

INPLASY

INPLASY2026100125

doi: 10.37766/inplasy2026.10.0125

Received: 30 October 2026

Published: 30 October 2026

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Factors Influencing the Certainty of Evidence in Systematic Reviews of Traditional Chinese Medicine for the Prevention and Treatment of Glucose–Lipid Metabolic Comorbidity: A Meta-epidemiological Study

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ADMINISTRATIVE INFORMATION**Support** - Guangdong Provincial Special.**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY2026100125**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 October 2026 and was last updated on 30 October 2026.**INTRODUCTION**

Study aim To identify methodological factors associated with the certainty of evidence in systematic reviews and meta-analyses (SRs/MAs) of traditional Chinese medicine (TCM) interventions for glucose–lipid metabolic comorbidity. To describe the use of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach, the distribution of evidence certainty ratings, and the main reasons for downgrading.

Background There has been a lack of systematic research on direct evidence for the prevention and treatment of glucose–lipid metabolic comorbidity using TCM, as well as on the factors influencing the certainty of evidence in related SRs/MAs. Currently, clinical studies and SRs/MAs in the field of glucose and lipid metabolism primarily focus on single conditions such as diabetes, dyslipidemia, obesity, or fatty liver disease. Although this evidence can provide guidance for the management of comorbidities, differences among

study populations—including disease composition, baseline risk, concomitant medications, and response to intervention—may limit the direct applicability of these findings. They cannot directly substitute for evidence specific to populations with coexisting glucose and lipid metabolism abnormalities. Methodological characteristics of SRs/MAs, such as protocol registration, comprehensiveness of literature searches, independent screening and data extraction by two reviewers, risk of bias assessment, and handling of inconsistency, imprecision, and publication bias, may be associated with the certainty of evidence. Previous meta-epidemiological studies in the field of TCM have primarily focused on the relationship between the characteristics of original studies and estimates of treatment effects, whereas a systematic analysis of the association between methodological characteristics at the SRs/MAs level and the certainty of evidence is still lacking.

Rationale Identifying methodological factors associated with the certainty of evidence may help clarify why certainty varies across SRs/MAs of

TCM interventions for glucose–lipid metabolic comorbidity. This study may identify key methodological weaknesses and priorities for improvement, thereby informing the conduct and reporting of future SRs/MAs and supporting more reliable interpretation of the available evidence.

METHODS

Search strategy The electronic database search will be conducted in nine databases: PubMed, Web of Science, Embase, the Cochrane Library, China National Knowledge Infrastructure (CNKI), Wanfang Data, VIP Database, Yiigle, and SinoMed. The search strategy will use terms related to glucose metabolism disorders, lipid metabolism disorders, obesity, related metabolic conditions, TCM interventions, and systematic reviews or meta-analyses. Search terms will include: “glucose metabolism disorders,” “diabetes mellitus,” “hyperglycaemia,” “impaired glucose tolerance,” “impaired fasting glucose,” “lipid metabolism disorders,” “dyslipidaemia,” “hyperlipidaemia,” “obesity,” “overweight,” “metabolic syndrome,” “insulin resistance syndrome,” “fatty liver disease,” “non-alcoholic fatty liver disease,” “polycystic ovary syndrome,” “traditional Chinese medicine,” “Chinese patent medicine,” “acupuncture,” “moxibustion,” “cupping,” “systematic review,” and “meta-analysis”. The search terms will be adapted to the terminology, indexing, and search requirements of each database.

Eligibility criteria The eligibility criteria will be defined according to the PICOS framework, as follows: Participants (P) will be adults aged 18 years or older. Eligible populations include, but are not limited to, patients with type 2 diabetes mellitus and dyslipidaemia, metabolic syndrome, non-alcoholic fatty liver disease (NAFLD), metabolic dysfunction-associated fatty liver disease (MAFLD), and polycystic ovary syndrome (PCOS), provided that both glucose and lipid metabolism abnormalities are explicitly documented. Intervention (I) will include traditional Chinese herbal compound formulations, Chinese patent medicines, acupuncture, moxibustion, tuina, Tai Chi, Baduanjin, Qigong, and TCM interventions combined with conventional treatment. Comparison (C): not applicable. Outcome (O): SRs/MAs report at least one glucose metabolism outcome and at least one lipid metabolism outcome. Eligible outcomes include: (1) Glucose metabolism outcomes: glycated haemoglobin (HbA1c), fasting blood glucose (FBG), 2-hour postprandial glucose (2-h PG), oral glucose tolerance test (OGTT)-related measures, fasting insulin, and homeostasis model

assessment of insulin resistance (HOMA-IR); (2) Lipid metabolism outcomes: total cholesterol (TC), triglycerides (TG), low-density lipoprotein cholesterol (LDL-C), and high-density lipoprotein cholesterol (HDL-C); (3) Safety outcomes: adverse events (AEs), serious adverse events (SAEs). Study design (S): SRs/MAs of TCM interventions for glucose–lipid metabolic comorbidity. Eligible reviews must employ explicit systematic search methods and include at least one quantitative meta-analysis meeting the eligibility criteria of this study. Exclusion criteria: narrative reviews, scoping reviews, editorials, letters, conference abstracts without sufficient data, network meta-analyses, individual participant data meta-analyses, dose-response meta-analyses, and umbrella reviews.

Data extraction A standardized data extraction form will be developed and pilot-tested independently by two reviewers on a random 10% sample of the included SRs/MAs. The extracted data will be compared, and discrepancies will be discussed to ensure completeness and consistency. If consensus cannot be reached, a third reviewer will be consulted.

The following information will be extracted: general study characteristics; review questions, eligibility criteria, types of comorbidity, and types of TCM interventions; protocol registration platform and registration number; number of databases searched; study selection and data extraction procedures; risk-of-bias assessment tools; meta-analysis methods; approaches to handling heterogeneity; and GRADE ratings and reasons for downgrading. If the reported GRADE assessments are insufficient for the planned meta-epidemiological analysis, two reviewers will independently reassess all eligible outcome-specific bodies of evidence using standardized criteria. Disagreements will be resolved by consulting a third reviewer.

Strategy of data synthesis / Statistical analysis

Descriptive statistics will be used to summarize study characteristics at the systematic review and outcome-specific body-of-evidence levels. Generalized estimating equations (GEE) will be used to examine associations between methodological characteristics and certainty of evidence. Results will be reported as effect estimates with corresponding 95% confidence intervals (CIs), as appropriate for the specified statistical models. Statistical analyses will be conducted in R (Version 4.6.0), with a two-sided P-value <0.05 considered statistically significant.

Country(ies) involved China.

Keywords Meta-epidemiology; Traditional Chinese medicine; Glucose and lipid metabolism disorders; Certainty of evidence; GRADE.

Dissemination plans The findings will be submitted to a peer-reviewed journal focusing on metabolic diseases, clinical epidemiology, evidence synthesis, or traditional Chinese medicine. The study may also be disseminated through scientific meetings and academic channels. No individual patient data or confidential information will be reported.

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