Efficacy and Safety of Shouhui Tongbian Capsule in the Treatment of Constipation: An Updated Meta-Analysis Postprint

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Abstract

Background Constipation is a common digestive system disease that seriously affects patients' quality of life. Although existing therapeutic modalities are effective, long-term use may lead to dependence and adverse reactions. In recent years, Shouhui Tongbian Capsule, as a traditional Chinese medicine compound, has gradually garnered attention in constipation treatment. Objective To systematically evaluate the efficacy and safety of Shouhui Tongbian Capsule in treating constipation. Methods A computerized search was conducted across PubMed, Embase, Cochrane Library, Web of Science, China Biology Medicine disc, CNKI, Wanfang Data Knowledge Service Platform, and VIP Database from inception to December 31, 2024. Randomized controlled trials (RCTs) investigating Shouhui Tongbian Capsule for constipation were collected, with references and grey literature of relevant studies manually searched. Following independent literature screening, data extraction, and quality assessment by two researchers, RevMan 5.4 and Stata 16 software were employed for Meta-analysis, TSA 0.9.5.10 beta software for trial sequential analysis, and GRADEpro GDT for evidence quality evaluation. Results A total of 19 RCTs were included, comprising 1,821 cases. Meta-analysis results demonstrated that compared with the control group, Shouhui Tongbian Capsule treatment improved the total effective rate (RR=1.22, 95%CI=1.17~1.27, P<0.01); reduced the degree of difficulty in defecation (SMD=-1.30, 95%CI=-1.65~-0.94, P<0.01), spontaneous defecation frequency (SMD=-0.82, 95%CI=-1.28~-0.35, P<0.01), defecation interval time (SMD=-1.36, 95%CI=-1.70~-1.03, P<0.01), incomplete evacuation sensation (SMD=-1.47, 95%CI=-2.13~-0.81, P<0.01), defecation time (SMD=-1.93, 95%CI=-2.60~-1.25, P<0.01), stool characteristics (SMD=-2.32, 95%CI=-2.82~-1.83, P<0.01), and traditional Chinese medicine syndrome scores (SMD=-1.42, 95%CI=-2.26~-0.58, P<0.01); increased motilin (SMD=1.67, 95%CI=1.11~2.23, P<0.01), gastrin (SMD=0.95,

95%CI=0.58~1.33, P<0.01), substance P (SMD=1.74, 95%CI=1.16~2.32, P<0.01), and vasoactive intestinal peptide (SMD=4.20, 95%CI=3.49~4.91, P<0.01), while decreasing nitric oxide (SMD=-2.20, 95%CI=-2.64~-1.75, P<0.01); yielded a lower recurrence rate (RR=0.31, 95%CI=0.18~0.53, P<0.01); and demonstrated a lower incidence of adverse reactions (RR=0.53, 95%CI=0.35~0.80, P<0.01). Trial sequential analysis confirmed the stability and reliability of the total effective rate results. GRADE evidence quality evaluation indicated that the total effective rate and adverse reactions were of moderate evidence quality, whereas clinical symptom scores, gastrointestinal hormones, and recurrence rate were of low evidence quality. Conclusion Shouhui Tongbian Capsule exhibits favorable efficacy and safety in constipation treatment. Nevertheless, future research should incorporate high-quality RCTs, long-term efficacy and safety assessments, and explore its potential application value across different constipation types and populations.

Full Text

Efficacy and Safety of Shouhui Tongbian Capsules in the Treatment of Constipation: An Updated Meta-Analysis

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Abstract

Background: Constipation is a prevalent digestive system disease that severely impacts patients' quality of life. While existing treatments are effective, long-term use may lead to dependency and adverse effects. In recent years, Shouhui Tongbian Capsule, a traditional Chinese medicine compound, has gained increasing attention for constipation management.

Objective: To systematically evaluate the efficacy and safety of Shouhui Tongbian Capsule in treating constipation.

Methods: We conducted comprehensive searches of PubMed, Embase, Cochrane Library, Web of Science, Chinese Biomedical Literature Service System (CBM), CNKI, Wanfang Data, and VIP databases from inception to December 31, 2024, to collect randomized controlled trials (RCTs) investigating Shouhui Tongbian Capsule for constipation. Manual searches of reference lists and grey literature were also performed. Two researchers

independently screened studies, extracted data, and assessed methodological quality. Meta-analysis was conducted using RevMan 5.4 and Stata 16 software, trial sequential analysis (TSA) was performed using TSA 0.9.5.10 beta software, and evidence quality was evaluated using GRADEpro GDT.

Results: Nineteen RCTs with a total of 1,821 participants were included. Meta-analysis results showed that compared with control groups, Shouhui Tongbian Capsule treatment improved total clinical effectiveness (RR=1.22, 95%CI=1.17~1.27, P<0.01), reduced difficulty of defecation (SMD=-1.30, 95%CI=-1.65~-0.94, P<0.01), increased spontaneous defecation frequency (SMD=-0.82, 95%CI=-1.28~-0.35, P<0.01), shortened defecation interval time (SMD=-1.36, 95%CI=-1.70~-1.03, P<0.01), alleviated incomplete defecation sensation (SMD=-1.47, 95%CI=-2.13~-0.81, P<0.01), decreased defecation time (SMD=-1.93, 95%CI=-2.60~-1.25, P<0.01), improved stool characteristics (SMD=-2.32, 95%CI=-2.82~-1.83, P<0.01), and lowered Traditional Chinese Medicine (TCM) syndrome scores (SMD=-1.42, 95%CI=-2.26~-0.58, P<0.01). The capsule also increased serum levels of motilin (SMD=1.67, 95%CI=1.11~2.23, P<0.01), gastrin (SMD=0.95, 95%CI=0.58~1.33, P<0.01), substance P (SMD=1.74, 95%CI=1.16~2.32, P<0.01), and vasoactive intestinal peptide (SMD=4.20, 95%CI=3.49~4.91, P<0.01), while reducing nitric oxide levels (SMD=-2.20, 95%CI=-2.64~-1.75, P<0.01). Additionally, the recurrence rate was lower (RR=0.31, 95%CI=0.18~0.53, P<0.01) and adverse event rates were lower (RR=0.53, 95%CI=0.35~0.80, P<0.01) in the treatment group. Trial sequential analysis confirmed the stability and reliability of the total effectiveness results. GRADE assessment indicated moderate-quality evidence for total effectiveness and adverse events, and low-quality evidence for clinical symptom scores, gastrointestinal hormones, and recurrence rates.

Conclusion: Shouhui Tongbian Capsule demonstrates favorable efficacy and safety in constipation treatment. However, future research should prioritize high-quality RCTs with extended follow-up, validate long-term outcomes, and explore its applications across constipation subtypes and diverse populations.

Keywords: Constipation; Shouhui Tongbian Capsules; Efficacy; Safety; Meta-analysis; Randomized controlled trials

Introduction

Constipation is a common functional gastrointestinal disorder characterized by reduced defecation frequency, hard stools, and difficulty in bowel movements, with a global prevalence of 12-15%. The incidence is notably higher among women and elderly populations. Chronic constipation severely impairs quality of life and may lead to complications including gastrointestinal dysfunction, psychological disorders, cardiovascular and cerebrovascular diseases, and potentially colorectal cancer. Conventional Western medical treatments such as prokinetic agents, osmotic laxatives, and lubricants provide short-term symptom

relief but carry risks of drug dependence, recurrence, and adverse effects with long-term use. Consequently, identifying safe and effective alternative therapies has become a critical research priority.

Traditional Chinese Medicine (TCM), guided by holistic principles emphasizing syndrome differentiation and treating both root causes and symptoms, has demonstrated unique advantages in constipation management. TCM theory attributes constipation primarily to the large intestine, with pathogenesis closely related to dysfunction of the lung, spleen, stomach, liver, and kidney organs. Treatment strategies focus on regulating organ function while employing comprehensive approaches to nourish yin, boost qi, moisten the intestines, and purge excess. Shouhui Tongbian Capsule, developed based on these principles, is a compound formulation characterized by "simultaneous tonification and purgation, addressing both root and branch." Its main ingredients include Polygonum multiflorum, Aloe vera, Cassia seeds, Ginseng, Donkey-hide gelatin, Goji berries, Atractylodes macrocephala, and Citrus aurantium, which collectively tonify qi, nourish yin, and eliminate turbidity to promote bowel movements.

Recent studies have explored the therapeutic efficacy and mechanisms of Shouhui Tongbian Capsule in constipation treatment. Clinical research indicates that the capsule significantly improves total clinical effectiveness, alleviates symptoms such as defecation difficulty and stool characteristics, and reduces adverse events and recurrence rates. The formulation exerts therapeutic effects by promoting gastrointestinal motility, increasing intestinal fluid secretion, regulating gut microbiota, enhancing energy metabolism and proliferation of interstitial cells of Cajal, modulating intestinal barrier proteins, and reducing inflammatory factor expression. A previous meta-analysis published in 2021 included only three RCTs, confirming clinical advantages but suffering from limitations including outdated literature (cutoff date May 25, 2020), significant methodological heterogeneity, and incomplete safety evaluation systems. With the emergence of additional RCTs in recent years, research has increasingly focused on evaluating efficacy across different functional constipation subtypes —a dimension inadequately explored in previous meta-analyses. Therefore, this study provides a comprehensive systematic review summarizing the clinical efficacy and safety of Shouhui Tongbian Capsule to furnish more robust evidence for clinical practice and explore its potential applications across constipation types. This meta-analysis was registered with PROSPERO (registration number: CRD42024621787).

Methods

1.1 Inclusion Criteria

1.1.1 Study Population: Patients with clinically diagnosed constipation, based on diagnostic criteria including the "Guidelines for Primary Care of Chronic Constipation (2019)," "Consensus on Integrated Traditional Chinese

and Western Medicine Diagnosis and Treatment of Functional Constipation (2017)," "Expert Consensus on TCM Diagnosis and Treatment of Constipation (2017)," or other recognized standards. No restrictions were placed on patient gender, age, disease duration, or TCM syndrome differentiation.

1.1.2 Interventions: The experimental group received Shouhui Tongbian Capsule as the primary intervention, with or without additional treatments. The control group received conventional basic treatment, other routine Chinese or Western medicines.

1.1.3 Outcome Measures: The primary outcome was total clinical effectiveness. Secondary outcomes included clinical symptom scores (defecation difficulty, spontaneous defecation frequency, incomplete defecation sensation, defecation time, stool characteristics, TCM syndrome scores), gastrointestinal hormones (motilin, gastrin, substance P, vasoactive intestinal peptide, nitric oxide), adverse event rates, and constipation recurrence rates after treatment discontinuation.

1.1.4 Study Design: Randomized controlled trials (RCTs).

1.2 Exclusion Criteria

Studies were excluded if they were duplicate publications from the same research center or authors, had incomplete data or unavailable original data, were not in Chinese or English, had inaccessible full text, or had mismatched interventions or outcome measures.

1.3 Literature Search Strategy

We searched PubMed, Embase, Cochrane Library, Web of Science, CBM, CNKI, Wanfang Data, and VIP databases from inception to December 31, 2024, following PRISMA guidelines. Manual searches of reference lists and grey literature were conducted. The search strategy combined subject headings and free-text terms. English search terms included "constipation," "functional constipation," "chronic constipation," "Shouhui Tongbian," "Shouhuitongbian," "traditional Chinese medicine," and "Chinese herbal medicine." Chinese search terms included "constipation," "functional constipation," "chronic constipation," "Shouhui Tongbian Capsule," and "Chinese medicine." Boolean logic operators were used appropriately. An example PubMed search strategy was: ("constipation"[MeSH Terms] OR "constipation"[Title/Abstract] OR "functional constipation"[Title/Abstract] OR "chronic constipation"[Title/Abstract]) AND ("Shouhuitongbian"[Title/Abstract] OR "Shouhui Tongbian"[Title/Abstract] OR "traditional Chinese medicine"[Title/Abstract]).

1.4 Literature Screening and Data Extraction

Two researchers independently screened literature according to inclusion and exclusion criteria, cross-checked selections, and extracted data. Disagreements

were resolved by discussion with a third researcher. Note Express software was used for literature management. Titles and abstracts were initially screened, followed by full-text review for final inclusion. Extracted data included first author, publication year, sample size, age, gender, interventions, treatment duration, and outcome measures.

1.5 Literature Quality Assessment

Two researchers independently assessed methodological quality using the Cochrane Handbook risk-of-bias tool for RCTs, evaluating seven domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other biases. Each domain was rated as low risk, high risk, or unclear risk. Results were cross-checked, with disagreements resolved by a third researcher.

1.6 Statistical Analysis

Meta-analysis was performed using RevMan 5.4 and Stata 16 software. For outcome measures, relative risk (RR) was used for dichotomous variables and standardized mean difference (SMD) for continuous variables, with 95% confidence intervals (95%CI). Heterogeneity was assessed using I^2 statistics: fixed-effects models were applied when I^2<50% (indicating low heterogeneity), and random-effects models when $I^2$$ $50% (indicating substantial heterogeneity). For outcomes with $ $10 included studies, funnel plots were used to assess publication bias, supplemented by Begg' s and Egger' s tests. Sensitivity analysis was conducted using the "leave-one-out"method. Trial sequential analysis was performed using TSA 0.9.5.10 beta software to evaluate result robustness. Statistical significance was set at P<0.05.

1.7 GRADE Evidence Quality Assessment

Two researchers independently used the GRADE system methodology, importing data into the online GRADEpro GDT tool (https://gradepro.org) to evaluate evidence quality for each outcome across five domains: risk of bias, inconsistency, indirectness, imprecision, and publication bias. Evidence quality was rated as high (no downgrade), moderate (downgrade by 1 level), low (downgrade by 2 levels), or very low (downgrade by 3 levels). Disagreements were resolved by a third researcher.

Results

2.1 Literature Screening Process

Database searches yielded 199 articles. After importing to Note Express and removing duplicates, 52 articles remained. Title and abstract screening identi-

fied 40 articles for full-text review, resulting in 31 articles assessed for eligibility. Twelve articles were excluded (4 reviews, 5 with inappropriate interventions, 1 non-RCT, 2 with inappropriate populations), leaving 19 articles included in the meta-analysis. All were Chinese-language studies. The screening process is illustrated in [Figure 1: see original paper].

2.2 Characteristics of Included Studies

All 19 studies were conducted in China, with a total sample of 1,821 participants (922 in experimental groups, 899 in control groups). Regarding constipation types: 8 studies focused on elderly functional constipation, 5 on constipation comorbid with other diseases, and 6 on post-chemotherapy constipation. Interventions included: Shouhui Tongbian Capsule versus other drugs (4 studies), Shouhui Tongbian Capsule plus basic treatment versus basic treatment alone (4 studies), and Shouhui Tongbian Capsule plus other drugs versus other drugs alone (11 studies). Treatment duration was 2 weeks in 12 studies, 4 weeks in 5 studies, and not specified in 2 studies. Daily dosages were 1.05g in 5 studies, 1.4g in 3 studies, and 2.1g in 11 studies. Detailed characteristics are presented in .

2.3 Quality Assessment of Included Studies

Fourteen studies reported randomization methods using random number tables; five studies only mentioned "randomization." Four studies reported allocation concealment methods (two using drawing lots, two using admission sequence), while 15 studies did not report specific allocation concealment. No studies mentioned blinding. All studies had complete data without selective reporting or other apparent biases. The risk-of-bias assessment is shown in [Figure 2: see original paper].

2.4 Meta-Analysis Results

2.4.1 Total Clinical Effectiveness: All 19 studies reported total effectiveness. Heterogeneity was low (I^2=0, P=0.69), so a fixed-effects model was used. The meta-analysis showed that the experimental group had significantly better total effectiveness than the control group (RR=1.22, 95%CI=1.17~1.27, P<0.01), as shown in [Figure 3: see original paper]. Sensitivity analysis indicated that removing any single study did not substantially change the effect direction or statistical significance, demonstrating high stability [Figure 4: see original paper]. The funnel plot showed asymmetrical distribution [Figure 5: see original paper], and both Begg' s (P=0.003) and Egger' s (P=0.002) tests suggested potential publication bias.

Subgroup analyses revealed consistent results across all subgroups: (1) By constipation type—elderly functional constipation (RR=1.20, 95%CI=1.13~1.27, P<0.01), disease-comorbid constipation (RR=1.28, 95%CI=1.17~1.40, P<0.01), and post-chemotherapy constipation (RR=1.20, 95%CI=1.11~1.30, P<0.01).

(2) By intervention type—Shouhui Tongbian Capsule versus other drugs (RR=1.19, 95%CI=1.04~1.37, P<0.01), Shouhui Tongbian Capsule plus basic treatment versus basic treatment (RR=1.24, 95%CI=1.13~1.36, P<0.01), and Shouhui Tongbian Capsule plus other drugs versus other drugs (RR=1.22, 95%CI=1.15~1.28, P<0.01). (3) By dosage—1.05g/d (RR=1.20, 95%CI=1.11~1.29, P<0.01), 1.4g/d (RR=1.31, 95%CI=1.15~1.50, P<0.01), and 2.1g/d (RR=1.22, 95%CI=1.15~1.29, P<0.01). (4) By treatment duration—2 weeks (RR=1.21, 95%CI=1.15~1.28, P<0.01), 4 weeks (RR=1.23, 95%CI=1.14~1.32, P<0.01), and unspecified duration (RR=1.26, 95%CI=1.07~1.50, P<0.01). Results are summarized in .

2.4.2 Clinical Symptom Scores: Clinical symptom scores included defecation difficulty, spontaneous defecation frequency, defecation interval, incomplete defecation sensation, defecation time, stool characteristics, and TCM syndrome scores. Nine studies reported defecation difficulty, three reported spontaneous defecation frequency, six reported defecation interval, three reported incomplete defecation sensation, four reported defecation time, two reported stool characteristics, and five reported TCM syndrome scores. High heterogeneity was observed, requiring random-effects models. The meta-analysis demonstrated that the experimental group significantly reduced defecation difficulty (SMD=-1.30, 95%CI=-1.65~-0.94, P<0.01), spontaneous defecation frequency (SMD=-0.82, 95%CI=-1.28~-0.35, P<0.01), defecation interval (SMD=-1.36, 95%CI=-1.70~-1.03, P<0.01), incomplete defecation sensation (SMD=-1.47, 95%CI=-2.13~-0.81, P<0.01), defecation time (SMD=-1.93, 95%CI=-2.60~-1.25, P<0.01), improved stool characteristics (SMD=-2.32, 95%CI=-2.82~-1.83, P<0.01), and lowered TCM syndrome scores (SMD=-1.42, 95%CI=-2.26~-0.58, P<0.01) [Figure 6: see original paper].

2.4.3 Gastrointestinal Hormones: Five studies reported motilin, one reported gastrin, five reported substance P, one reported vasoactive intestinal peptide, and one reported nitric oxide. High heterogeneity necessitated random-effects models. The meta-analysis showed that the experimental group increased serum motilin (SMD=1.67, 95%CI=1.11~2.23, P<0.01), gastrin (SMD=0.95, 95%CI=0.58~1.33, P<0.01), substance P (SMD=1.74, 95%CI=1.16~2.32, P<0.01), and vasoactive intestinal peptide (SMD=4.20, 95%CI=3.49~4.91, P<0.01), while decreasing nitric oxide (SMD=-2.20, 95%CI=-2.64~-1.75, P<0.01) [Figure 7: see original paper].

2.4.4 Adverse Events: Adverse events were reported in 15 studies. Low heterogeneity (I^2=0, P=0.80) allowed use of a fixed-effects model. The meta-analysis revealed that the experimental group had significantly lower adverse event rates than the control group (RR=0.53, 95%CI=0.35~0.80, P<0.01) [Figure 8: see original paper].

2.4.5 Recurrence Rate: Five studies reported constipation recurrence. Low heterogeneity (I^2=0, P=0.63) permitted a fixed-effects model analysis, showing the experimental group had lower recurrence rates (RR=0.31, 95%CI=0.18~0.53, P<0.01) [Figure 9: see original paper].

2.5 Trial Sequential Analysis

TSA for total clinical effectiveness was performed using TSA 0.9.5.10 beta software, with two-sided type I error probability α=0.05 and type II error probability β=0.20. The required information size (RIS) was set based on sample size, with relative risk reduction and control group event rates determined from the meta-analysis. The cumulative Z-curve crossed the conventional boundary after inclusion of the second study and the TSA boundary after the fourth study, indicating that Shouhui Tongbian Capsule improves total effectiveness in constipation treatment with conclusions free from false positives [Figure 10: see original paper]. Penalized statistical analysis confirmed these findings, with the penalized Z-curve exceeding the conventional boundary (Z=1.96) [Figure 11: see original paper].

2.6 GRADE Evidence Quality Assessment

GRADE assessment indicated moderate-quality evidence for total clinical effectiveness and adverse events, and low-quality evidence for clinical symptom scores, gastrointestinal hormones, and recurrence rates. Downgrading factors included risk of bias from inadequate allocation concealment and blinding, substantial heterogeneity across studies, and small sample sizes .

Discussion

Constipation is a common functional gastrointestinal disorder that severely impacts quality of life and is associated with colorectal cancer, cardiovascular disease, and Alzheimer' s disease. With population aging and lifestyle changes, its incidence continues to rise. While conventional medications provide short-term relief, they often cause drug resistance and serious adverse effects including abdominal pain, diarrhea, hypotension, renal failure, and melanosis coli. Non-pharmacological approaches such as biofeedback, dietary modification, and surgery suffer from unstable efficacy, high costs, and poor compliance, making them unsuitable for long-term management. Consequently, developing novel constipation treatments is urgently needed. In contrast, TCM, particularly compound herbal formulas with multi-target mechanisms, demonstrates significant clinical advantages. TCM theory recognizes complex pathogenesis involving multiple organ systems, emphasizing holistic regulation and syndrome-based treatment.

Recent research reveals that Shouhui Tongbian Capsule exerts therapeutic effects through multi-level, multi-target mechanisms centered on gut microbiota regulation, combined with multi-dimensional metabolic modulation and anti-inflammatory protection, providing new perspectives for chronic constipation treatment. This study followed Cochrane systematic review guidelines to comprehensively analyze 19 RCTs evaluating Shouhui Tongbian Capsule' s efficacy

and safety. Meta-analysis results demonstrated superior total effectiveness compared to controls, with improvements in core constipation symptoms including increased defecation frequency, shortened time to first defecation, and improved stool characteristics. Subgroup analyses explored efficacy heterogeneity across constipation types, intervention methods, dosages, and treatment durations, revealing consistent therapeutic effects across all subgroups. This stability supports clinical applicability in various scenarios and provides a reliable basis for individualized treatment. TSA further confirmed the robustness of these clinical efficacy findings.

Regarding gastrointestinal hormone modulation, Shouhui Tongbian Capsule increased serum motilin, gastrin, substance P, and vasoactive intestinal peptide while decreasing nitric oxide. These hormones play crucial roles in constipation pathophysiology by regulating gastrointestinal motility, secretion, and barrier function. Motilin and gastrin enhance smooth muscle contraction and promote intestinal transit, playing central roles in restoring bowel function. Research suggests the capsule upregulates the c-Kit/SCF signaling pathway, improves interstitial cell function, enhances smooth muscle motility, and stimulates hormone secretion. Additionally, it activates PI3K/Akt pathways and tricarboxylic acid cycle-related metabolic pathways, boosting cellular energy metabolism and gastrointestinal motility to promote hormonal regulation.

In safety comparisons, Shouhui Tongbian Capsule showed no higher adverse event rates than controls, demonstrating favorable clinical safety. Compared to Western medications that may cause bloating, nausea, and diarrhea, the capsule exhibited lower adverse event rates, mostly mild and reversible. This characteristic is particularly important for chronic functional constipation requiring long-term or lifelong management, as treatment tolerance and compliance are key determinants of efficacy. The low-risk profile enhances patient compliance and clinical applicability.

During literature review, we identified one previous systematic review on Shouhui Tongbian Capsule for chronic constipation. Our study offers several advancements: (1) We included 19 RCTs (1,821 participants) versus only 3 RCTs in the previous review, substantially enhancing statistical power. (2) Our outcome measures were more comprehensive and standardized, including not only total effectiveness but also core indicators such as defecation frequency, difficulty, recurrence, and adverse events, with subgroup and sensitivity analyses for greater persuasiveness. (3) We conducted detailed subgroup analyses exploring effects of different intervention methods, constipation types, dosages, and treatment durations, providing new evidence for individualized therapy. (4) We analyzed the capsule' s regulatory effects on gastrointestinal hormones, revealing multi-target biological advantages that provide clearer mechanistic support and suggest potential applications in functional constipation and related motility disorders. (5) We employed TSA and GRADE assessment to validate result robustness from statistical and evidence-based perspectives—methods not used in previous reviews.

Despite these strengths, limitations remain: (1) Methodologically, some studies inadequately reported randomization and blinding details, potentially affecting reliability. Most studies originated from mainland China, limiting regional representativeness. (2) Although meta-analysis showed low adverse event rates, long-term safety in special populations (elderly, chronic disease patients, postoperative constipation, chemotherapy-related constipation) requires further investigation. (3) Heterogeneity challenges persist, including inconsistent diagnostic criteria for functional constipation (Rome IV vs. TCM principles) and variable efficacy assessment indicators, potentially affecting result robustness and generalizability. (4) Most studies had 4-8 week treatment periods without long-term follow-up, insufficient for chronic recurrent constipation. Evidence suggests potential symptom recurrence or dependence after discontinuation, necessitating long-term follow-up studies to assess sustained efficacy and safety. (5) Sample representativeness is limited, as most studies focused on middle-aged and elderly women, lacking data on male and younger patients.

Future research should focus on: (1) Designing high-quality RCTs following international standards, optimizing randomization and blinding, and standardizing outcome measures encompassing both subjective symptoms and objective indicators such as intestinal motility tests and stool form scales to enhance scientific rigor and comparability. (2) Strengthening long-term efficacy and safety research, particularly assessing symptom recurrence after discontinuation and long-term tolerance and safety issues. Studies should include both treatment and follow-up phases, exploring different management strategies such as intermittent therapy or combination regimens. (3) Investigating mechanisms of action using modern omics technologies to systematically analyze target pathways of core components in humans, focusing on gut microbiota, brain-gut axis, and neuroendocrine regulation. (4) Conducting head-to-head RCTs comparing Shouhui Tongbian Capsule with mainstream medications (Western drugs like polyethylene glycol and lactulose; Chinese formulas like Mazirenwan) using standardized outcomes (Bristol stool scale, intestinal transit time) across diverse populations (European, American, African cohorts) to validate cross-cultural applicability and facilitate transformation from "regional experience" to "global evidence." (5) Health economic evaluations should quantify cost-effectiveness ratios to provide scientific evidence for long-term use and insurance coverage, expanding clinical application potential.

In conclusion, Shouhui Tongbian Capsule, as a TCM-based compound formulation, demonstrates favorable efficacy and safety in treating functional constipation. This systematic review further validates its significant effects on improving clinical effectiveness, alleviating constipation symptoms, regulating gastrointestinal hormones, and reducing recurrence rates, with low adverse event rates. However, future research requires high-quality RCTs, long-term efficacy and safety assessments, mechanistic exploration, and investigation of applications across different constipation types and populations to clarify its clinical value and advance TCM modernization. Integration of biomarkers and clinical mechanism validation, particularly exploring long-term mechanisms, may

provide deeper understanding and support for its application in chronic constipation treatment.

Author Contributions

YAN Keqiu contributed to conceptualization, study design, literature collection, data curation, and manuscript writing. LIN Aizhen supervised manuscript revision, quality control, and overall responsibility. ZHANG Xiaoyu, XIAO Wenjie, BAO Xinkun, and SUN Guangjun contributed to table editing and data organization.

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