served as connecting hubs across studies. Notably, although “asthma” (73 times) appeared slightly less frequently than “cough” (76 times), it shared co-occurrence relationships with a wider range of disorders, suggesting that asthma-related research is more frequently interconnected with research topics such as cough and pneumonia. In terms of co-occurrence pairs, cough–cupping (63 times), asthma–cupping (54 times) and cupping–

pneumonia (39 times) were the main disorder-related pairs; children–cupping (29 times) reflected the main population-related dimension; cupping–acupoint application (20 times) and cupping–acupuncture (16 times) reflected the research orientation toward combined therapies; and cupping–pulmonary function (13 times) and cupping–inflammatory factors (8 times) indicated that outcome measures were shifting from symptom description to objective measurement. Representative corpus records included balanced fire cupping, flash cupping, and related pediatric and respiratory interventions ^[5–14]. **(Figure 5) (Table 2)**

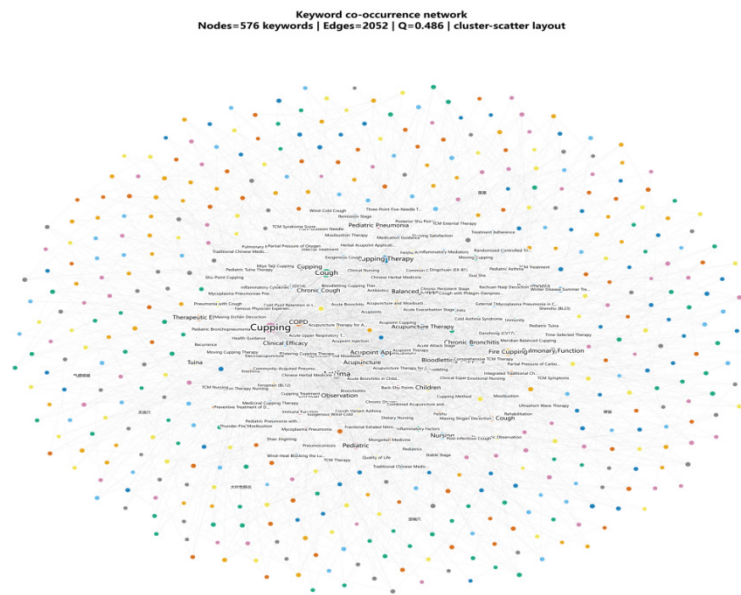


Figure 5. Keyword co-occurrence network of the 341 publications (576 nodes and 2052 links; deterministic non-overlapping cluster-scatter layout).

Table 2. Top 16 high-frequency keywords of the 341 publications on cupping therapy for cough and related respiratory disorders

No.	Keyword	Frequency
1	Cupping	267
2	Cough	76
3	Asthma	73
4	Pneumonia	43
5	Bronchitis	32
6	Children	31
7	COPD	30
8	Acupoint application	23
9	Acupuncture	17
10	Pulmonary function	14
11	Acupuncture and moxibustion	14
12	Efficacy	10
13	Clinical efficacy	10
14	Feishu (BL13)	9

No.	Keyword	Frequency
15	Immune function	8
16	Inflammatory factors	8

4.4.2. Semantic topic analysis

Sequential topic analysis identified two major research trajectories (Figure 6): COPD and Asthma Treatment Outcomes, representing disease-specific respiratory outcomes and pulmonary function evaluation; and Acupoint-Based Treatment for Cough and Asthma, representing cough and asthma management through cupping and acupoint-based interventions. Together, these trajectories indicate that the field has developed from symptom-oriented clinical observation toward disease-specific management and objective outcome evaluation. These trajectories were also represented by studies of acupuncture or medicated cupping for COPD, airway clearance, and pulmonary rehabilitation^[15–24]. (Figure 6)

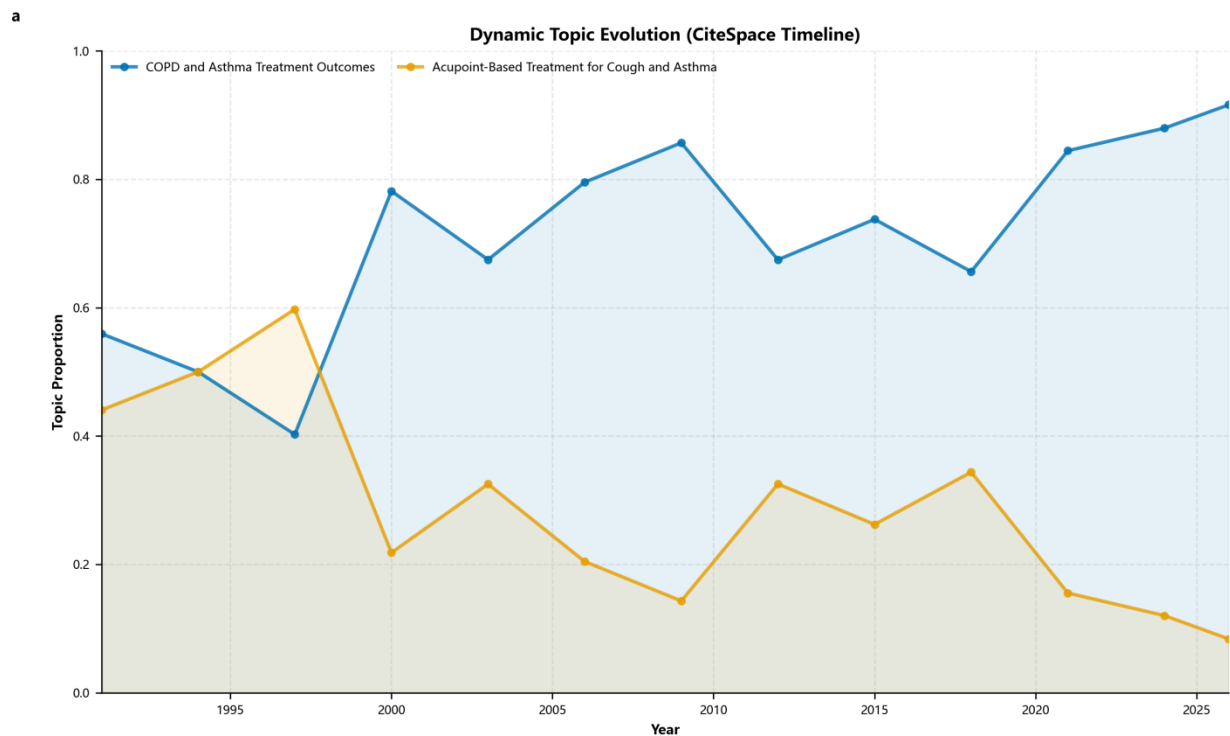


Figure 6. Dynamic evolution of the two major research topics.

4.4.3. Burst detection analysis

Burst detection of keywords in the included literature identified 44 burst keywords; the top 10 by burst strength are shown in Table 3 and Figure 7. “Cupping” had the highest burst strength (100.5063), with a burst period from 2013 to 2020, largely coinciding with the period of rapid growth in publication volume. “Cough” and “asthma” showed comparable burst strength (both 27.0327) and emerged mainly after 2013, suggesting that research in this stage deepened rapidly toward specific diseases. The burst periods of “pneumonia” (2013–2026), “COPD” (2014–2026), and “pulmonary function” (2015–2026) have continued to the present, constituting ongoing research frontiers. “Inflammatory factors” showed a burst signal only

after 2022, representing the newest frontier direction and indicating that research is extending from efficacy observation to mechanism exploration.

Table 3. Top 10 burst keywords of the 341 publications on cupping therapy for cough and related respiratory disorders

No.	Keyword	Burst Strength	Begin	End
1	Cupping	100.5063	2013	2020
2	Asthma	27.0327	2013	2020
3	Cough	27.0327	2013	2018
4	Pneumonia	26.3396	2013	2026
5	COPD	17.3287	2014	2026
6	Acupoint application	13.1698	2007	2018
7	Children	12.4766	2011	2017
8	Pulmonary function	9.7041	2015	2026
9	Acupuncture	7.6246	2013	2018
10	Inflammatory factors	5.5452	2022	2026

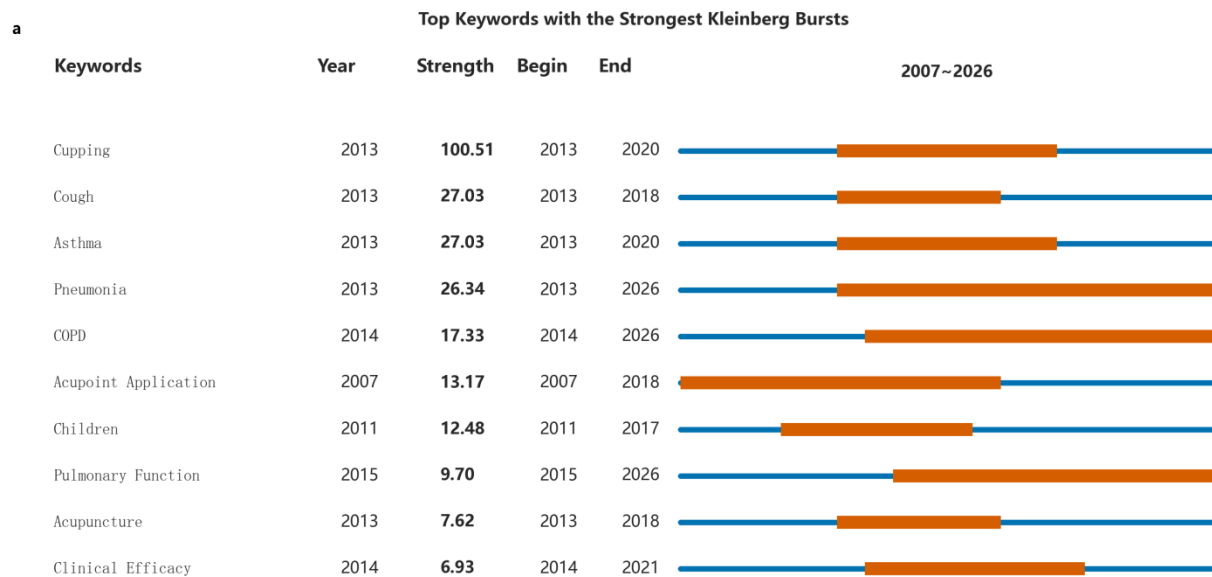


Figure 7. Burst keywords of the 341 publications.

4.4.4. Timeline analysis

The temporal evolution of high-frequency keywords is shown in **Figure 8**. In the early stage (1990–2005), research mainly focused on cupping application for respiratory diseases such as asthma and bronchitis, with a small scale and relatively concentrated topics. Thereafter, cough-related research gradually increased; keywords such as acupoint application, acupuncture, children, and pneumonia entered the research scope, co-occurrence between cupping and combined therapies such as acupuncture and acupoint application increased accordingly, and the research objects expanded from single diseases to populations and disease types such as children and pneumonia. From 2013 to 2018, the field entered a highly active period: the frequencies of keywords including cupping, cough, asthma, pneumonia, children, and bronchitis increased markedly, and

research content further involved topics such as acupuncture, acupoint application, winter-disease-treated-in-summer, Feishu (BL13), Back-shu points, and clinical efficacy. Since 2019, keywords such as COPD, pulmonary function, inflammatory factors, airway remodeling, and the syndrome of phlegm-heat obstructing the lung have become more prominent, and the research focus has gradually shifted from the symptomatic level of cough, expectoration, and wheezing to the management of chronic respiratory diseases, pulmonary function evaluation, pulmonary rehabilitation, and mechanism-related indicators. Reviewing the four stages, the research topics of this field have roughly followed an evolutionary path of “disease expansion – population segmentation – outcome objectification”. Later-period records further covered bloodletting cupping, acupoint application, pediatric tuina, and moving cupping for COPD [25–34].

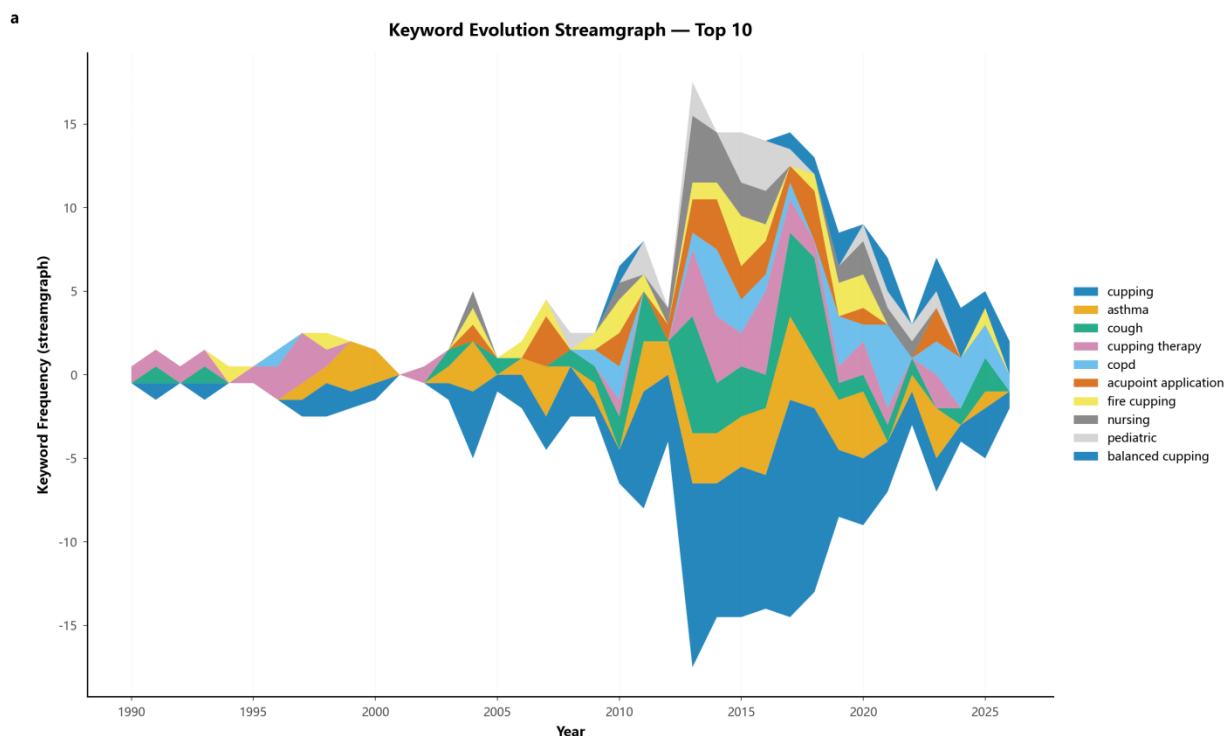


Figure 8. Temporal evolution of high-frequency keywords.

5. Discussion

This study shows that research on cupping therapy for cough and related respiratory disorders became markedly active after 2013, with 2013–2018 as the concentrated publication period. This turning point may be related to changes in policy support and clinical demand. In 2013, TCM health management was incorporated into China’s national basic public health service program, through which appropriate techniques such as cupping and acupoint application entered primary care and child healthcare settings. The Strategic Plan for the Development of Traditional Chinese Medicine (2016–2030) was issued in 2016, and the Law of the People’s Republic of China on Traditional Chinese Medicine came into force in 2017, further establishing the clinical status of TCM external therapies. As these policies took effect one after another, clinical research expanded accordingly: during this period, disease keywords, cupping technique keywords, and clinical efficacy keywords increased synchronously, and research content shifted from early empirical application

to clinical studies targeting specific diseases, populations, and treatment regimens. This temporal pattern is basically consistent with bibliometric findings in other application areas of cupping therapy^[35]. It is worth noting that although the annual publication volume has declined somewhat in recent years, keywords such as COPD, pulmonary function, and inflammatory factors have remained active—fewer articles, but increasingly refined research; the field’s momentum has not genuinely faded. In 2019, the Healthy China Initiative (2019–2030) deployed a special action for the prevention and control of chronic respiratory diseases, making chronic disease management a new policy focus. During the COVID-19 pandemic in 2020, cupping as a non-pharmacological intervention combined with conventional treatment was shown to improve patients’ respiratory symptoms, and the Expert Consensus on TCM Rehabilitation for COVID-19 (First Edition) explicitly incorporated cupping into rehabilitation regimens^[36–38]. With policy orientation and clinical demand reinforcing each other, this context may have contributed to the extension of recent research toward chronic disease management and pulmonary rehabilitation.

The distribution pattern of research actors also deserves attention. The most productive institution was Hebei Provincial Hospital of Traditional Chinese Medicine (23 articles), while no other institution published more than 8 articles; the author collaboration network contained as many as 163 Louvain communities and the institution collaboration network 62 communities, indicating that researchers mostly work in small, relatively independent teams. This contrasts sharply with the cross-regional collaboration networks that have taken shape in international cupping research^[35]. This pattern may reflect the fact that research in this field is mostly conducted by clinical departments of TCM hospitals based on their own cases, dominated by single-center clinical observation, leaving little ground for cross-institutional collaboration to grow. Once collaboration is absent, however, operational norms and efficacy evaluation criteria for cupping become difficult to unify—this is not a problem of any single team, but a structural weakness that the field as a whole needs to address first.

Children constitute the most prominent application population in this field. In the semantic topic analysis, topics targeting children accounted for 38.1% of the included literature, and “children–cupping” was also a major population-related co-occurrence pair; relevant clinical studies have covered specific diseases such as exogenous cough in children, post-infectious cough in children and pediatric pneumonia^[39–43]. This pattern may be explained by the fact that children face particular limitations in tolerance of and adherence to pharmacological treatment, and the safety advantage of cupping as a non-pharmacological external therapy is amplified in this population. Moreover, since 2013, TCM health management services have been extended to primary care, and TCM nursing techniques for children aged 0–6 years have gained a policy channel; pediatric research has remained active ever since, corroborating the time nodes observed in this study. Another clue is COPD: this keyword has shown a sustained burst since 2014, and existing research suggests that balance fire cupping helps promote pulmonary rehabilitation and improve pulmonary function in patients with acute exacerbation of COPD^[44]. With the increasing demand for chronic respiratory disease management, pulmonary rehabilitation for COPD may become a new research direction following pediatric diseases.

Combined therapy is the main form of intervention research in this field. Keywords such as acupoint application, acupuncture, acupuncture and moxibustion, tuina, Chinese herbal medicine, and nursing co-occur frequently with cupping, and cupping is often combined with acupuncture, blood-letting puncture, warm needling, and acupoint application in the treatment of respiratory diseases^[43,45,46]. Combined intervention conforms to the clinical reality of comprehensive TCM treatment, but it also raises a methodological difficulty: when cupping is administered simultaneously with other treatments, it becomes hard to attribute

the observed efficacy to any particular intervention. Existing evidence also indicates that the overall quality of clinical research on cupping therapy remains to be improved, which in this field manifests as insufficient reporting of intervention components, unreasonable control settings, and small sample sizes^[47,48]. Future studies should specify intervention components, set reasonable controls, and standardize the reporting of intervention parameters such as cupping manipulation, negative pressure intensity, cup retention time, treatment frequency, acupoint selection, and treatment course, so as to ensure comparability across studies^[49].

Changes in outcome indicators are equally visible. Early studies mainly observed cough, expectoration, wheezing, and clinical efficacy, whereas recent studies have gradually extended to pulmonary function, quality of life, immune function, inflammatory factors, and airway remodeling; some studies have even observed changes in serum immunoglobulin levels in children after cupping intervention^[9,10]. “Inflammatory factors” showed a burst signal after 2022, representing the newest research frontier. After the pandemic, the modern mechanistic interpretation of TCM efficacy has received increasing attention, and the 14th Five-Year Plan for TCM Development has also listed evidence-based evaluation and mechanism research as priorities; this shift in the field is consistent with the overall direction of the discipline^[50]. However, it should also be recognized that the occurrence of a keyword only represents the expression of a research topic; it cannot be used to judge whether the relevant indicators were measured in a standardized manner, let alone to directly infer the mechanism of cupping. To genuinely answer mechanistic questions, modern biological techniques need to be integrated to investigate the mechanisms of cupping for respiratory diseases at the levels of inflammatory factor expression and neural regulation^[50].

This study has three main limitations. First, at the data level: the analysis was based on CNKI bibliographic fields and lacked complete citation counts, reference lists, and citation network data, so reliable co-citation, bibliographic coupling, and citation main-path analyses could not be performed; meanwhile, the coverage of author and institution fields did not reach the preset quality threshold, and author name disambiguation has not been completed, so the collaboration network indicators and the publication volumes of authors and institutions only reflect literature productivity and should not be used as a basis for judging academic influence. Second, at the level of scope and methods: the included literature covered both the core topic of cough and extended topics of other respiratory disorders, so the results cannot be equated with clinical research on cough as a single disease in the strict sense; literature screening was completed with rule-based assistance without independent screening and adjudication by multiple researchers, and screening consistency remains to be tested; some keywords and abstracts suffer from insufficient standardization or formulaic expression, and the results of clustering, burst detection, and semantic topic analysis still require manual verification against the original texts. Third, 2026 is an incomplete year, and its publication volume and burst periods only represent interim results; the relevant conclusions await validation with complete annual data.

In conclusion, research on cupping therapy for cough and related respiratory disorders has developed into a sustained research field, with the expansion of the disease spectrum, combined therapies, pediatric populations, and the objectification of outcome indicators as research hotspots, while weak collaboration networks and insufficient standardization of research design are the main shortcomings restricting the development of the field. Future research should, on the basis of standardized reporting of intervention regimens, carry out multicenter, large-sample and high-quality clinical studies, and further evaluate the clinical value and possible mechanisms of cupping therapy for respiratory diseases in combination with pulmonary function, inflammatory indicators and long-term follow-up outcomes^[19,20].

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Disclosure statement

The authors declare no conflict of interest.

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