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Evolution and Current Landscape of Traditional Chinese Medicine in Olfactory Disorders: Insights from a 61-Year Bibliometric Study

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ABSTRACT

Olfactory dysfunction (OD) refers to disorders affecting the sense of smell. Prior investigations suggest that traditional Chinese medicine (TCM) may offer therapeutic benefits for OD. This study performed a bibliometric assessment of TCM-related OD research to reveal patterns and emerging areas of focus. Eleven databases were systematically reviewed from inception to September 4, 2024, covering all clinical research involving TCM for OD. Information extracted with Excel 2016 and R Studio included study profiles, underlying diseases, therapeutic modalities, control measures, endpoints, effectiveness, and safety data. Randomized controlled trials (RCTs) were appraised using the Revised Cochrane Risk-of-Bias Tool.

Among 412 publications spanning 1963–2024, the dataset comprised 10 systematic reviews, 255 RCTs, 16 non-randomized trials, 80 case reports, 47 case series, 3 cohort studies, and 1 case–control study. OD stemmed from multiple etiologies, with chronic rhinosinusitis being the predominant cause and hyposmia the most frequent form of impairment. The most widely applied TCM interventions were decoction therapy, acupuncture, and Chinese patent medicines. “Xin Yi (Magnolia Flower)” and the acupoint “Yingxiang (LI 20)” appeared most commonly. The majority of RCTs described beneficial effects of TCM on OD, and no serious TCM-associated adverse reactions were documented. The overall methodological quality of the RCTs was low. Current research hotspots primarily concern OD secondary to upper respiratory tract infections, with emphasis on the internal administration of TCM decoctions and acupuncture treatment.

Keywords: Olfactory dysfunction, Traditional Chinese medicine, Acupuncture, Herbal medicine, Bibliometric analysis, Clinical studies

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Introduction

The olfactory system helps individuals avoid hazards (e.g., toxic gases) and notice favorable stimuli (e.g., appealing foods) [1]. It also influences feeding behavior, detection of microbial threats, and social interaction [2]. Olfactory dysfunction (OD), classified into qualitative disturbances (parosmia, phantosmia) and quantitative ones (hyposmia, anosmia, hyperosmia) [3, 4], arises from many factors, including rhinosinusitis, upper airway infections, trauma, congenital abnormalities, aging, neurological disorders, chemical exposures, medications, as well as tumors or surgical procedures [5–10]. Evidence shows that OD affects not only physical well-being but also psychological health, social participation, energy levels, diet, and intimate life [1, 11]. One systematic review estimated OD prevalence in healthy populations at 22.2 % (mean age 63.5 years; range 18–101), with subjective assessments likely underestimating true prevalence by at least 20 %, as objective testing suggests a rate closer to 29 % [12].

Current management involves olfactory training and certain Western medicines such as prednisone, ginkgo biloba extract, mecobalamin, and mometasone furoate nasal spray [5, 13]. Olfactory training requires daily exposure to selected scents for prolonged periods [14]. A review of 13 studies including 1005 individuals found that this training may assist recovery [15], possibly by promoting regeneration of olfactory neurons [16, 17]. Its

effectiveness varies with age, cause of OD, and treatment duration [18, 19], and remains uncertain in older adults and post-infectious OD [20–22]. Training may continue for over 12 weeks and sometimes extend to 56 weeks [23]. Regarding pharmaceuticals, corticosteroids may elevate olfactory marker protein expression in the olfactory mucosa [24]; zinc sulphate may support regeneration of olfactory pathways; and ginkgo biloba extract with steroids may enhance recovery processes [25, 26]. Mecobalamin is thought to aid peripheral nerve repair [27]. Yet, robust clinical evidence confirming meaningful benefit for these drugs is still lacking [28–30].

Several clinical reports indicate that TCM-based approaches—both herbal and non-herbal—have produced favorable outcomes in OD [31–33]. Herbal modalities include individualized TCM decoctions administered internally or externally, and proprietary Chinese medicines [34, 35]. Decoctions usually vary by case, guided by syndrome differentiation [36]. Frequently mentioned patent medicines include “Xiangju capsule” and “Biyuan Tongqiao granule” [35, 37]. Non-pharmacological methods encompass manual acupuncture, auricular acupuncture, electroacupuncture, intradermal needling, laser acupuncture, and acupoint injection, among others [38–42].

To date, no comprehensive systematic review has summarized the landscape of TCM treatments for OD. The aim of this work was to collate and analyze existing research to clarify therapeutic scopes and offer direction for future clinical investigations.

Materials and Methods

This review was carried out in accordance with the PRISMA 2020 reporting framework [43].

Eligibility criteria

We considered every form of clinical evidence involving TCM for OD, including randomized controlled trials (RCTs), non-randomized controlled trials (non-RCTs) (here defined as controlled studies without genuine random allocation), cohort investigations, case–control designs, case series, single-case reports, and systematic reviews (SRs). Reference lists of all included SRs were also checked manually. Any intervention classified under traditional Chinese medicine—such as herbal preparations, plant extracts, acupuncture, acupoint injection, moxibustion, therapeutic massage, taichi, wuqinxi, baduanjin, needle-knife procedures, and cupping—was eligible. No limitations were placed on demographic factors (age, gender, ethnicity, location), comparator types, precipitating diseases leading to OD, or publication category. Studies published in languages other than Chinese or English were not included.

Data sources and searches

We performed a full search of five major Chinese sources (CNKI, VIP, SinoMed, Wanfang, Yiigle) and six English-language databases (PubMed, Cochrane Library, EMBASE, CINAHL, PsycINFO, ProQuest), covering all content from their launch dates to September 4, 2024.

Study selection and data extraction

Seven reviewers (XY Zou, BX He, YL Liao, T Liu, YD Dai, SH Qi, ZJ Sheng) independently screened titles, abstracts, and full documents using NoteExpress (V3.7.0.9258). Eligibility conflicts were discussed with a third contributor (XH Liu) until agreement was reached.

The data extraction form—developed by XH Liu and XY Zou—captured:

1. Study descriptors: article title, publication type, language, country, journal name, first author, year, funding status, and methodological design.
2. Participant information: inclusion and exclusion rules, case recruitment source, sample size, gender distribution, age details, OD subtype and etiology, main disease, and disease classification based on ICD-11 [44].
3. Therapeutic details: intervention characteristics (Western medicine, TCM treatments, olfactory training, practitioner credentials), along with comparator methods for controlled studies.
4. Outcome measures: all reported endpoints—OD-specific results, measurement time points, outcome categories (e.g., disappearance or improvement of OD, symptom scales, global symptom ratings, quality-of-life tools, patient descriptions, author judgments), and safety outcomes.
5. Supplementary data: follow-up duration, follow-up findings, number returning for follow-up, attrition counts with reasons, and reported adverse events.

Seven trained reviewers used Excel (2016) for extraction. All extracted items were verified by XY Zou, and unresolved differences were adjudicated by XH Liu.

Assessment of risk of bias

Nine researchers (XY Zou, ZJ Sheng, BX He, SH Qi, YL Liao, T Liu, YQ Cai, BR Zhang, JL Wang) assessed the RCTs in pairs, each pair independently rating bias according to healthcare evaluation standards [45]. Any inconsistencies were resolved via a third reviewer (XH Liu).

Risk of bias was evaluated with the Revised Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2), which involves five judgment domains and assigns classifications of "low risk," "high risk," or "some concerns." Risk-of-bias figures were generated with the "ROB2_IRPG_beta_v9.xlms" file [46].

Data analysis

We used Excel (2016) to summarize descriptive features (study region, languages used, methodology types, funding, publication year), sample data, sex ratios, attrition, OD categories, related diseases, types of treatment, comparison groups, outcome variables, effectiveness, and reports of adverse reactions. R Studio and the bibliometrix package were employed to map co-occurrence networks, analyze temporal word patterns, and explore emerging thematic areas in TCM research [47].

Additional mining of TCM prescription content—including internal/external herbal medicine and Chinese patent drugs—and acupuncture point usage was performed. Standardization of herb and acupoint names followed the reference works Chinese Herbal Medicine [48] and Acupuncture [49]. Frequency statistics were generated in R Studio, and associations between herbs and acupoints were examined using the arules package. Rules with support ≥0.07 and confidence ≥0.6 were considered acceptable, and second-, third-, and fourth-order rules were extracted. Visual and tabular formats were used for presentation. To prevent duplication, SRs presenting these same outcomes were excluded.

Results and Discussion

Search results

A total of 5209 records were identified. After removing 4797 ineligible reports based on the inclusion criteria, 412 studies remained for analysis **(Figure 1)**.

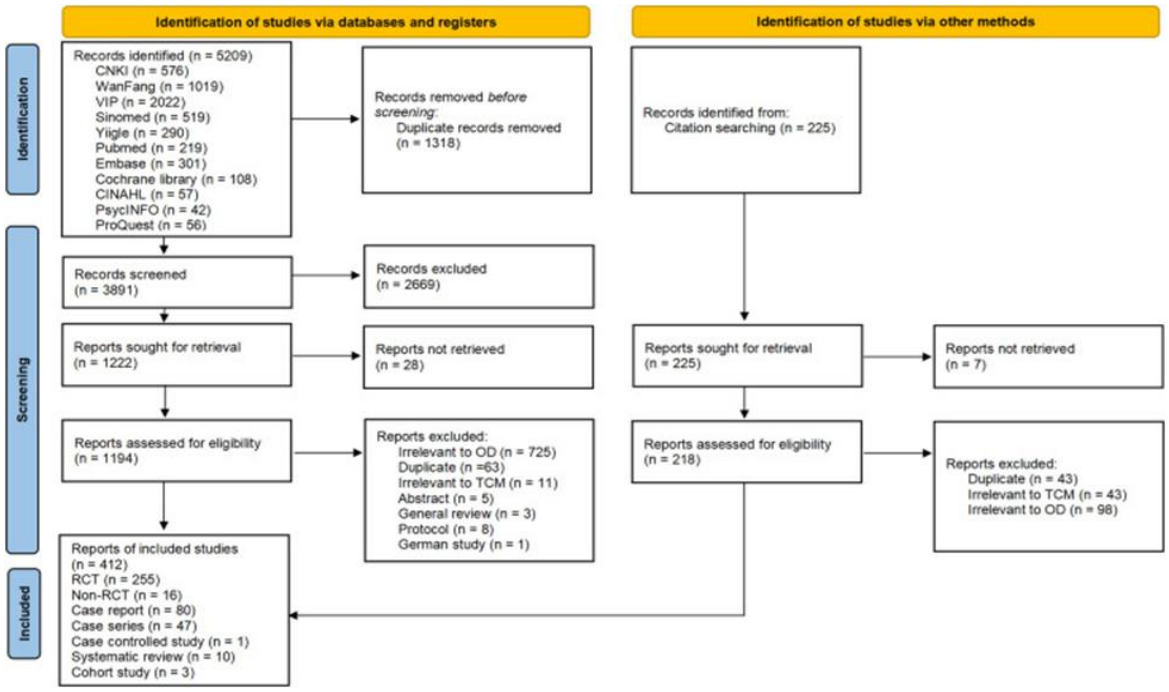


Figure 1. Flow diagram illustrating how studies were screened and selected.

General characteristics of included studies

Among the 412 eligible publications, 394 (394/412, 95.63%) appeared in Chinese-language journals, while 18 (18/412, 4.37%) were written in English. The vast majority originated from China (400/412, 97.09%). A small number were conducted in the United States (4/412, 0.97%), Japan (2/412, 0.49%), Germany (2/412, 0.49%), the United Kingdom (2/412, 0.49%), India (1/412, 0.24%), and Iran (1/412, 0.24%) **(Table 1)**.

Regarding study design, the collection consisted of 255 RCTs (255/412, 61.89%), 16 non-RCTs (16/412, 3.88%), 80 case reports (80/412, 19.42%), 47 case series (47/412, 11.41%), 10 systematic reviews (10/412, 2.43%), three cohort studies (3/412, 0.73%), and one case–control study (1/412, 0.24%) **(Table 1)**. Publication numbers climbed steadily over time, particularly beginning in 2001 **(Figure 2)**.

The Chinese Journal of Otorhinolaryngology in Integrative Medicine ("zhong guo zhong xi yi jie he er bi yan hou ke za zhi") was the most frequent outlet, contributing 15 articles (15/412, 3.64%). Only 81 studies (81/412, 19.66%) acknowledged funding support.

The earliest clinical report on TCM for OD—a case study using acupuncture—was published in 1963 [50]. The first RCT appeared in 1998, evaluating nasal fumigation with an herbal decoction for OD following endoscopic nasal surgery [51].

Table 1. Characteristics of included studies (n = 412).

ICD Code	Disease Category	Count (%)
12	Respiratory system diseases	296 (73.63%)
21	Symptoms, signs, and clinical findings not elsewhere classified	82 (20.40%)
26	Traditional Medicine Conditions – Module I (Supplementary Chapter)	71 (17.66%)
08	Nervous system diseases	7 (1.74%)
02	Neoplasms (tumours)	6 (1.49%)
06	Mental, behavioural, and neurodevelopmental disorders	4 (1.00%)
25	Codes for special purposes	4 (1.00%)
11	Circulatory system diseases	3 (0.75%)
22	Injury, poisoning, and certain other consequences of external causes	3 (0.75%)
09	Diseases of the visual system	1 (0.25%)
21	Symptoms, signs, and clinical findings not elsewhere classified	1 (0.25%)

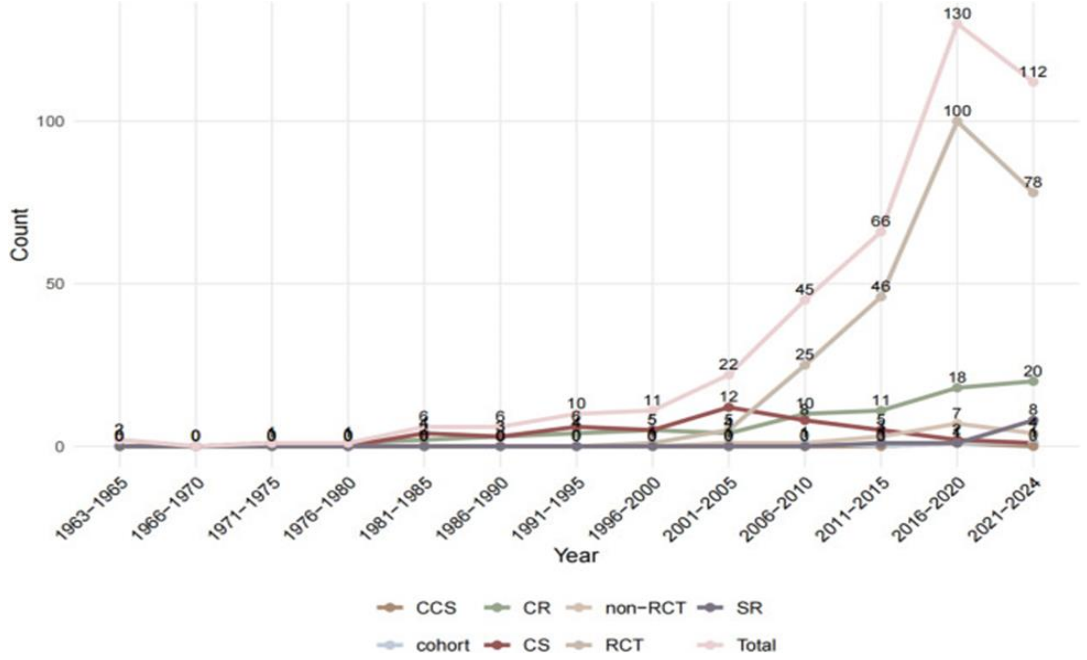


Figure 2. Publication years across all study designs related to TCM use for OD.
RCT = randomized controlled trial; non-RCT = non-randomized controlled trial; CR = case report; CS = case series; cohort = cohort study; CCS = clinical controlled study; SR = systematic review; TCM = traditional Chinese medicine; OD = olfactory dysfunction.

Quality assessment of included RCTs

A substantial portion of the RCTs (168/255, 65.88%) were rated as having a high risk of bias. Most reports failed to provide information on allocation concealment or blinding procedures. Nevertheless, the majority (231/255, 90.59%) demonstrated **low** risk regarding incomplete outcome data **(Figure 3)**.

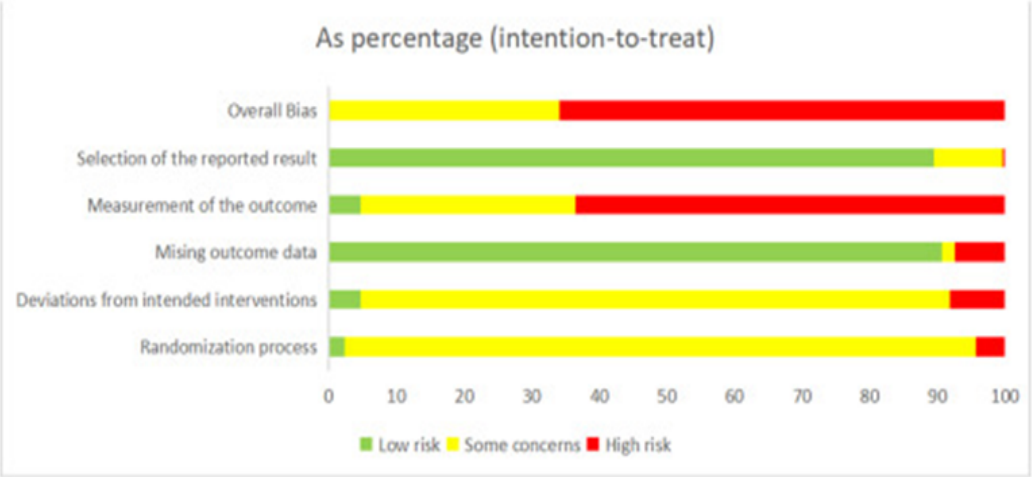


Figure 3. Risk-of-bias evaluation for included RCTs (n = 255).

Characteristics of participants

Across 402 clinical studies, a total of 28,413 individuals were enrolled, with 239 dropouts (239/28,413, 0.84%). Sample sizes ranged from 1 to 348, and participant ages spanned 2 to 86 years. Gender data were not supplied in 21 studies (21/402, 5.22%). In the studies that did report sex distribution, there were 15,098 males (15,098/28,413, 53.14%) and 13,315 females (13,315/28,413, 46.86%), giving a male-to-female ratio of approximately 1.13 (15,098/13,315). No follow-up information was available for 293 studies (293/402, 72.89%). For those reporting follow-up, durations ranged from 1 week to 2 years.

Primary conditions aligned with ten major ICD-11 categories, with Diseases of the respiratory system being the most common **(Table 2)**. Frequency counts for the underlying disorders are summarized in **Table 3**. The ten most frequently observed conditions were: chronic rhinosinusitis, chronic rhinitis, post-surgical states, nasal sinusitis disorder, nasal polyps, acute sinusitis, allergic rhinitis, acute nasopharyngitis, allergic rhinitis disorder, and tumors. ("Unknown" categories were excluded.)

Table 2. classification of main diseases in included studies. ICD-11 = International Classification of Diseases, 11th Revision.

Category	Study Type	RCT	Non-RCT	Case Report (CR)	Case Series (CS)	Cohort	Case-Control Study (CCS)	Systematic Review (SR)	Total (%)
Language									
	Chinese	251	15	72	47	2	1	6	394 (95.63%)
	English	4	1	8	0	1	0	4	18 (4.37%)
Country/ Region									
	China	253	16	73	47	2	1	8	372 (97.09%)
	United States	0	0	2	0	0	0	2	4 (0.97%)
	Japan	0	0	2	0	0	0	0	2 (0.49%)
	Germany	1	0	0	0	1	0	0	2 (0.49%)
	United Kingdom	0	0	2	0	0	0	0	2 (0.49%)
	India	0	0	1	0	0	0	0	1 (0.24%)
	Iran	1	0	0	0	0	0	0	1 (0.24%)
Overall Total		255	16	80	47	3	1	10	412 (100%)

RCT = randomized controlled trial; non-RCT = non-randomized controlled trial; CR = case report; CS = case series; cohort = cohort study; CCS = clinical controlled study; SR = systematic review.

Table 3. Primary diseases or conditions with ICD-11 codes for included studies.

ICD Code	Disease/Condition	Count (%)
CA0A	Chronic rhinosinusitis	197 (49.00%)
CA09.0	Chronic rhinitis	115 (28.61%)
–	Post-surgical cases	83 (20.65%)
–	Unknown etiology*	77 (19.15%)
SC91 (TM1)	Nasal sinusitis disorder (Traditional Medicine)	62 (15.42%)
CA0J.Y	Nasal polyps	35 (8.71%)
CA08.0	Allergic rhinitis	32 (7.96%)
CA01	Acute sinusitis	30 (7.46%)
CA00	Acute nasopharyngitis (common cold)	12 (2.98%)
SC90 (TM1)	Allergic rhinitis disorder (Traditional Medicine)	9 (2.23%)
RA02	COVID-19	8 (1.99%)
02	Neoplasms (tumours)	6 (1.49%)
8A00	Parkinsonism	5 (1.24%)
–	Post-radiotherapy cases	5 (1.24%)
12	Upper respiratory tract infection	4 (1.00%)
6D81	Vascular dementia	2 (0.49%)
6D71	Mild neurocognitive disorder	2 (0.49%)
BA5Z	Chronic ischaemic heart disease	2 (0.49%)
–	Other conditions**	11 (2.73%)

a Primary disease not specified.

b Includes single-occurrence conditions: deviated nasal septum, allergic asthma, epilepsy linked to cerebrovascular disorders, cerebral ischemic stroke from small artery occlusion, olfactory nerve injury, cervical spine strain/sprain, chest impediment disorders, intracranial injury, olfactory nerve disorders, parasympathoparetic pupils, and intracranial space-occupying lesion.

Based on OD classification, participants were separated into six categories. The most prevalent were hyposmia, anosmia, and phantosmia (excluding "Unknown") **(Figure 4)**.

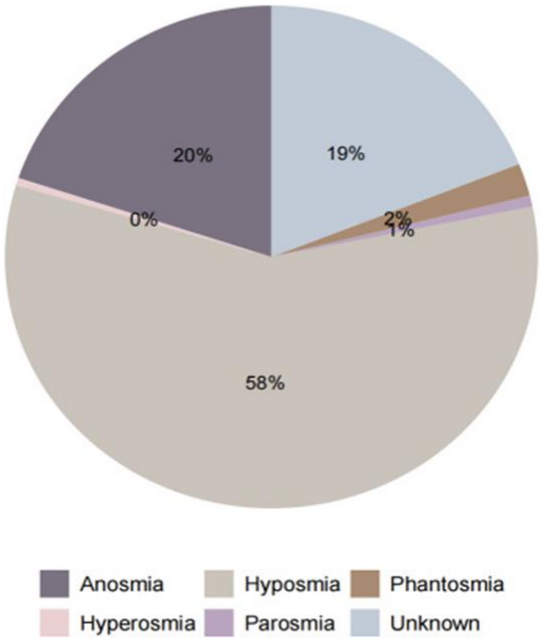


Figure 4. Categories of OD represented in the included studies.

Characteristics of interventions

Across the 402 clinical reports, 378 studies (378/402, 94.03 %) did not specify the qualifications of their practitioners. Only 24 studies (24/402, 5.97 %) provided such information. Among these, 20 papers (20/402, 4.98

%) stated that treatment was delivered by senior or highly experienced clinicians. One study involved a postgraduate trainee, and another relied on patients or relatives who administered nasal irrigation after receiving instruction from trained practitioners.

A wide array of TCM approaches was documented. For simplicity, therapies of a similar nature were grouped together. Thus, all orally administered herbal decoctions (e.g., Qingfei-Tongqiao-Yin, Qinghua-Bihui-Tang) were categorized as internal-use TCM decoctions. Preparations such as nasal washing, fumigation, or other outward applications using herbal liquid were categorized as external-use TCM decoctions. The same principle was applied to Chinese patent medicines (e.g., Biyuan-Tongqiao granule, Xiangju capsule) when these replaced herbal mixtures.

The three most frequently used interventions were internal TCM decoctions (170/402, 42.29 %), acupuncture (103/402, 25.62 %), and internally administered Chinese patent medicines (79/402, 19.65 %). **Figure 5** displays the expanding use of different modalities, with internal decoctions showing the most rapid growth. **Figure 6** illustrates usage duration, where acupoint injection shows the longest continuous span.

Among the 402 studies, 249 (249/402, 61.94 %) involved oral decoctions, powders, granules, or patent medicines, which were further classified by treatment rationale. In 11 studies (11/249, 4.42 %), therapy followed syndrome differentiation without specifying a guiding principle, and two studies (2/249, 0.80 %) omitted both formula details and treatment rationale. The most common therapeutic aim was unblocking the nasal passages (190/249, 75.39 %), followed by dispelling wind/diffusing lung/exterior-resolving actions (138/249, 55.42 %), and heat-clearing methods (135/249, 54.22 %). The combination most frequently adopted was dispelling wind + unblocking nasal orifices (123/249, 49.40 %), followed by dispelling wind + heat-clearing (89/249, 35.74 %), and heat-clearing + nasal unblocking (88/249, 35.34 %).

The co-occurrence network in **Figure 7** illustrates modality interactions. Node size reflects usage frequency, and line thickness indicates how often two methods were applied together. The most typical pairings were internal TCM decoction with acupuncture and internal TCM decoction with internal Chinese patent medicines.

Analysis of herbal usage identified Xinyi (Magnolia Flower) as the most frequently selected herb **(Figure 8a)**. Association-rule mining yielded 8774 rules, comprising 112 second-order rules, 726 third-order rules, and 1710 fourth-order rules **(Figure 8b)**. The figure presents the top 50 herb combinations by confidence; their support levels were relatively similar, with no uniquely dominant pattern. However, the rule linking {Fu Ling, Mu Tong} → {Jie Geng} displayed an elevated lift. In the second-order rules, "{Gao Ben} ⇒ {Cang Er Zi}" reached a confidence of 1, indicating that Gao Ben always appeared when Cang Er Zi was included. For the third-order rules, 63 combinations had confidence = 1, and 399 fourth-order rules exhibited the same.

Acupoint-frequency analysis showed Yingxiang (LI 20) as the most commonly selected point **(Figure 8c)**. Association-rule evaluation generated 75 acupoint rules, consisting of 18 second-order, 37 third-order, and 19 fourth-order rules **(Figure 8d)**. The top 50 pairs and triplets with the highest confidence are shown in **Figure 8d**. A particularly strong association—with notable lift and support—was observed for the set {Shangyingxiang, Shangxing} + {Hegu}, indicating its frequent and influential use in practice. Within second-order rules, "{Yintang} ⇒ {Yingxiang}" reached a confidence of 1. Additionally, six third-order and seven fourth-order rules also reached complete confidence.

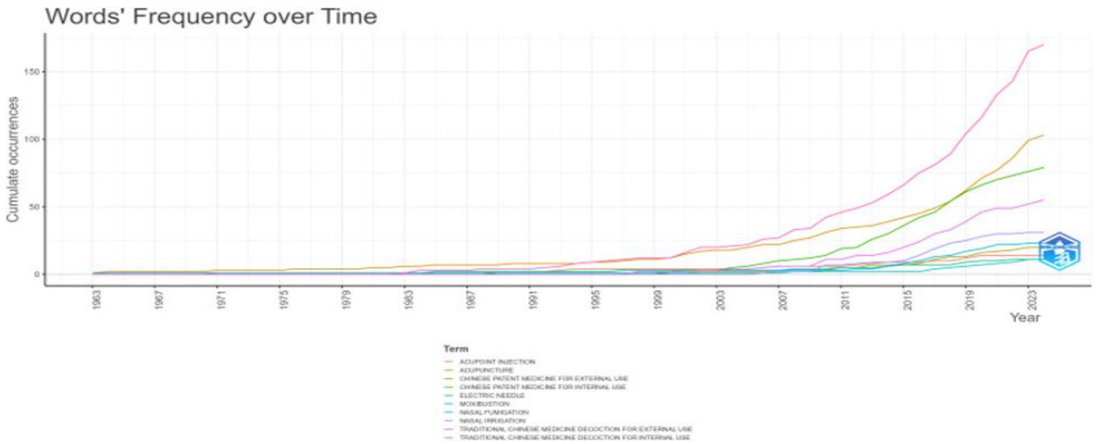


Figure 5. Trends in how often various TCM interventions were used over the years.

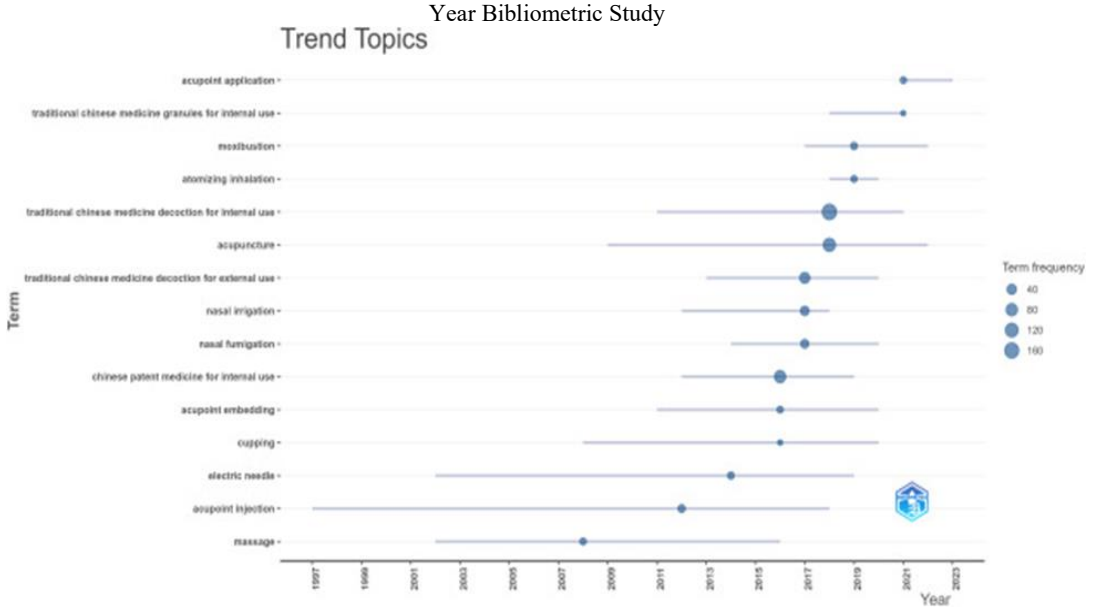


Figure 6. Shifts in research focus related to TCM treatment modalities.

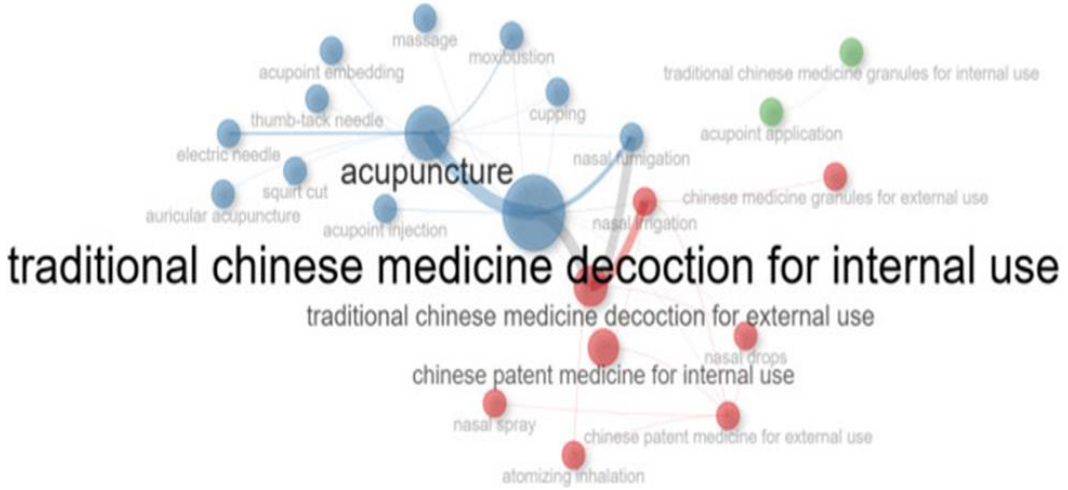
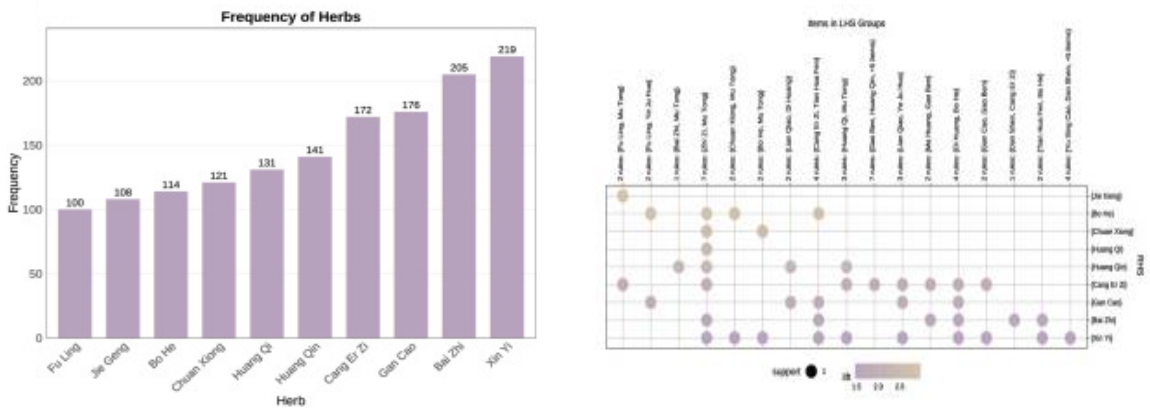
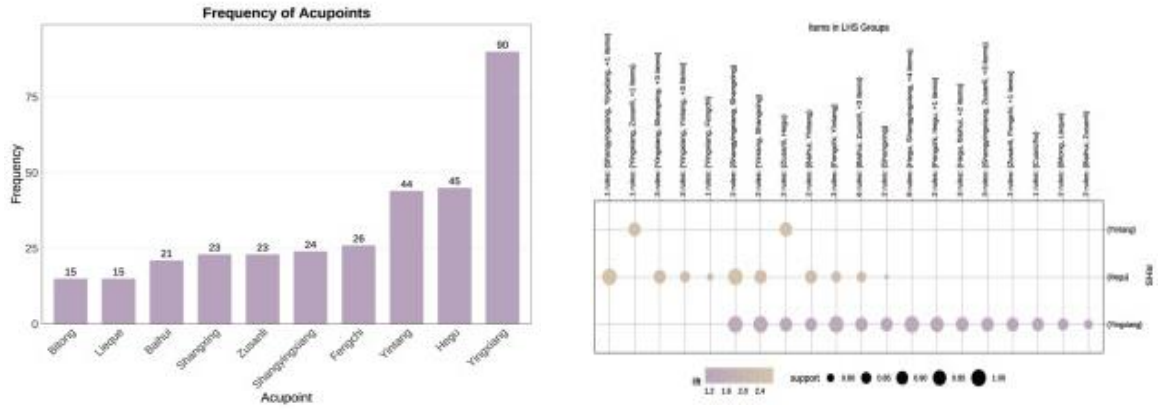


Figure 7. Network map of co-occurring TCM therapies. Each node corresponds to one modality, with node size reflecting its usage frequency, and line thickness showing how often two approaches were applied together.



a) b)



c) d)

Figure 8. Summary of herb and acupoint analyses from the included publications.
(a) Bar chart showing how frequently each herb appeared.
(b) Matrix illustrating the top 50 herb association rules ordered by confidence. Dot size indicates support (larger dots = higher support and more frequent appearance), while dot color represents lift (values above 1 indicate stronger-than-expected co-occurrence; increasingly yellow hues signify higher lift). LHS: left-hand side; RHS: right-hand side.
(c) Bar chart of acupoint usage frequency.
(d) Matrix of the 50 highest-confidence association rules for acupoints.

Characteristics of comparisons

Among the 402 studies, 275 (275/402, 68.41 %) included comparator groups, while 127 (127/402, 31.59 %) were case reports or case series. The five most frequent comparison formats were:

- TCM + Western medicine (WM) vs WM: 148/402, 36.82 %
- TCM vs WM: 42/402, 10.45 %
- TCM vs TCM: 20/402, 4.98 %
- TCM + TCM vs TCM: 11/402, 2.74 %
- TCM vs placebo: 7/402, 1.74 %

Over the years, the comparison of TCM + WM versus WM became increasingly common **(Figure 9)**.

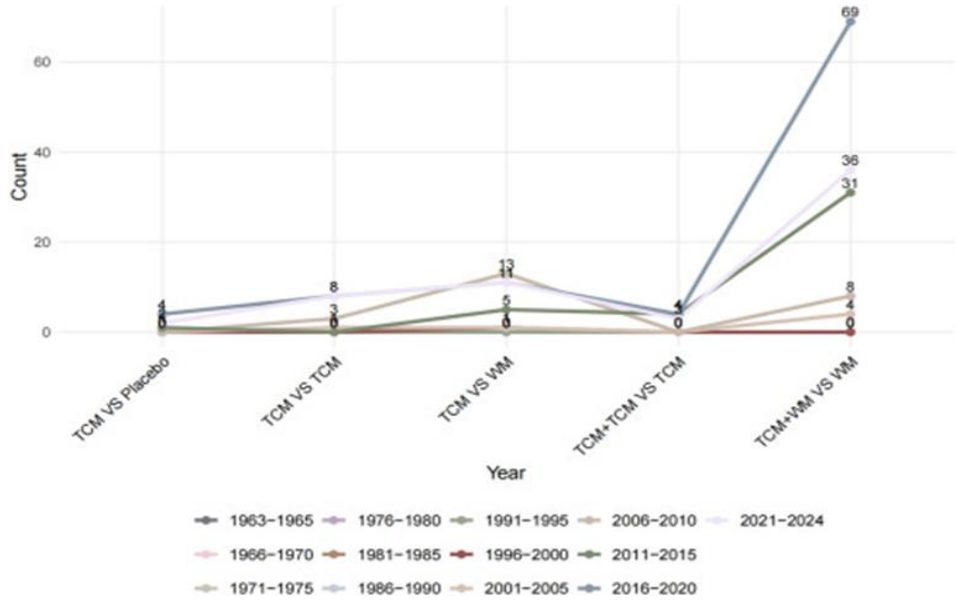


Figure 9. Top five comparison categories across time. TCM: traditional Chinese medicine; WM: western medicine; VS: versus.
* Controlled studies were absent prior to 1996, so those years were excluded.

Outcomes and main findings

Four primary outcome types for OD were reported: symptom relief rate was the most frequent, followed by symptom resolution rate, symptom scoring, and finally symptom resolution/relief time. 51 studies did not directly assess OD outcomes but relied on general efficacy criteria **(Table 4)**.

A total of 137 studies (137/402, 34.08 %) did not describe their olfactory assessment method. Most studies that reported testing relied on self-created tools, VAS, or numeric ratings (206/402, 51.24 %). Only five studies (5/402, 1.24 %) used standardized scales (Questionnaire of Olfactory Disorders-Parosmia statements; Questionnaire of Olfactory Disorders-VAS; EORTC QoL Questionnaire; Rhinoconjunctivitis QoL Questionnaire; Total Non-Nasal Symptoms Score).

34 studies (34/402, 8.46 %) used subjective odor detection, while 28 studies (28/402, 6.97 %) adopted standard subjective smell tests such as Sniffin' Sticks, the Indian Smell Identification Test, T&T olfactometer, CCCRC test, or intravenous olfaction. Only three studies (3/402, 0.75 %) employed objective assessments, two via paranasal sinus CT/MRI and one using olfactory event-related potentials.

Regarding effectiveness, 318 studies (318/402, 79.10 %) reported beneficial outcomes for OD, whereas 84 (84/402, 20.90 %) did not reach definitive conclusions. For studies comparing TCM + WM vs WM, 118/148 (79.73 %) found improvement, while 30/148 (20.27 %) showed uncertain results.

Safety reporting was limited: 288 studies (288/402, 71.64 %) omitted adverse event data, and 60 (60/402, 14.93 %) stated that no adverse events occurred.

Table 4. Outcome categories related to olfactory dysfunction were used across the studies. OD: olfactory dysfunction.

Outcome Measured	Count (%)
Complete resolution of symptoms	151 (37.56%)
Symptom improvement rate	157 (39.05%)
Symptom severity score	193 (48.01%)
Time to symptom disappearance or remission	15 (3.73%)
No outcomes directly related to olfactory dysfunction	51 (12.69%)

Summary of findings

This review provides an extensive overview of the existing landscape of TCM-related research for OD, incorporating systematic reviews and a full range of clinical evidence. In recent years, publications—particularly RCTs—investigating TCM therapies for OD have steadily increased. Given the predominantly positive outcomes reported, it is likely that the number of studies will continue to expand. China remains the primary contributor to the literature in this domain. From an etiological perspective, respiratory tract disorders, including chronic rhinosinusitis and chronic rhinitis, represent the major sources of OD, with hyposmia being the most common clinical presentation. Statistical analysis of treatment methods shows that internal-use TCM decoctions and acupuncture are the most frequent therapeutic options, and "Xin Yi (Magnolia Flower)" along with "Yingxiang (LI 20)" appear most often among herbs and acupoints. Most clinical reports describe the beneficial effects of TCM and note only rare adverse reactions, offering promising directions for clinical practice.

Potential mechanisms

The pathways through which TCM improves olfactory impairment are still not well characterized. One investigation suggested that acupuncture may enhance olfactory ability by stimulating neural stem cell proliferation [52]. Another study examining post-viral OD found that Ganlu Disinfectant decoction may influence intracellular calcium signaling and modulate key molecular targets—JUN, AKT1, RELA, TP53, MAPK1, ESR1, FOS, IL6, CAV1, TNF—ultimately reducing inflammatory activity and contributing to OD recovery [53]. From a TCM standpoint, therapeutic strategies rely on the principle of bidirectional regulation aimed at reestablishing Yin–Yang balance, a framework that may be advantageous for patients with either diminished or excessive sensory functioning [54]. More research is needed to clarify both the underlying disease mechanisms and how herbal approaches and acupuncture exert their effects.

Inspiration for clinical application

Our findings indicate that most published studies report favorable outcomes of TCM interventions for OD, though the generally low methodological quality warrants careful interpretation. Among the various causes of OD, sinusitis appears most frequently. Consequently, clinicians managing sinusitis should pay particular attention to patients' olfactory function and consider preventive strategies when possible. The herbs "Xin Yi (Magnolia Flower)" and "Bai Zhi (Angelica Dahurica)" are highly prevalent in related treatments, and "Yingxiang (LI 20)" is among the most commonly used acupoints. These may serve as useful references during clinical decision-making for OD management.

Strengths and limitations

To date, bibliometric statistical analyses of TCM interventions for OD have not been available. This study used eleven major Chinese and English databases and relied on manual extraction to obtain more complete information. Compared with automated tools such as VOSviewer or CiteSpace, our dataset is broader and more granular. We also incorporated multidimensional analysis through R Studio and the "bibliometrix" package. However, only studies in Chinese and English were included, and database indexing delays may have excluded newly published or non-English/Chinese articles. Furthermore, the predominance of Chinese-language publications may hinder access for English-speaking readers. Many included studies had methodological weaknesses—particularly inadequate blinding, poor allocation concealment, and suboptimal randomization—which means their conclusions should be viewed cautiously.

Implications for research

Non-RCTs, case reports, and case series usually involve small samples and methodological constraints, limiting confidence in their findings. Future investigations should strive for larger cohorts and more rigorous design frameworks to confirm the therapeutic value of TCM for OD. Our review noted that most RCTs lacked sample size justification, robust randomization, blinding, and proper allocation concealment. Reporting of practitioner credentials was also inconsistent, and some comparison groups were poorly chosen, such as comparing two interventions with no proven efficacy. Outcome measurements were not standardized, and adverse events—particularly minor ones—were seldom documented, preventing a full appraisal of TCM safety.

We recommend employing validated subjective or objective smell assessments, applying strict diagnostic criteria, and clearly identifying etiology before participant inclusion. For acupuncture-focused studies, pragmatic RCT designs may be more appropriate, as they are easier to implement and still meaningful [55, 56], especially since placebo acupuncture can produce its own effects [57]. For herbal decoction trials, carefully chosen placebos are essential to maintain blinding. Reporting practitioner qualifications should also be standard. Future research should include more high-quality trials and thorough documentation of all adverse events to properly evaluate both safety and efficacy. Furthermore, the exact mechanisms underlying OD still need to be clarified.

Conclusion

Interest in TCM-based therapies for OD has grown rapidly in recent years, reflected in a sharp rise in related publications. Current hotspots mainly involve OD linked to upper respiratory infections, and the primary interventions remain internal-use TCM decoctions and acupuncture. This work provides a comprehensive overview of existing research trends and offers recommendations to support improved study design for future investigations into TCM treatments for OD.

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Conflict of Interest: None

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