Systematic Reviews

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An evidence mapping study based on systematic reviews of traditional Chinese medicine (TCM) for diabetic retinopathy

Juan Ling[1,2†], ZhuoLin Xie[3†], XiangXia Luo[3*], Mei Hu[1], Demián Glujovsky[4], JiaYuan Zhuang[1], Yan Wang[2], Jun Zhou[5] and Deng HongYong[6]

Abstract

Background Diabetic retinopathy (DR) is a leading cause of vision impairment and blindness among individuals with diabetes. Traditional Chinese medicine (TCM) has been explored as an alternative treatment for DR, but the quality of evidence remains uncertain. A comprehensive evidence mapping study is necessary to synthesize existing SRs, identify gaps in the literature, and highlight areas requiring further research.

Objective This study aims to evaluate the reporting and methodological quality of SRs on TCM for DR and to assess the effectiveness of TCM interventions using an evidence-mapping approach.

Methods A comprehensive search of major biomedical databases to identify relevant SRs published up to November 2023. The reporting quality of the included SRs was assessed using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, while the methodological quality was evaluated using the Assessment of Multiple Systematic Reviews 2 (AMSTAR 2) tool.

Results A total of 51 SRs involving 131,084 participants were included in the analysis. Evidence mapping indicated that TCM is relatively effective in treating DR. However, the methodological quality and reporting standards of these SRs were generally suboptimal. According to the AMSTAR 2 assessment, only one SR (2%) was rated as high quality, 29 SRs (56.9%) were of moderate quality, 20 SRs (39.2%) were of low quality, and one SR (2%) was of critically low quality. While all studies adequately reported the PICO components, risk of bias assessment, and statistical methods, none provided information on funding sources. Furthermore, only one study (2%) included a list of excluded studies with reasons, and eight SRs (15.7%) documented pre-specified protocols. Common reporting deficiencies included incomplete protocol and registration details, unclear review rationales, and insufficient presentation of relevant outcome data.

Conclusion This evidence mapping study highlights the potential benefits of TCM for treating DR while identifying significant gaps in the existing literature. Although TCM interventions show potential benefits for treating DR, the overall quality of SRs is suboptimal. Future research should focus on addressing these gaps, particularly in areas such as funding disclosure and methodological rigor, to enhance the reliability of evidence on TCM interventions for DR.

†Juan Ling and ZhuoLin Xie are contributed equally to this work and co-first authors.

*Correspondence:
XiangXia Luo
279089608@qq.com
Full list of author information is available at the end of the article

Keywords Traditional Chinese medicine, Diabetic retinopathy, Evidence mapping, Systematic review, AMSTAR 2, PRISMA

Introduction

Diabetes mellitus (DM) is a group of metabolic diseases characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The main types of diabetes are type 1 diabetes (resulting from autoimmune destruction of pancreatic beta cells), type 2 diabetes (due to progressive loss of insulin secretion on the background of insulin resistance), gestational diabetes (diabetes diagnosed during pregnancy), and other specific types. Chronic hyperglycemia is associated with long-term damage and dysfunction of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels. The medical expenses related to diabetes have skyrocketed to $850 billion, imposing an enormous economic burden on society [1].

Diabetic retinopathy (DR) is one of the most common microvascular complications of diabetes and a leading cause of vision impairment and blindness worldwide. Furthermore, China has the highest prevalence of diabetes globally, and diabetic retinopathy (DR) has emerged as a severe complication of the illness, presenting a significant public health problem [2]. Management of diabetes primarily involves lifestyle modifications and pharmacotherapy, including insulin and oral hypoglycemic agents. However, even with optimal glycemic control, patients may develop complications like DR. This has led to increased interest in complementary and alternative therapies to manage diabetes and its complications. Traditional Chinese medicine (TCM), which includes herbal medicine, acupuncture, and other modalities, has been used in China for centuries and is gaining attention globally for its potential benefits in managing diabetes and DR. In recent years, there has been a significant increase in the publication of systematic reviews (SRs) and meta-analyses evaluating the efficacy of TCM for the treatment of DR. These SRs are crucial for synthesizing evidence on the effectiveness and safety of TCM interventions, providing high-confidence, evidence-based recommendations for clinical practice [3]. High-quality SRs can minimize bias and offer a more accurate assessment of an intervention efficacy. However, the reporting and methodological quality of these SRs have not been comprehensively evaluated. Ensuring rigorous reporting is essential to guarantee that all pertinent information on study design, interventions, outcomes, and potential biases is accurately reported. By systematically appraising the methodological quality of a review process, we can gain valuable insights into their rigor and robustness, encompassing critical aspects such as study selection, data extraction, and statistical analysis.

Evidence mapping (EM) is a research method that rapidly compiles and evaluates existing evidence on a specific topic, providing a visual overview and identifying knowledge gaps requiring further investigation [4]. This approach enables decision-makers to make informed choices about patient care and helps prevent the unnecessary expenditure of academic resources [5]. Therefore, this study was aimed to evaluate the reporting and methodological quality of SRs investigating TCM interventions for DR and to analyze the effectiveness, methodological quality, and classification of TCM treatment methods for DR using an EM approach.

Methods

Literature search

A comprehensive literature search was conducted to identify relevant SRs and meta-analyses on the treatment of diabetic retinopathy (DR) using TCM. The search encompassed PubMed, Embase, the Cochrane Library, Web of Science, Chinese Biomedical Literature Database(CBM), WanFang Data, China National Knowledge Infrastructure(CNKI), and CQVIP from their inception to November 2023. Both Medical Subject Headings (MeSH) and free-text terms were used, including "Traditional Chinese Medicine," "diabetic retinopathy," "Meta-Analysis," and "Systematic Review." The detailed search strategy, adapted with Chinese terms for the Chinese electronic databases, is provided in "Supplementary File Table 1."

Inclusion and exclusion criteria

The inclusion criteria were as follows: (1) patients diagnosed with DR, with no restrictions on gender, age, or nationality; (2) interventions involving TCM alone or a combination of traditional Chinese and conventional Western medicine; (3) comparators including conventional Western medicine, placebo, or blank control; and (4) studies that were SRs and meta-analyses of randomized controlled trials. Exclusion criteria encompassed duplicates, protocols, reviews, comments, conference abstracts, and animal studies.

Study selection and data extraction

Two reviewers (J Ling and ZL X) independently conducted the screening and data extraction. Discrepancies

were resolved by consulting a third reviewer. Duplicate records were efficiently removed using EndNote X20 software (Thomson Corporation, Stamford, CT). Titles and abstracts of the identified studies were screened meticulously, followed by thorough full-text reviews to ensure the inclusion of relevant and high-quality studies. Extracted data included the first author's name, publication date, methodological quality assessment tool used, intervention methods, control measures, outcome measures, number of included studies, total number of patients, year of publication, treatment methods of TCM for DR, and the number of original studies included in each SR.

Quality assessment

Two reviewers independently assessed the methodological quality of the included SRs using the AMSTAR 2 (Assessment of Multiple Systematic Reviews 2) tool [6]. AMSTAR 2 comprises 16 items, each assessed as "Yes" (criterion explicitly met), "Partial Yes" (item relevant but not fully described), "No" (criterion not met), or "No meta-analysis conducted." Assessments were carried out online via the AMSTAR checklist (https://amstar.ca/Amstar_Checklist.php), which generated overall quality ratings of "Critically low," "Low," "Moderate," or "High"). Data analysis was performed using R software (R-4.3.2).

Additionally, the quality of reviews was independently assessed using the 27-item PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) statement [7]. Discrepancies were resolved through consensus with a third reviewer. Each items were rated as "complete report" (criterion explicitly met), "partial report" (criterion partially met), and "not report" (item not described). Compliance below 50% with PRISMA and AMSTAR 2 guidelines indicated a substantial need for improvement in both the reporting and methodological quality of the SRs.

Evidence mapping

Currently, no standardized reporting guidelines or methodological standards exist for Evidence Mapping (EM). Therefore, we adopted the Global Evidence Mapping methodology [8], along with previous EM research [9–11] and evidence gap mapping methodologies to guide our study. These methods were expanded and refined through extensive discussion among all authors [12, 13].

We employed a four-dimensional bubble plot to present our findings [14, 15]. Each bubble represents a SR, with its size indicating the number of original studies included. The *X*-axis depicts the effectiveness of TCM in treating DR, while different bubble colors represent various treatments. The *Y*-axis represents the methodological quality of the SRs. The bubble chart was generated using the online evidence mapping tool available on the Pymeta.com website (https://www.pymeta.com/evdmap/) [16], effectively displaying the key features of the studies [10].

Results

Study identification

A total of 201 records were identified. After removing duplicates, 139 records remained for screening. Titles and abstracts screening resulted in the exclusion of 83 records were excluded. The full text of the remaining 56 records was assessed for eligibility, leading to the exclusion of 5 studies that did not meet the inclusion criteria. Ultimately, 51 SRs were included in this overview. The study selection process is summarized in Fig. 1.

Characteristics of included SRs

The general characteristics of the population, interventions, and comparison groups included in the 51 SRs are summarized in Table 1. Among the 51 SRs, a total of 131,084 patients were involved. Notably, 12 articles (23.5%) were published in English, while the remaining 39 studies (76.5%) were published in Chinese. The publication years of these SRs ranged from 2013 to 2023. The control groups in these studies received conventional treatment of western medicine (CW), which included blood sugar and blood pressure control as passive control interventions and basic treatments, placebo, or no treatment (blank group). In contrast, the treatment groups received TCM treatments or integrated traditional Chinese and Western medicine (ITCW). Specifically, 20 studies (39.2%) utilized Chinese herbal medicine, 3 studies (5.9%) employed Chinese herbal extracts, 2 studies (3.9%) implemented ITCM, 23 studies (45.1%) utilized traditional Chinese patent medicines, and 3 studies (5.9%) incorporated acupuncture.

All included studies underwent rigorous methodological quality evaluation. Of these, 42 studies (82.4%) were assessed using the Cochrane risk of bias tool (ROB), while 9 studies (17.6%) were evaluated using the Jadad scale.

Assessment of quality and evidence mapping

Methodological quality of included SRs

The methodological quality of the 51 included studies was evaluated using the AMSTAR 2 checklist (Supplementary File Table 2). As illustrated in Fig. 2, 1 SR (2%) was of high quality, 29 (56.9%) were of moderate quality, 20 (39.2%) were of low quality, and 1 (2%) was of critically low quality.

All studies fully addressed on item 1 (PICO components), item 9 (risk of bias assessment techniques), and item 11 (appropriate methods for the statistical

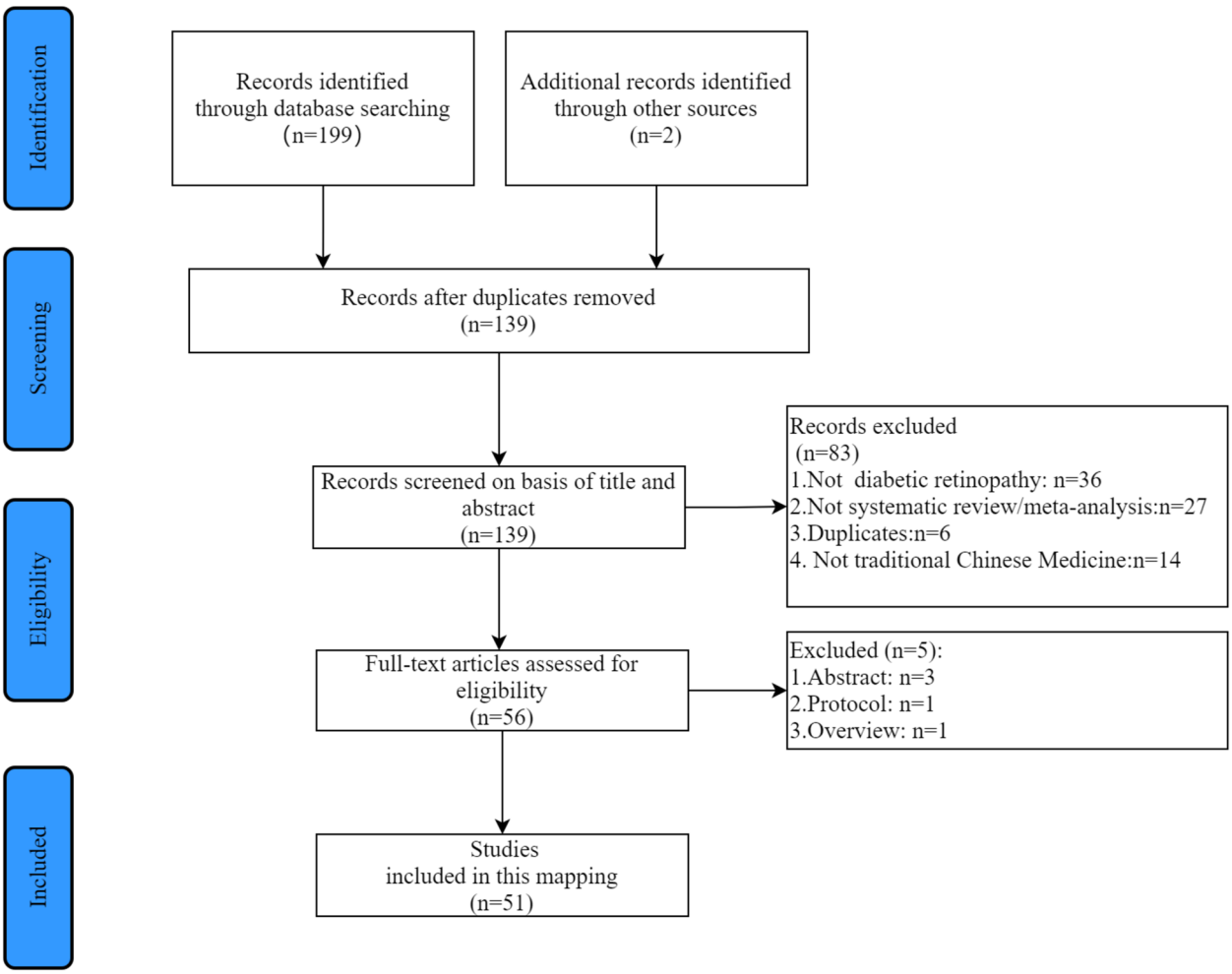

Fig. 1 Flow chart of the literature screening process and results

combination of results). None of the SRs provided information on item 10 (funding sources of included studies), only 1 (2%) addressed item 7 (list of excluded studies with justifications), 8 (15.7%) discussed item 2 (pre-specified protocol development), and 20 (39.2%) adequately covered item 14 (explanations and discussions of heterogeneity). Additionally, only 15 and 5 SRs, respectively provided a complete discussion for item 4 (a comprehensive search strategy) and item 8 (detailed basic information of the included studies).

Reporting quality of included SRs

Figure 3 illustrates the reporting quality of the SRs. A compliance rate below 50% indicated significant information omissions. Of the 51 SRs, only 8 (15.7%) provided protocol and registration information (item 5), 15 (29.4%) explained the review rationale within the context of existing knowledge (item 3), and 18 (35.3%) reported outcomes from additional analyses such as sensitivity analysis, subgroup analysis, and meta-regression analysis (item 23). Detailed reporting quality assessment results are presented in Supplementary File Table 3.

Evidence mapping

Figure 4 illustrates a bubble plot evaluating the methodological quality and evidence of TCM for DR across 51 SRs. The overall methodological quality ranged from moderate to low, with 29 SRs (56.9%) classified as moderate quality and 20 SRs (39.2%) as low quality. Outcome indicators revealed that 48 studies (94.1%) demonstrated beneficial effects, 2 SRs (3.9%) were potentially beneficial, and 1 SR (2%) was unclear. The TCM treatments for DR were categorized as follows: 18 studies focused on promoting blood circulation (Huoxuefa), 17 on tonifying (Buyifa), 14 on removing blood stasis (Huayufa), 5 on

Table 1 Basic characteristics of included studies

Study ID	Studies included (*n*)	Samples (*n*)	Treatments		Quality evaluation tools
			Experimental group	Control group	
Tian XC, 2023 [17]	38	3880	Chinese patent medicines (CXC, CDDP, SDMUC, MMDHP, HXMMT)	CW	ROB
Liu ZQ, 2023 [18]	42	10,836	Chinese patent medicines(CXC, CDDP, SDMUC, QG, DHHYK, MMDHP, HXMMT) + CD	CD	ROB
Li HD, 2023 [19]	107	9710	TCM (CXC, CDDP, SDMUC, QG, DHHYK, QJDHP, XFZYD, DGBXD, DGBXD, MMDHP, BYHWD, HXMMT) + CW	CW	ROB
Huai BG, 2023 [20]	18	1392	TCM (DaMing Yin, BYHWD) + CW	CW	ROB
Du JA, 2023 [21]	7	835	SDMUC + CW	CW	ROB
Xu ZH, 2023 [22]	18	1801	TCM (-) + acupuncture	CW	ROB
Wang SQ, 2023 [23]	15	1925	CDDP + CW	CW	ROB
Pang QB, 2023 [24]	18	1487	Yishen Yangyin Huoxue Method + Control	CW	ROB
Li H, 2023 [25]	28	3290	CXC + Control	CD	ROB
Hou XY, 2023 [26]	20	2263	Yishen Huoxue Method + Control	CD + CW	ROB
Gao K, 2023 [27]	42	3532	Yishen Yangyin Huoxue Method	CW	ROB
Ding S, 2023 [28]	6	365	Compound Rutin Tablets/Shihu Night Light Pills + Control	CW	ROB
Zhang YH, 2022 [29]	19	3190	Chinese patent medicines (-) + Control	CD	ROB
Wang Y, 2023 [30]	26	2047	CDDP	CW/placebo	Jadad Scale
Sun W, 2022 [31]	45	9503	Chinese herbal extracts(DH, DS, DSL, GBEP, GLED, KDZ, LIG, MLN, PUE, SAF, SXN, SXT, SYSC)	CW	ROB
Li XD, 2022 [32]	27	2144	TCM (MHF,HMM, HYP, DHMD, DaMing Yin) + CW	CW	ROB
Zhao SY, 2022 [33]	19	1549	ITCW + CW	CW	ROB
Li HD, 2022 [34]	14	1299	QG + CW + CD	CW + CD	ROB
Hu ZY, 2022 [35]	17	1379	Huoxue Huayu Method + CD	CD	ROB
Duan JN, 2022 [36]	32	4852	TCM (QG,JPLSD, YQCMD, SLBZS, XFZYD, HXMMT) + Control	Anti VEGF + LP	ROB
Hu ZP, 2021 [37]	16	-	QG + Control	CW/placebo	ROB
Xu JY, 2021 [38]	15	1145	acupuncture	CW + TCM	ROB
Liu WQ, 2021 [39]	10	180	acupuncture + TCM (-)	CW	ROB
Pang B, 2020 [40]	33	3430	Huoxue Huayu Method + Control	CW/placebo	ROB
An XD, 2020 [41]	18	1522	TCM (-) + Control	CW	ROB
Yang XR, 2020 [42]	13	1250	ITCW + Control	CW	ROB
Wang MR, 2020 [43]	24	2601	CDDP + Control	CD/placebo	ROB
Su MG, 2020 [44]	14	1664	QG	CW	Jadad Scale
Cheng JJ, 2020 [45]	19	1778	CXC + Control	CD	ROB
Ou C, 2019 [46]	10	661	Yiqi Yangyin Method + Control	CW	ROB
Zhou LJ, 2019 [47]	29	2820	QG	Placebo	ROB
Qu C, 2019 [48]	12	1735	Daming Yin + Control	CW + CD	ROB
Gui P, 2019 [49]	8	688	QG	CD	ROB
Guan MD, 2019 [50]	8	628	acupuncture	CW	ROB
Chen BM, 2019 [51]	13	1268	CXC + Control	CD	ROB
Zhang N, 2018 [52]	43	3875	Mingmu Tang + Control	CD	ROB
Qu C, 2018 [53]	9	1082	Xuefu Zhuyu Decoction + Control	CW	ROB
Ou C, 2018 [54]	10	723	TCM (-)	CW	ROB
Ning SY, 2018 [55]	39	4800	Huoxue Huayu Method	CW + CD	ROB
Huang SW, 2018 [56]	17	1756	TCM (SDMUC,CDDP, QG, DaMing Yin, TSKG, DGBXT, THSWD)	CD/placebo	ROB
Gao MZ, 2018 [57]	72	6165	TCM (-) + LP	LP	Jadad Scale
Yan XY, 2017 [58]	56	8670	TCM (DaMing Yin, QG, CDDP, JTHMF)	CW/placebo	ROB
Wang F, 2017 [59]	62	5180	TCM (-)	CD + CW	Jadad Scale

Table 1 (continued)

Study ID	Studies included (*n*)	Samples (*n*)	Treatments		Quality evaluation tools
			Experimental group	Control group	
Ning SY, 2017 [60]	10	1522	Chinese herbal extracts (ligustrazine) + CW	CW	Jadad Scale
Chen QY, 2017 [61]	26	2421	TCM (-) + CD	CD	ROB
Zhu T, 2015 [62]	17	1050	CDDP	CD/placebo/inosine tablets	Jadad Scale
Si JK, 2014 [63]	6	759	QG	Blank group/CW	ROB
Lin J, 2014 [64]	6	1346	CXC + CW + LP	CW + LP	ROB
Shen GH, 2014 [65]	9	1076	CXC + CW	CW	Jadad Scale
Hu R, 2013 [66]	8	550	Chinese herbal extracts (puerarin) injection + CW	CW	Jadad Scale
Gao J, 2013 [67]	14	1460	ITCW + CW	CW	Jadad Scale

Note:-, unreported; *CDDP* Compound Danshen Dripping Pills, *ROB* Cochrane Risk of Bias Tool, *CXC* Compound Xueshuantong Capsule, *SDMUC* Shuangdan Mingmu Capsule, *QG* Qiming granule, *MMDHP* Mingmu Dihuang Pill, *HXMMT* Hexuemingmu Tablet, *DHHYK* Danhong Huayu Koufuye, *MMDHP* Mingmu Dihuang Pill, *QJDHP* Qiju Dihuang Pill, *XFZYD* Xuefu Zhuyu Decoction, *DGBXD* DanguiBuxue Decoction, *BYHWD* BuYang Huanwu Decoction, *AST* astragalus, *DH* danhong, *DS* danshen, *DSL* danshen-ligustrazine, *GBEP* Ginkgo biloba extract powder, *GLED* ginkgo leaf extract and dipyridamole, *KDZ* kudiezi, *LIG* ligustrazine, *MLN* mailuoning, *PUE* puerarin, *SAF* safflower, *SXN* shuxuening, *SXT* shuxuetong, *SYSC* safflower yellow sodium chloride, *MHF* Mimenhua Formula, *HMM* Huayu Mingmu mixture, *HYP* Heying Prescription, *DHMD* Danhuang Mingmu Decoction, *JPLSD* Jianpi Lishui Decoction, *YQCMD* Yiqi Congming Decoction, *SLBZS* Shenlin Baizhu San, *JTHMF* Jiangtang Humu Formula, *TWKG* Tangwang Kang granule, *DGBXD* Danggui Buxue Decoction, *THSWT* Taohong Siwu Decoction, *LP* laser photocoagulation, *CD* calcium dobesilate, *CW* conventional treatment of Western medicine, *ITCW* Integrated Traditional Chinese and Western Medicine

unblocking collaterals (Tongluofa), and 4 studies investigated other treatment approaches.

Discussion

This study serves as a comprehensive evidence mapping review, illustrating the landscape of TCM interventions for DR. It identifies key areas where TCM has been explored and highlights significant gaps in the literature, such as the reporting and methodology remain suboptimal. Addressing these gaps is crucial for advancing the understanding and application of TCM in treating DR.

Mechanisms of probable benefits of TCM for DR

TCM has emerged as a promising therapeutic approach for DR, demonstrating efficacy through multiple mechanisms. TCM can ameliorate DR by exerting anti-inflammatory, anti-oxidative stress, anti-angiogenic, and anti-apoptotic effects, which collectively contribute to retinal protection and the preservation of vascular integrity [68]. Key signaling pathways implicated in TCM's therapeutic action against DR include NF-κB, MAPK/NF-κB, TLR4/NF-κB, VEGF/VEGFR2, HIF-1α/VEGF, STAT3, and Nrf2/HO-1, highlighting the complex interplay of molecular targets involved in its efficacy [69]. Furthermore, TCM formulations that activate blood circulation have been shown to protect the vascular endothelium and basement membrane, enhance blood rheology, inhibit platelet aggregation, reduce advanced glycation end products (AGEs), regulate oxidative stress, and improve lipid metabolism. These actions not only prevent DR but also address other diabetic microvascular complications [70]. Notable TCM compounds such as curcumolide, erianin, quercetin, blueberry anthocyanins, puerarin, arjunolic acid, and herbal formulations like Shengpuhuang-tang and LuoTong formula have demonstrated beneficial effects on DR through these mechanisms [71]. This multifaceted approach underscores the potential of TCM as a complementary strategy in the management of DR, warranting further investigation through rigorous clinical trials to validate its efficacy and safety.

However, the use of TCM is associated with potential adverse events that warrant careful consideration. Some herbal remedies may lead to side effects such as gastrointestinal disturbances, allergic reactions, or interactions with conventional medications [72–74]. The quality and purity of herbal products can vary significantly, raising concerns about contamination or mislabeling, which can compromise patient safety. Therefore, it is crucial for patients to consult healthcare professionals before initiating TCM therapies, especially those with pre-existing health conditions or those currently taking other medications. This precaution helps ensure safe and effective treatment outcomes while minimizing the risk of adverse effects.

Methodological and reporting quality needed to be improved

The AMSTAR 2 tool was employed to evaluate various aspects of the methodological quality of the included SRs, highlighting several areas for improvement. Firstly, many studies lacked comprehensive funding information (Item 10), which is critical as research funded by commercial sources may introduce bias in conclusions related to the sponsors' products [75].

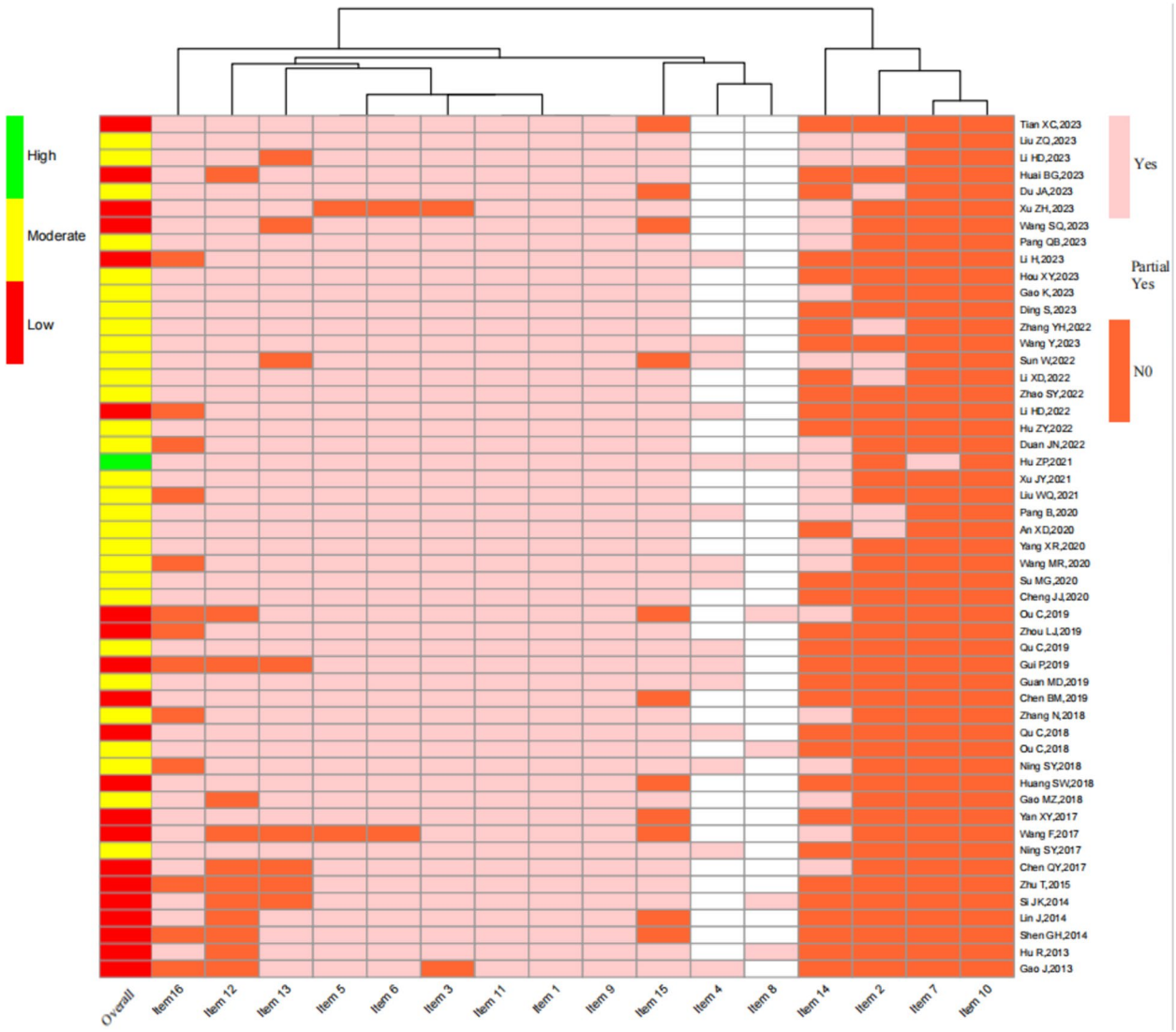

Fig. 2 The methodological quality of included studies

It is imperative for researchers to disclose funding sources or clarify the status of undisclosed funding to accurately assess study results. Future research should enhance the transparency of funding disclosures to uphold the scientific integrity of findings. Secondly, the absence of a list of excluded studies along with the reasons for their exclusion (Item 7) was noted in most studies. Providing such a list is essential for ensuring the accuracy of study selection and has been recommended by other researchers. A clear and detailed description of excluded studies is vital for validating the overall selection process, as supported by similar conclusions drawn by authors like Sun Wenyu [76]. Lastly, many studies did not adequately detail the development of a pre-specified research protocol (Item 2) prior to conducting the SRs. Establishing a research protocol is crucial for minimizing bias in evaluation results. Registering the protocol with platforms such as PROSPERO or publishing it in a journal enhances transparency and mitigates bias in reported outcomes [77].

Compliance with items 3, 5, and 23 in the included SRs was found to be below 50%, revealing significant gaps in reporting quality. Notably, only eight SRs disclosed their applied protocol and registration information. Timely design and registration of protocols for SRs/MAs are essential to mitigate reporting bias. Furthermore, it is crucial to articulate the review's rationale within the context of existing knowledge and to provide a clear statement of the objectives or questions addressed.

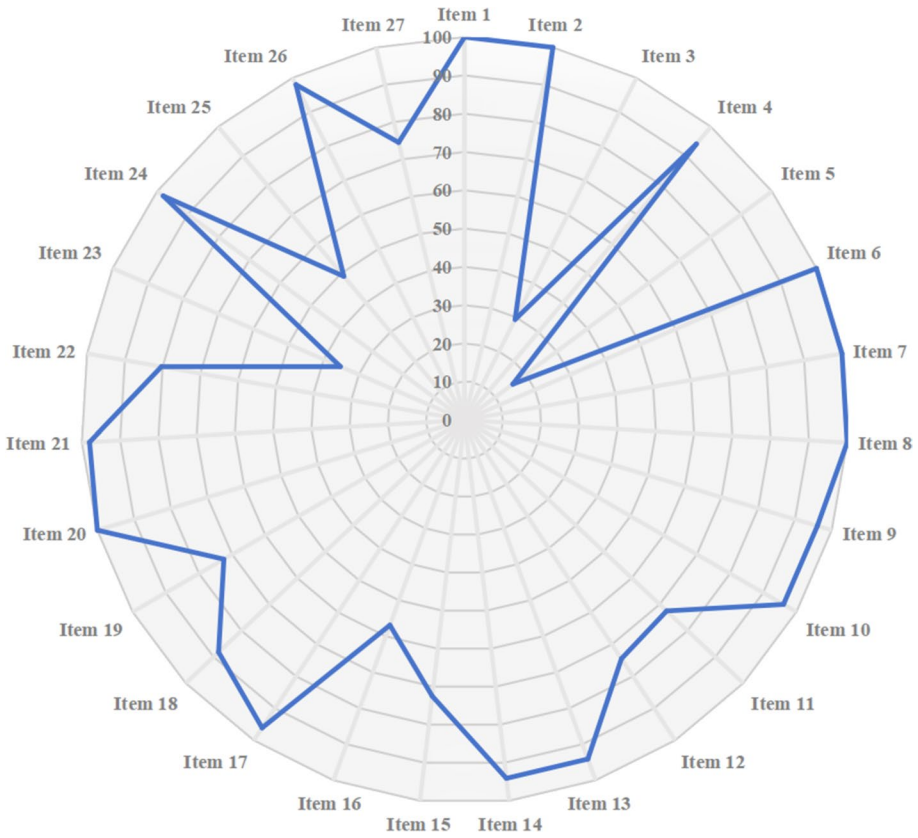

Fig. 3 Complete report on PRISMA included in the study

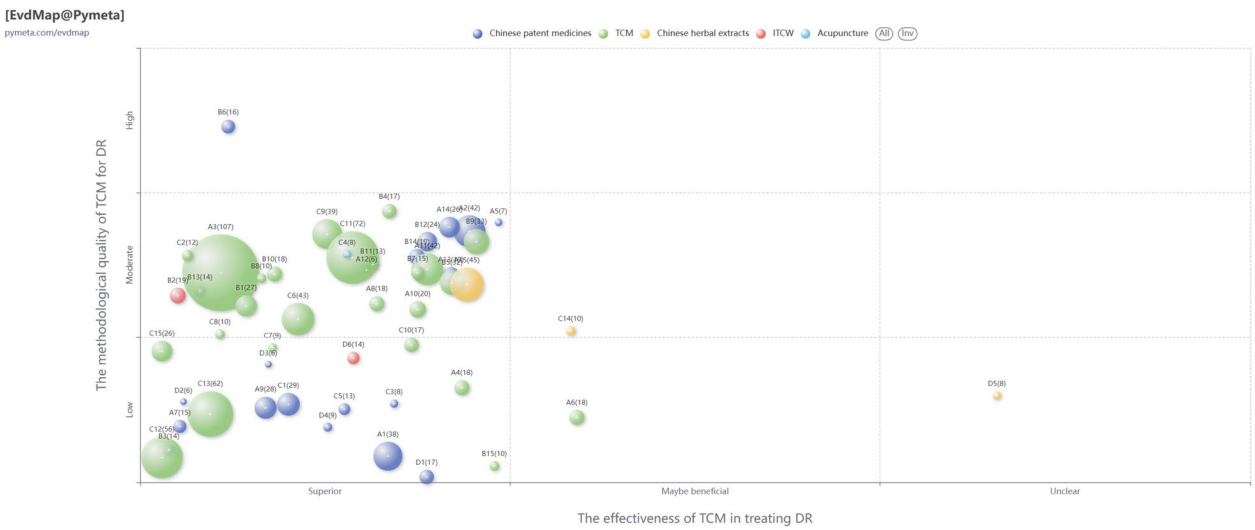

Fig. 4 Evidence mapping of included studies

Additionally, reporting relevant outcomes from other analyses, irrespective of their statistical significance, and clarifying whether these analyses were pre-specified are vital components of transparent reporting. In the context of TCM research, variations in formulas and syndrome types represent significant sources of heterogeneity [71]. Therefore, conducting subgroup analyses based on different categories of TCM formulas and subjects with

varying syndrome types is strongly recommended to enhance the robustness of findings.

Strengths and limitations

This mapping study is the first to assess the methodological quality of SRs using the AMSTAR 2 and PRISMA tools to evaluate the quality of evidence for the efficacy of TCM in DR patients. However, a limitation of our study is that the majority of the included SRs were conducted in China and involved Chinese populations. This may affect the generalizability of the findings to other populations due to potential differences in genetic backgrounds, cultural practices, and healthcare systems. Therefore, caution should be exercised when extrapolating these results to global populations, and further studies involving diverse populations are necessary to validate the effectiveness of TCM for DR worldwide.

Conclusion

This study represents the first comprehensive evaluation of the reporting and methodological quality of SRs investigating the use of TCM for the treatment of DR. Our findings indicate that while TCM shows promise as an effective therapy for DR, the overall quality of reporting and methodology in the included SRs is often inadequate. The mapping study reveals critical gaps in the literature, including the need for more rigorous methodological standards, comprehensive reporting of funding sources, the provision of excluded studies, and the establishment of pre-specified protocols in future research. These gaps must be addressed to strengthen the evidence base for TCM interventions in DR. In conclusion, while TCM shows promise for DR, this mapping study underscores the necessity for future SRs to focus on filling the identified gaps. Adhering to established reporting guidelines and conducting studies with diverse populations will be vital for validating the effectiveness of TCM interventions for DR globally.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s13643-025-02755-w.

Supplementary Material 1: Table 1. Search strategy. Table 2. Methodological quality assessment results for SRs (AMSTAR 2). Table 3. Reporting quality assessment results for SRs (PRISMA).

Authors' contributions

All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by LJ, XZL, DG, WY, ZYH, and ZJ. The first draft of the manuscript was written by LJ and LXX and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript. Conceptualization: DHY, methodology: LJ, LXX, writing—original draft preparation: LJ, XZL, writing—review and editing: LJ, LXX, supervision: LXX.

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Data availability

Not applicable.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

All participants consented to publication of the results of this study.

Competing interests

We have no conflicts of interest that are directly relevant to the content of this article.

Author details

[1]Clinical College of Chinese Medicine, Gansu University of Chinese Medicine, Lanzhou, Gansu Province 730030, China. [2]Gansu Provincial Hospital, Lanzhou 730030, China. [3]Gansu Provincial Hospital of TCM, Lanzhou, Gansu Province 730050, China. [4]Research Department, Private Center for Reproductive Medicine and Genetics, Buenos Aires, Argentina. [5]Xichang Hospital of Traditional Chinese Medicine, Xichang 615000, China. [6]Science and Information Center, Shanghai University of Traditional Chinese Medicine, Shanghai 201203, China.

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