Systematic Review and Quality Assessment of Research Literature on Traditional Chinese Medicine Pharmacoeconomics from 2020 to 2025

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Background and Objective

- Chinese herbal medicine is essential in disease treatment, and with supportive national policies and faster insurance reimbursements for TCM, robust cost-effectiveness evaluations have become crucial for health decision-making. However, rising drug numbers pressure insurance resources, and existing TCM pharmacoeconomic (PE) studies exhibit methodological flaws and uneven quality, with no thorough review of recent literature from 2020–2025. This study fills this gap by systematically evaluating global TCM PE publications using CHEERS 2022, BMJ, and QHES standards to assess quality, identify key issues, and improve future TCM economic evaluations.
- To examine the current status and quality of internationally published research literature on the pharmacoeconomics (PEs) of traditional Chinese medicine (TCM), and to propose relevant recommendations for improving the quality of future TCM PE research.

Results*

Our initial literature retrieval yielded 90 studies totally, comprising 71 Chinese-language and 19 English-language studies. The enrolled studies were conducted focusing on 17 disease categories involving the circulatory system, infectious diseases or parasites, nervous system, respiratory system, and genitourinary system. Funding support was available for 54.44% of the enrolled studies. Economic evaluations were carried out on 130 types of TCM by the included studies, with capsules being the most common dosage form in both quantity and variety. Furthermore, 63.33% of studies reported their perspective; most evaluations were short-term, with 70.00% performed within a study period of <6 months; over half (66.67%) employed cost-effectiveness analysis, while 10 studies (11.11%) integrated two evaluation methods; 67.78% of studies collected only direct medical cost data; 71 studies (78.89%) used effectiveness measures as outcome indicators, predominantly clinical efficacy rates (70 studies). Meanwhile, 5 studies (5.56%) utilized utility measures, all using QALYs; while 14 studies (15.56%) used both clinical effectiveness measures and QALYs. All 13 studies with a time horizon exceeding 1 year reported discount rates; 64 studies (71.11%) conducted incremental analysis, with 38 studies specifying willingness-to-pay threshold ranges; and 67 studies (74.44%) discussed limitations. In addition, quality assessment across three scales showed the lowest scores using the CHEERS 2022 checklist, and the highest scores using the BMJ checklist, with the average compliance rates of 56.23.77% and 71.61% among the included studies, respectively; and an average quality score of 65.34 using the QHES checklist.

*All the stata has been updated in Apr 2025

Conclusion

The quality of TCM PE research has improved in recent years compared to previous periods. But it leaves room for further improvement, such as non-standard implementation of key PE evaluation techniques, as well as persistent gaps between economic evaluation practices and healthcare management decision outcomes. Furthermore, differences in quality assessment results across the three scales stem from variations in scale design, item configuration, and scoring mechanisms.

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Methods

This study was initiated with a systematic retrieval of TCM PE research literature (from 2020 to April 2025) from six databases [China National Knowledge Infrastructure (CNKI), VIP , Wanfang Data, PubMed, Embase, and the Cochrane Library] using a predefined literature retrieval strategy and inclusion/exclusion criteria. Subsequent data extraction covered 22 items such as basic study details, research design, and content. In addition, quality assessments were conducted using the CHEERS 2022, BMJ, and QHES scales to classify included studies, combined with the analysis of discrepancies among the three tools.

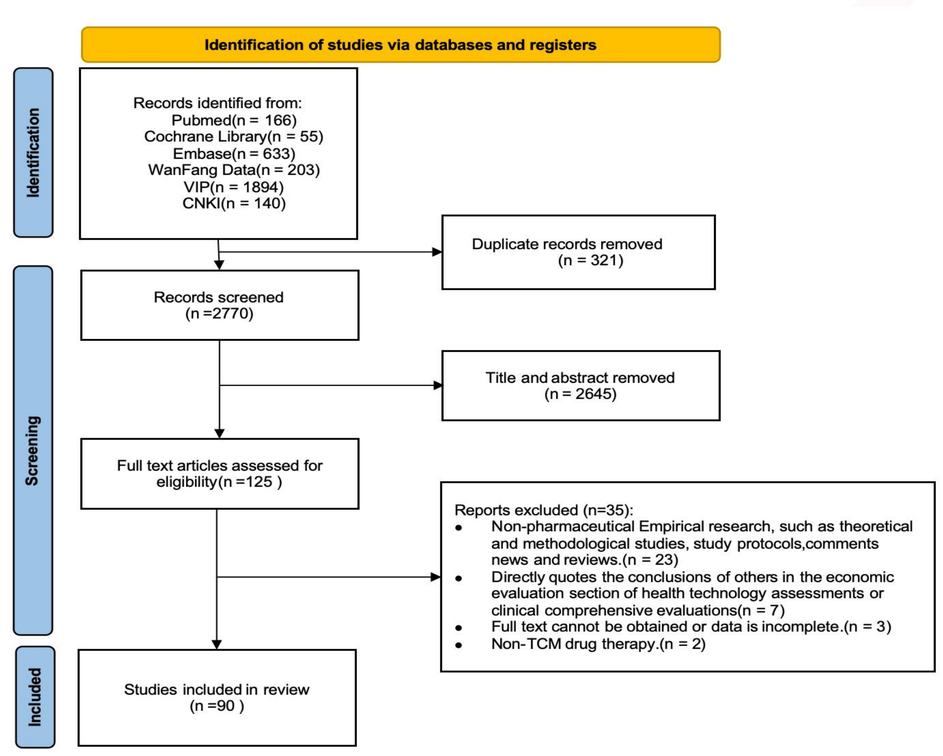

Fig.1 PRISMA flow diagram of the literature retrieval process

TABLE 1 | Study characteristics for the included PE studies [Number/Item (Percentage (%)] (N= 90)

Study Characteristics	Number of Studies (%)
Study Design	
Model-Based Study	39(43.33)
Decision Tree Model	21(23.33)
Markov Model	14(15.56)
Partition Survival Model	1(1.11)
Unspecified Model Type	3(3.33)
Individual-level Data-based Study	51(56.67)
Prospective Study	
Prospective RCT	9(10.00)
Prospective Observational Study	5(5.56)
Retrospective Study	37(41.11)
Research Perspective	
Societal Perspective	21(23.33)
Healthcare Payer Perspective	17(18.89)
Healthcare System Perspective	15(16.67)
Healthcare Provider's Perspective	2(2.22)
Patient's Perspective	2(2.22)
Not Mentioned	33(36.67)
Treatment comparison	
TCM used as monotherapy	57(63.33)
TCM vs. TCM	24(26.67)
Comparing 3 TCMs	8(8.89)
TCM vs. Placebo	8(8.89)
TCM vs. Conventional Treatment	5(5.56)
TCM vs. Western Medicine	3(3.33)
Comparing 5 TCMs	2(2.22)
TCM vs. TCM vs. Western Medicine	3(3.33)
TCM vs. Placebo	1(1.11)
Comparison of 4 TCMs, Comparison of 6 TCMs, Comparison of 7 TCMs	3(3.33)
TCM Used as Combination Therapy	33(36.67)
TCM + Conventional Treatment vs. Conventional Treatment	19(21.11)
TCM + Western Medicine vs Western Medicine	7(7.78)
TCM + Western Medicine vs. TCM + Western Medicine	2(2.22)
TCM + Conventional Treatment vs Placebo + Conventional Treatment, TCM + Conventional Treatment vs Western Medicine + Conventional Treatment, TCM + Conventional Treatment vs TCM + Conventional Treatment, TCM + Western Medicine + Conventional Treatment vs Western Medicine + Conventional Treatment, TCM + Conventional Treatment vs TCM	5(5.56)
Study Duration	
≦14 d	25(27.78)
15-30 d	15(16.67)
1-3 m	16(17.78)
4-6 m	7(7.78)
7-12 m	4(4.44)
>12 m	13(14.44)
Not Specified	10(11.11)
Study Sample Size (N=51)[a]	
≦100	20(39.22)
101-500	19(37.25)
501-1000	1(1.96)
>1000	10(19.61)
Not Specified	1(1.96)
Evaluation Method	
CEA	59(66.67)
CMA	8(8.89)
CUA	13(14.44)
CEA + CUA	9(10.00)
CEA + CMA	1(1.11)
Cost Type	
Direct Medical Costs	61(67.78)
Direct Medical Costs + Direct Non-Medical Costs	7(7.78)
Direct Medical Costs + Indirect Costs	8(8.89)
Direct Medical Costs + Direct Non-Medical Costs + Indirect Costs	11(12.22)
Direct Medical Costs + Indirect Costs + Intangible Costs	1(1.11)
Not Mentioned	2(2.22)
Deterministic Sensitivity Analysis	
Single-Factor Sensitivity Analysis + Probabilistic Sensitivity Analysis	32(35.56)
Single-Factor Sensitivity Analysis	31(34.44)
Multi-Factor Sensitivity Analysis + Probabilistic Sensitivity Analysis	2(2.22)
Single-Factor Sensitivity Analysis + Multi-Factor Sensitivity Analysis + Probabilistic Sensitivity Analysis	1(1.11)
Single-Factor Sensitivity Analysis + Multi-Factor Sensitivity Analysis	1(1.11)
Multi-Factor Sensitivity Analysis	1(1.11)
Not Conducted	22(24.44)
Deterministic Sensitivity Analysis Variables (N=68)[b]	
Drug Costs	15(22.06)
Drug Costs + Other Costs [c]	13(19.12)
Drug Costs + Health Outcomes Indicators [d]	10(14.71)
Drug Costs + Health Outcomes Indicators [d] + Other Variables [e]	6(8.82)
Drug Costs + Other Costs [c] + Health Outcomes Indicators [d]	6(8.82)
Drug Costs + Other Costs [c] + Health Outcomes Indicators [d] + Other Variables [e]	3(4.41)
Drug Costs + Other Costs [c] + Other Variables [e]	2(2.94)
Drug Costs + Other Variables [e]	2(2.94)
Health Outcomes Indicators [d]	2(2.94)
Health Outcomes Indicators [d] + Other Variables [c]	1(1.47)
Not Mentioned	8(11.76)

*d, day; m, month. CEA, Cost-effectiveness analysis. CMA, Cost-minimization analysis. CUA, Cost-utility analysis. (a)Exclusion of studies that did not establish a PE model, resulting in 51 studies. (b)Exclusion of studies that did not conduct deterministic sensitivity analysis, resulting in 68 studies. (c)Variables mainly involving treatment costs,diagnostic test fees, medical service fees, and Costs of Absenteeism. (d)Variables mainly involving health utility and clinical efficiency . (e) Variables mainly involving patient compliance, discount rate, probability of disease state transition, hospitalization days , and patient income.

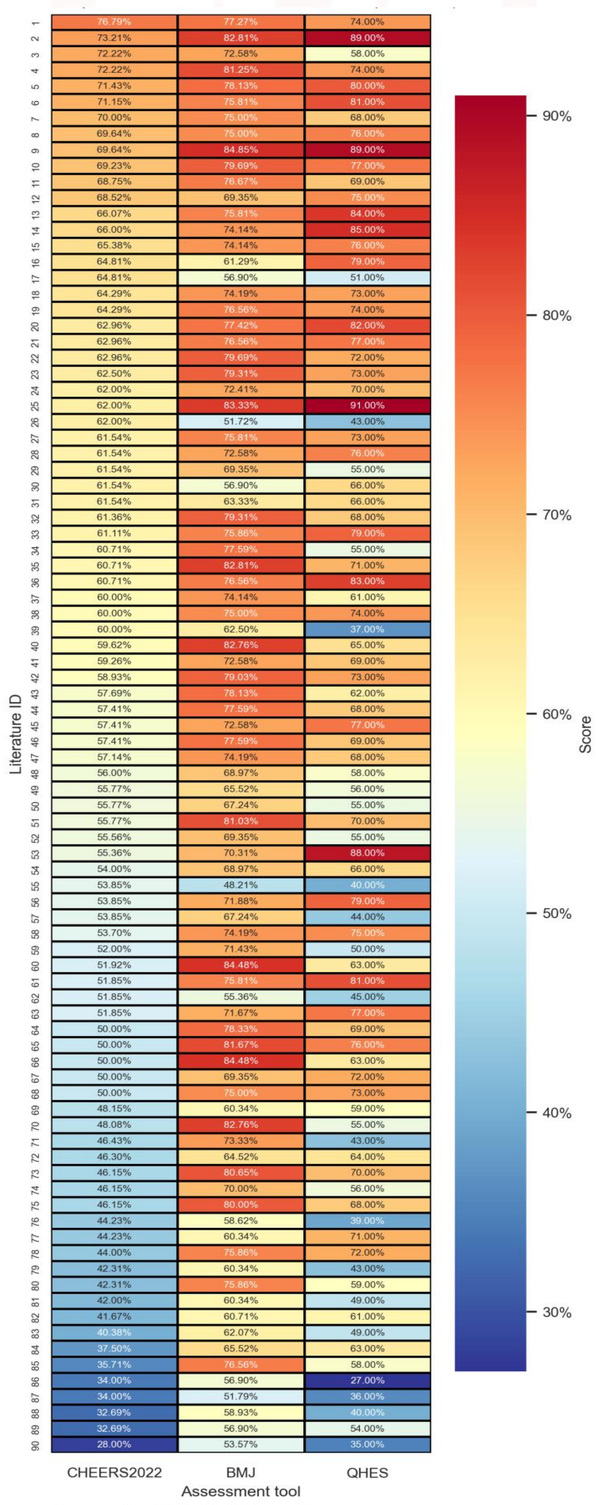

Fig.2 Heatmap of CHEERS2022, BMJ, QHES scores (90 studies)

*The horizontal axis of the heatmap represents the three quality assessment scales, while the vertical axis corresponds to the identification number of each study (e.g., the first study denoted as No. 1). Meanwhile, each column indicates the quality assessment outcomes for all studies evaluated using a specific scale; each row shows the quality assessment results for the same study across different scales; and each cell represents the quality assessment outcome for a specific study using a particular scale. With the compliance rate distinguished by cool and warm colors, the blue and red colors indicate low and high compliance, respectively. The color bar on the right side displays corresponding values of compliance rates, with its base and top representing the minimum and maximum compliance rates across all studies for each quality assessment.