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Polycystic Ovary Syndrome:

Syndrome des ovaires polykystiques : évaluation de l'acupuncture

Articles connexes : - conduites thérapeutiques -

1. Systematic Reviews and Meta-Analysis

1.1. Generic Acupuncture

1.1.1. He 2025 (ovulation and pregnancy)

He Y, Chen X, Lin J, Wang H, Wang B, Xu J, Lin Y. Meta-analysis of the effects of acupuncture combined with letrozole on ovulation induction and pregnancy outcomes in patients with polycystic ovary syndrome. J Manipulative Physiol Ther. 2025 Nov 20:S0161-4754(25)00079-X. https://doi.org/10.1016/j.jmpt.2025.10.059

Objective	The purpose of this meta-analysis was to systematically review the effects of acupuncture with letrozole's effect on polycystic ovary syndrome (PCOS) ovulation and pregnancy outcomes.
Methods	We searched 7 electronic databases for clinical studies of acupuncture combined with letrozole for PCOS published until August 31, 2024. Meta-analysis was done using RevMan 5.4, while funnel plot symmetry was evaluated using Stata 16.0.
Results	**Fifteen randomized controlled trials, encompassing 1311 cases**, were included. The meta-analysis revealed that acupuncture combined with letrozole significantly improved the clinical efficacy rate (RR = 1.27, 95% CI [1.17, 1.37], P < .001), pregnancy rate (RR = 1.84, 95% CI [1.59, 2.13], P < .001), ovulation rate (RR = 1.30, 95% CI [1.18, 1.43], P < .001), endometrial thickness (MD = 1.05, 95% CI [0.76, 1.34], P < .00001), serum estradiol levels (MD = 8.34, 95% CI [6.71, 9.96], P < .001) and the rate of A-type endometrium (RR = 2.19, 95% CI [1.35, 3.55], P < .001). Additionally, it significantly reduced the miscarriage rate (RR = 0.20, 95% CI [0.08, 0.51], P < .001), serum luteinizing hormone levels (MD = -2.10, 95% CI [-3.58, -0.62], P < .001), serum testosterone levels (MD for treatment ≤3 menstrual cycles = -0.43, 95% CI [-0.49, -0.37], P < .001; MD for treatment >3 menstrual cycles = -3.06, 95% CI [-5.12, -0.99], P < .001), ovarian volume (MD = -2.21, 95% CI [-2.99, -1.43], P < .001), and TCM syndrome scores (MD = -4.33, 95% CI [-5.43, -3.24], P < .001). Begg's test for publication bias indicated some degree of bias (P ≤ .05).
Conclusion	Current evidence suggests that acupuncture combined with letrozole may be more effective for PCOS than letrozole alone; however, the quality of this evidence is low, necessitating further high-quality research to confirm these findings.

1.1.2. Jin 2025 (network meta-analysis)

Jin Q, Xu G, Ying Y, Liu L, Zheng H, Xu S, Yin P, Chen Y. Effects of non-pharmacological interventions

on biochemical hyperandrogenism in women with polycystic ovary syndrome: a systematic review and network meta-analysis. J Ovarian Res. 2025 Jan 20;18(1):8. https://doi.org/10.1186/s13048-025-01595-5

Objective	To systematically evaluate the effectiveness of non-pharmacological interventions (NPIs), including electroacupuncture, exercise, diet, and lifestyle changes, in reducing androgen levels in women with polycystic ovary syndrome (PCOS) through a systematic review and network meta-analysis.
Methods	Comprehensive searches were conducted in PubMed, Embase, Cochrane Library, Web of Science, CNKI, and Wanfang up to June 2024. Randomized controlled trials (RCTs) comparing NPIs with other NPIs or placebo treatments in adult women with PCOS were included. Study selection was independently performed by three authors. Quality assessment followed PRISMA guidelines using the Cochrane RoB2 tool. The confidence of evidence was examined using Confidence in Network Meta-Analysis (CINeMA). Traditional meta-analysis of continuous variables was conducted using Stata 17.0 software with a random-effects model, reporting effect sizes as standardized mean differences (SMD) and weighted mean differences (WMD). Network meta-analysis (NMA) was used to synthesize data, with network diagrams illustrating comparisons between NPIs. We assessed the consistency of the results, performed sensitivity analyses, and examined publication bias to evaluate the influence of individual studies. Furthermore, subgroup analysis and network meta-regression analysis were conducted to explore potential sources of heterogeneity.
Results	The review included **21 studies with 1,196 participants**, with meta-analysis focusing on 17 studies involving 1,013 participants. NPIs significantly reduced serum testosterone (SMD = -0.57; 95% CI: -0.86 to -0.29, $p < 0.01$), A4 (SMD = -1.37; 95% CI: -2.63 to -0.12, $p = 0.03$), and mFG score (WMD = -0.81; 95% CI: -1.26 to -0.37, $p < 0.01$). Notably, the reduction in testosterone levels achieved with NPIs met the Minimum Clinically Important Difference (MCID) of 12.47 ng/dL (WMD = -12.57; 95% CI: -18.92 to -6.23; $p < 0.01$), affirming the clinical relevance of these reductions. No significant effects were observed on Free Androgen Index (FAI), Sex Hormone-Binding Globulin (SHBG), Dehydroepiandrosterone (DHEA), DHEA Sulfate (DHEAS), Free Testosterone (FT), or Dihydrotestosterone (DHT) levels (all $p > 0.05$). The NMA (18 studies, 1,067 participants) identified electroacupuncture combined with diet and exercise as the most effective intervention for reducing serum testosterone (WMD = -21.75; 95% CI: -49.58 to 6.07; SUCRA 72.3%). Evidence certainty for many interventions was low, highlighting the need for higher-quality studies. Sensitivity analysis confirmed the robustness of the findings, and no publication bias was detected.
Conclusions	NPIs, particularly electroacupuncture combined with exercise and dietary management, effectively reduce androgen levels in PCOS patients. These findings provide valuable guidance for clinicians and women with PCOS, with multi-component approaches recommended for more substantial clinical benefit.

1.1.3. Wei 2025

Wei J, Shen Z, Zhao C, Xie C, Bai H, Yin J, Wang J. Dose-response of acupuncture on ovulation rates in polycystic ovary syndrome: a meta-analysis and exploratory dose-response analysis. Front Endocrinol (Lausanne). 2025 Aug 28;16:1610338. https://doi.org/10.3389/fendo.2025.1610338

Objective	To evaluate the efficacy of acupuncture in improving ovulation rates in women with polycystic ovary syndrome (PCOS) and to explore optimal treatment parameters including acupoint number, frequency, and duration using integrated meta-analytic and dose-response modeling approaches.

Methods	Nine databases were searched through January 2025, identifying **43 randomized controlled trials (n = 4,827)** comparing acupuncture with sham acupuncture, pharmacotherapy, or standard care. Pairwise and network meta-analyses were conducted alongside model-based dose-response analyses to assess treatment efficacy and identify optimal dosing protocols.
Results	Acupuncture alone significantly increased ovulation rates versus sham acupuncture (RR = 1.15, 95 % CI 1.04–1.27) and pharmacotherapy (RR = 1.11, 95 % CI 1.04–1.20). Acupuncture combined with herbal medicine outperformed pharmacotherapy (RR = 1.27, 95 % CI 1.12–1.43) and ranked highest in efficacy (SUCRA = 97.8%). Dose-response modeling suggested optimal regimens of 30-minute sessions, 29 acupoints, and three sessions per week for 24 weeks for acupuncture alone, and 19-minute sessions, 26 acupoints, and four sessions per week for combined therapy.
Conclusion	Acupuncture effectively improves ovulation in PCOS, with efficacy influenced by specific dose parameters. Standardized, evidence-based dosing protocols are needed to optimize treatment outcomes and enable personalized acupuncture regimens in clinical practice.

1.1.4. Zhang 2025

Zhang GS, Lim ECN, Cheng NCL, Lim CED. Acupuncture for polycystic ovary syndrome. Cochrane Database Syst Rev. 2025 Oct 28;10:CD007689. https://doi.org/10.1002/14651858.CD007689.pub5

Background	Polycystic ovary syndrome (PCOS) is characterised by oligo-amenorrhoea, infertility, and hirsutism. Treatments include pharmacological agents, lifestyle modifications, and surgery. During ovulation in healthy women, the concentration of beta-endorphin, a neuropeptide involved in pain and hormonal regulation, is higher in follicular fluid than in plasma. Acupuncture may improve ovulatory function by stimulating beta-endorphin production, which is hypothesised to enhance gonadotropin-releasing hormone (GnRH) secretion. This is an update of a review first published in 2011 and last updated in 2019.
Objective	To assess the benefits and harms of acupuncture in managing fertility and symptoms in oligo/anovulatory women with polycystic ovary syndrome.
Methods	Search methods: We searched the Cochrane Gynaecology and Fertility Group Specialised Register, CENTRAL, MEDLINE, Embase, PsycINFO, AMED, and three Chinese databases (CNKI, CBM, and VIP). We also reviewed trial registries and reference lists for related papers. The searches in CENTRAL, MEDLINE, Embase, PsycINFO, and CNKI are current to December 2024, the VIP search to November 2024, and the CBM search to November 2015. We also performed reference checking, citation searching, and contacted study authors to identify additional studies. Eligibility criteria: We included randomised controlled trials (RCTs) on the efficacy of acupuncture for oligo/anovulatory women with PCOS. Outcomes: Critical outcomes were live birth rate, multiple pregnancy rate, and ovulation rate. Important outcomes were clinical pregnancy rate, restored regular menstrual period, miscarriage rate, and adverse events. Risk of bias: We used the original Cochrane risk of bias tool (RoB 1). Synthesis methods: Two authors independently selected studies, extracted data, and assessed risk of bias. We calculated risk ratios (RRs), mean differences (MDs), and standardised mean differences (SMDs) with 95% confidence intervals (CIs). Certainty of evidence was evaluated using GRADE. Skewed data and small-study effects were considered, and unreliable results interpreted cautiously.

Results	**Nine RCTs (one added in this update) with 1606 women** were included: acupuncture versus sham acupuncture (3 RCTs), low-frequency electroacupuncture versus exercise/no intervention (1 RCT), acupuncture versus relaxation (1 RCT), acupuncture versus clomiphene (1 RCT), and acupuncture versus Diane-35 (3 RCTs). Evidence remains uncertain regarding fertility and symptom control. Compared with sham acupuncture, acupuncture may result in little to no difference in live birth (RR 0.97, 95% CI 0.76-1.23), multiple pregnancy (RR 0.89, 95% CI 0.33-2.45), ovulation (SMD 0.02, 95% CI -0.15-0.19), clinical pregnancy (RR 1.07, 95% CI 0.85-1.35), and miscarriage (RR 1.10, 95% CI 0.77-1.56). Acupuncture may reduce mean days between menstrual periods at 12 weeks (MD -312.09 days, 95% CI -344.59–279.59; very low-certainty) and is probably associated with more adverse events (RR 1.16, 95% CI 1.02-1.31). Other comparisons (electroacupuncture, relaxation, clomiphene, Diane-35) yielded very low-certainty evidence with inconsistent outcomes.
Conclusion	No clear evidence of a difference between acupuncture and sham acupuncture in live birth, multiple pregnancy, ovulation, clinical pregnancy, miscarriage, or restored menstrual periods. Acupuncture is probably associated with more adverse events. The limited number and quality of RCTs mean that the effectiveness of acupuncture for PCOS remains uncertain.

1.1.5. Li 2022 ☆☆

Li P, Peng J, Ding Z, Zhou X, Liang R. Effects of Acupuncture Combined with Moxibustion on Reproductive and Metabolic Outcomes in Patients with Polycystic Ovary Syndrome: A Systematic Review and Meta-Analysis. Evid Based Complement Alternat Med. 2022 Mar 31;2022:3616036. doi: 10.1155/2022/3616036. PMID: 35399633; PMCID: PMC8991411.

Objectives	In this systematic review, the effects of acupuncture combined with moxibustion on reproductive and metabolic outcomes in patients with polycystic ovary syndrome (PCOS) were evaluated.
Methods	Randomized controlled trials (RCTs) assessing acupuncture combined with moxibustion + basic treatment (experimental group) versus basic treatment alone (control group) for treating PCOS were identified from English and Chinese databases up to November 3, 2021. Outcomes related to pregnancy, ovulation, miscarriage, sex hormones, and metabolic disorders were of interest. In the meta-analysis, risk ratios (RRs) and mean differences (MDs) and their 95% confidence intervals (CIs) were used as effect measures.
Results	**Twenty-five RCTs (n = 1991)** were included. The pooled results showed that the experimental group had significant increases in the pregnancy rate (RR 1.81, 95% CI 1.58 to 2.08) and ovulation rate (RR 1.31, 95% CI 1.22 to 1.40) and decreases in the miscarriage rate (RR 0.45, 95% CI 0.28 to 0.73), and ovarian volume (MD -0.75 cm3, 95% CI -1.30 to -0.20). In the experimental group, improvements in the luteinizing hormone (LH) level, the LH-to-follicle-stimulating hormone (FSH) ratio, total testosterone level, fasting insulin level, and body mass index, but not in FSH, oestradiol, or dehydroepiandrosterone sulfate levels, were significantly greater. All reported adverse events were mild. Based on the limitations of risk of bias, inconsistency, imprecision, and/or publication bias, the level of evidence was judged to be moderate for the pregnancy rate, ovulation rate, miscarriage rate, LH level, and LH/FSH ratio and very low for the other outcomes.
Conclusion	Among patients with PCOS, using acupuncture combined with moxibustion as a complementary therapy to basic treatments can improve pregnancy, ovulation, and miscarriage rates, the levels some sex hormones, and metabolic indicators, with good safety. Additionally, this combination therapy may have no effect on the FSH, oestradiol, or dehydroepiandrosterone sulfate level.

1.1.6. Wu 2020 ☆

Wu J, Chen D, Liu N. Effectiveness of acupuncture in polycystic ovary syndrome: A systematic review and meta-analysis of randomized controlled trials. Medicine (Baltimore). 2020;99(22). [210017]. doi

Objective	To evaluate the effectiveness of acupuncture in reproductive-age females with polycystic ovary syndrome (PCOS).
Methods	We searched the Pubmed, Web of Science, Embase, Cochrane, China National Knowledge Infrastructure (CNKI), Wanfang Data, and Chongqing VIP databases for the relevant literature. The meta-analysis was performed with a random-effects model with RevMan 5.3. The primary outcomes of interest included the rate of live birth, pregnancy and ovulation, and the secondary outcomes included the recovery of menstrual period and hormone levels. Results were expressed as the relative risk (RR) for the discrete data and the mean difference (MD) for the continuous outcomes with a 95% confidence interval (CI).
Results	**Twenty-two studies with 2315 participants** were included in this systematic review and meta-analysis. A pooled analysis showed a recovery of the menstrual period (5 trials; 364 participants; SMD, -0.52; 95% CI [-0.89, -0.14]; I=67%; P=.0007; low certainty) in the acupuncture group. Furthermore, there were significant decreases in the luteinizing hormone (LH) (13 trials; 917 participants; MD, -0.92; 95% CI [-1.43, -0.41]; I=60%; P=.0004; very low certainty) and testosterone (13 trials; 923 participants; SMD, -0.46; 95% CI [-0.73, -0.20]; I=75%; P=.0006; very low certainty) in the acupuncture group. No significant differences were observed in the rates of live birth, pregnancy, and ovulation, and no significant differences were observed in the LH/follicle-stimulating hormone (FSH) ratio.
Conclusions	There was insufficient evidence to support that acupuncture could promote live birth, pregnancy, and ovulation. However, acupuncture could promote the recovery of menstrual cycles as well as downregulate the levels of LH and testosterone in patients with PCOS.

1.1.7. Lim 2019

Lim CED, Ng RWC, Cheng NCL, Zhang GS, Chen H. Acupuncture for polycystic ovarian syndrome. Cochrane Database Syst Rev. 2019. [201949]. doi

Background	Polycystic ovarian syndrome (PCOS) is characterised by the clinical signs of oligo-amenorrhoea, infertility and hirsutism. Conventional treatment of PCOS includes a range of oral pharmacological agents, lifestyle changes and surgical modalities. Beta-endorphin is present in the follicular fluid of both normal and polycystic ovaries. It was demonstrated that the beta-endorphin levels in ovarian follicular fluid of otherwise healthy women who were undergoing ovulation were much higher than the levels measured in plasma. Given that acupuncture impacts on beta-endorphin production, which may affect gonadotropin-releasing hormone (GnRH) secretion, it is postulated that acupuncture may have a role in ovulation induction via increased beta-endorphin production effecting GnRH secretion. This is an update of our previous review published in 2016.
Objectives	To assess the effectiveness and safety of acupuncture treatment for oligo/anovulatory women with polycystic ovarian syndrome (PCOS) for both fertility and symptom control.

Methods	SEARCH METHODS: We identified relevant studies from databases including the Gynaecology and Fertility Group Specialised Register, CENTRAL, MEDLINE, Embase, PsycINFO, CNKI, CBM and VIP. We also searched trial registries and reference lists from relevant papers. CENTRAL, MEDLINE, Embase, PsycINFO, CNKI and VIP searches are current to May 2018. CBM database search is to November 2015. SELECTION CRITERIA: We included randomised controlled trials (RCTs) that studied the efficacy of acupuncture treatment for oligo/anovulatory women with PCOS. We excluded quasi- or pseudo-RCTs. DATA COLLECTION AND ANALYSIS: Two review authors independently selected the studies, extracted data and assessed risk of bias. We calculated risk ratios (RR), mean difference (MD), standardised mean difference (SMD) and 95% confidence intervals (Cis). Primary outcomes were live birth rate, multiple pregnancy rate and ovulation rate, and secondary outcomes were clinical pregnancy rate, restored regular menstruation period, miscarriage rate and adverse events. We assessed the quality of the evidence using GRADE methods.
Main Results	We included **eight RCTs with 1546 women**. Five RCTs were included in our previous review and three new RCTs were added in this update of the review. They compared true acupuncture versus sham acupuncture (three RCTs), true acupuncture versus relaxation (one RCT), true acupuncture versus clomiphene (one RCT), low-frequency electroacupuncture versus physical exercise or no intervention (one RCT) and true acupuncture versus Diane-35 (two RCTs). Studies that compared true acupuncture versus Diane-35 did not measure fertility outcomes as they were focused on symptom control. Seven of the studies were at high risk of bias in at least one domain. For true acupuncture versus sham acupuncture, we could not exclude clinically relevant differences in live birth (RR 0.97, 95% CI 0.76 to 1.24; 1 RCT, 926 women; low-quality evidence); multiple pregnancy rate (RR 0.89, 95% CI 0.33 to 2.45; 1 RCT, 926 women; low-quality evidence); ovulation rate (SMD 0.02, 95% CI -0.15 to 0.19, I2 = 0%; 2 RCTs, 1010 women; low-quality evidence); clinical pregnancy rate (RR 1.03, 95% CI 0.82 to 1.29; I2 = 0%; 3 RCTs, 1117 women; low-quality evidence) and miscarriage rate (RR 1.10, 95% CI 0.77 to 1.56; 1 RCT, 926 women; low-quality evidence).Number of intermenstrual days may have improved in participants receiving true acupuncture compared to sham acupuncture (MD -312.09 days, 95% CI -344.59 to -279.59; 1 RCT, 141 women; low-quality evidence).True acupuncture probably worsens adverse events compared to sham acupuncture (RR 1.16, 95% CI 1.02 to 1.31; I2 = 0%; 3 RCTs, 1230 women; moderate-quality evidence).No studies reported data on live birth rate and multiple pregnancy rate for the other comparisons: physical exercise or no intervention, relaxation and clomiphene. Studies including Diane-35 did not measure fertility outcomes.We were uncertain whether acupuncture improved ovulation rate (measured by ultrasound three months post treatment) compared to relaxation (MD 0.35, 95% CI 0.14 to 0.56; 1 RCT, 28 women; very low-quality evidence) or Diane-35 (RR 1.45, 95% CI 0.87 to 2.42; 1 RCT, 58 women; very low-quality evidence).Overall evidence ranged from very low quality to moderate quality. The main limitations were failure to report important clinical outcomes and very serious imprecision.

Authors' Conclusions	For true acupuncture versus sham acupuncture we cannot exclude clinically relevant differences in live birth rate, multiple pregnancy rate, ovulation rate, clinical pregnancy rate or miscarriage. Number of intermenstrual days may improve in participants receiving true acupuncture compared to sham acupuncture. True acupuncture probably worsens adverse events compared to sham acupuncture. No studies reported data on live birth rate and multiple pregnancy rate for the other comparisons: physical exercise or no intervention, relaxation and clomiphene. Studies including Diane-35 did not measure fertility outcomes as the women in these trials did not seek fertility. We are uncertain whether acupuncture improves ovulation rate (measured by ultrasound three months post treatment) compared to relaxation or Diane-35. The other comparisons did not report on this outcome. Adverse events were recorded in the acupuncture group for the comparisons physical exercise or no intervention, clomiphene and Diane-35. These included dizziness, nausea and subcutaneous haematoma. Evidence was very low quality with very wide Cis and very low event rates. There are only a limited number of RCTs in this area, limiting our ability to determine effectiveness of acupuncture for PCOS.

1.1.8. Zheng 2019

Zheng Shuzhen, Tang Shunli, Zhang Jiabi, Li Kexin, Zou Xiaoqiu, Wu Liqun, Liu Jianbo, Li Yuemei. [Systematic Review of Acupuncture in Treatment of Polycystic Ovary Syndrome in China]. Chinese Journal of Information on Traditional Chinese Medicine. 2019;1:105-109. [201728].

目的 系统评价针刺治疗多囊卵巢综合征(PCOS)临床疗效和安全性. 方法 计算机检索中国知识资源总库(CNKI)、中国学术期刊数据库(万方数据)、中国生物医学文献数据库(CBM)、中文科技期刊数据库(维普网)建库至2017年6月收录的针刺治疗PCOS随机对照试验文献. 2名评价员独立按照纳入与排除标准筛选文献、提取资料, 采用《Cochrane系统评价员手册》偏倚风险评估工具进行文献质量评价, 采用RevMan5.3软件进行Meta分析. 结果 最终纳入8项研究, 共494例受试者.Meta分析结果显示:针刺治疗PCOS在降低黄体生成素[SMD=-0.55,95%CI (-0.76,-0.35)]、睾酮[SMD=-0.72,95%CI(-1.03,-0.41)]、黄体生成素与卵泡刺激素比值[SMD=-0.52,95%CI (-0.90,-0.14)]、体质量指数(BMI)[SMD=-0.38,95%CI(-0.66,-0.10)]方面均明显优于单用西药(P<0.01),在提高有效率[RR=1.04,95%CI(0.94,1.16),P=0.44]、降低卵泡刺激素[SMD=-0.09,95%CI (-0.31,0.12),P=0.40]方面与单用西药疗效相当. 结论 针刺治疗PCOS临床疗效确切, 且安全性较好. 由于纳入研究样本量较少, 质量普遍偏低, 尚需要大样本、多中心、高质量随机对照研究支

[Automatic translation].	
Objective	To systematically evaluate the clinical efficacy and safety of acupuncture in the treatment of polycystic ovary syndrome (PCOS).
Methods	Computer search Chinese Knowledge Resource Pool (CNKI), Chinese Academic Journal Database (Wanfang Data), China Biomedical Literature Database (CBM) The Chinese Science and Technology Periodical Database (Vip Network) was built to the Acupuncture Treatment PCOS randomized controlled trial literature included in June 2017. Two reviewers independently selected the literature according to the inclusion and exclusion criteria, extracted the data, and adopted the Cochrane System Evaluator's Manual. The bias risk assessment tool was used to evaluate the quality of the literature. Meta-analysis was performed using RevMan5.3 software.
Results	The results were finally included in 8 studies with a total of 494 subjects. The results of the meta-analysis showed that acupuncture treatment of PCOS reduced luteinizing hormone [SMD= -0.55, 95% CI (-0.76, -0.35)], testosterone [SMD=-0.72, 95% CI (-1.03, -0.41)], ratio of luteinizing hormone to follicle stimulating hormone [SMD=-0.52, 95% CI (-0.90,-0.14)], body mass index (BMI) [SMD=-0.38, 95% CI (-0.66, -0.10)] were significantly better than Western medicine alone (P<0.01). Efficiency [RR=1.04, 95% CI (0.94, 1.16), P=0.44], decreased follicle stimulating hormone [SMD=-0.09, 95% CI (-0.31, 0. 12), P=0.40] is equivalent to the efficacy of western medicine alone.
Conclusion	Acupuncture treatment of PCOS is effective and safe. Due to the small sample size and low quality, large samples and multi-center are needed.

1.1.9. Jo 2017 ☆

Jo J, Lee YJ, Lee H. Acupuncture for polycystic ovarian syndrome: A systematic review and meta-analysis. Medicine (Baltimore). 2017. 35(3):162-70. [195184].

Background	This systematic review aimed at summarizing and evaluating the evidence from randomized controlled trials (RCTs) using acupuncture to treat polycystic ovarian syndrome (PCOS), specifically focusing on ovulation rate, menstrual rate, and related hormones.
Methods	Fifteen databases were searched electronically through February 2016. Our review included RCTs of women with PCOS; these RCTs compared acupuncture with sham acupuncture, medication, or no treatment. Two reviewers independently extracted data. Data were pooled and expressed as mean differences (MDs) for continuous outcomes and risk ratios for dichotomous outcomes, with 95% confidence intervals (Cis) using a random-effects model.
Results	We found a low level of evidence that acupuncture is more likely to improve ovulation rate (MD 0.35, 95% CI: 0.14-0.56) and menstruation rate (MD 0.50, 95% CI: 0.32-0.68) compared with no acupuncture. We found statistically significant pooled benefits of acupuncture treatment as an adjunct to medication in luteinizing hormone (LH), LH/follicular stimulating hormone (FSH) ratio, testosterone, fasting insulin, and pregnancy rates, but the level of evidence was low/very low.
Conclusion	**There is limited evidence to judge the efficacy and safety of acupuncture on key reproductive outcomes in women with PCOS.** Large-scale, long-term RCTs with rigorous methodological input are needed.

1.1.10. Lim 2016 Ø

Lim CE, Ng RW, Xu K, Cheng NC, Xue CC, Liu JP, Chen N. Acupuncture for polycystic ovarian syndrome. Cochrane Database Syst Rev. 2016. [186498].

Background	Polycystic ovarian syndrome (PCOS) is characterized by the clinical signs of oligo-amenorrhea, infertility and hirsutism. Conventional treatment of PCOS includes a range of oral pharmacological agents, lifestyle changes and surgical modalities. Beta-endorphin presents in the follicular fluid of both normal and polycystic ovaries. It was demonstrated that the beta-endorphin levels in ovarian follicular fluid of otherwise healthy women who were undergoing ovulation were much higher than the levels measured in plasma. Given that acupuncture has an impact on beta-endorphin production, which may affect gonadotropin-releasing hormone (GnRH) secretion, it is postulated that acupuncture may have a role in ovulation induction and fertility.
Objectives	To assess the effectiveness and safety of acupuncture treatment of oligo/anovulatory women with polycystic ovarian syndrome (PCOS).
Methods	SEARCH METHODS: We identified relevant studies from databases including the Cochrane Central Register of Controlled Trials (CENTRAL), Ovid MEDLINE, EMBASE, PsycINFO, CNKI and trial registries. The data are current to 19 October 2015. SELECTION CRITERIA: We included randomised controlled trials (RCTs) that studied the efficacy of acupuncture treatment for oligo/anovulatory women with PCOS. We excluded quasi- or pseudo-RCTs. Primary outcomes were live birth and ovulation (primary outcomes), and secondary outcomes were clinical pregnancy, restoration of menstruation, multiple pregnancy, miscarriage and adverse events. We assessed the quality of the evidence using GRADE methods. DATA COLLECTION AND ANALYSIS: Two review authors independently selected the studies, extracted data and assessed risk of bias. We calculated Mantel-Haenszel odds ratios (Ors) and mean difference (MD) and 95% confidence intervals (Cis).

Main Results	We included **five RCTs with 413 women.** They compared true acupuncture versus sham acupuncture (two RCTs), true acupuncture versus relaxation (one RCT), true acupuncture versus clomiphene (one RCT) and electroacupuncture versus physical exercise (one RCT). Four of the studies were at high risk of bias in at least one domain. No study reported live birth rate. Two studies reported clinical pregnancy and found no evidence of a difference between true acupuncture and sham acupuncture (OR 2.72, 95% CI 0.69 to 10.77, two RCTs, 191 women, very low quality evidence). Three studies reported ovulation. One RCT reported number of women who had three ovulations during three months of treatment but not ovulation rate. One RCT found no evidence of a difference in mean ovulation rate between true and sham acupuncture (MD -0.03, 95% CI -0.14 to 0.08, one RCT, 84 women, very low quality evidence). However, one other RCT reported very low quality evidence to suggest that true acupuncture might be associated with higher ovulation frequency than relaxation (MD 0.35, 95% CI 0.14 to 0.56, one RCT, 28 women). Two studies reported menstrual frequency. One RCT reported true acupuncture reduced days between menstruation more than sham acupuncture (MD 220.35, 95% CI 252.85 to 187.85, 146 women). One RCT reported electroacupuncture increased menstrual frequency more than no intervention (0.37, 95% CI 0.21 to 0.53, 31 women). There was no evidence of a difference between the groups in adverse events. Evidence was very low quality with very wide Cis and very low event rates. Overall evidence was low or very low quality. The main limitations were failure to report important clinical outcomes and very serious imprecision.
Authors' Conclusions	Thus far, only a limited number of RCTs have been reported. At present, **there is insufficient evidence to support the use of acupuncture for treatment of ovulation disorders in women with PCOS.**

1.1.11. Li 2016 ☆

LI Ruigen, WANG Wei, XU Xiaobei, BU Weijing, WU Zhaoli. [A systematic review and meta-analysis: the efficacy of integrated acupuncture with medicine for the treatment of polycystic ovary syndrome]. Journal of Practical Traditional Chinese Internal Medicine. 2016;1:1-5. [187014].

Background	The efficacy of integrated acupuncture with medicine for the treatment of polycystic ovary syndrome is distinct.
Objective	To evaluate the clinical efficacy and safety of integrated acupuncture with Chinese or western medicine for the treatment of Polycystic ovary syndrome. [Search Strategy] Subject headings combined with free words were used to search in the database of CBM□VIP□CNKI, etc. Retrieval time: from the database built time up to April 2015. The Journal of Chinese Acupuncture &Moxibustion and Clinical Acupuncture and Moxibustion were used as manual retrieval. In addition, the bibliography of the included literatures should be taken into account. [Inclusion Criteria] RCT and quasi-RCT of Chinese literatures. 1 Study object: fulfilling the diagnostic criteria with regardless of age and gender. 2Intervention measures: Treatment group: acupuncture + Chinese medicine or acupuncture + western medicine, Control group: blank control (sham acupuncture or placebo) or conventional therapy with Chinese herbal or western medicine. 3 outcomes: clinical curative effect. [Collection and Analysis of Data] According to the inclusion criteria, 4 researcher independently screened the literatures extracted information and evaluated the risk of bias of all-inclusive studies and cross-checked. Asking the third party for help when disagreement during the overall process. The content of extraction table including: 1) general condition of inclusive studies: authors, cases of experimental and control group, intervention measures, publication data etc. 2) basic features of study object. 3) key element for assessing risk of bias. 4specific details to intervention measures.

Main results	removed 462 papers after reading their theme and summary from the primary 476 papers and did further reading the left **14 papers.** Compared to the control group, the overall clinical efficacy of the experimental group was remarkably higher (Z=7. 15, P<0. 00001). As to the pregnancy rate, there Also showed a significantly difference between the two groups (Z=4. 55, P<0. 00001), which suggesting the integrated acupuncture with Chinese herbal or western medicine was superior to the control group.
Problem and Prospect	Due to the quality of the methodology of the inclusion literature is not high, its reliability need to be further demonstrated.

1.1.12. Qu 2016

Qu F, Wu Y, Hu Xiao-Yangu, Barry JA et al. The effects of acupuncture on polycystic ovary syndrome: A systematic review and meta-analysis. European Journal of Integrative Medicine. 2016;8(1):12-18. [207265].

Introduction	A systematic review and meta-analysis was carried out to assess the clinical effectiveness of acupuncture in treating polycystic ovarian syndrome (PCOS).
Methods	RCTs that compared either acupuncture with no/sham (placebo) acupuncture or a certain therapy with acupuncture added in the treatment of PCOS were included in the review. Measures of treatment effectiveness were the pooled odds ratios (OR) for women with PCOS having acupuncture compared with women in the control group for the recovery of menstrual cycles, standardized mean difference (SMD) for body mass index (BMI), fasting insulin (FINS), fasting plasma glucose (FPG), luteinizing hormone (LH), follicle stimulating hormone (FSH), and the ratio of LH/FSH.
Results	A total of nine RCTs (531 women) met criteria for inclusion into the systematic review. Using the random effects model, pooling of the effect estimates from all RCTs showed recovery of menstrual cycles (OR = 0.20, 95% CI: 0.09–0.41, P < 0.01), BMI (SMD = −0.63, 95% CI: −1.04 to −0.21, P = 0.04), and LH (SMD = −0.39, 95% CI: −0.65 to −0.12, P < 0.01) which favored the acupuncture group. No significant differences were observed for FINS, FPG, FSH and the ratio of LH/FSH between acupuncture and control groups (P > 0.05).
Conclusions	Acupuncture appears to significantly improve the recovery of the menstrual cycles and decrease the levels of BMI and LH in women with PCOS. However, the findings should be interpreted with caution due to the limited methodological quality of included RCTs.

1.1.13. Zhu 2014 ☆

Zhu Yi, Shen Weidong. [Meta-analysis of acupuncture and western medicine in the treatment of polycystic ovarian syndrome]. Journal of Chinese Medicine. 2014;11:1649-165. [186989].

Objective	Use Meta-analysis to compare the therapeutic effect of acupuncture and western medicine in the treatment of polycystic ovarian syndrome.
Methods	Use electronic retrieval of published in the magazine at home and abroad about acupuncture literature for the treatment of polycystic ovary syndrome from 1980 to 2013. In the exclusion of repetition and after a randomized controlled trial, screen into standard randomized controlled trials of acupuncture treatment of polycystic ovary syndrome with the Jadad score evaluating quality evaluation of the literature and Manage 5. 0 software for curative effect evaluation. Use RR value as an index of effect, compared the advantage of acupuncture with western medicine treatment of ovulation disorder infertility and heterogeneity inspection. According to the heterogeneity test results, use fixed or random effects model combined with RR values, P values 95% CI.

Results	In accordance with the inclusion criteria of a randomized controlled with **10 references, a total of 823 patients**. Compared acupuncture group with the western medicine group, the relative risk was 1. 54, 95% CI (1. 27, 1. 86), the overall effect inspection Z = 4. 38, P < 0. 000 01, the difference was statistically significant, suggesting acupuncture treatment group was superior to western medicine in control group. Compared acupuncture plus Chinese medicine and western medicine group, combined effect was 1. 48, 95% CI (1. 25, 1. 75), the overall effect inspection Z = 4. 49, P < 0. 000 1, the difference was statistically significant, suggesting acupuncture combined with Chinese medicine treatment was superior to western medicine.
Conclusion	The curative effect of acupuncture treatment in treating polycystic ovary syndrome is superior to western medicine, but the quality of evaluation literature generally is not high, look forward to high quality papers with more sample, randomized controlled method and strict specification.

1.1.14. Ren 2014

Ren LN, Guo LH, Ma WZ, Zhang R. [A Meta-Analysis on Acupuncture Treatment of Polycystic Ovary Syndrome]. Acupuncture Research. 2014;39(3):238-46. 174756

Objectifs	To evaluate the effect and safety of acupuncture treatment of polycystic ovary syndrome (PCOS) by using systematic review in view of evidence-based medicine (EBM).
Méthodes	Original articles about acupuncture treatment of PCOS published from the database-established year to November of 2013 were searched from the Chinese National Knowledge Infrastructure Database (CNKI), Chongqing VIP Chinese Science and Technology Periodical Database (VIP), Chinese Biomedical Library (CBM), Wanfang Data, PubMed, and the Cochrane Library and the associated references-indicated papers by using keywords of polycystic ovary syndrome, randomization, acupoint, acupuncture, acupuncture plus moxibustion, acupuncture plus acupoint-embedment of catgut, and acupuncture plus otopoint application. Those articles about treatment of PCOS with simple abdominal acupuncture, simple acupoint-embedment of catgut, simple otopoint-pellet-pressure, and simple moxibustion treatment, and simple abstracts were excluded. If the articles re-published in both Chinese and English and in academic conferences and journals, one of them with higher quality was included. Two independent reviewers extracted data from located articles in a pre-defined structured way, and the Meta-analysis was conducted using software RevMan 5.2, otherwise using the qualitative analysis.
Résultats	A total of 31 articles (28 in Chinese, 3 in English) containing 2,321 cases of PCOS patients met the included criteria. Meta-analysis showed that the clinical efficacy of simple acupuncture was the same as that of western medicine, and the efficacy of acupuncture combined with Chinese herbal medicine interventions was obviously higher than that of western medicine (P < 0.05). In addition, simple acupuncture intervention and acupuncture combined with Chinese herbal medicines or with moxibustion treatment have advantages in reducing serum luteinizing hormone/follicle-stimulating hormone (LH/FSH), insulin resistance (IR), testosterone (T), and body mass index (BMI). However, the quality of the collected articles is generally lower due to unclear bias, no sample quantity estimation, incorrect randomization methods, no follow-up survey, etc.
Conclusion	Acupuncture therapy may be effective for PCOS, but needs to be confirmed further by larger sample randomized controlled trials.

1.1.15. Lim 2011 Ø

Lim DC, Chen W, Cheng LN, Xue CC, Wong FW, O'Sullivan AJ, Liu JP. Acupuncture for polycystic ovarian syndrome, Cochrane Database Syst Rev. 2011. [160670].

Background	Polycystic ovarian syndrome (PCOS) is characterised by the clinical signs of oligo-amenorrhoea (infrequent or very light menstruation), infertility (failure to conceive), and hirsutism (excessive hair growth). Whilst Aleem 1987 revealed the presence of beta-endorphin in the follicular fluid of both normal and polycystic ovaries, Petraglia 1987 demonstrated that the beta-endorphin levels in ovarian follicular fluid of otherwise healthy women who were undergoing ovulation were much higher than the levels measured in plasma. Given that acupuncture has an impact on beta-endorphin production, which may affect gonadotropin-releasing hormone (GnRH) secretion, it is postulated that acupuncture may have a role in ovulation induction and fertility.
Objectives	To assess the efficacy and safety of acupuncture treatment for women with polycystic ovarian syndrome (PCOS).
Methods	Search strategy: Relevant studies were identified from the Menstrual Disorders and Subfertility Group Specialised Register, Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library), Ovid MEDLINE® In-Process and other non-indexed citations, Ovid MEDLINE® Daily and Ovid MEDLINE(R), EMBASE, PsycINFO, AMED, Chinese National Knowledge Infrastructure (CNKI) (including the Chinese journal full-text database (CJFD)), Chinese BioMedical Literature Database (CBM), VIP database for Chinese Technical Periodicals, China's important Conference Papers Database, and the China dissertation database. Selection criteria: Truly randomised controlled trials (RCTs) that studied the efficacy of acupuncture treatment for infertility in women with PCOS. We excluded quasi- or pseudo-RCTs. Data collection and analysis: We aimed to extract data independently by three authors using a piloted data extraction form. Data on study characteristics including methods, participants, interventions, and outcomes would be extracted. Crossover trials were not included unless there were first-phase data provided. Non-randomised controlled studies have been excluded.
Main results	**No truly randomised controlled trials of acupuncture for PCOS were found.**
Authors' conclusions	The current conventional medical treatments for women with PCOS are prescription medications, surgery, and lifestyle changes. Associated problems with current western therapies are the cost, risk of multiple pregnancies, undesirable side effects, and inconsistent effectiveness. Non-randomised acupuncture studies in PCOS have suggested a low associated adverse events rate, no increased risk of multiple pregnancies, and that it is inexpensive. However, there no RCTs have been performed in this area thus far. Therefore, properly designed RCTs are required before a conclusive statement can be drawn to support the use of acupuncture in the management of PCOS.

1.1.16. Lim 2010

Lim CE, Wong WS. Current evidence of acupuncture on polycystic ovarian syndrome. Gynecol Endocrinol. 2010;16:. [155287].

Objective. This paper aims to provide a literature review on evaluating the efficacy of acupuncture therapy in the treatment of polycystic ovarian syndrome (PCOS) by reviewing clinical trials; randomised and non-randomised and observational studies on PCOS. The paper will also determine the possible mechanism of acupuncture treatment in PCOS, limitations of recruited studies and suggest further improvements in future studies. Design. A comprehensive literature search was conducted through the databases Medline, PubMed, EMBASE, Cochrane, AMED (Allied and Complementary Medicine), NCCAM (The National Centre for Complementary and Alternative Medicine) to identify relevant monographs. Results. Four studies were recruited. Several studies showed that acupuncture significantly increases beta-endorphin levels for periods up to 24 h and may have regulatory effect on FSH, LH and androgen. beta-endorphin increased levels secondary to acupuncture affects the hyperthalamic-pituitary-adrenal (HPA) axis through promoting the release of ACTH through stimulation of its precursor pro-opiomelanocortin synthesis. Inclusion criteria. All available acupuncture studies on human subjects with PCOS from June 1970 to June 2009. Exclusion criteria. Studies not meeting the inclusion criteria, published in languages

other than English or animal studies. ^Conclusion. Acupuncture is a safe and effective treatment to PCOS as the adverse effects of pharmacologic interventions are not expected by women with PCOS. Acupuncture therapy may have a role in PCOS by: increasing of blood flow to the ovaries, reducing of ovarian volume and the number of ovarian cysts, controlling hyperglycaemia through increasing insulin sensitivity and decreasing blood glucose and insulin levels, reducing cortisol levels and assisting in weight loss and anorexia. However, well-designed, randomised controlled trials are needed to elucidate the true effect of acupuncture on PCOS.

1.2. Special Acupuncture Techniques

1.2.1. Comparison of Acupuncture techniques

1.2.1.1. Du 2026

Du Z, Yerebake M, Shi A, Zhao S, Li S, Wan Y, Wang J, Yan C. Efficacy and safety of acupuncture-related therapies in improving insulin resistance, reproductive endocrine outcomes, and ovarian morphology in polycystic ovary syndrome: a systematic review and network meta-analysis. Front Endocrinol (Lausanne). 2026 Feb 27:17:1748814. https://doi.org/10.3389/fendo.2026.1748814

Objective	This network meta-analysis aimed to compare and rank the efficacy and safety of acupuncture-related therapies (ARTs) for polycystic ovary syndrome (PCOS) in improving insulin resistance (IR), reproductive endocrine outcomes, and ovarian morphology.
Methods	Randomized controlled trials (RCTs) in Chinese and English were retrieved up to September 2025 from eight databases (the Cochrane Library, Web of Science, PubMed, Embase, VIP, CNKI, Wanfang, and CBM). Eligible participants were women with PCOS diagnosed using established international or Chinese criteria. Interventions compared ARTs (e.g., acupuncture, moxibustion, electroacupuncture) versus conventional medication and/or placebo. The primary outcome was homeostatic model assessment of IR (HOMA-IR). Secondary outcomes included fasting insulin (FINS), fasting blood glucose (FBG), body mass index (BMI), waist-to-hip ratio (WHR), testosterone (T), luteinizing hormone (LH), follicle-stimulating hormone (FSH), LH/FSH, antral follicle count (AFC), and ovarian volume (OV). Risk of bias was assessed using Review Manager 5.3, and network meta-analysis with surface under the cumulative ranking curve (SUCRA) rankings was conducted in Stata 17.0. All outcomes were summarized as mean differences (MDs) with 95% confidence intervals (CIs).
Results	**53 RCTs involving 4,406 participants** and 12 ART regimens (including two combined regimens) were included. Acupoint injection therapy (AIT) and acupuncture plus moxibustion (Acu + Moxi) significantly reduced HOMA-IR (MD = 2.20, 95% CI 0.44-3.96; MD = 1.06, 95% CI 0.28-1.84). AIT, catgut implantation at acupoint (CIAA), and Acu reduced FINS (MD = 7.30, 95% CI 0.83-13.77; MD = 3.11, 95% CI 1.97-4.25; MD = 2.97, 95% CI 1.87-4.06). Acu + Moxi reduced BMI (MD = 5.80, 95% CI 3.38-8.22), and electroacupuncture (EA) reduced WHR (MD = 0.06, 95% CI 0.02-0.09). Laser acupuncture (LA) reduced T and LH (MD = 0.59, 95% CI 0.33-0.85; MD = 3.00, 95% CI 0.47-5.53). For ovarian morphology, warm needle therapy (WNT) and Acu reduced AFC (MD = 4.08, 95% CI 0.63-7.53; MD = 3.06, 95% CI 1.07-5.05), and Acu reduced ovarian volume (OV) (MD = 2.38, 95% CI 0.67-4.08). Overall, Acu ranked among the top interventions across multiple outcomes. Most reported adverse events were non-serious and transient. Adverse-event reporting was limited across trials.
Conclusion	ARTs may be safe and effective complementary therapies for improving IR, reproductive endocrine outcomes, and ovarian morphology in women with PCOS.

1.2.1.2. Li 2026

Li P, Lu Y, Wang Y, Weng A, Liang X. Effects of different acupuncture methods on polycystic ovarian syndrome: a systematic review and network meta-analysis. BMC Complement Med Ther. 2026 Feb 13. https://doi.org/10.1186/s12906-026-05295-5

Background	Acupuncture has been widely applied to polycystic ovarian syndrome (PCOS) patients. This network meta-analysis (NMA) aims to compare the effects of different acupuncture methods on PCOS from the aspects of hyperandrogenism, metabolic status, sexual hormone disturbance, and infertility.
Methods	We searched eight electronic databases for randomized controlled trials on different acupuncture methods vs. placebo or standard treatment by the end of 30 October, 2023. Stata17 and R 4.5.2 were used for a Bayesian NMA, and Cochrane RoB 2.0 tool for the methodological quality assessment of the included studies.
Results	A total of **59 studies (5937 participants)** were included. In terms of hyperandrogenism, acupuncture greatly reduced testosterone levels in PCOS patients compared with medicine (mean difference(MD)): 0.69; 95% credible interval [0.35, 1.03]). Based on surface under the cumulative ranking curve (SUCRA), acupoint catgut embedding (ACE) was the most recommended in decreasing testosterone levels(SUCRA = 81.7%). Compared with placebo, electro-acupuncture (E-acupuncture) was significantly effective in decreasing Ferriman-Gallwey scores in PCOS patients (MD: 1.52; 95% CrI [0.50, 2.53]), and it was also the preferred choice for reducing Ferriman-Gallwey scores (SUCRA = 84.9%). In terms of metabolic status, ACE was regard the most recommended in reducing body mass index (SUCRA = 90.9%) and waist hip rate (SUCRA = 95.3%); acupuncture was considered as the top preferred option in reducing triglyceride (SUCRA = 79.3%) and high-density lipoprotein (SUCRA = 54.8%); E-acupuncture was possibly the preferred choice for reducing low-density lipoprotein (SUCRA = 75.2%) and fasting blood glucose (SUCRA = 64.6%), and medicine was the preferred choice for reducing homeostasis model assessment of insulin resistance. For sexual hormone disturbance, ACE served as the most recommended option in reducing luteinizing hormone (LH) (SUCRA = 73.3%) and LH/follicle-stimulating hormone(FSH) ratio (SUCRA = 80.9%). For infertility, acupuncture acted as the preferred choice in increasing the pregnancy rate (SUCRA = 76.6%). Sensitivity analyses indicated that the results were generally robust.
Conclusion	No single acupuncture method is the optimal method for all indicators in PCOS patients. Clinically, clinicians may select acupuncture treatment based on patients' primary clinical concerns, acknowledging the limitations of current evidence and individualizing treatment decisions. These findings remain to be further verified by rigorously designed studies due to limitations of existing clinical studies and evidence.

1.2.2. Catgut embedding

1.2.2.1. Yu 2017

Yu Chao-Chao, Ma Chao-Yang, Xiong Yuan, Wu Miao, Shen Feng, Zhou Yi-Lun, Kong Li-Hong, Tang Lei. Effectiveness of acupoint catgut embedding therapy for polycystic ovary syndrome: a systematic review and meta-analysis World Journal of Acupuncture-Moxibustion. 2017;27(4): 41-51. [102339].

Objective	This review aimed to systematically evaluate the evidence on the effects of acupoint catgut embedding(ACE) therapy for patients with polycystic ovary syndrome(PCOS).

Methods	Five databases (CBM, CNKI, Wanfang Database, VIP Database, and Pub Med) were searched to identify relevant studies published before June 2017. The outcomes were resumption of menstruation and serum levels of testosterone(T). The methodological quality of the included studies was judged using the Cochrane risk of bias tool. The overall level of evidence was judged by the Grading of Recommendations Assessment, Development, and Evaluation(GRADE) criteria.
Results	Twenty-five randomized controlled trials were included. ACE therapy significantly lowered serum T levels, and patients receiving ACE treatment reported resumption of menstruation. However, these results should be interpreted with caution due to a high risk of randomization and blinding bias, and likely publication bias. The level of evidence for resumption of menstruation and serum T levels was assessed as “low” and “low”, respectively, using GRADE.
Conclusion	The current evidence on ACE therapy for PCOS is insufficient to draw firm conclusions due to the poor methodological quality. Future well-designed trials are needed to validate the therapeutic efficacy, safety, and mechanisms of ACE in patients with PCOS.

1.2.3. Auricular acupuncture

1.2.3.1. Li 2026

Li X, Xu S, Xie L, Kuang H, Liu J, Li Y. Effectiveness and safety of auricular therapy for polycystic ovary syndrome: a systematic review and meta-analysis. Front Endocrinol (Lausanne). 2026 Mar 4;17:1726938. https://doi.org/10.3389/fendo.2026.1726938

Background	Auricular therapy (AT) has attracted significant interest as a potential treatment for polycystic ovary syndrome (PCOS). A systematic review and a meta-analysis were conducted to evaluate the effectiveness and safety of AT in managing PCOS by analyzing evidence from randomized controlled trials (RCTs).
Methods	Eight electronic databases were searched from their inception until December 22, 2024. Two independent reviewers performed study screening, data extraction, and quality assessment using the Cochrane Collaboration's Risk of Bias tool. A random-effects meta-analysis was conducted to synthesize data from included studies using mean differences (MDs). This study was registered with the Open Science Framework (OSF) (DOI: 10.17605/OSF.IO/VBPSM).

Results	This systematic review and meta-analysis, which included **18 RCTs involving 1,231 patients** with PCOS, found insufficient evidence to support the efficacy of AT as a stand-alone intervention for PCOS. However, AT used as an adjunct therapy exerted beneficial effects on PCOS outcomes. For AT combined with traditional Chinese medicine (TCM) formula versus TCM formula alone, a reduction in body mass index (BMI) (MD: -0.82, 95% confidence interval (CI): -1.60 to -0.03, P = 0.04) was observed. Moreover, the reductions were associated with scores on the Self-rating Anxiety Scale (SAS) (MD: -3.81, 95% CI: -6.26 to -1.36, P = 0.002) and Self-rating Depression Scale (SDS) (MD: -4.22, 95% CI: -7.74 to -0.69, P = 0.02). No significant effect was identified for hormonal profiles (luteinizing hormone (LH) levels, LH/follicle-stimulating hormone (FSH) ratio, testosterone (T) levels), metabolic parameters (fasting blood glucose (FBG) levels, fasting insulin (FINS) levels, or Homeostasis Model Assessment of Insulin Resistance (HOMA-IR)), or waist-hip ratio (WHR). For AT combined with metformin versus metformin alone, a reduction was observed in BMI (MD: -0.77, 95% CI: -1.23 to -0.31, P = 0.0009), WHR (MD: -0.03, 95% CI: -0.05 to -0.02, P < 0.0001), and LH levels (MD: -0.81, 95% CI: -1.05 to -0.57, P < 0.0001). For AT combined with acupuncture versus acupuncture alone, a reduction was observed in BMI (MD: -3.21, 95% CI: -5.09 to -1.33, P = 0.0008), LH levels (MD: -0.80, 95% CI: -1.16 to -0.43, P < 0.0001), and HOMA-IR (MD: -0.10, 95% CI: -0.16 to -0.05, P < 0.0001). A reduction was also associated with the LH/FSH ratio (MD: -1.39, 95% CI: -1.76 to -1.02, P < 0.0001). However, no significant effect was identified for WHR, and the evidence was insufficient for the effect on FINS levels.
Conclusion	Our findings suggest that adjunctive AT may be associated with improvements in key clinical outcomes, including anthropometric measures (BMI, WHR), hormonal parameters (T levels, LH levels, LH/FSH ratio), and psychological health. However, the specific benefits may vary depending on the co-intervention. Although the included studies did not report any serious adverse events, this should be interpreted with caution due to the potential for underreporting. Methodological limitations warrant careful interpretation of our findings, including a high risk of bias, high heterogeneity, and small sample sizes. These limitations highlight the need for further high-quality, well-designed, and adequately powered RCTs to confirm the efficacy and safety of AT in PCOS management.

1.3. Specific outcome

1.3.1. Glucose Metabolism and Lipid Profiles

1.3.1.1. Wang 2025

Wang Y, Bao H, Cong J, Qu Q. Comparative effects of acupuncture and metformin on insulin sensitivity in women with polycystic ovary syndrome: a systematic review and meta-analysis. Front Endocrinol (Lausanne). 2025 Jun 18;16:1553684. https://doi.org/10.3389/fendo.2025.1553684

Objective	To systematically compare the clinical efficacy of acupuncture and metformin in improving insulin resistance (IR) among women with polycystic ovary syndrome (PCOS).
Methods	Comprehensive searches were conducted in PubMed, EMBASE, Cochrane Library, CBM, CNKI, Wanfang, and VIP databases up to September 30, 2024. Randomized controlled trials comparing acupuncture and metformin were included. Primary outcome: homeostasis model assessment of insulin resistance (HOMA-IR). Secondary outcomes: fasting blood glucose (FBG), fasting insulin (FINS), body mass index (BMI), and waist-to-hip ratio (WHR). Data extraction and bias assessment followed Cochrane Handbook 5.1.0. Analyses were performed using Stata 17.

Results	Eleven RCTs (n = 1,248) were included. Reductions in HOMA-IR (SMD = 0.17, 95 % CI –0.18 to 0.52) and FINS (SMD = 0.17, 95 % CI –0.38 to 0.71) were smaller with acupuncture than with metformin, though differences were not significant. Acupuncture achieved slightly greater reductions in BMI, WHR, and FBG, without statistical significance. In subgroup analyses, metformin + sham acupuncture more effectively reduced HOMA-IR (SMD = 0.49, 95 % CI 0.02–0.96), while acupuncture + placebo better reduced FBG (SMD = –0.38, 95 % CI –0.57 to –0.19). Network meta-analysis showed electroacupuncture (SMD = –0.27, 95 % CI –1.37 to 0.83) and abdominal acupuncture (SMD = –0.13, 95 % CI –1.19 to 0.94) as most effective for lowering HOMA-IR, though not statistically significant. SUCRA rankings identified electroacupuncture (67.4%) and abdominal acupuncture (58%) as top modalities.
Conclusion	Metformin remains more effective for improving insulin resistance, while acupuncture shows better performance in lowering fasting glucose. Electroacupuncture appears to be the most promising acupuncture modality for reducing HOMA-IR in PCOS, though further large, high-quality RCTs are needed for confirmation.

1.3.1.2. Yan 2025

Yan WL, Kan ZQ, Wang LQ, Yu ZP, Liu CZ, Yan SY, Yang NN. Comparative effectiveness and safety of acupuncture vs metformin in insulin-resistant polycystic ovary syndrome women: a network meta-analysis of RCTs. Integr Med Res. 2025 Jun;14(2):101148. https://doi.org/10.1016/j.imr.2025.101148

Background	This study conducted a network meta-analysis (NMA) comparing the effectiveness and safety of acupuncture versus metformin to identify a safe and effective alternative treatment for women with polycystic ovary syndrome (PCOS) complicated by insulin resistance (IR).
Methods	PubMed, EMBASE, Web of Science, Cochrane Library, and ClinicalTrials.gov were searched up to August 12, 2024, for randomized controlled trials (RCTs). Two reviewers independently performed data extraction and risk-of-bias assessment. Bayesian NMA was conducted using the GeMTC package with a random-effects model. Outcomes included HOMA-IR, fasting plasma glucose, fasting insulin, and adverse event (AE) incidence.
Results	**Twelve RCTs (n = 870)** were included: 4 compared acupuncture with metformin, 6 compared metformin with control, and 2 compared acupuncture with sham acupuncture. Both acupuncture (MD = –0.76, 95 % CrI –1.42 to –0.03) and metformin (MD = –0.74, 95 % CrI –1.28 to –0.17) significantly reduced insulin resistance (HOMA-IR) versus control. No significant difference was found between acupuncture and metformin in improving glucose metabolism. Acupuncture showed fewer adverse events (RR = 0.13, 95 % CrI 0.01–0.68). Overall, acupuncture ranked highest across SUCRA analyses for efficacy and safety.
Conclusion	Acupuncture is as effective as metformin for improving insulin resistance in PCOS while being safer and easier to perform. These findings support acupuncture as a viable alternative therapy, though further high-quality RCTs are warranted to strengthen the evidence base.

1.3.1.3. Yu 2025

Yu Z, Chen S, Zhang Q, Fu W, Geng H, Wang C, Wen H. Effectiveness of acupuncture and moxibustion therapy on glycolipid metabolism in patients with obese-type polycystic ovarian syndrome: a systematic review and network meta-analysis. Medicine (Baltimore). 2025 Jun 13;104(24):e42812. https://doi.org/10.1097/MD.0000000000042812

Background	The efficacy of acupuncture and moxibustion-related therapy (AMRT) in improving glycolipid metabolism in obese-type polycystic ovary syndrome (PCOS) remains uncertain. This review assessed the impact of various AMRT interventions on metabolic regulation in obese PCOS.
Methods	Randomized controlled trials comparing AMRT with conventional medicine or blank control were searched across seven databases. Continuous outcomes were analyzed using mean differences (MD) with 95 % confidence intervals (CIs) via RevMan 5.4 and R software. Methodological quality was appraised with ROB2, and evidence certainty with GRADE.
Results	**Thirty RCTs** were included. Compared with control groups, AMRT significantly improved fasting plasma glucose (MD = –0.19, 95 % CI –0.28 to –0.09), weight (MD = –2.34, 95 % CI –4.51 to –0.17), triglycerides (MD = –0.35, 95 % CI –0.40 to –0.29), low-density lipoprotein (MD = –0.20, 95 % CI –0.40 to –0.01), and total cholesterol (MD = –0.36, 95 % CI –0.49 to –0.23), all with moderate-certainty evidence. Network meta-analysis identified moxibustion combined with catgut embedding as most effective for reducing fasting plasma glucose, fasting insulin, and insulin resistance, while manual acupuncture plus metformin ranked best for improving BMI, triglycerides, insulin resistance, and waist-hip ratio. No inconsistency was found between direct and indirect evidence.
Conclusion	Acupuncture and moxibustion-related therapies effectively improve glycolipid metabolism in obese PCOS, with benefits comparable to conventional medicine for insulin resistance. Moxibustion plus catgut embedding is optimal for glycemic control, whereas manual acupuncture with metformin best improves lipid metabolism and body composition.

1.3.1.4. Zheng 2021

Zheng R, Qing P, Han M, Song J, Hu M, Ma H, Li J. The Effect of Acupuncture on Glucose Metabolism and Lipid Profiles in Patients with PCOS: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Evid Based Complement Alternat Med. 2021. [218000]. doi

Objective	To evaluate the effectiveness of acupuncture on glucose metabolism and lipid profiles in patients with polycystic ovary syndrome (PCOS).
Methods	Databases, including the China National Knowledge Infrastructure (CNKI), the China Science and Technology Journal Database (VIP), Wanfang, PubMed, and the Cochrane Library were searched for the relevant literature, with the retrieval deadline being February 2020. Two reviewers independently screened, selected, and extracted the data and validated the results. The methodological quality of the included studies was evaluated with the risk of bias tool, and the meta-analysis was performed using the RevMan 5.3.5 software.
Results	A total of 737 patients with PCOS from 10 randomized controlled trials were included in the meta-analysis. A pooled analysis showed significant decreases in body mass index (mean difference (MD) = -1.47, 95% CI -2.35 to -0.58, $P < 0.001$) and waist-to-hip ratio (MD = -0.04, 95% CI [-0.06, -0.02], $P < 0.001$) in the acupuncture group along with significant improvements in fasting plasma glucose (MD = -0.38, 95% CI [-0.70, -0.07], $P = 0.02$), homeostasis model assessment of insulin resistance (MD = -0.22, 95% CI [-0.41, -0.02], $P = 0.03$), and triglycerides (MD = -0.26, 95% CI [-0.48, -0.04], $P = 0.02$). No significant differences were observed in the Ferriman-Gallwey score, 2 h fasting plasma glucose, fasting insulin, 2 h fasting insulin, serum total cholesterol, low-density lipoprotein cholesterol, or high-density lipoprotein cholesterol.

Conclusion	Acupuncture is relatively effective and safe in improving glucose metabolism and insulin sensitivity in patients with PCOS. The included studies were generally of not bad methodological quality, but further large-scale, long-term randomized controlled trials with rigorous methodological standards are still warranted.

1.3.2. Endometrial lesions in patients with polycystic ovary syndrome (PCOS)

1.3.2.1. Hu 2021

Hu J, Shi W, Xu J, Liu S, Hu S, Fu W, Wang J, Han F. Complementary and Alternative Medicine for the Treatment of Abnormal Endometrial Conditions in Women with PCOS: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Evid Based Complement Alternat Med. 2021. [211697]. doi

Background	Endometrial lesions in patients with polycystic ovary syndrome (PCOS) exhibit complex pathological features, and these patients are at risk of both short-term and long-term complications. Complementary and alternative medicine (CAM), which is gradually becoming more accepted and is believed to be clinically effective, claims to be promising for treating PCOS, and thus its effect on the abnormal endometrium of PCOS patients should be assessed. The present meta-analysis sought to evaluate the efficacy and safety of CAM in treating endometrial lesions in patients with PCOS.
Methods	Randomized trials on CAM were identified in four Chinese and seven English-language databases from their establishment to January 2020. The present study included patients diagnosed with PCOS and abnormal endometrial conditions who underwent CAM therapy independently or in combination with traditional western medicine. Data were extracted, and the Cochrane “risk of bias” tool was used to assess methodological quality. Effects were expressed as the relative risk (RR) or mean difference (MD/SMD) with 95% confidence interval (CI) as calculated with Rev Man 5.3.
Results	A total of 13 randomized controlled trials were included, involving 1,297 PCOS patients treated for endometrial abnormalities. Methodological quality was generally unclear or had a low risk of bias. The trials tested four different types of CAM therapies (i.e., traditional Chinese medicine treatment, acupuncture treatment, traditional Chinese medicine in combination with western medicine treatment, and acupuncture in combination with western medicine treatment). CAM treatment could significantly reduce the endometrial thickness in PCOS patients compared to western medicine alone (SMD -0.88, 95% CI [-0.12, -0.57]; I 2 = 64%). Compared with clomiphene treatment for the induction of ovulation, CAM treatment showed a clear improvement in endometrial thickness during ovulation (SMD 2.03, 95% CI [1.64, 2.02]; I 2 = 48%). Moreover, CAM was more effective than western medicine alone in reducing the endometrial spiral artery pulsatility index. No significant difference was seen between CAM and traditional treatment when these were used to improve traditional Chinese medicine syndrome scores. Acupuncture alone or traditional Chinese medicines (taken orally) in combination with western medicine significantly increased the pregnancy rate of PCOS patients (RR 1.59, 95% CI [1.30, 1.93]; I 2 = 51%, P < 0.00001), and CAM was more effective than western medicine alone for improving hormone levels. No serious adverse events were reported in 11 of the 13 trials.
Conclusions	CAM may effectively ameliorate the endometrial condition of PCOS patients, and it can regulate the level of hormone secretion to increase the ovulation rate and the pregnancy rate.
Acupuncture	L’acupuncture est incluse, mais sans données spécifiques

1.3.3. in vitro fertilization

see corresponding item

1.3.4. Infertility

see corresponding item

1.3.5. Anxiety and depression

1.3.5.1. Ye 2026

Front Med (Lausanne). 2026 Jan 21;13:1738629. Acupuncture improves anxiety and depression in patients with polycystic ovary syndrome: a systematic evaluation and meta-analysis. https://doi.org/10.3389/fmed.2026.1738629

Background	Acupuncture is increasingly utilized to address anxiety and depression in polycystic ovary syndrome (PCOS), yet evidence for non-pharmacological interventions remains limited. This study aimed to rigorously evaluate the efficacy and safety of acupuncture in alleviating anxiety and depression among women with PCOS, while exploring its potential mechanisms.
Methods	Eight Chinese/English databases (CNKI, Web of Science, PubMed, Embase, etc.) were searched from inception to March 1, 2025. Two investigators independently screened studies, extracted data, and assessed quality via the Cochrane risk-of-bias tool. The meta-analyses were performed with RevMan 5.4. Additionally, data mining methods were used, including frequency statistics to analyze the frequency of acupuncture points and the meridians involved.
Results	**Twelve RCTs (n = 2,127 patients**; acupuncture = 1,059, control = 1,068) were included. Compared with the control, acupuncture significantly reduced anxiety scores [MD = -6.42, 95% CI (-8.91, -3.56); p < 0.00001] and depression scores [MD = -5.89, 95% CI (-9.01, -2.78); p = 0.0002] versus controls. Acupuncture also improved testosterone [MD = -0.05, 95% CI (-0.11, 0.00); p = 0.05], BMI [MD = -0.70, 95% CI (-1.19, -0.21); p = 0.005], and the waist-hip ratio [MD = -0.06, 95% CI (-0.11, -0.01); p = 0.03], with no significant adverse effects [OR = 0.08, 95% CI (0.01, 0.81); p = 0.03]. The effects on insulin resistance were not significant [MD = -0.41, 95% CI (-1.18, 0.37); p = 0.31]. Data mining revealed that Foot Taiyin Spleen Meridian (SP), Conception Vessel (CV), and Foot Yangming Stomach Meridian (ST) were the most frequently used, and the most commonly used combination of points included SP6, LR3, and ST36.
Conclusion	Acupuncture, particularly manual and short-term protocols, is a safe and effective adjunct for reducing anxiety and depression in PCOS. These benefits may be mediated via modulation of androgen levels, adiposity, and neuroendocrine pathways. Nevertheless, conclusions are limited by sample size, methodological heterogeneity, and inadequate adverse event reporting. Higher-quality RCTs are needed to confirm the safety and efficacy of these methods.

1.3.6. Negative emotions

1.3.6.1. Lai 2025

Lai L, Wu Z, Zhao J, Li J, Wu B, Yang H, Xu N, Yi W. Efficacy of acupuncture in alleviating negative emotions in polycystic ovary syndrome: a systematic review and meta-analysis. Brain Behav. 2025;15(12):e71129. https://doi.org/10.1002/brb3.71129

Background	Preliminary studies suggest that acupuncture may alleviate negative emotions in patients with polycystic ovary syndrome, but the available evidence remains limited and of generally low methodological quality.
Objective	To evaluate the efficacy of acupuncture as a therapeutic intervention for negative emotional symptoms in patients with polycystic ovary syndrome through systematic review and meta-analysis.
Methods	Nine databases were systematically searched to identify randomized controlled trials assessing acupuncture for negative emotions in polycystic ovary syndrome. Primary outcomes were depression and anxiety assessed by the Self-Rating Depression Scale and Self-Rating Anxiety Scale. Secondary outcomes included Rosenfield score, Ferriman–Gallwey score, and body mass index. Risk of bias was assessed using Cochrane RoB 2.0, and certainty of evidence was graded using GRADE.
Results	**Seven randomized controlled trials** were included. Acupuncture was more effective than drug treatment in improving Self-Rating Depression Scale scores, but showed no significant benefit on Self-Rating Anxiety Scale scores. Acupuncture significantly improved Ferriman–Gallwey scores, while no significant effect was observed for Rosenfield scores. GRADE assessment indicated low certainty for depression and Ferriman–Gallwey outcomes and very low certainty for anxiety, Rosenfield score, and body mass index.
Conclusion	Acupuncture may have a potential effect in alleviating depressive symptoms in patients with polycystic ovary syndrome, but the evidence is limited by the low quality of the included trials. Definitive conclusions cannot be drawn, and higher-quality randomized controlled trials are required before firm therapeutic claims can be made.

1.3.7. Safety

1.3.7.1. Nurwati 2025

Nurwati I, Tristan CD, Modesty K, Kynaya EM, Hanif I, Sudiono NE, Ilyas MF. Safety of acupuncture in polycystic ovary syndrome: a systematic review and meta-analysis of randomized controlled trials. Med Acupunct. 2025 Aug 14;37(4):281-291. https://doi.org/10.1177/19336586251360119

Background	Acupuncture has gained recognition as an adjunctive therapy for polycystic ovary syndrome (PCOS), but safety concerns persist, particularly regarding adverse events and potential miscarriage risk with electroacupuncture (EA). This systematic review assessed the safety profile of acupuncture in PCOS.
Methods	PubMed, ScienceDirect, and Scopus were searched up to September 8, 2024, for randomized controlled trials comparing acupuncture with control (sham/no acupuncture) or active drugs. Study quality was evaluated using the RoB 2.0 tool, and meta-analyses were conducted using R Studio.
Results	From 1,041 screened records, **13 RCTs were included**. No serious or life-threatening adverse events were reported. Compared with controls, acupuncture was associated with a higher incidence of mild bruising at needle sites (OR = 3.34, 95 % CI 1.76–6.37, $p < 0.01$) but no increase in other mild or moderate adverse events. When compared with active drugs, adverse event rates were similar. Miscarriage rates were comparable between acupuncture and control or ovulation-induction drug groups, particularly when low-frequency (2 Hz) EA was administered before conception.
Conclusion	Acupuncture is a safe complementary therapy for PCOS, showing no increase in serious adverse events or miscarriage risk. Further studies are warranted to standardize stimulation parameters and optimize clinical safety protocols.

1.4. Special Acupuncture Techniques

1.4.1. Comparison of Acupuncture techniques

1.4.1.1. Wu 2025

Wu T, Liu Y, Kong F, Hu J, Liu Y, Yang J, Chen J. Improvement of endocrine and metabolic conditions in patients with polycystic ovary syndrome through acupuncture and its combined therapies: a systematic review and meta-analysis. Ann Med. 2025 Dec;57(1):2477295. https://doi.org/10.1080/07853890.2025.2477295

Background	Polycystic ovary syndrome (PCOS) is a prevalent endocrine disorder in reproductive-age women that affects fertility and metabolic function. Acupuncture and combined therapies have been proposed to improve endocrine and metabolic parameters, but their comparative efficacy with metformin remains uncertain.
Methods	Outcomes included hormonal, metabolic, and body weight indicators. Studies involving additional interventions or comorbidities were excluded. Data mining methods were applied to identify frequently used acupoints and meridians, including frequency analysis and Apriori association rule algorithms to determine effective point combinations. Comparisons were made between acupuncture-related interventions and oral metformin.
Results	**Forty-six articles (51 studies)** covering six interventions—acupuncture + metformin, acupuncture alone, acupuncture + Chinese herbal medicine + metformin, acupuncture + Chinese herbal medicine, acupuncture + cupping, and auricular acupuncture + metformin—showed significant improvements across hormonal, metabolic, and weight parameters. The most frequently used meridian was the Stomach meridian of Foot Yangming, with common acupoints CV4, SP6, and ST36 identified as core combinations.
Conclusion	Acupuncture and its combined therapies appear to improve endocrine and metabolic conditions in PCOS, suggesting potential benefits comparable to or synergistic with metformin. Nonetheless, heterogeneity and bias across included studies warrant cautious interpretation and call for rigorously designed RCTs to strengthen clinical recommendations.

1.4.1.2. Ye 2025

Ye J, Guo H, Zeng Q, Gan Z, Jin Q, Su H, Lin H. Comparative efficacy and safety of different traditional Chinese medicine external therapies for polycystic ovary syndrome in women: a network meta-analysis. Medicine (Baltimore). 2025 Oct 24;104(43):e44441. https://doi.org/10.1097/MD.0000000000044441

Background	Polycystic ovary syndrome (PCOS) is one of the most prevalent endocrine disorders in women. Traditional Chinese medicine (TCM) external therapies have shown promising efficacy, offering simple and cost-effective management options. This study compared the efficacy and safety of various external TCM therapies for PCOS using network meta-analysis.

Methods	Comprehensive searches were conducted in Web of Science, Embase, PubMed, Cochrane Library, CNKI, VIP, Wanfang, and China Biomedical Literature Database. Randomized controlled trials assessing TCM external treatments for PCOS were included. Outcomes included FSH, LH, LH/FSH ratio, testosterone, and BMI. Odds ratios and standardized mean differences with 95 % confidence intervals were calculated, and interventions were ranked using SUCRA values. Analyses were performed with Stata 17.0.
Results	Electroacupuncture ranked highest for increasing FSH (SUCRA = 86%). Regulating the conception–governor vessel showed the best efficacy for reducing LH (SUCRA = 76.6%). Abdominal acupuncture was most effective for improving LH/FSH ratio (SUCRA = 58.6%) and reducing testosterone (SUCRA = 98.2%). Acupuncture combined with medication achieved the best BMI reduction (SUCRA = 98.2%). However, abdominal acupuncture also showed the highest likelihood of adverse effects (SUCRA = 58.6%).
Conclusion	Different TCM external therapies target distinct PCOS-related parameters. Electroacupuncture, regulating conception–governor vessel therapy, abdominal acupuncture, and acupuncture plus medication each demonstrate specific strengths, though abdominal acupuncture may carry an increased risk of adverse events.

2. Overview of systematic reviews

2.1. Bai 2024

Bai T, Deng X, Bi J, Ni L, Li Z, Zhuo X. The effects of acupuncture on patients with premature ovarian insufficiency and polycystic ovary syndrome: an umbrella review of systematic reviews and meta-analyses. Front Med (Lausanne). 2024 Nov 25;11:1471243.
https://doi.org/10.3389/fmed.2024.1471243

Backgound	Previous studies have suggested that acupuncture could improve the clinical outcomes of women with premature ovarian insufficiency (POI) and polycystic ovary syndrome (PCOS). However recent meta-analyses have provided inconclusive findings. This umbrella meta-analysis aimed to explore the effect of acupuncture therapies on PCOS and POI outcomes.
Methods	A systematic literature search was carried out in in PubMed, Scopus, Web of Science, and Chinese databases, including Wan Fang Data Knowledge Service Platform, CBM, CNKI, and VIP up until April 2024 to gather relevant studies. Inclusion criteria were meta-analyses on the effect of acupuncture or combined therapies with standard medications or traditional Chinese medicine (TCM) on PCOS and POI. The outcomes were pregnancy rates, ovulation rates, hormone levels, glycemic indices, resumption of menstruation, endometrial thickness, live birth rates, abortion rates, and body mass index (BMI). Studies with irrelevant interventions, animal studies, reviews without quantitative analysis, and studies with insufficient data were excluded. Standardized mean difference (SMD) with a 95% confidence interval (CI) and relative risk (RR) with a 95% CI were used as effect sizes to pool the data using a random effects model.
Results	A total of 38 meta-analyses, 20 studies (sample size: 27,106 patients) for PCOS and **18 studies (sample size: 19,098 patients)** for POI, were included. Overall, in women with PCOS, acupuncture therapies were significantly associated with a higher pregnancy rate, ovulation rate, and reduced serum levels of luteinizing hormone (LH), testosterone, LH/follicle-stimulating hormone (FSH), insulin resistance, and BMI. Moreover, FSH, fasting glucose, and fasting insulin levels were improved in subgroup analyses. For POI, acupuncture significantly improved serum levels of LH, FSH, LH/FSH ratio, and estradiol.
Conclusion	Acupuncture-related therapies improve pregnancy rate, and metabolic and hormonal imbalances in patients with POI and PCOS.

2.1.1. Yang 2023

Yang H, Xiao ZY, Yin ZH, Yu Z, Liu JJ, Xiao YQ, Zhou Y, Li J, Yang J, Liang FR. Efficacy and safety of acupuncture for polycystic ovary syndrome: An overview of systematic reviews. J Integr Med. 2023 Mar;21(2):136-148. https://doi.org/10.1016/j.joim.2022.12.002

Background	Polycystic ovary syndrome (PCOS) is the primary cause of anovulatory infertility, bringing serious harm to women's physical and mental health. Acupuncture may be an effective treatment for PCOS. However, systematic reviews (SRs) on the efficacy and safety of acupuncture for PCOS have reported inconsistent results, and the quality of these studies has not been adequately assessed.
Objective	To summarize and evaluate the current evidence on the efficacy and safety of acupuncture for PCOS, as well as to assess the quality and risks of bias of the available SRs.
Methods	Search strategy: Nine electronic databases (Cochrane Library, MEDLINE, Embase, PsycINFO, CINAHL, Chinese National Knowledge Infrastructure, Wanfang Data, Chongqing VIP Chinese Science and Technology Periodical Database, and China Biology Medicine disc) were searched from their establishment to July 27, 2022. Based on the principle of combining subject words with text words, the search strategy was constructed around search terms for “acupuncture,” “polycystic ovary syndrome,” and “systematic review.” Inclusion criteria: SRs of randomized controlled trials that explored the efficacy and (or) safety of acupuncture for treating patients with PCOS were included. Data extraction and analysis: Two authors independently extracted study data according to a predesigned form. Tools for evaluating the methodological quality, risk of bias, reporting quality, and confidence in study outcomes, including A Measurement Tool to Assess Systematic Reviews 2 (AMSTAR 2), Risk of Bias in Systematic Reviews (ROBIS), Preferred Reporting Items for Systematic Reviews and Meta-analyses for Acupuncture (PRISMA-A), and the Grading of Recommendations Assessment, Development and Evaluation (GRADE), were used to score the included SRs.
Results	A total of 885 studies were retrieved, and **11 eligible SRs** were finally included in this review. The methodological quality of 2 SRs (18.18%) was low, while the other 9 SRs (81.82%) were scored as extremely low. Four SRs (36.36%) were considered to be of low risk of bias. As for reporting quality, the reporting completeness of 9 SRs (81.82%) was more than 70%. Concerning the confidence in study results, 2 study results were considered to have a high quality of evidence (3.13%), 14 (21.88%) a “moderate” quality, 28 (43.75%) a “low” quality, and 20 (31.24%) considered a “very low” quality. Descriptive analyses suggested that combining acupuncture with other medicines can effectively improve the clinical pregnancy rate (CPR) and ovulation rate, and reduce luteinizing hormone/follicle-stimulating hormone ratio, homeostasis model assessment of insulin resistance, and body mass index (BMI). When compared with medicine alone, acupuncture alone also can improve CPR. Further, when compared with no intervention, acupuncture had a better effect in promoting the recovery of menstrual cycle and reducing BMI. Acupuncture was reported to cause no adverse events or some adverse events without serious harm.
Conclusion	The efficacy and safety of acupuncture for PCOS remains uncertain due to the limitations and inconsistencies of current evidence. More high-quality studies are needed to support the use of acupuncture in PCOS.

2.1.2. Luo 2018

Luo YN, Zheng QH, Liu ZB, Zhang FR, Chen Y, Li Y. Methodological and reporting quality evaluation of systematic reviews on acupuncture in women with polycystic ovarian syndrome: A systematic review.

Complement Ther Clin Pract. 2018;:197-203. [181359].

Purpose	To evaluate the methodological and reporting quality of systematic reviews (SRs) on acupuncture treatment for women with polycystic ovarian syndrome (PCOS).
Methods	A comprehensive search on multiple databases was performed. Methodological and reporting quality of reviews were assessed by revised assessment of multiple systematic reviews (AMSTAR 2) and preferred reporting items for SRs and meta-analyses (PRISMA), respectively.
Results	Ten SRs were included. Among the SRs using AMSTAR 2, two achieved a good overall rating (percentage of items with “yes” > 50%) and severe limitation existed in eleven items (percentage of items with “yes” < 50%). Among the SRs using PRISMA, six reviews achieved a good overall rating (percentage of items with “yes” > 50%), while twelve items were poorly reported (percentage of items with “yes” < 50%).
Conclusion	There were many deficiencies in the methodological and reporting quality of SRs assessing acupuncture in women with PCOS.

3. Clinical Practice Guidelines

3.1. World Health Organization (WHO) 2016 Ø

Balen AH, Morley LC, Misso M, Franks S, Legro RS, Wijeyaratne CN, Stener-Victorin E, Fauser BC, Norman RJ, Teede H. The management of anovulatory infertility in women with polycystic ovary syndrome: an analysis of the evidence to support the development of global WHO guidance. Hum Reprod Update. 2016. [187945].

There is no clear evidence for efficacy of acupuncture or herbal mixtures in women with PCOS