



Efficacy and safety of acupuncture therapy for psoriasis: an overview of systematic reviews

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Background: Acupuncture therapy is a method of piercing needles into acupoints to treat diseases with/without corresponding manipulations, which could serve as a useful supplementary therapy for psoriasis. The present study aimed to outline and sum up current evidence from systematic reviews (SRs)/meta-analyses (MAs) that investigate the clinical efficacy of acupuncture on psoriasis.

Methods: A comprehensive search involving eight electronic databases was conducted from the date of inception to July 2021, and grey literatures were manually searched. The research was selected according to prespecified inclusion criteria and relevant data were obtained. The methodological quality of the included SRs was scrutinized using the Assessing the Methodological Quality of Systematic Reviews 2 (AMSTAR-2) tool. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was used to appraise the reporting quality of the included SRs. Risk of Bias in Systematic Reviews (ROBIS) was selected for the evaluation of bias risk of the included SRs. Grading of Recommendations Assessment, Development, and Evaluation (GRADE) was applied to determine the quality of evidence from primary outcome measures.

Results: After screening, seven SRs/MAs met the inclusion criteria, including two English and five Chinese articles. All of the SRs were published between 2015 and 2020. Based on AMSTAR-2, the quality of all SRs was rated as dangerously low. Using the PRISMA-A checklist, major reporting flaws were observed in the financial statements, protocols, and registrations of the included literature. According to the ROBIS tool, two SRs/MAs were classed as low bias risk. Using the GRADE tool, this review contained 27 outcomes, with only one being classified as high-quality evidence, seven moderate-quality evidences, and 19 as low-quality evidence. The present research results advocated acupuncture therapy as a supplementary treatment for psoriasis patients; however, the evidence should still be treated with caution due to certain limitations.

Conclusions: Our overview suggests that acupuncture could be used as a complementary therapy to produce effective clinical result for psoriasis. Nonetheless, considering the poor quality of SRs/MAs that advocate these findings, studies with more rigorous design, larger populations samples and of higher quality are called for to provide stronger evidence for definitive conclusions.

Keywords: Acupuncture; psoriasis; overview; systematic reviews (SRs); therapy

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Introduction

Psoriasis is a chronic inflammatory skin disease mediated by the immune system, and its clinical hallmarks are well-defined, erythematous plaques covered by silvery-white scales, typically appearing symmetrically on the elbows, knees, trunk, and scalp with or without pruritus (1,2). Globally, the prevalence of psoriasis is approximately 2%, however this varies from region to region (3,4). Its prevalence is lower in Asian and some African populations, but is as high as 11% in Caucasian and Scandinavian populations (4-7). The factors influencing the progression of psoriasis include intrinsic (such as obesity, diabetes mellitus, dyslipidemia, hypertension, and mental stress) and extrinsic risk factors (such as air pollutants, UV exposure, mechanical stress, drugs, vaccination, infection, and individual lifestyle) (8). Psoriasis has a long course of disease with a high relapse rate, leading to a major decline in quality of life (QoL). The goal of treatment is to reduce disease severity and improve the QOL of patients (9).

The specific treatment approach for psoriasis is dependent on disease severity, comorbidities, and access to health care. Patients with psoriasis are often classified into mild or moderate to severe based on the extent of clinical manifestation, the percentage of total body surface affected, and the impact on QOL (10). Topical therapy is the standard of care for treating mild to moderate disease. Mild psoriasis can be treated topically with corticosteroids (11). Vitamin D analogues are the first choice for the treatment of plaque psoriasis and moderate to severe scalp psoriasis (12). Evidence has shown that calcipotriol combined with betamethasone propionate is more effective than either monotherapy alone in the treatment of psoriasis (13). Systemic treatment, such as phototherapy, methotrexate, cyclosporine, and acitretin, is usually preferred for moderate to severe psoriasis when topical agents do not take effect; and methotrexate can be also used for psoriatic arthritis (12,14,15). If traditional treatment is ineffective, biological agents are an effective treatment (16). However, most of these treatments have significant side effects (17,18) and high financial costs that limit their long-term use. Therefore, some clinicians and researchers have been looking for better treatments. Acupuncture therapy is considered as a characteristic traditional Chinese medicine therapy, which has been widely adopted in treating psoriasis in recent years. In particular, fire acupuncture has significant therapeutic effect on psoriasis with less side effects and low recurrence rate.

In short, acupuncture therapy has good clinical efficacy and low incidence of adverse reactions, and it is an ideal method for the treatment of psoriasis. The innovation of this paper is to reorganize the latest literatures and include the relevant literatures of fire acupuncture in the treatment of psoriasis for the first time, so as to make a comprehensive and systematic evaluation of acupuncture therapy for psoriasis, and evaluate the effectiveness and safety of acupuncture therapy for psoriasis.

Psoriasis is a common disease in dermatology with unknown etiology. Until now, there are no specific drugs and methods for psoriasis. Acupuncture can effectively reduce thickness, scales of the lesions and skin itching with fewer side effects, and its importance is being recognized increasingly. In recent years, a growing number of experts have realized the advantages of acupuncture in the treatment of psoriasis. The researcher used acupuncture at Back-shu points combined with surrounded needling at local skin lesions to treat psoriasis vulgaris in resting stage, and it produced superior overall curative effect compared to that of the control group of qingdai compound capsule combined with external caspotriol after 3 months of treatment (19). Acupuncture combined with moxibustion was used to treat psoriasis, and the control group took acitretin capsule orally (20). After 12 weeks, it was found that the overall effective rate was 95% in the acupuncture and moxibustion group but 80% in the control group. There were no adverse reactions in the group of acupuncture combined with moxibustion, and 31 of the 40 patients in the control group had tolerable adverse reactions. Psoriasis with blood heat syndrome was treated with Tripterygium Glycosides Tablets combined with blood-letting therapy, and the control group was given Tripterygium Glycosides Tablets (21). The results showed that the total effective rate in the treatment group was 66.67%, on the other hand, that of the control group was only 50.00% ($P < 0.05$). The clinical observation of fire acupuncture combined with cotton moxibustion was carried out on patients with plaque psoriasis (22). After eight weeks of clinical treatment, the PASI score and DLQI score of patients were significantly lower than those before treatment. All in all, acupuncture therapy provides a promising choice for the clinical treatment of psoriasis.

Acupuncture belongs to a broad family of clinical techniques, producing therapeutic effects by stimulating acupoints (23). Acupuncture has been used in China for more than 2,000 years (24), and has been widely recognized in the USA and other parts of the Western world (25). At present, acupuncture therapy is mostly used as an

adjuvant therapy to treat psoriasis, especially in the adjuvant treatment of psoriasis with traditional Chinese medicine. The study found that acupuncture and moxibustion combined with Liangxue Xiaoyin Decoction can significantly improve the T-lymphocyte subsets and Th1/Th2 levels in peripheral blood of erythroderma psoriasis patients (26). A combination of Huoxue Jiedu decoction with fire acupuncture was utilized to treat patients with blood-stasis psoriasis for 8 weeks, and the control group was only treated with Huoxue Jiedu Decoction for 8 weeks (27). The total effective rate in the study group was 88.68%, which was notably higher than 71.7% in the control group. Another study used Liangxue Xiaofeng Decoction combined with fire acupuncture to treat psoriasis vulgaris, while the control group used Liangxue Xiaofeng Decoction to treat psoriasis vulgaris (28). The results showed that both groups could reduce PASI score, and the experimental group was lower than the control group. At present, there are still some problems in acupuncture therapy. For example, there is no unified standard for the operation of fire acupuncture and the selection of needle tools. Therefore, acupuncture-assisted traditional Chinese medicine is better than acupuncture alone in the treatment of psoriasis.

Most noteworthy, the research on the mechanism of acupuncture and moxibustion in psoriasis treatment is constantly expanding. T cell-mediated immune response is the main factor promoting and leading to psoriasis (29). The study found that the proportion of CD4/CD8 in psoriatic lesions was higher than that in blood, suggesting that CD4 T cells were relatively increased, and the natural regression of psoriatic drip lesions was significantly related to the decrease of CD4 T cells and the intervention of CD8 T cells (30). Acupuncture therapy can significantly adjust the ratio of CD4/CD8, promote the transformation of CD4 to CD8, and reduce the release of CD4 T cell related cytokines (31). Neuropeptides and sensory nerve have crucial roles in the pathogenesis of psoriasis, and acupuncture therapy can regulate nerve excitability and neuropeptide level by regulating the release of a variety of neurotransmitters (acetylcholine, etc.) (32). In addition, acupuncture therapy can directly affect the local vascular system, inhibit the increase of vascular permeability in the process of inflammation, and reduce the local infiltration of inflammatory substances, so as to achieve the purpose of treating psoriasis (33). HSP has the effect of stress protection, and the expression of HSP27 and HSP70 disappears in the psoriatic epidermis (34,35). An experiment

also found that acupuncture and moxibustion can increase the expression of HSP70 mRNA and the content of HSP70 in local tissues (33).

All in all, acupuncture is an effective, safe, simple, economical, and easy to use for treating psoriasis, with a long-term action on the control of psoriasis symptoms, and has few side effects or toxicities (36). Therefore, acupuncture paratherapy has been widely accepted for psoriasis treatment by physicians who wish to minimize the side effects brought by medication while maximizing its therapeutic effect. In recent years, an increasing number of systematic reviews (SRs) have been carried out to evaluate the potential therapeutic benefits of acupuncture for psoriasis; however, their conclusions are questionable due to the quality of primary studies or methodological flaws. A systematic overview of SRs/meta-analyses (MAs) is a rather novel research method for combining the outcomes from multiple SRs/MAs, assessing their quality and aiming to resolve inconsistencies. Thus, the present overview is aimed at investigating the scientific quality of relevant SRs/MAs with regard to the clinical application of acupuncture in psoriasis treatment from a critical perspective.

Methods

Studies searches

We performed an electronic literature search in eight databases, including China National Knowledge Infrastructure (CNKI), Chinese Biomedical Databases (CBM), Wanfang Databases, VIP Journals Database, PubMed, Cochrane Library, Embase, and the Web of Science from the dates of their inception to July 2021. The following search terms were used: “psoriasis”, “acupuncture”, “acupuncture therapy”, “needle”, “needling”, “medicine, East Asian Traditional”, “acupressure”, “acupoint*”, “electro-acupuncture”, “electroacupuncture”, “moxibust*”, “meridian*”, “traditional oriental medicine”, “traditional Chinese medicine”, “SR”, “systematic review”, “systematic assessment”, “systematic evaluation”, “meta-analysis*”, and “Cochrane review”.

Inclusion criteria

Types of reviews

SRs with or without MA of randomized controlled trials (RCTs) in which acupuncture therapy was adopted to treat psoriasis were included. Repetitive papers, graduation

dissertations, and SRs/MAs that lacked rigorosity were not included.

Types of participants

Participants must have been diagnosed with psoriasis according to any international or national diagnostic guidelines. Patients' age, gender, ethnicity, the length and stage of the disease were not restricted.

Types of interventions

The intervention group included acupuncture therapy alone, as well as of a combination of fire needle therapy and other medications. For example, acupuncture therapy and acupuncture therapy plus oral/external Chinese medicine or plus oral/external Western medicine.

Types of comparators

The control groups received oral/external Chinese medicine or oral/external Western medicine, and sham-acupuncture.

Types of outcomes

The severity and area of lesions in psoriasis patients are commonly evaluated by Psoriasis Area and Severity Index (PASI). Evaluation of the therapeutic results of acupuncture therapy in psoriasis treatment was mainly based on the curative rate, markedly effective rate, and improved rate of PASI. The secondary outcome indicators of the research included Traditional Chinese Medicine (TCM) syndrome score, QOL score, Hamilton Anxiety Scale (HAM-A) score, the incidence of adverse events, and the relapse rate. Moreover, we also summarized and analyzed the changes of inflammatory cells and cytokines to provide evidence for the study of its mechanism.

Exclusion criteria

Literatures were excluded according to the following criteria: (I) the diagnostic criteria for psoriasis mentioned above were not used; (II) non-SR/MA; (III) duplicated publication or review comments; (IV) non-Chinese or English literatures; and (V) studies that did not include the full text.

Data extraction

All studies were read by two independent authors. According to the predefined criteria, the two authors also

validated and extracted data from the studies. During the data extraction process, disagreements were settled by discussions with a third investigator.

Quality assessment

Methodological, reporting, and evidence quality, along with risks of bias were assessed by two independent authors using the Assessing the Methodological Quality of Systematic Reviews 2 (AMSTAR-2) tool (37), the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)-A statements (38), the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system (39), and the Risk of Bias in Systematic Reviews (ROBIS) tool (40), respectively. Conflicting opinions were resolved through consulting a third investigator.

- (I) The AMSTAR-2 tool (37) was applied to evaluate the methodological quality of the included SRs. There were 16 items on the checklist, including 7 critical items (items 2, 4, 7, 9, 11, 13, and 15) used to evaluate the validity of SRs included. Each item within the AMSTAR-2 tool was answered with a “yes” (a positive result), a “partial yes” (partial adherence to the standard), or a “no” (absence of information for assessing an item), based on the level of adherence to the standard. After evaluating the defects found in all items, the general quality of work was divided into “high”, “moderate”, “low”, or “critically low”.
- (II) The PRISMA-A statements (38) published in 2019 is an extension of PRISMA and specifically used for acupuncture that contains a checklist of 27-item and a four-phase flow diagram, which aims to guide authors on improving the reporting quality of SRs regarding acupuncture intervention. It covers a total of seven aspects of SRs, including titles, abstracts, introductions, methodology, results, discussions, and funding. Each item was answered with “yes”, “no”, and “not applicable”, and the completion of each item was expressed as a ratio.
- (III) The ROBIS tool (39) is commonly used by researchers to scrutinize the level of bias in an SR across four domains of two phases (“study eligibility criteria”, “identification and selection of studies”, “data collection and study appraisal”, and “synthesis and findings”). Finally, the results were classed as

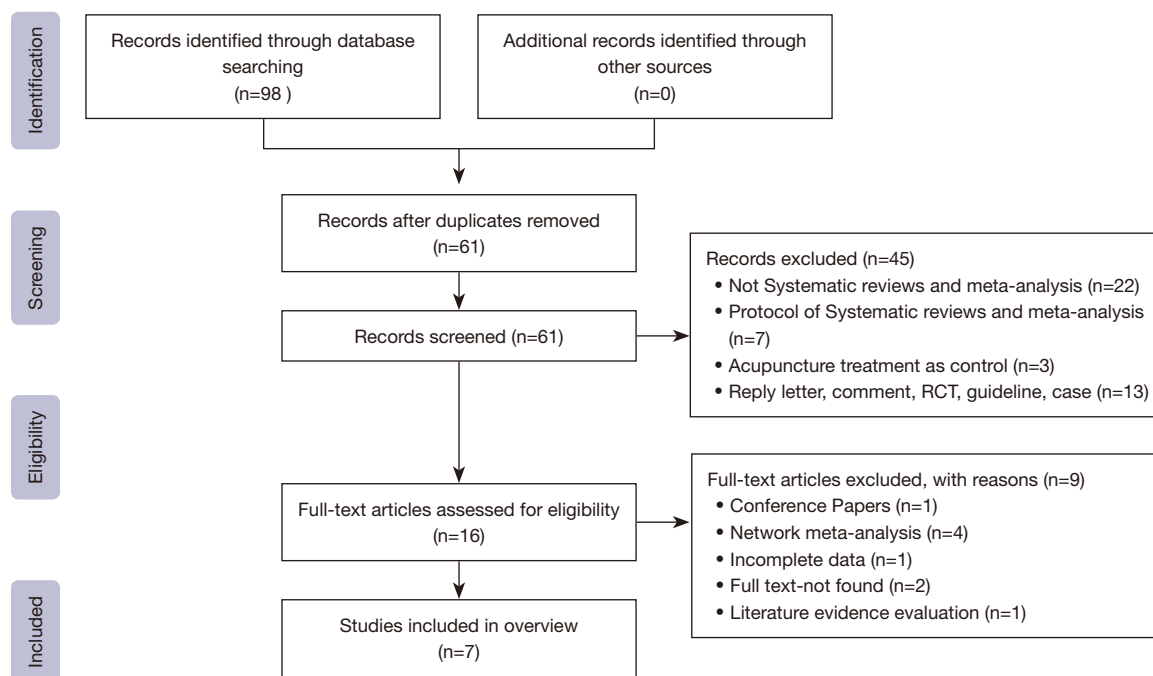


Figure 1 PRISMA flow chart of the study selection process.

having low, high, or unclear risk.

- (IV) The GRADE system (41,42) uses four grading levels: very low, low, moderate, and high. The initial grading was based on five aspects: study limitations, indirectness of evidence, inconsistent results, lack of precision, and reporting bias.

Statistical analysis

This paper summarizes the data of the included systematic review (SRs)/meta-analysis (MAs), so a descriptive analysis is carried out.

Results

Description of the screening process

According to the search strategy, we searched eight databases, and a total of 98 studies were selected. Thirty-seven duplicates were removed by EndNote (version X9, Clarivate Analytics) reference management software. Forty-five studies were excluded after title/abstract screening. Eventually, seven SR/MAs were included in the present overview after full-texts inspection (43-49). The entire screening and process of selection is depicted in *Figure 1*.

Characteristics of SRs

A total of 79 RCTs and 6,773 patients were included among the seven SR/MAs, and the data extracted are shown in *Table 1*. All of these SRs were published between 2015 and 2020, including two English articles and five Chinese literatures. All included literatures assessed the clinical efficacy of acupuncture therapy in psoriasis vulgaris treatment. Acupuncture therapy was prescribed in the treatment group, while the control group received oral/external Chinese medicine or oral/external Western medicine and sham-acupuncture group. The number of RCTs in the included literatures ranged between 6 and 17. For the evaluation of literature quality, the Jadad score was used in one SR (47), and the rest were evaluated in accordance with Cochrane Collaboration Risk of Bias Tool (43-46,48,49). Sensitivity analysis was used in three studies (44,47,48) and subgroup analysis was used in five studies (43-45,47,48). All SRs/MAs showed the efficiency of acupuncture therapy in treating psoriasis.

Methodological quality of included SRs

Table 2 present an overview of methodological quality of the SRs included. The AMSTAR-2 instrument was used for the

Table 1 Basic information of the included studies

The presenting author and publication year	Research design	No. of study [patient]	Interventional approach	Control	Outcomes	Assessing the methodological quality	Was a meta analysis carried out?	Sensitivity/ subgroup analysis	Results
Meaghan Coyle [2015]	RCT	6 [522]	Acupuncture therapies (either on its own or combined with other TCM approaches, including point stimulation)	No treatment, sham acupuncture, or Western medicines	PASI score, health-related quality of life, relapse rate, and adverse events	Cochrane risk of bias tool	Yes	No/yes	Effective
Liu Liu [2021]	RCT	16 [1,267]	Fire acupuncture, fire needle therapy plus oral/external Chinese medicine or plus oral/external Western medicine	TCM and oral/external Chinese medicine or oral/external Western medicine	PASI, TCM syndrome scores, incidence of adverse events, quality of life score, HAM-A score, recurrence rate, changes of inflammatory cells and cytokines	Cochrane risk-of-bias tool	Yes	Yes/yes	Effective
Yuhua Huang [2019]	RCT	6 [527]	Bleeding combined with electroacupuncture	Conventional therapy	PASI, effective rate	Cochrane risk-of-bias tool	Yes	No/yes	Effective
Meihong Li [2020]	RCT	12 [1,088]	Fire acupuncture or combined with other conventional therapy	TCM, Western medicine, placebo treatment	PASI, TCM syndrome scores	Cochrane risk-of-bias tool	Yes	No/no	Effective
Xingxing Wang [2019]	RCT	17 [1,607]	Fire acupuncture combined with TCM or Western medicine	Western medicine	PASI, recurrence rates, adverse reactions, effective rate	Jadad score	Yes	Yes/yes	Effective
Ran Sun [2015]	RCT	13 [1,293]	Acupuncture and moxibustion therapy	Western medicine or placebo acupuncture	PASI, DLQI score, Npt score, adverse reactions, effective rate, TCM syndrome scores	Cochrane risk-of-bias tool	Yes	Yes/yes	Effective
Jiahua Zou [2020]	RCT	9 [469]	Acupuncture and moxibustion therapy	Conventional therapy	PASI, adverse reactions (itchy/cutaneous desquamation, dry mouth), effective rate, treatment cure rate	Cochrane risk-of-bias tool	Yes	No/no	Effective

RCT, randomized controlled trial; PASI, Psoriasis Area Severity Index; DLQI, dermatological quality of life indicators; CM, Chinese medicine; TCM, traditional Chinese medicine; HAM-A, Hamilton Anxiety Rating Scale; Npt, Neopterin.

Table 2 Results of the AMSTAR-2 assessments (37)

Item	Meaghan Coyle [2015]	Liu Liu [2021]	Yuhua Huang [2019]	Meihong Li [2020]	Xingxing Wang [2019]	Ran Sun [2015]	Jiahua Zou [2020]
1. Did the research questions and inclusion criteria for the review include the components of PICO?	Y	Y	Y	Y	Y	Y	Y
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	N	N	N	N	N	N	N
3. Did the review authors explain their selection of the study designs for inclusion in the review?	Y	Y	Y	Y	Y	Y	Y
4. Did the review authors use a comprehensive literature search strategy?	PY	Y	PY	Y	PY	Y	Y
5. Did the review authors perform study selection in duplicate?	Y	Y	N	PY	Y	Y	Y
6. Did the review authors perform data extraction in duplicate?	Y	Y	PY	Y	Y	Y	Y
7. Did the review authors provide a list of excluded studies and justify the exclusions?	N	N	N	N	N	Y	N
8. Did the review authors describe the included studies in adequate detail?	Y	Y	Y	Y	Y	Y	Y
9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review?	Y	Y	Y	Y	Y	Y	Y
10. Did the review authors report on the sources of funding of studies included in the review?	Y	N	N	Y	Y	N	Y
11. If meta-analysis was performed, did the review authors use appropriate methods for the statistical combination of results?	Y	Y	Y	Y	Y	Y	Y
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	Y	Y	PY	Y	Y	Y	N
13. Did the review authors account for RoB in primary studies when interpreting/discussing the results of the review?	Y	Y	N	N	Y	Y	Y
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	N	Y	PY	PY	Y	Y	Y
15. If they performed quantitative synthesis, did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	Y	Y	N	N	Y	Y	Y
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	Y	Y	N	Y	Y	N	Y
Quality	CL	CL	CL	CL	CL	CL	CL

RoB, risk of bias; Y, yes; PY, partial yes; N, no; CL, critically low; L, low; H, high.

evaluation of methodological quality, which is developed from AMSTAR and contains 16 items. Items 2, 4, 7, 9, 11, 13, and 15 were used to critically evaluate the effectiveness of an SR. Considering that several critical items of the included SRs/MAs were not met, the final evaluation of methodological quality was critically low for seven SR/MAs.

Reporting quality of included SRs

The reporting quality of the included SRs using the PRISMA-A tool is summarized in *Table 3*. Generally, the reports were relatively comprehensive, but there were still some defects. In the “Methods” section, only one SRs/MAs (44) reported on the protocol and registration. Three SRs/MAs (44,47,48) presented detailed search, risk of bias across studies was presented in four SRs/MAs (44,47-49), and only two SRs/MAs (44,47) presented additional analyses. In the “Discussion” section, limitations were presented in four SRs/MAs (43,44,48,49). Funding information was presented in five SRs/MAs (43,44,46,47,49).

Risk of bias of included SRs

With the ROBIS, all SRs/MAs were evaluated to bear low risk of bias in phase 1, which evaluated the relevance of the research topic. Phase 2 had four domains. Assessing the eligibility criteria of studies in Domain 1, the risk of bias of six SRs/MAs (43,44,46-49) was low. Domain 2 investigated study identification and inclusion, four SRs/MAs (44,47-49) were at a low bias risk. Domain 3 investigated the gathering and appraisal, in which six SRs/MAs (43,44,46-49) were classed as low risk of bias. For Domain 4, which evaluated the combination and results, five SRs/MAs (43,44,46,47,49) were at a high bias risk. In Phase 3, the risk of bias was considered overall, and two SRs/MAs (44,48) had a low risk. *Table 4* presents more detailed information.

Evidence quality of included SRs

This review contains seven SRs/MAs involving 27 outcomes. There was one high-quality evidence, seven moderate-quality evidences, and 19 outcomes in low-quality evidence. Due to the elevated risk of bias, lack of precision, inconsistent results, and indirectness, the evidence was downgraded. More details are provided in *Tables 5,6*. In addition, there were 25 outcome indicators of acupuncture therapy, including effective rate (n=7) and PASI score (n=15),

50% of lesion reduction (n=1), and relapse rate (n=2). Among these, there were eight moderate-quality evidences, 17 low-quality evidences, and no high-quality evidence.

Efficacy of acupuncture for psoriasis

In the seven included SRs, the efficacy of acupuncture therapy in psoriasis treatment (acupuncture alone or acupuncture-based combination therapies) yielded superior results than the control treatments. The clinical efficacy of acupuncture therapy in psoriasis treatment was evaluated in five literatures, and it was considered to be effective: relative risk (RR) =1.20, 95% confidence interval (CI): 1.09–1.33, P=0.0002; RR =0.82, 95% CI: 0.71–0.95, P<0.006; odds ratio (OR) =2.42, 95% CI: 1.75–3.35, P<0.01; OR =3.06, 95% CI: 2.19–4.28, P<0.001; OR =2.63, 95% CI: 1.62–4.28, P<0.0001 (44-47,49). Four SRs/MAs (44,45,47,49) showed that acupuncture treatment of psoriasis could reduce the PASI score [mean difference (MD) =-1.32, 95% CI: -2.19 to -0.44, P=0.003; MD =0.97, 95% CI: 0.44–1.51, P<0.0004; weighted mean difference (WMD) =-2.65, 95% CI: -3.92 to -1.37, P<0.001; MD =-1.49, 95% CI: -2.16 to -0.83, P<0.0001]. One SRs/MAs (44) showed that fire needle did not significantly improve the QOL of patients (MD =-0.44, 95% CI: -1.11 to 0.24, P=0.21), but could significantly reduce the TCM syndrome score (MD =-0.72, 95% CI: -1.15 to -0.28, P=0.001), and did not reduce anxiety in patients with psoriasis by HAM-A score (MD =-0.16, 95% CI: -0.98 to 0.67, P=0.71). Two SRs/MAs (44,47) evaluated the relapse rate and found that it was low (RR =0.48, 95% CI: 0.29–0.80, P=0.005; OR =0.32, 95% CI: 0.17–0.60, P<0.05).

Simultaneously, in view of the numerous operation methods of acupuncture treatment, we also conducted a subgroup analysis. When the acupuncture group was compared with the oral Western medicine group, one SRs/MAs (43) considered that there was a lack of statistical difference in improving Psoriasis Area and Severity Index assessment of 60% reductions (PASI 60), while another SRs/MAs (48) believed that there was a statistical difference in improving the PASI score, and thus, further investigation is needed in the future. When the electroacupuncture group was compared with control group that received sham-acupuncture, one study (43) did not discover any significant difference in the PASI score between the two groups, and another study (48) reported that there was a lack of significant difference in the effective rate and PASI score between the two groups. When the electroacupuncture

Table 3 PRISMA-A results (38)

Section/topic	Items	Meaghan Coyle [2015]	Liu Liu [2021]	Yuhua Huang [2019]	Meihong Li [2020]	Xingxing Wang [2019]	Ran Sun [2015]	Jiahua Zou [2020]
Title	1. Title	Y	Y	Y	Y	Y	Y	Y
Abstract	2. Structured summary	Y	Y	Y	Y	Y	Y	Y
Introduction	3. Rationale	Y	Y	Y	Y	Y	Y	Y
	4. Objectives	Y	Y	Y	Y	Y	Y	Y
Methods	5. Protocol and registration	N	Y	N	N	N	N	N
	6. Eligibility criteria	Y	Y	Y	Y	Y	Y	Y
	7. Information sources	PY	Y	PY	Y	PY	Y	Y
	8. Search	N	Y	PY	PY	Y	Y	PY
	9. Study selection	Y	Y	Y	Y	Y	Y	Y
	10. Data collection process	Y	Y	Y	Y	Y	Y	Y
	11. Data items	Y	Y	Y	Y	Y	Y	Y
	12. Risk of bias in individual studies	Y	Y	Y	Y	Y	Y	Y
	13. Summary measures	Y	Y	Y	Y	Y	Y	Y
	14. Synthesis of results	Y	Y	Y	Y	Y	Y	Y
	15. Risk of bias across studies	N	Y	N	N	Y	Y	PY
	16. Additional analyses	PY	Y	PY	PY	Y	PY	N
Results	17. Study selection	Y	Y	Y	Y	Y	Y	Y
	18. Study characteristics	Y	Y	Y	Y	Y	Y	PY
	19. Risk of bias within studies	Y	Y	N	Y	Y	Y	Y
	20. Results of individual studies	Y	Y	N	N	Y	Y	Y
	21. Synthesis of results	Y	Y	Y	Y	Y	Y	Y
	22. Risk of bias across studies	Y	Y	N	Y	PY	Y	Y
	23. Additional analysis	Y	PY	N	PY	N	N	N
Discussion	24. Summary of evidence	Y	Y	Y	Y	Y	Y	Y
	25. Limitations	Y	Y	PY	PY	N	Y	Y
	26. Conclusions	Y	Y	Y	Y	Y	Y	Y
Funding	27. Funding	Y	Y	N	Y	Y	N	Y

Y, yes; PY, partial yes; N, no.

Table 4 Results of the ROBIS assessment (40)

References	Phase 2				Phase 3
	Domain 1. study eligibility criteria	Domain 2. identification and selection of studies	Domain 3. data collection and study appraisal	Domain 4. synthesis and findings	Risk of bias in the review
Meaghan Coyle [2015]	☺	☹	☺	☺	☹
Liu Liu [2021]	☺	☺	☺	☺	☺
Yuhua Huang [2019]	☹	?	☹	☹	☹
Meihong Li [2020]	☺	☹	☺	☺	☹
Xingxing Wang [2019]	☺	☺	☺	☺	☹
Ran Sun [2015]	☺	☺	☺	☹	☺
Jiahua Zou [2020]	☺	☺	☺	☺	☹

☺, low risk; ☹, high risk; ?, unclear risk.

group was compared with oral Western medicine group, one SRs/MAs (48) implied that electroacupuncture produced more effective outcome than Western medicine in treating psoriasis (RR =1.13, 95% CI: 1.02–1.26, P=0.02) and improving the PASI score (standardised mean difference (SMD) =-0.35, 95% CI: -0.64 to -0.06, P=0.02). When bloodletting plus cupping was compared with tazarotene, one SRs/MAs (43) found that there were significant differences in the PASI score (MD =-0.54, 95% CI: -1.01 to -0.07) and relapse rate (RR =0.23, 95% CI: 0.05–0.99) between the two groups, and another SRs/MAs (49) had the same conclusion (effective rate, RR =1.10, 95% CI: 1.01–1.21, P=0.03; PASI score, SMD =-0.21, 95% CI: -0.39 to -0.03, P=0.02). eOne SRs/MAs (44) confirmed that fire needle could improve the overall effect for psoriasis (RR =1.20, 95% CI: 1.09–1.33, P=0.0002), in which fire needle plus oral medications was more effective than oral medications without fire needle (RR =1.35, 95% CI: 1.16–1.57, P=0.0001). Furthermore, compared oral medications plus topical medications, the risk of PASI score increase is lower after fire needle combined with internal and external medications (MD =-0.53, 95% CI: -0.72 to -0.33, P=0.00001). Another SRs/MAs (47) analyzed fire needle combined therapy. When fire needle plus oral Western medicine was compared with oral Western medicine, there was a statistical difference in the PASI score (WMD =-1.05, 95% CI: -2.53 to -0.47, P<0.05); a statistical difference in PASI score (WMD =-2.17, 95% CI: -5.99 to 1.65, P=0.26) was discovered when the use of oral Chinese medicine alone was compared with its combined use with fire needle; when fire needle combined with oral Chinese medicine

was compared with oral Western medicine, there was a statistical difference in the PASI score (WMD =-1.12, 95% CI: -2.11 to -0.13, P=0.03); when fire needle incorporated with oral Chinese medicine plus oral Western medicine was compared with oral Western medicine, there was a statistical difference in the PASI score (WMD =-1.87, 95% CI: -2.59 to -1.15, P<0.0001). More details are provided in *Table 5*.

Safety of acupuncture for psoriasis

Among the seven included SRs/MAs, five evaluated the adverse events of acupuncture in psoriasis treatment (43,44,47-49). One SRs/MAs (43) found no adverse events in the acupuncture group, while dry skin, desquamation, pruritus, etc. all occurred in the control group. Another SRs/MAs (44) reported that adverse events of the fire needle group were comparable to that of the control (RR =0.67; 95% CI: 0.28–1.63, P=0.38), and the control group had a high incidence of anaphylaxis (RR =0.21; 95% CI: 0.05–0.95, P=0.04). The remaining three SRs/MAs (47-49) showed that the likelihood of adverse events was low in the acupuncture group, with statistical significance (OR =0.54, 95% CI: 0.32–0.93, P<0.05; OR =0.09, 95% CI: 0.04–0.20, P<0.00001; OR =0.06, 95% CI: 0.01–0.46, P=0.007).

Discussion

Summary of evidence

The present paper is the first overview of SRs that investigated the efficacy and safety of acupuncture

Table 5 Evidence quality results

References	Outcomes	Risk of bias	Certainty assessment					P value	Relative effect (95% CI)	Certainty
			Inconsistency	Indirectness	Imprecision	Other considerations				
Liu Liu [2021]	Overall effect [13]	Low risk	Significant	Significant	Not significant	None	0.0002	RR 1.20 (1.09 to 1.33)	Low:	
	PASI [10]	Low risk	Not significant	Not significant	Not significant	None	0.003	MD -1.32 (-2.19 to 0.44)	High:	
	TCM syndrome scores [6]	At risk	Not significant	Not significant	Significant	None	0.001	MD -0.72 (-1.15 to -0.28)	Low:	
	Adverse events [10]	Low risk	Significant	Not significant	Not significant	None	0.38	RR 0.67 (0.28 to 1.63)	Moderate:	
	Regarding anaphylaxis [4]	At risk	Not significant	Significant	Not significant	None	0.04	RR 0.21 (0.05 to 0.95)	Low:	
	QoL [4]	At risk	Not significant	Significant	Not significant	None	0.21	MD -0.44 (-1.11 to 0.24)	Low:	
	HARS [4]	At risk	Not significant	Not significant	Significant	None	0.71	MD -0.16 (-0.98 to 0.67)	Low:	
	Recurrence rate [2]	Low risk	Not significant	Significant	Not significant	None	0.005	RR 0.48 (0.29 to 0.80)	Moderate:	
	Inflammatory cells [4]	At risk	Not significant	Significant	Not significant	None	0.06	MD 0.46 (-0.02 to 0.94)	Low:	
	(CD)8+ T cells [4]	At risk	Not significant	Significant	Not significant	None	<0.00001	MD -4.30 (-5.70 to -2.90)	Low:	
	CD4+ T cells [4]	At risk	Not significant	Significant	Not significant	None	<0.00001	MD 8.90 (6.41 to 11.39)	Low:	
	Ratio of CD4+/CD8+ [4]	At risk	Not significant	Significant	Not significant	None	<0.00001	MD 0.52 (0.43 to 0.61)	Low:	
	Inflammatory cytokines	At risk	Not significant	Not significant	Not significant	None	0.13	MD -7.86 (-18.02 to 2.29)	Moderate:	
Yuhua Huang [2019]	Effective rate [6]	At risk	Not significant	Significant	Significant	None	<0.006	RR 0.82 (0.71 to 0.95)	Low:	
	PASI [3]	At risk	Not significant	Not significant	Significant	None	<0.0004	MD 0.97 (0.44 to 1.51)	Low:	
Meihong Li [2020]	Effective rate [12]	At risk	Significant	Not significant	Not significant	None	<0.01	OR 2.42 (1.75 to 3.35)	Low:	

Table 5 (continued)

Table 5 (continued)

References	Outcomes	Certainty assessment					Relative effect (95% CI)	P value	Certainty
		Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations			
Xingxing Wang [2019]	Effective rate [17]	Low risk	Not significant	Significant	Not significant	None	OR 3.06 (2.19 to 4.28)	<0.001	Moderate:
	PASI [17]	Low risk	Not significant	Significant	Not significant	None	WMD -2.65 (-3.92 to -1.37)	<0.001	Moderate:
Ran Sun [2015]	Recurrence rate [3]	At risk	Significant	Not significant	Not significant	None	OR 0.32 (0.17 to 0.60)	<0.05	Low:
	Adverse reactions [10]	At risk	Not significant	Significant	Not significant	None	OR 0.54 (0.32 to 0.93)	<0.05	Low:
Jiahua Zou [2020]	Adverse reactions [5]	At risk	Not significant	Not significant	Significant	None	OR 0.09 (0.04 to 0.20)	<0.00001	Low:
	Effective rate [8]	Low risk	Significant	Not significant	Not significant	None	OR 2.63 (1.62 to 4.28)	<0.0001	Moderate:
Jian Sun [2015]	Cure rate [5]	At risk	Not significant	Not significant	Significant	None	OR 2.96 (1.07 to 8.15)	0.04	Low:
	PASI [7]	Low risk	Significant	Not significant	Not significant	None	MD -1.49 (-2.16 to -0.83)	<0.0001	Moderate:
Jian Sun [2015]	Skin Itch [5]	At risk	Significant	Not significant	Significant	None	Not mentioned	>0.05	Low:
	Erythema [2]	At risk	Not significant	Significant	Not significant	None	OR 0.06 (0.01 to 0.46)	0.007	Low:
Jian Sun [2015]	Mouth dryness [2]	At risk	Not significant	Significant	Not significant	None	OR 0.03 (0.00 to 0.22)	0.0006	Low:

High, ; moderate, ; low, ; very low, . QoL, quality of life; OR, odds ratio; RR, relative risk; MD, mean difference; WMD, weighted mean difference; SMD, standardized mean difference.

Table 6 Detail results of evidence quality

References	Outcomes	Certainty assessment					Relative effect (95% CI)	P value	Certainty
		Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations			
Acupuncture plus moxibustion vs. Western medicine									
Meaghan Coyle [2015]	PASI60 [1]	Significant	Not significant	Significant	Significant	None	RR 1.31 (0.87 to 1.97)	**	Low:
Ran Sun [2015]	Effective rate [12]	Significant	Significant	Not significant	Not significant	None	RR 1.14 (1.08 to 1.21)	<0.00001	Low:
	PASI [12]	Not significant	Not significant	Significant	Not significant	None	SMD -0.29 (-0.41 to -0.18)	<0.00001	Moderate:
Electroacupuncture vs. sham acupuncture									
Meaghan Coyle [2015]	PASI [1]	Significant	Not significant	Significant	Significant	None	MD 0.70 (-0.71 to 2.11)	**	Low:
Ran Sun [2015]	Effective rate [1]	Significant	Significant	Not significant	Not significant	None	RR 0.89 (0.60 to 1.32)	0.58	Low:
	PASI [1]	Not significant	Not significant	Significant	Not significant	None	SMD 0.47 (-0.06 to 1.01)	0.08	Moderate:
Electroacupuncture vs. Western medicine									
Ran Sun [2015]	Effective rate [2]	Significant	Not significant	Not significant	Not significant	None	RR 1.13 (1.02 to 1.26)	0.02	Moderate:
	PASI [2]	Not significant	Not significant	Significant	Not significant	None	SMD -0.35 (-0.64 to -0.06)	0.02	Moderate:
Bloodletting plus cupping vs. tazarotene									
Meaghan Coyle [2015]	PASI 50	Significant	Not significant	Significant	Significant	None	RR1.47 (1.03 to 2.09)	*	Low:
	Relapse rate (follow-up)	Significant	Not significant	Significant	Significant	None	RR0.23 (0.05 to 0.99)	*	Low:
	PASI score	Significant	Not significant	Significant	Significant	None	MD -0.54 (-1.01 to -0.07)	*	Low:
Ran Sun [2015]	Effective rate [5]	Significant	Significant	Not significant	Not significant	None	RR1.10 (1.01 to 1.21)	0.03	Low:
	PASI [5]	Not significant	Not significant	Significant	Not significant	None	SMD -0.21 (-0.39 to -0.03)	0.02	Moderate:
Point application therapy vs. halcinonide									
Meaghan Coyle [2015]	Lesion reduction (50%)	Significant	Significant	Significant	Not significant	None	RR 0.90 (0.79 to 1.02)	**	Low:
	Relapse rate (follow-up)	Significant	Not significant	Significant	Not significant	None	RR 0.58 (0.33 to 1.00)	**	Low:

Table 6 (continued)

Table 6 (continued)

References	Outcomes	Certainty assessment					Relative effect (95% CI)	P value	Certainty
		Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations			
Fire needle vs. topical medication									
Liu Liu [2021]	Overall effect [4]	Significant	Not significant	Significant	Not significant	None	RR 1.15 (0.97 to 1.36)	0.11	Low:
	PASI [2]	Not significant	Significant	Not significant	Not significant	None	MD -0.48 (-1.14 to 0.19)	0.16	Moderate:
Fire needle + oral medicine + topical medication vs. oral medicine + topical medication									
Liu Liu [2021]	Overall effect [5]	Significant	Not significant	Significant	Not significant	None	RR 1.14(0.82 to 1.59)	0.44	Low:
	PASI [5]	Not significant	Significant	Not significant	Not significant	None	MD -0.53 (-0.72 to -0.33)	<0.00001	Moderate:
Fire needle + oral medicine vs. oral medicine									
Liu Liu [2021]	Overall effect [4]	Significant	Not significant	Significant	Not significant	None	RR 1.35 (1.16 to 1.57)	0.0001	Low:
	PASI [2]	Not significant	Significant	Not significant	Not significant	None	MD -4.30(-9.77 to 1.18)	0.12	Moderate:
Xingxing Wang [2019]									
	PASI [2] (Western medicine)	Significant	Not significant	Significant	Not significant	None	WMD -1.05 (-2.53 to -0.47)	<0.05	Low:
	PASI [4] (Chinese medicine)	Significant	Not significant	Significant	Significant	None	WMD -2.17 (-5.99 to 1.65)	0.26	Low:
	PASI [2] (Chinese medicine vs. Western medicine)	Significant	Not significant	Not significant	Significant	None	WMD -1.12 (-2.11 to -0.13)	0.03	Low:
	PASI [2] (Chinese medicine + Western medicine vs. Western medicine)	Significant	Not significant	Significant	Significant	None	WMD -1.87 (-2.59 to -1.15)	<0.0001	Low:

*, statistically significant; **, no statistically significant. High, ; low, ; moderate, ; very low, . PASI, Psoriasis Area and Severity Index Scores.

therapy (acupuncture alone or acupuncture-based combination therapies) for psoriasis in recent years. Compared with previous similar articles, our study finally included more literatures, including the literatures on fire acupuncture. The design of the control group is richer in this paper. In addition to the western medicine group and sham/placebo acupuncture, there are also the combined treatment groups, such as oral medicine plus topical medication. Moreover, the databases searched in this article included Chinese and English databases, which has a wider retrieval range and the latest literatures. Our study suggested that compared to the control groups, acupuncture therapy of psoriasis, specifically in patients with psoriasis vulgaris, effectively improved skin lesions with few adverse events. Moreover, the acupuncture therapy group displayed a decent effect in improving the effective rate, as well as reducing the PASI score and relapse rate. All in all, the outcomes of this overview supported acupuncture paratherapy for psoriasis patients, but the result should still be interpreted cautiously due to the methodological flaws and low quality of the included SRs/MAs.

Implications

This overview put forward certain challenges that authors of SRs should consider. We conducted a comprehensive analysis of the included literatures using AMSTAR-2, PRISMA, ROBIS, and other evaluation tools, and found that future research of this kind could be enhanced. Firstly, researchers should use AMSTAR-2, PRISMA, and ROBIS assessments to critically evaluate their work, so as to curtail the likelihood of subjective bias and enhance the quality of their research. Secondly, the quality of the included documents was generally low, and they must be registered in Prospero (<http://www.crd.york.ac.uk/prospero>) before publication of a meta-analysis, so as to reduce the risk of bias. Thirdly, it is necessary to provide a comprehensive research strategy for at least one database, as well as a list and explanation of those studies excluded. At the same time, in the data synthesis analysis, if the heterogeneity of the analysis results is significant, subgroup analysis or meta-regression analysis is needed to avoid publication bias. Finally, the source of funding should be stated, as the project sponsor may influence the results of the study.

Overall, compared with the treatments of the control groups, acupuncture therapy (acupuncture alone or acupuncture-based combination therapies) for psoriasis could improve the effective rate, and reduce the PASI score

and relapse rate, despite some flaws in the seven included SR/MAs. Acupuncture therapy for psoriasis was generally effective and safe. In future, acupuncture therapy for psoriasis needs the support of more high-quality studies.

Limitations

There are several limitations in this overview that should be noted. First of all, it is possible that certain information had been missed by us, therefore only SRs published in Chinese and English were included. Secondly, the sample size of our study was relatively small. Finally, this overview was also limited due to the subjective quality process. The personal beliefs of authors can also influence their judgment, so their direct results may be different.

Conclusions

Our overview suggests that acupuncture could serve as a useful complementary therapy for psoriasis. Nevertheless, there is a lack of evidence of higher quality advocating these findings, studies with more rigorous design and larger population samples are necessary to provide stronger evidence for definitive conclusions.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://dx.doi.org/10.21037/apm-21-2523>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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