Table des matières

in vitro fertilization:

Fécondation in vitro : évaluation de l'acupuncture

1. Systematic Reviews and Meta-Analysis

1.1. Generic Acupuncture

1.1.1. Huang 2026 (recurrent implantation failure)

Huang Q, Liu XY, Zhu ZM, Hou TS, Long Y, Li SH, Huang QH, Yang HM, Wang JR, Wu QF. Efficacy of acupuncture for recurrent implantation failure: a systematic review and meta-analysis of randomized controlled trials. Front Med (Lausanne). 2026;13:1758790.
https://doi.org/10.3389/fmed.2026.1758790

Background	Recurrent implantation failure (RIF) presents significant clinical and psychological challenges. While acupuncture is a potential adjunctive therapy during embryo transfer (ET), comprehensive evidence regarding its multidimensional effects remains limited. This study systematically evaluates acupuncture's impact on pregnancy outcomes, endometrial receptivity, and psychological status in RIF patients.
Methods	We performed a systematic review and meta-analysis of randomized controlled trials (RCTs) comparing acupuncture + ET with ET alone in patients with RIF. Eight major databases were searched from inception through October 2025. Risk of bias was assessed using the Risk of Bias 2 (RoB 2) tool, and the certainty of evidence was evaluated using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework.
Results	**Fourteen RCTs involving 1,428 patients** were included. Regarding clinical efficacy, acupuncture + ET significantly increased the clinical pregnancy rate (relative risk [RR] = 1.73, 95% confidence interval [CI] [1.51, 1.99], $p < 0.001$), the embryo implantation rate (RR = 1.69, 95% CI [1.34, 2.13], $p < 0.001$), and the live birth rate (RR = 1.82, 95% CI [1.16, 2.86], $p = 0.009$), while reducing the miscarriage rate (RR = 0.40, 95% CI [0.17, 0.97], $p = 0.04$). In terms of endometrial receptivity, acupuncture significantly increased endometrial thickness (mean difference [MD] = 1.20, 95% CI [0.75, 1.66], $p < 0.001$) and reduced the endometrial pulsatility index (MD = -0.49, 95% CI [-0.93, -0.06], $p = 0.03$) and resistance index (MD = -0.21, 95% CI [-0.30, -0.13], $p < 0.001$). Furthermore, significant reductions in Self-Rating Anxiety Scale and Self-Rating Depression Scale scores were observed (MD = -5.89, $p = 0.02$ and MD = -6.83, $p = 0.003$, respectively). However, the certainty of evidence ranged from very low to moderate due to methodological limitations and high heterogeneity.
Conclusion	Acupuncture may be a promising adjunctive therapy for RIF patients undergoing ET. However, the current evidence is constrained by significant methodological limitations. These results support the clinical integration of acupuncture into multidisciplinary RIF management but should be further confirmed by multicenter, rigorously blinded trials with standardized protocols and long-term outcome assessments.

1.1.2. Wang 2026

Wang JY, Xu JB, Chen XL, Liu T, Shi D, Li WJ. Acupuncture to ensure high-quality embryos in women undergoing in vitro fertilization: A systematic review and meta-analysis. J Integr Med. 2026; Epub ahead of print. https://doi.org/10.1016/j.joim.2026.03.002

Background	Acupuncture therapy has garnered significant attention for its potential role in enhancing the quantity and quality of oocytes retrieved and the number of embryos formed during in vitro fertilization (IVF) with controlled ovarian stimulation (COS).
Objective	This systematic review and meta-analysis evaluated the effectiveness of acupuncture for improving oocyte and embryo quality in IVF patients undergoing COS.
Methods	PubMed, Embase, Web of Science, Cochrane Library, CNKI, Wanfang Data, VIP Database and SinoMed were searched, from inception to 30 June 2025. Randomized controlled trials (RCTs) comparing IVF (with or without intracytoplasmic sperm injection) combined with acupuncture (manual acupuncture or electroacupuncture) to IVF alone or IVF with sham/placebo acupuncture in female infertility patients were included, without restrictions on race, age or nationality. Outcome variables included high-quality embryo rate (HQER), high-quality oocyte rate (HQOR), fertilization rate (FR) and the number of retrieved oocytes (ROs). Data were analyzed using Review Manager 5.4.0. The primary outcome was HQER, and secondary outcomes comprised ROs, HQOR and FR.
Results	**Eighteen studies were analyzed**. Six studies showed that acupuncture significantly improved HQER (odds ratio [OR] = 1.76, 95% confidence interval [CI] [1.30, 2.39], P = 0.0003; moderate-certainty evidence) with moderate heterogeneity (I2 = 49%). Two RCTs indicated that IVF combined with acupuncture was better than IVF alone for HQOR (OR = 2.39, 95% CI [1.42, 4.02], P = 0.001; low-certainty evidence) with substantial heterogeneity (I2 = 69%). Four RCTs showed significant improvement in FR in the acupuncture group (OR = 1.47, 95% CI [1.19, 1.82], P = 0.0003; I2 = 0%; moderate-certainty evidence). Subgroup analyses revealed that acupuncture increased oocytes retrieved in the follicle-stimulating hormone (FSH) ≥ 25 mIU/mL group (mean difference [MD] = 0.55, 95% CI [0.29, 0.82], P < 0.0001; I2 = 38%; low-certainty evidence) and within 12-24 sessions (MD = 1.44, 95% CI [0.12, 2.76], P = 0.03; I2 = 0%; low-certainty evidence).
Conclusion	Acupuncture is an effective adjunct therapy for improving embryo quality in assisted reproductive technology, which is supported by moderate-certainty evidence. Its efficacy is not uniform but follows two key principles: first, a patient-stratified effect, where increased oocyte yield is exclusive to women with high FSH (≥ 25 mIU/mL); and second, an outcome-dependent dosing, where embryo quality benefits from brief courses (5-8 sessions), while oocyte number requires longer regimens (≥ 12 sessions). This recommended a personalized acupuncture treatment regime for IVF, moving beyond a one-size-fits-all approach.

1.1.3. Chen 2025

Chen J, Lyu Y, Cheng X, Zhang F. The impact of acupuncture and moxibustion treatment in individuals with recurrent implantation failures: A systematic review and meta-analysis. Medicine (Baltimore). 2025 Dec 19;104(51):e46587. https://doi.org/10.1097/MD.0000000000046587

Background	The therapeutic efficacy of acupuncture and moxibustion in addressing recurrent implantation failure (RIF) remains a topic of debate. This systematic review and meta-analysis aims to synthesize current evidence on the benefits of acupuncture and moxibustion for patients with RIF.

Methods	Embase, PubMed, Cochrane, Web of Science, CBM, WanFang, CNKI, and VIP databases were retrieved, with the search period spanning from each database's inception to January 19, 2024, and an updated search was conducted on September 18, 2025. Studies were selected based on predefined criteria, and the quality was assessed using the RoB-2 tool. Data were analyzed using Review Manager5.3 software.
Results	The meta-analysis included **15 studies, encompassing 1029 subjects**. Statistically significant improvements were observed in clinical pregnancy rates (RR = 1.84, 95% CI: 1.53–2.20, P < .05), live birth rates (RR = 2.39, 95% CI: 1.59–3.58, P < .05), endometrial thickness (MD = 1.37, 95% CI: 0.95–1.80, P < .05), endometrial morphology (RR = 1.67, 95% CI: 1.30–2.14, P < .05), and serum estradiol levels (SMD = 2.70, 95% CI: 0.20–5.21, P < .05) compared with control interventions. Subgroup analyses showed greater increases in endometrial thickness with interventions lasting three menstrual cycles (MD = 1.62, 95% CI: 0.92–2.33, P < .001, I^2 = 92.4%), electroacupuncture combined with warm acupuncture (MD = 2.41, 95% CI: 2.05–2.77, P < .001, I^2 = 0%), and staged acupuncture point selection (MD = 2.41, 95% CI: 2.05–2.77, P < .001, I^2 = 0%).
Conclusion	Compared with continuous oral estrogen and conventional hormone replacement therapy, acupuncture and moxibustion appear to confer greater benefits in improving clinical pregnancy rates, live birth rates, endometrial thickness, endometrial morphology, and serum estradiol levels in patients with recurrent implantation failure.

1.1.4. Fu 2025

Fu QW, Zhu SM, Chen J, Liu YQ, Liang CH, Song LJ, Zhuang J, Tan X, Liu LZ, Luo L, Yin HY, Yeung WF, Chen SC, Liu WT, Zhang QX, Tang Y. Acupuncture for women undergoing in vitro fertilization: An updated systematic review and meta-analysis with trial sequential analysis. Int J Nurs Stud. 2025 Apr 24;168:105097. https://doi.org/10.1016/j.ijnurstu.2025.105097

Backgound	In vitro fertilization (IVF) is a widely utilized assisted reproductive technology, but its success rates remain suboptimal due to various physiological and psychological factors. Acupuncture, as a complementary therapy, has been proposed to improve reproductive outcomes and alleviate associated pain and anxiety.
Objective	To evaluate the effectiveness and safety of acupuncture as an adjunctive treatment for women undergoing IVF, focusing on reproductive outcomes, pain reduction, and anxiety alleviation.
Methods	Five English databases were searched up to June 20th, 2024. Manual acupuncture or electro-acupuncture was used solely as a complementary adjuvant in the experimental groups, and control interventions were sham acupuncture or blank (wait-list) control. Systematic reviews and meta-analyses were conducted based on the Cochrane systematic review method, and trial sequential analyses were performed. Meta-influence analyses, meta-regression and subgroup-analyses were performed for exploration of heterogeneity and related variables. Egger's together with trim and fill tests were conducted for evaluation of publication bias. The quality of the results was assessed, and correlation coefficient and cluster analyses were also performed.
Results	Finally, 42 trials identified from **37 published articles, involving 7400 participants**, were included, representing diverse populations worldwide. Compared to sham acupuncture and blank controls, acupuncture significantly (P < 0.05) improved biochemical pregnancy rate (RR = 1.28, 95 % CI: 1.04-1.57) and clinical pregnancy rates (RR = 1.19, 95 % CI: 1.06-1.34). Additionally, acupuncture was associated with better pain management during surgery and reduced anxiety levels. Acupuncture-specific adverse events were reported in eight of 42 trials, primarily mild to moderate local reactions. However, a significantly higher early miscarriage rate was observed in the acupuncture groups (RR = 1.51, 95 % CI: 1.10-2.08).

Conclusions	Acupuncture may improve certain reproductive outcomes and alleviate pain and anxiety in women undergoing IVF. However, the potential risk of early miscarriage warrants caution, and further rigorous trials are needed to confirm these findings.

1.1.5. Liu 2025

Liu KX, Wu YY, Zhang M, Jia M, Wang D, Zhang CX, Guan YC, Tian PL. Effectiveness of non-pharmacological interventions on pregnancy rates in infertile individuals undergoing IVF/ICSI: a systematic review and network meta-analysis. Arch Public Health. 2025 Apr 22;83(1):110. https://doi.org/10.1186/s13690-025-01571-x

Aim	To assess the impact of various non-pharmacological interventions on the likelihood of achieving pregnancy in individuals undergoing IVF/ICSI.
Backgound	Despite significant advancements in assisted reproductive technology, the strategic utilization of non-pharmacological interventions to enhance clinical outcomes continues to pose a significant challenge in the field of reproductive medicine.
Methods	Relevant studies published in English or Chinese were comprehensively selected from databases including CNKI, Wanfang Data, VIP Database, PubMed, Web of Science, and Embase up to December 2023. Studies that examined various non-pharmacological interventions during IVF/ICSI treatment, and reported subsequent pregnancy outcomes, were included. The control group received standard treatment. Study quality was assessed based on the methodology and criteria outlined in the Cochrane Collaboration Handbook. This review protocol was registered with PROSPERO (CRD42023414729).
Results	Out of the initial 28,688 studies identified, 43 trials involving 5,779 women were included. When compared to the control treatment, cognitive-behavioral therapy, **acupuncture**, lifestyle intervention, health education, and music therapy were associated with a significantly increased likelihood of clinical pregnancy (OR 1.44, 95% CI 1.21 to 1.72; 1.89, 1.46 to 2.43; 1.75, 1.18 to 2.57; 2.10, 1.57 to 2.80; 1.52, 1.08 to 2.13, respectively). Among the non-pharmacological treatments studied, cognitive-behavioral therapy and lifestyle intervention were associated with the highest number of oocytes retrieved (OR 0.31, 95% CI 0.11 to 0.86; 0.15, 95% CI 0.04 to 0.58, compared to controls). No significant differences were observed among non-pharmacological interventions and the control group. Cognitive-behavioral therapy and health education led to the highest rate of high-quality embryos (OR 0.41, 95% CI 0.20 to 0.84; 0.52, 95% CI 0.28 to 0.97, compared to controls).
Conclusions	Non-pharmacological treatments such as cognitive-behavioral therapy, health education, lifestyle intervention, **acupuncture**, and music therapy showed trends suggesting better clinical outcomes in terms of pregnancy achievement compared to the control group. More high-level RCT studies are clearly necessary for future meta-analyses to better guide clinical practice.
Implications for nursing and/or health policy	Policymakers should promote non-pharmacological programs for infertile population and develop standard guidelines. This will ensure that non-pharmacological interventions are implemented responsibly, protecting patient rights and enhancing healthcare outcomes.

1.1.6. Wang 2025 (embryo transfer day)

Wang Y, Ji J, Duan N, Yin Y. Acupuncture as an adjunctive therapy on embryo transfer day: a systematic review and meta-analysis of clinical pregnancy and live birth outcomes. Front Reprod Health. 2025 Sep 23;7:1673144. https://doi.org/10.3389/frph.2025.1673144

Background	Acupuncture is frequently used as an adjunctive intervention during embryo transfer in assisted reproductive technology (ART). However, its precise role in improving clinical pregnancy or live birth rates remains uncertain, with conflicting results across randomized trials.
Objective	To assess the effectiveness of acupuncture performed on embryo transfer day in enhancing clinical pregnancy and live birth outcomes among women undergoing ART, and to compare effects across different acupuncture protocols.
Methods	A systematic search of Cochrane Central, PubMed, and Embase databases was conducted through May 2025 for randomized controlled trials (RCTs) evaluating acupuncture during embryo transfer. Eleven RCTs met inclusion criteria. Study selection, quality assessment, and data extraction were performed independently by two reviewers. Meta-analysis used pooled risk ratios (RRs) and 95% confidence intervals (CIs). Primary outcome: clinical pregnancy rate (CPR), defined as the presence of an intrauterine gestational sac confirmed by ultrasound. Secondary outcome: live birth rate (LBR), defined as pregnancy ≥20 weeks or birth weight ≥400 g.
Results	Eleven RCTs were reviewed, nine of which were included in quantitative synthesis. Compared with no-treatment controls, acupuncture significantly increased clinical pregnancy rate (RR = 1.25, 95% CI 1.05–1.50; p = 0.013). No difference was observed between acupuncture and sham acupuncture (RR = 1.01, 95% CI 0.87–1.17; p = 0.907). Protocol comparison revealed no significant difference between the Paulus protocol (RR = 1.083, 95% CI 0.946–1.240) and Delphi consensus protocol (RR = 1.164, 95% CI 0.938–1.445). Acupuncture showed no effect on live birth rate (RR = 1.01, 95% CI 0.88–1.15; p = 0.930).
Conclusion	

1.1.7. Yang 2025

Yang Y, Chen H, Tang H, Kuang H, Gou Y, Zhao H. Different effectiveness of acupuncture treatment schedule on ART pregnancy outcomes: a systematic review and network meta-analysis. Front Endocrinol (Lausanne). 2025 Sep 5;16:1602710. https://doi.org/10.3389/fendo.2025.1602710

Background	Acupuncture has shown potential benefits in improving pregnancy outcomes for women undergoing assisted reproductive technology (ART). However, variability in acupuncture timing, duration, and frequency across studies has led to uncertainty about the most effective treatment schedule.
Objective	To evaluate the effects of different acupuncture treatment schedules—including timing, duration, and frequency—on ART pregnancy outcomes and to identify optimal strategies for clinical application.
Methods	A systematic review and network meta-analysis of randomized controlled trials (RCTs) published up to May 2024 was performed. Eligible studies examined acupuncture interventions aimed at enhancing ART outcomes. Primary outcomes were clinical pregnancy rate (CPR) and live birth rate (LBR); secondary outcomes included fertilization rate and high-quality embryo rate. Treatment schedules were analyzed by timing (embryo culture, ovarian stimulation, ART preparation), duration, and number of sessions.
Results	Acupuncture significantly improved ART outcomes, with higher clinical pregnancy rate (RR = 1.26), live birth rate (RR = 1.10), fertilization rate (RR = 6.64), and high-quality embryo rate (RR = 12.67). Ranking analysis identified acupuncture during the embryo culture period as most effective, followed by the ovarian stimulation and ART preparation phases. Longer treatment durations (≥3 months) and higher treatment frequency (≥20 sessions) were associated with superior outcomes.

Conclusion	Acupuncture effectively enhances ART pregnancy outcomes, with optimal benefits achieved through personalized treatment schedules emphasizing adequate duration and session frequency. Tailoring acupuncture timing and intensity to individual ART stages may maximize reproductive success.

1.1.8. Wang 2024

Wang X, Xu HM, Wang QL, Zhu XY, Zeng YM, Huang L, Feng X, Chen S. The Timing and Dose Effect of Acupuncture on Pregnancy Outcomes for Infertile Women Undergoing In Vitro Fertilization and Embryo Transfer: A Systematic Review and Meta-Analysis. J Integr Complement Med. 2024 Nov;30(11):1031-1046. https://doi.org/10.1089/jicm.2023.0478

Backgound	Women undergoing in vitro fertilization and embryo transfer (IVF-ET) often utilize acupuncture to enhance pregnancy outcomes. Yet, the optimal timing for acupuncture sessions and the relationship between dosage and effect remain uncertain.
Objectives	To investigate the impact of the timing and dosage of acupuncture on pregnancy outcomes, drawing on existing research.
Methods	A comprehensive search of eight databases was conducted from their inception to January 14th, 2023, without restrictions on language. Only randomized controlled trials comparing acupuncture with either sham acupuncture or no adjuvant treatment were selected for inclusion. This meta-analysis assessed the efficacy of acupuncture in IVF-ET, analyzing the influence of varied timing and dosage on pregnancy outcomes. Subgroup analyses were undertaken to address any heterogeneity across the studies.
Results	A total of **38 RCTs involving 5,991 participants** were analyzed. In infertile women undergoing IVF fresh cycles, acupuncture performed during controlled ovarian hyperstimulation (COH) significantly increased the clinical pregnancy rate (CPR) (relative risk [RR] = 1.33, 95% confidence interval [CI]: 1.07-1.65, p = 0.01), whereas acupuncture administered either before COH or on the day of ET did not demonstrate reproductive benefits. Regarding frozen cycles, acupuncture before freeze-thaw embryo transfer (FET) significantly enhanced the CPR (RR = 1.71, 95% CI: 1.36-2.16, p < 0.00001) and live birth rate (LBR) (RR = 2.40, 95% CI: 1.20-4.79, p = 0.01). Improvements in CPR were observed across all dosage groups, but only the high-dosage group showed a significant increase in LBR (RR = 1.75, 95% CI: 1.05-2.92, p = 0.03).
Conclusions	Timing and dosage of acupuncture are crucial factors affecting pregnancy outcomes in IVF-ET. For women undergoing IVF fresh cycles, acupuncture during COH yielded more significant reproductive benefits. In addition, acupuncture before freeze-thaw embryo transfer (FET) was associated with improved pregnancy outcomes in frozen cycles. Furthermore, higher dosages of acupuncture were linked to more favorable outcomes.

1.1.9. Xu 2024

Xu M, Zhu M, Zheng C. Effects of acupuncture on pregnancy outcomes in women undergoing in vitro fertilization: an updated systematic review and meta-analysis. Arch Gynecol Obstet. 2024 Mar;309(3):775-788. https://doi.org/10.1007/s00404-023-07142-1

Purpose	To evaluate the effects of acupuncture on IVF-ET outcomes.

Methods	Digital databases, including Pubmed, Embase, the Cochrane Library, the Web of Science and ScienceDirect, were searched from their inception to July 2022. The MeSH terms we used included: acupuncture, in vitro fertilization, assisted reproductive technology and randomized controlled trial. The reference lists of relevant documents were also searched. The biases of included studies were assessed by the Cochrane Handbook 5.3. The major outcomes were clinical pregnancy rate (CPR) and live birth rate (LBR). The pregnancy outcomes reported in these trials were pooled and expressed as risk ratios (RR) with 95% confidence interval (CI) in the Review Manager 5.4 meta-analysis software. Heterogeneity of the therapeutic effect was evaluated with a forest plot analysis. Publication bias was assessed by a funnel plot analysis.
Results	**Twenty-five trials (a total of 4757 participants)** were included in this review. There were no significant publication biases for most of the comparisons among these studies. The pooled CPR (25 trials) of all the acupuncture groups (43.6%) was significantly higher than that of all the control groups (33.2%, $P < 0.00001$), and the pooled LBR (11 trials) of all the acupuncture groups (38.0%) was significantly higher than that of all the control groups (28.7%, $P < 0.00001$). Different acupuncture methods (manual acupuncture, electrical acupuncture and transcutaneous acupoint electrical stimulation), acupuncture time (before or during the time of controlled ovarian hyperstimulation and around the time of embryo transfer), and acupuncture courses (at least 4 sessions and less than 4 sessions) have respectively positive effects on IVF outcomes.
Conclusion	Acupuncture can significantly improve CPR and LBR among women undergoing IVF. Placebo acupuncture can be a relatively ideal control measure.

1.1.10. Zhang 2023

Zhang HR, Zhang C, Ma PH, Sun CY, Sun CY, Liu XY, Pu ZQ, Lin YH, Liu BY, Liu CZ, Yan SY. Pregnancy Benefit of Acupuncture on in vitro Fertilization: A Systematic Review and Meta-Analysis. Chin J Integr Med. 2023 Nov;29(11):1021-1032. https://doi.org/10.1007/s11655-023-3748-3

Background	Currently, more and more infertility couples are opting for combined acupuncture to improve success rate of in vitro fertilization (IVF). However, evidence from acupuncture for improving IVF pregnancy outcomes remains a matter of debate.
Objective	To quantitatively summarized the evidence of the efficacy of acupuncture among women undergoing IVF by means of systematic review and meta-analysis.
Methods	Four English (PubMed, Web of Science, EMBASE, and Cochrane Register of Controlled Clinical Trials) and Four Chinese databases (Wanfang Databases, Chinese National Knowledge Infrastructure, Chinese Science and Technology Periodical Database, and SinoMed) were searched from database inception until July 2, 2023. Randomized controlled trials (RCTs) that evaluated the acupuncture's effects for women undergoing IVF were included. The subgroup analysis was conducted with respect to the age of participants, different acupuncture types, type of control, acupuncture timing, geographical origin of the study, whether or not repeated IVF failure, and acupuncture sessions. Sensitivity analyses were predefifined to explore the robustness of results. The primary outcomes were clinical pregnancy rate (CPR) and live birth rate (LBR), and the secondary outcomes were ongoing pregnancy rate and miscarriage rate. Random effects model with I2 statistics were used to quantify heterogeneity. Publication bias was estimated by funnel plots and Egger's tests.

Results	A total of **58 eligible RCTs representing 10,968 women** undergoing IVF for pregnant success were identifified. Pooled CPR and LBR showed a signifificant difference between acupuncture and control groups [69 comparisons, relative risk (RR) 1.19, 95% confifidence intervals (CI) 1.12 to 1.25, I2=0], extremely low evidence; 23 comparisons, RR 1.11, 95%CI 1.02 to 1.21, I2=14.6, low evidence, respectively). Only transcutaneous electrical acupoint stimulation showed a positive effect on both CPR (16 comparisons, RR 1.17, 95%CI 1.06 to 1.29; I2=0, moderate evidence) and LBR (9 comparisons, RR 1.20, 95%CI 1.04 to 1.37; I2=8.5, extremely low evidence). Heterogeneity across studies was found and no studies were graded as high-quality evidence.
Conclusion	Results showed that the convincing evidence levels on the associations between acupuncture and IVF pregnant outcomes were relatively low, and the varied methodological design and heterogeneity might influence the findings.

1.1.11. Masoud 2022 Ø

Masoud A, Elsayed F, Abu-Zaid A, Marchand G, Lowe R, Liang B, Jallad M. Systematic review and meta-analysis of the efficacy of acupuncture as an adjunct to IVF cycles in China and the world. Turk J Obstet Gynecol. 2022 Dec 13;19(4):315-326. https://doi.org/10.4274/tjod.galenos.2022.04752.

Background	Acupuncture has been introduced as an adjuvant therapy to in vitro fertilization (IVF) cycles in many randomized controlled trials (RCTs). However, there has been a debate among trials regarding the effectiveness and safety of the procedure. To determine how effective and safe acupuncture is as an adjunct to IVF cycles for primary and secondary female infertility.
Methods	We conducted a literature search for relevant RCTs and ultimately included nine studies. The main selected outcomes included the rates of clinical pregnancy, ongoing pregnancy, miscarriage, live birth, and side effects. Patients receiving acupuncture were grouped together regardless of the acupuncture points used or the protocol for the insertion of needles. We performed a subgroup analysis according to whether studies originated inside and outside China to investigate the results of the different RCTs. We pooled outcomes as a risk ratio (RR) with 95% confidence interval (CI).
Results	The analysis revealed that in China, acupuncture led to lower clinical [RR=0.80, 95% CI (0.66, 0.97), p=0.02] and ongoing [RR=0.78, 95% CI (0.63, 0.97), p=0.03] pregnancy rates than placebo. Outside China, acupuncture increased clinical pregnancy rates [RR=1.38, 95% CI (1.11, 1.71), p=0.003] and ongoing [RR=1.73, 95% CI (1.29, 2.31), p<0.001] pregnancy rates. Rates of live birth and miscarriage did not significantly differ between the arms. Regarding side effects, acupuncture groups had a significantly higher rate of puncture site itching compared to control groups [RR=1.51, 95% CI (1.12, 2.04), p=0.007].
Concusions	Overall analysis does not show a statistically significant increase in clinical pregnancy rates worldwide when using acupuncture as an adjunct therapy to IVF. There were no issues regarding patient safety from any included study. Subgroup results indicated that better rates for clinical pregnancy seem to be occurring more often in RCTs performed outside China than within.

1.1.12. Tyler 2022 Ø

Tyler B, Walford H, Tamblyn J, Keay SD, Mavrelos D, Yasmin E, Al Wattar BH. Interventions to optimize embryo transfer in women undergoing assisted conception: a comprehensive systematic review and meta-analyses. Hum Reprod Update. 2022 Jun 30;28(4):480-500. https://doi.org/10.1093/humupd/dmac009. https://pubmed.ncbi.nlm.nih.gov/35325124.

Background	Several interventions and techniques are suggested to improve the outcome of embryo transfer (ET) in assisted conception. However, there remains no consensus on the optimal practice, with high variations among fertility specialists.
Objective and rationale	We conducted a comprehensive systematic review and meta-analyses of randomized controlled trials (RCTs) aiming to identify effective interventions that could be introduced around the time of ET to improve reproductive outcomes.
Search methods	We searched the electronic databases (MEDLINE, EMBASE and Cochrane CENTRAL) from inception until March 2021 using a multi-stage search strategy of MeSH terms and keywords, and included all RCTs that evaluated an intervention in the 24-h period before/after ET in women undergoing IVF/ICSI. Our primary outcome was clinical pregnancy rate post-ET confirmed as viable pregnancy on ultrasound scan. We assessed the risk of bias in included trials and extracted data in duplicate. We pooled data using a random-effect meta-analysis and reported using risk ratio (RR) with 95% CI. We explored publication bias and effect modifiers using subgroup analyses.
Outcomes	Our search yielded 3685 citations of which we included 188 RCTs (38 interventions, 59 530 participants) with a median sample size of 200 (range 26-1761). The quality of included RCTs was moderate with most showing a low risk of bias for randomization (118/188, 62.8%) and attrition (105/188, 55.8%) but there was a significant risk of publication bias (Egger's test P = 0.001). Performing ET with ultrasound guidance versus clinical touch (n = 24, RR 1.265, 95% CI 1.151-1.391, I2 = 38.53%), hyaluronic acid versus routine care (n = 9, RR 1.457, 95% CI 1.197-1.261, I2 = 46.48%) and the use of a soft versus hard catheter (n = 27, RR 1.122, 95% CI 1.028-1.224, I2 = 57.66%) led to higher clinical pregnancy rates. Other pharmacological add-ons also showed a beneficial effect including granulocyte colony-stimulating factor (G-CSF: n = 4, RR 1.774, 95% CI 1.252-2.512, I2 = 0), Atosiban (n = 7, RR 1.493, 95% CI 1.184-1.882, I2 = 68.27%) and hCG (n = 17, RR 1.232, 95% CI 1.099-1.382, I2 = 57.76%). Bed rest following ET was associated with a reduction in clinical pregnancy (n = 6, RR 0.857, 95% CI 0.741-0.991, I2 = 0.01%). Other commonly used interventions, such as non-steroidal anti-inflammatory drugs, prophylactic antibiotics, **acupuncture** and cervical mucus removal, did not show a significant benefit on reproductive outcomes. Our effect estimates for other important outcomes, including miscarriage and live birth, were limited by the varied reporting across included RCTs.
Wider implications	Using ultrasound guidance, soft catheters and hyaluronic acid at the time of ET appears to increase clinical pregnancy rates. The use of Atosiban, G-CSF and hCG showed a trend towards increased clinical pregnancy rate, but larger trials are required before adopting these interventions in clinical practice. Bed rest post-ET was associated with a reduction in clinical pregnancy and should not be recommended.

1.1.13. Zhou 2022 ★

Zhou X, Li X, Ding H, Lu Y. Acupuncture effects on in-vitro fertilization pregnancy outcomes: A meta-analysis. Complement Ther Clin Pract. 2022 Feb;46:101525.
https://doi.org/10.1016/j.ctcp.2021.101525

Background	The effects of acupuncture on in-vitro fertilization outcomes remain controversial. This study aimed to perform a meta-analysis to assess the effectiveness of acupuncture as an adjuvant therapy to embryo transfer compared to sham-controls or no adjuvant therapy controls on improving pregnancy outcomes in women undergoing in-vitro fertilization.

Methods	A systematic literature search up to January 2021 was performed and 29 studies included 6623 individuals undergoing in-vitro fertilization at the baseline of the study; 3091 of them were using acupuncture as an adjuvant therapy to embryo transfer, 1559 of them were using sham-controls, and 1441 of them were using no adjuvant therapy controls. They reported a comparison between the effectiveness of acupuncture as an adjuvant therapy to embryo transfer compared to sham-controls or no adjuvant therapy controls on improving pregnancy outcomes in women undergoing in-vitro fertilization. Odds ratio (OR) with 95% confidence intervals (CIs) were calculated assessing the effectiveness of acupuncture as an adjuvant therapy to embryo transfer compared to sham-controls or no adjuvant therapy controls using the dichotomous method with a random or fixed-effect model.
Results	Significantly higher outcomes with acupuncture were observed in biochemical pregnancy (OR, 1.98; 95% CI, 1.55-2.53, $p < 0.001$); clinical pregnancy (OR, 1.70; 95% CI, 1.46-1.98, $p < 0.001$); ongoing pregnancy (OR, 1.78; 95% CI, 1.41-2.26, $p < 0.001$); and live birth (OR, 1.58; 95% CI, 1.15-2.18, $p = 0.005$) compared to no adjuvant therapy controls. However, no significant difference were found between acupuncture and no adjuvant therapy controls in miscarriage (OR, 0.96; 95% CI, 0.48-1.92, $p = 0.91$). No significant difference was observed with acupuncture in biochemical pregnancy (OR, 1.16; 95% CI, 0.65-2.08, $p = 0.62$); clinical pregnancy (OR, 1.13; 95% CI, 0.83-1.54, $p = 0.43$); ongoing pregnancy (OR, 1.04; 95% CI, 0.66-1.62, $p = 0.87$); live birth (OR, 1.02; 95% CI, 0.73-1.42, $p = 0.90$), and miscarriage (OR, 1.16; 95% CI, 0.86-1.55, $p = 0.34$) compared to sham-controls.
Conclusions	Using acupuncture as an adjuvant therapy to embryo transfer may improve the biochemical pregnancy, clinical pregnancy, ongoing pregnancy, and live birth outcomes compared to no adjuvant therapy controls. However, no significant difference was found between acupuncture as an adjuvant therapy to embryo transfer and sham-controls in any of the measured outcomes. This relationship forces us to recommend the use of acupuncture as adjuvant therapy in women undergoing in-vitro fertilization and inquire further studies comparing acupuncture and sham-controls to reach the best procedure.

1.1.14. Zhu 2022 ☆

Zhu C, Xia W, Huang J, Zhang X, Li F, Yu X, Ma J, Zeng Q. Effects of acupuncture on the pregnancy outcomes of frozen-thawed embryo transfer: A systematic review and meta-analysis. Front Public Health. 2022 Sep 9;10:987276. https://doi.org/10.3389/fpubh.2022.987276.

Background	Acupuncture is increasingly used as adjuvant therapy for infertile women undergoing frozen-thawed embryo transfer (FET); however, its effects and safety are highly controversial. This study aimed to evaluate the pooled effects of adjuvant acupuncture on FET pregnancy outcomes.
Methods	We considered only randomized controlled trials (RCTs) that compared acupuncture with sham acupuncture or no adjuvant treatment during FET and the primary outcome was clinical pregnancy rate. Two authors separately selected studies, extracted data, and performed a risk of bias assessment. Pooled data were expressed as risk ratio (RR) or mean difference (MD), with a 95% confidence interval (CI). In addition, we conducted subgroup and sensitivity analyses to investigate the sources of heterogeneity, and we also constructed funnel plots to assess the likelihood of publication bias. Finally, Grading of Recommendation, Assessment, Development, and Evaluation (GRADE) was applied to evaluate the quality of evidence.

Results	A total of **14 RCTs** with a total of **1,130 participants** were included in the study. We found significant effects of acupuncture adjuvant to FET on the outcomes of clinical pregnancy rate (RR = 1.54, 95% CI [1.28, 1.85], I 2 = 34%; 14 trials), biochemical pregnancy rate (RR = 1.51, 95% CI [1.21, 1.89]; 5 trials), endometrial thickness (MD = 0.97, 95% CI [0.43, 1.51]; 12 trials), and endometrial pattern (RR = 1.41, 95% CI [1.13, 1.75]; 7 trials). For live birth rate (RR = 1.48, 95% CI [0.90, 2.43], 4 trials), there were no statistical effectiveness. For subgroup analyses, most variables had tolerable heterogeneity (I 2 = 0%) except for trials that were sham-controlled, performed acupuncture only after FET, or <5 times, which appeared to interpret most of the heterogeneity. Additionally, the quality of evidence of all outcomes in this review ranged from low to moderate.
Conclusion	Acupuncture could be instrumental in the pregnancy outcomes of FET, and has very few risks of severe adverse events; however, the quality of evidence is unsatisfactory. Further research with rigorous methodological quality should be considered, and the protocols of acupuncture also need more investigations (e.g., appropriate control groups, sessions, and times).

1.1.15. Coyle 2021 Ø

Coyle ME, Stupans I, Abdel-Nour K, Ali H, Kotlyarsky M, Lie P, Tekin S, Thrimawithana T. Acupuncture versus placebo acupuncture for in vitro fertilisation: a systematic review and meta-analysis. Acupuncture in Medicine. 2021;39(1):20-29. [218571]. doi

Objective	To evaluate the efficacy of acupuncture compared to placebo acupuncture for women undergoing in vitro fertilisation (IVF) in a systematic review and meta-analysis.
Methods	A search was conducted in seven English-language biomedical databases from their inception to 3 April 2019 to identify studies evaluating acupuncture as an adjunct to IVF treatment. Randomised controlled trials (RCTs) that compared acupuncture with placebo acupuncture using a non-invasive placebo acupuncture device in women undergoing a fresh or frozen IVF cycle were eligible, as were studies that tested placebo acupuncture as the intervention. Outcomes were clinical pregnancy rate, ongoing pregnancy rate, miscarriage rate, live birth rate and adverse events.
Results	Eight RCTs involving 3607 women were included. Studies were judged to be low risk for most of the risk of bias domains. Acupuncture around the time of embryo transfer was not significantly different to placebo acupuncture in terms of the clinical pregnancy rate (6 RCTs, 2473 women, risk ratio (RR) = 0.99 (95% confidence interval (CI) = 0.88, 1.11), I2 = 51%, moderate certainty evidence), ongoing pregnancy rate (4 RCTs, 1459 women, RR = 0.88 (95% CI = 0.75, 1.02), I2 = 50%, moderate certainty evidence), miscarriage rate (4 RCTs, 502 women, RR = 1.23 (95% CI = 0.89, 1.71), I2 = 30%, high certainty evidence) or live birth rate (4 RCTs, 1835 women, RR = 0.87 (95% CI = 0.75, 1.01), I2 = 0%, high certainty evidence). Outcomes with placebo acupuncture were not significantly different to usual care. Adverse events relating to acupuncture, such as discomfort and bruising, were mild to moderate.
Conclusion	Acupuncture administered around the time of embryo transfer did not have a statistically significant effect on IVF outcomes compared with placebo acupuncture.

1.1.16. Liu 2021 ☆

Li M, Liu Y, Wang H, Zheng S, Deng Y, Li Y. The Effects of Acupuncture on Pregnancy Outcomes of Recurrent Implantation Failure: A Systematic Review and Meta-Analysis. Evid Based Complement Alternat Med. 2021. [217100]. doi

Objective	To systematically evaluate the efficacy and safety of acupuncture for patients with recurrent implantation failure (RIF) undergoing in vitro fertilization-embryo transfer (IVF-ET) and hopefully provide reliable guidance for clinicians and patients.
Methods	Through searching domestic and foreign medical journals, the literature of randomized controlled trials (RCTs) of acupuncture for RIF undergoing IVF-ET was collected. RevMan 5.3 software was used for meta-analysis and Cochrane's risk of bias assessment tool was used to evaluate the quality of the included studies.
Results	**Seven documents** meeting the criteria were finally included. The results showed that the intervention group contributes more in outcomes including clinical pregnancy rate (RR = 1.90, 95% CI (1.51, 2.40), P < 0.05), biochemical pregnancy rate (RR = 1.59, 95% CI (1.27, 1.99), P < 0.05), embryo implantation rate (RR = 1.89, 95% CI (1.47, 2.45), P < 0.05), and endometrial thickness (MD = 1.11, 95% CI (0.59, 1.63), P < 0.05) when compared with the control group, and the difference is statistically significant. In terms of the number of embryo transfers and the type of endometrium, the difference between the acupuncture group and the control group was not statistically significant.
Conclusion	Acupuncture therapy on patients with RIF can improve the pregnancy outcome of patients. It is a relatively effective treatment with satisfactory safety and suitable for clinical application. However, as the quality of the included studies is not good enough, the conclusion of this meta-analysis should be treated with caution. More double-blind RCTs equipped with high quality and large samples are expected for the improvement of the level of evidence.

1.1.17. Gu 2019

Gu YE, Zhang X, Zhang Q, Dai MC, Wu Y, Zhou Y, Qu F. The effects of acupuncture on pregnancy outcomes of in vitro fertilization with embryo transfer: An interdisciplinary systematic review. J Gynecol Obstet Hum Reprod. 2019;48(8):677-684. [208012]. doi

Aim	The present systematic review is designed to summarize the evidence concerning the effect of acupuncture on pregnancy outcomes in vitro fertilization with embryo transfer (IVF-ET).
Methods	We searched MEDLINE, the Wanfang Database, the China Academic Journal Electronic Full-text Database in the China National Knowledge Infrastructure, and the Index to Chinese Periodical Literature. Randomized controlled trials with intervention groups using acupuncture and control groups consisting of no acupuncture or sham (placebo) acupuncture in IVF-ET treatment were selected. Study characteristics were examined from these studies and an intention-to-treat approach was used to extract outcome data from each study.
Results	In total, **31 articles including 4450 women** passed our selection criteria. The legitimacy, characteristics, and IVF outcomes of the included trials were summarized.
Conclusions	Additional Traditional Chinese Medicine (TCM) theory-based, standardized, large-size, randomized, and multicenter trials are necessary prior to any conclusions being drawn on whether TCM can improve IVF outcome

1.1.18. Smith 2019 ☆

Smith CA, Armour M, Shewamene Z, Tan HY, Norman RJ, Johnson NP. Acupuncture performed around the time of embryo transfer: a systematic review and meta-analysis. Reprod Biomed Online. 2019;38(3):364-379. [207929]. doi

Objectives	This was a systematic review and meta-analysis to examine the efficacy, effectiveness and safety of acupuncture as an adjunct to embryo transfer compared with controls to improve reproductive outcomes. The primary outcome was clinical pregnancy.
Results	Twenty trials and 5130 women were included in the review. The meta-analysis found increased pregnancies (risk ratio [RR] 1.32, 95% confidence interval [CI] 1.07-1.62, 12 trials, 2230 women), live births (RR 1.30, 95% CI 1.00-1.68, 9 trials, 1980 women) and reduced miscarriage (RR 1.43, 95% CI 1.03-1.98, 10 trials, 2042 women) when acupuncture was compared with no adjunctive control. There was significant heterogeneity, but no significant differences between acupuncture and sham controls. Acupuncture may have a significant effect on clinical pregnancy rates, independent of comparator group, when used in women who have had multiple previous IVF cycles, or where there was a low baseline pregnancy rate.
Results	The findings suggest acupuncture may be effective when compared with no adjunctive treatment with increased clinical pregnancies, but is not an efficacious treatment when compared with sham controls, although non-specific effects may be active in both acupuncture and sham controls. Future research examining the effects of acupuncture for women with poorer IVF outcomes is warranted.

1.1.19. Xie 2019 ☆

Xie ZY, Peng ZH, Yao B, Chen L, Mu YY, Cheng J, Li Q, Luo X, Yang PY, Xia YB. The effects of acupuncture on pregnancy outcomes of in vitro fertilization: a systematic review and meta-analysis. BMC Complement Altern Me. 2019;19(1):131. [199913] .

Background	The effects of acupuncture on in vitro fertilization (IVF) outcomes remain controversial. And the variation in participant, interventions, outcomes studied, and trial design may relate to the efficacy of adjuvant acupuncture.
METHODS	We searched digital databases for relevant studies, including Embase, PubMed, Cochrane Library and some Chinese databases up to December 2018, for randomized controlled trials (RCTs) evaluating the effects of acupuncture on women undergoing IVF. We included studies with intervention groups using needling, and control groups consisting of no acupuncture or sham (placebo) acupuncture. Primary outcomes were clinical pregnancy rate (CPR) and live birth rate (LBR). Meta-regression and subgroup analysis were conducted on the basis of eight pre-specified covariates to investigate the variances of the effects of adjuvant acupuncture on pregnancy rates and the sources of heterogeneity.
Results	**Twenty-seven studies with 6116 participants** were included. The pooled clinical pregnancy rate (CPR) from all of acupuncture groups was significantly greater than that of control groups (RR 1.21, 95% CI: 1.07-1.38), whereas the pooled live birth rate (LBR) was not. Meta-regression subgroup analysis showed a more significant benefit of acupuncture for repeated IVF cycle proportion (number of women with a history of prior unsuccessful IVF attempt divided by number of women included in each trial) ≥ 50% group (CPR: RR 1.60, 95% CI: 1.28-2.00; LBR: RR 1.42, 95% CI: 1.05-1.92), and this covariate explained most of the heterogeneity (CPR and LBR: adjusted R2 = 100 and 87.90%). Similar results were found between CPR and number of acupuncture treatments (CPR: p = 0.002, adjusted R2 = 51.90%), but not LBR.
Conclusions	Our analysis finds a benefit of acupuncture for IVF outcomes in women with a history of unsuccessful IVF attempt, and number of acupuncture treatments is a potential influential factor. Given the poor reporting and methodological flaws of existing studies, studies with larger scales and better methodologies are needed to verify these findings.

1.1.20. Schwarze 2018 Ø

Schwarze JE, Ceroni JP, Ortega-Hrepich C, Villa S, Crosby J, Pommer R. Does acupuncture the day of embryo transfer affect the clinical pregnancy rate? Systematic review and meta-analysis. JBRA Assist Reprod. 2018;22(4):363-368. [203458]. DOI

Background	The effects of acupuncture on IVF outcomes is still unknown. We carried out a systematic review and meta-analysis of RCT to determine whether acupuncture performed at the time of ET improves outcomes.
Methods	We searched Medline and Embase from January 1990 to June 2017, for the following terms): (acupuncture; acupuncture therapy) and (reproductive techniques, assisted; in vitro fertilization; embryo transfer). We selected RCT that compared acupuncture with sham acupuncture or no treatment. We included only trials in which acupuncture involved the insertion of needles into traditional meridian points. We evaluated the methodological quality of the trials using the Cochrane risk of bias tool. The measure of treatment effect was the pooled odds ratio of achieving a clinical pregnancy, ongoing pregnancy, or live birth for women in the acupuncture group compared with women in the control group. For pooled data, summary test statistics were calculated using the Mantel-Haenszel method, using the Rev-Man software, version 5.1.
Results	We analyzed six studies, including 2,376. In all trials, there were no significant differences between the groups concerning the mean numbers of embryos transferred, the mean age of the women undergoing the procedure, diagnose and use of ICSI. **Acupuncture performed the day of ET was associated with a reduced risk of clinical pregnancy** (0.87, 95% confidence interval 0.77 to 0.98). The pooled rate difference was -0.06 (-0.12 to -0.01) for clinical pregnancy. None of the trials reported significant adverse effects of acupuncture.

1.1.21. Zhang 2018

Zhang Xian, Lee Myeong Soo, Smith CA, Robinson N et al. Effects of acupuncture during in vitro fertilization or intracytoplasmic sperm injection: An updated systematic review and meta-analysis. European Journal of Integrative Medicine. 2018;23:14-25. [206351].

Introduction	Systematic reviews need constantly updating as new evidence emerges. The aim of this comprehensive systematic review/meta-analysis focused on trials that provided acupuncture during in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI) which were compared with routine care for a range of outcomes - implantation rate, biochemical pregnancies (presence of a positive urinary pregnancy test or a positive serum human chorionic gonadotrophin test), clinical pregnancies, ongoing pregnancies, and rates of miscarriage and live birth.
Methods	A systematic search of MEDLINE and EMBASE databases for randomized controlled trials (RCTs) on acupuncture treatment during IVF or ICSI was carried out from database inception until July 31, 2017. Study selection, data extraction, quality assessment and bias assessment were carried out by 2 researchers independently, with adjudication by the third researcher when necessary. A meta-analysis was performed to compare outcomes between women receiving acupuncture and those receiving routine care, and pooled relative risks (RR) were calculated.

Results	Statistically significant differences were observed in rates of clinical pregnancy (RR = 1.19, 95% confidence intervals (CI): 1.06–1.34 p = 0.002), live birth (RR = 1.36, 95% CI: 1.09–1.69 p = 0.006), and implantation rate (RR = 1.31, 95% CI: 1.08–1.59 p = 0.006) between the acupuncture and the control groups. No significant differences were found for biochemical pregnancies (RR = 1.12, 95% CI: 0.92–1.35 p = 0.268), ongoing pregnancies (RR = 1.21, 95% CI: 0.95–1.55 p = 0.130), or miscarriage (RR = 0.89, 95% CI: 0.67–1.20 p = 0.447) between the two groups. Adverse events were described in 4 studies.
Conclusions	Acupuncture may have an impact on the outcome rates of implantation, clinical pregnancy, and live birth; however, well-designed RCTs are warranted to further validate its effects.

1.1.22. Qian 2017 ☆☆

Qian Y, Xia XR, Ochin H, Huang C, Gao C, Gao L, Cui YG, Liu JY, Meng Y. Therapeutic effect of acupuncture on the outcomes of in vitro fertilization: a systematic review and meta-analysis. Arch Gynecol Obstet. 2017. 295(3):543-58. [190430].

Objectives	Controversial results have been reported concerning the effect of acupuncture on in vitro fertilization (IVF) outcomes. The current review was conducted to systematically review published studies of the effects of acupuncture on IVF outcomes.
Methods	Women undergoing IVF in randomized controlled trials (RCTs) were evaluated for the effects of acupuncture on IVF outcomes. The treatment groups involved traditional, electrical, laser, auricular, and other acupuncture techniques. The control groups consisted of no, sham, and placebo acupuncture. The PubMed, Embase, and Web of Science databases were searched. The pregnancy outcomes data are expressed as odds ratios (Ors) with 95% confidence intervals (Cis) based on a fixed model or random model depending on the heterogeneity determined by the Q test and I2 statistic. The major outcomes were biochemical pregnancy rate (BPR), clinical pregnancy rate (CPR), live birth rate (LBR), and ongoing pregnancy rate (OPR). Heterogeneity of the therapeutic effect was evaluated by a forest plot analysis, and publication bias was assessed by a funnel plot analysis.
Results	**Thirty trials (a total of 6344 participants)** were included in this review. CPR data showed a significant difference between the acupuncture and control groups (OR 1.26, 95% CI 1.06-1.50, p = 0.01), but there was significant statistical heterogeneity among the studies (p = 0.0002). When the studies were restricted to Asian or non-Asian area trials with a sensitivity analysis, the results significantly benefited the CPR in Asian group (OR 1.51, 95% CI 1.04-2.20, p = 0.03). Based on the area subgroup analysis, we found that in the Asian group, the IVF outcomes from the EA groups were all significantly higher than those from the control groups (CPR: OR 1.81, 95% CI 1.20-2.72, p = 0.005; BPR: OR 1.84, 95% CI 1.12-3.02, p = 0.02; LBR: OR 2.36, 95% CI 1.44-3.88, p = 0.0007; OPR: OR 1.94, 95% CI 1.03-3.64, p = 0.04). Meanwhile, compared with other acupuncture time, the IVF outcome results were significantly superior in the acupuncture group when acupuncture was conducted during controlled ovarian hyperstimulation (COH) (CPR: OR 1.71, 95% CI 1.27-2.29, p = 0.0004; LBR: OR 2.41, 95% CI 1.54-3.78, p = 0.0001; BPR: OR 1.50, 95% CI 1.02-2.20, p = 0.04; OPR: OR 1.88, 95% CI 1.06-3.34, p = 0.03). However, when acupuncture was conducted at the time of embryo transfer, the BPR and OPR from the acupuncture groups were significantly lower than those of the controls in the Asian group (BPR: OR 0.67, 95% CI 0.48-0.92, p = 0.01; OPR: OR 0.68, 95% CI 0.49-0.96, p = 0.03).

Conclusions	Based on an analysis of the studies, **acupuncture improves the CPR among women undergoing IVF**. When the studies were restricted to Asian or non-Asian area patients, compared with traditional acupuncture and other methods, **electrical acupuncture yielded better IVF outcomes**. Optimal positive effects could be expected using acupuncture in IVF during COH, especially in Asian area. However, as a limitation of this review, most of the included studies did not mention the number of embryos transferred.

1.1.23. Jo 2017 Ø

Jo J, Lee YJ. Effectiveness of acupuncture in women with polycystic ovarian syndrome undergoing in vitro fertilisation or intracytoplasmic sperm injection: a systematic review and meta-analysis.Acupuncture in Medicine Published Online First: 11 January 2017. doi: 10.1136/acupmed-2016-011163.

Importance	Acupuncture is widely used by women undergoing in vitro fertilization (IVF), although the evidence for efficacy is conflicting.
Objective	To determine the efficacy of acupuncture compared with a sham acupuncture control performed during IVF on live births.
Design, Setting, and Participants	A single-blind, parallel-group randomized clinical trial including 848 women undergoing a fresh IVF cycle was conducted at 16 IVF centers in Australia and New Zealand between June 29, 2011, and October 23, 2015, with 10 months of pregnancy follow-up until August 2016.
Interventions	Women received either acupuncture (n = 424) or a sham acupuncture control (n = 424). The first treatment was administered between days 6 to 8 of follicle stimulation, and 2 treatments were administered prior to and following embryo transfer. The sham control used a noninvasive needle placed away from the true acupuncture points.
Main Outcomes and Measures	The primary outcome was live birth, defined as the delivery of 1 or more living infants at greater than 20 weeks' gestation or birth weight of at least 400 g.
Results	Among 848 randomized women, 24 withdrew consent, 824 were included in the study (mean [SD] age, 35.4 [4.3] years); 371 [45.0%] had undergone more than 2 previous IVF cycles), 607 proceeded to an embryo transfer, and 809 (98.2%) had data available on live birth outcomes. Live births occurred among 74 of 405 women (18.3%) receiving acupuncture compared with 72 of 404 women (17.8%) receiving sham control (risk difference, 0.5% [95% CI, −4.9% to 5.8%]; relative risk, 1.02 [95% CI, 0.76 to 1.38]).
Conclusions and Relevance	Among women undergoing IVF, administration of acupuncture vs sham acupuncture at the time of ovarian stimulation and embryo transfer resulted in no significant difference in live birth rates. These findings do not support the use of acupuncture to improve the rate of live births among women undergoing IVF.

1.1.24. Shen 2015 ☆☆

Shen C, Wu M, Shu D, Zhao X, Gao Y. The role of acupuncture in vitro fertilization: a systematic review and meta-analysis. Gynecol Obstet Invest. 2015;79:1-12. [171263].

Purpose	The aim of this study was to evaluate the impact of acupuncture during in vitro fertilization (IVF) treatment on the outcomes of clinical pregnancy in published randomized studies.

Methods	This is a systematic review and meta-analysis. Data sources used were MEDLINE, Embase, Web of Knowledge and the Chinese Biomedical Database.
Results	There was no statistically significant difference between the acupuncture group and no acupuncture (intervention) controls around the time of embryo transfer (ET; risk ratio, RR, 1.24,95% confidence interval, CI, 1.02–1.50) or in unblinded trials, trials blinded to physicians and double-blind trials (95% CI 1.26–1.88, 0.82–1.33 and 0.89–1.25, respectively). This was also the case when comparing acupuncture with sham acupuncture controls around the time of ET (RR, 1.03, 95% CI 0.87–1.22) or when restricting to unblinded trials, trials blinded to physicians and double-blind trials (95% CI 0.80–2.02,0.82–1.18 and 0.77–1.17, respectively). **There was a statistically significant difference when performed at 30 min after ET and implantation phase (RR 1.76, 95% CI 1.22–2.55). There was also a statistically significant difference when performed at follicle phase and 25 min before and after ET (RR 1.56, 95% CI 1.04–2.33)**.
Conclusion	Our study showed that acupuncture did not significantly improve the IVF clinical pregnancy rate when performed only at the time of ET, while **we found pooled benefit of acupuncture for IVF when performed at follicle phase and 25 min before and after ET, as well as 30 min after ET and implantation phase**.

1.1.25. Manheimer 2013 Ø

Manheimer E, Van Der Windt D, Cheng K, Stafford K, Liu J, Tierney J, Lao L, Berman BM, Langenberg P, Bouter LM.. The Effects of Acupuncture on Rates of Clinical Pregnancy among Women Undergoing In Vitro Fertilization: A Systematic Review and Meta-Analysis. Hum Reprod Update. 2013;19(6):696-713.[160473].

Objectifs	Recent systematic reviews of adjuvant acupuncture for IVF have pooled heterogeneous trials, without examining variables that might explain the heterogeneity. The aims of our meta-analysis were to quantify the overall pooled effects of adjuvant acupuncture on IVF clinical pregnancy success rates, and evaluate whether study design-, treatment- and population-related factors influence effect estimates.
Méthodes	We included randomized controlled trials that compared needle acupuncture administered within 1 day of embryo transfer, versus sham acupuncture or no adjuvant treatment. Our primary outcome was clinical pregnancy rates. We obtained from all investigators additional methodological details and outcome data not included in their original publications. We analysed sham-controlled and no adjuvant treatment-controlled trials separately, but since there were no large or significant differences between these two subsets, we pooled all trials for subgroup analyses. We prespecified 11 subgroup variables (5 clinical and 6 methodological) to investigate sources of heterogeneity, using single covariate meta-regressions.

Résultats	Sixteen trials (4021 participants) were included in the meta-analyses. There was no statistically significant difference between acupuncture and controls when combining all trials [risk ratio (RR) 1.12, 95% confidence interval (CI), 0.96-1.31; I(2) = 68%; 16 trials; 4021 participants], or when restricting to sham-controlled (RR 1.02, 0.83-1.26; I(2) = 66%; 7 trials; 2044 participants) or no adjuvant treatment-controlled trials (RR 1.22, 0.97-1.52; I(2) = 67%; 9 trials; 1977 participants). The type of control used did not significantly explain the statistical heterogeneity (interaction P = 0.27). Baseline pregnancy rate, measured as the observed rate of clinical pregnancy in the control group of each trial, was a statistically significant effect modifier (interaction P < 0.001), and this covariate explained most of the heterogeneity of the effects of adjuvant acupuncture across all trials (adjusted R(2) = 93%; I(2) residual = 9%). Trials with lower control group rates of clinical pregnancy showed larger effects of adjuvant acupuncture (RR 1.53, 1.28-1.84; 7 trials; 1732 participants) than trials with higher control group rates of clinical pregnancy (RR 0.90, 0.80-1.01; 9 trials; 2289 participants). The asymmetric funnel plot showed a tendency for the intervention effects to be more beneficial in smaller trials.
Conclusion	We found no pooled benefit of adjuvant acupuncture for IVF. The subgroup finding of a benefit in trials with lower, but not higher, baseline pregnancy rates (the only statistically significant subgroup finding in our earlier review) has been confirmed in this update, and was not explained by any confounding variables evaluated. However, this baseline pregnancy rate subgroup finding among published trials requires further confirmation and exploration in additional studies because of the multiple subgroup tests conducted, the risk of unidentified confounders, the multiple different factors that determine baseline rates, and the possibility of publication bias.

1.1.26. Cheong 2013 Ø

Cheong YC, Dix S, Hung YU Ng E, Ledger WL, Farquhar C. Acupuncture and assisted reproductive technology. Cochrane Database Syst Rev. 2013. Jul 26:CD006920. [160364].

Background	Acupuncture is commonly undertaken during an assisted reproductive technology (ART) cycle although its role in improving live birth and pregnancy rates is unclear.
Objectives	To determine the effectiveness and safety of acupuncture as an adjunct to ART cycles for male and female subfertility.
Methods	Search methods: All reports which described randomised controlled trials of acupuncture in assisted conception were obtained through searches of the Menstrual Disorders and Subfertility Group Specialised Register, CENTRAL, Ovid MEDLINE, EMBASE, CINAHL (Cumulative Index to Nursing & Allied Health Literature), AMED , www.clinicaltrials.gov (all from inception to July 2013), National Research Register, and the Chinese clinical trial database (all to November 2012). Selection criteria: Randomised controlled trials of acupuncture for couples who were undergoing ART, comparing acupuncture treatment alone or acupuncture with concurrent ART versus no treatment, placebo or sham acupuncture plus ART for the treatment of primary and secondary infertility. Women with medical illness that was deemed to contraindicate ART or acupuncture were excluded. Data collection and analysis: Twenty randomised controlled trials were included in the review and nine were excluded. Study selection, quality assessment and data extraction were performed independently by two review authors. Meta-analysis was performed using odds ratio (OR) and 95% confidence intervals (CI). The outcome measures were live birth rate, clinical ongoing pregnancy rate, miscarriage rate, and any reported side effects of treatment. The quality of the evidence for the primary outcome (live birth) was rated using GRADE methods.

Main results.	This updated meta-analysis showed no evidence of overall benefit of acupuncture for improving live birth rate (LBR) regardless of whether acupuncture was performed around the time of oocyte retrieval (OR 0.87, 95% CI 0.59 to 1.29, 2 studies, n = 464, I(2) = 0%, low quality evidence) or around the day of embryo transfer (ET) (OR 1.22, 95% CI 0.87 to 1.70, 8 studies, n = 2505, I(2) = 69%, low quality evidence). There was no evidence that acupuncture had any effect on pregnancy or miscarriage rates, or had significant side effects.
Authors' conclusions	There is no evidence that acupuncture improves live birth or pregnancy rates in assisted conception.

1.1.27. Zheng 2012a ☆

Zheng CH, Zhang MM, Huang GY, Wang W. The Role of Acupuncture in Assisted reproductive technology. Evidence-Based Complementary and Alternative Medicine 2012. ID 543924. [166534].

Objective	The aim of this paper was to provide reliable evidence by performing a systematic review and meta-analysis for evaluating the role of acupuncture in assisted reproductive technology.
Methods	All randomized controlled trials that evaluated the effects of acupuncture, including manual, electrical, and laser acupuncture (LA) techniques, on the clinical pregnancy rate (CPR) and live birth rate (LBR) of in vitro fertilization (IVF) or artificial insemination were included. The controlled groups consisted of no acupuncture and sham acupuncture groups. The sham acupuncture included sham acupuncture at acupoints, sham acupuncture at non- or inappropriate points, sham LA, and adhesive tapes.
Results	Twenty-three trials (a total of 5598 participants) were included in this paper. The pooled CPR from all acupuncture groups was significantly higher than that from all controlled groups, whereas the LBR was not significantly different between the two groups. However, the results were quite distinct when the type of control and/or different acupuncture times were examined in a sensitivity analysis.
Conclusions	The results mainly indicate that acupuncture, especially around the time of the controlled ovarian hyperstimulation, improves pregnancy outcomes in women undergoing IVF. More positive effects from acupuncture in IVF can be expected if a more individualized acupuncture programs are used.

1.1.28. Zheng 2012b ☆

Zheng CH, Huang GY, Zhang MM, Wang W. Effects of Acupuncture on Pregnancy Rates in Women Undergoing In Vitro Fertilization: A Systematic Review and Meta-Analysis. Fertil Steril 2012;97(3):599-611. [160374]

Objectifs	To evaluate the effect of acupuncture on in vitro fertilization (IVF) outcomes
Méthodes	Systematic review and meta-analysis. *Patient(s)*: Women undergoing IVF in randomized controlled trials (RCTs) who were evaluated for the effects of acupuncture on IVF outcomes. *Setting*: Not applicable. *Intervention(s)*: The intervention groups used manual, electrical, and laser acupuncture techniques. The control groups consisted of no, sham, and placebo acupuncture.*Main Outcome Measure(s)*: The major outcomes were clinical pregnancy rate (CPR) and live birth rate (LBR). Heterogeneity of the therapeutic effect was evaluated with a forest plot analysis. Publication bias was assessed by a funnel plot analysis.

Résultats	Twenty-four trials (a total of 5,807 participants) were included in this review. There were no significant publication biases for most of the comparisons among these studies. The pooled CPR (23 studies) from all of the acupuncture groups was significantly greater than that from all of the control groups, whereas the LBR (6 studies) was not significantly different between the two groups. The results were different when the type of control was examined in a sensitivity analysis. The CPR and LBR differences between the acupuncture and control groups were more obvious when the studies using the Streitberger control were ignored. Similarly, if the underlying effects of the Streitberger control were excluded, the LBR results tended to be significant when the acupuncture was performed around the time of oocyte aspiration or controlled ovarian hyperstimulation.
Conclusion	Acupuncture improves CPR and LBR among women undergoing IVF based on the results of studies that do not include the Streitberger control. The Streitberger control may not be an inactive control. More positive effects from using acupuncture in IVF can be expected if an appropriate control and more reasonable acupuncture programs are used.

1.1.29. Qu 2012 Ø

Qu F, Zhou J, Ren Rx. Effects of acupuncture on the outcomes of in vitro fertilization: a systematic review and meta-analysis. J Altern Complement Med. 2012. 18(5):429-39. [157287].

Objectives	The objective of this article was to conduct a systematic review with meta-analysis of the trials of acupuncture during in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI) treatment on the outcomes of clinical pregnancy, biochemical pregnancy, ongoing pregnancy, implantation rate, live birth, and miscarriage.
Methods	Search strategy: The search was conducted by using MEDLINE(®), SCISEARCH, the Cochrane Menstrual Disorders and Subfertility Group trials register, AMED, Cumulative Index to Nursing and Allied Health Literature, EMBASE, Wanfang Database, China Academic Journal Electronic full text Database in China National Knowledge Infrastructure, Index to Chinese Periodical Literature, ISI Proceedings for conference abstracts, and ISRCTN Register and Meta-register for randomized controlled trials. Data collection and analysis: Study selection, quality appraisal, and data extraction were performed independently and in duplicate. The measures of treatment effect were the pooled relative risks (RR) of achieving clinical pregnancy, biochemical pregnancy, ongoing pregnancy, implantation rate, live birth, or miscarriage for women in the acupuncture group compared with women in the control group.
Results	Using the random-effects model, pooling of the effect estimates from all of the 17 trials showed no significant difference in the clinical pregnancy outcome between the acupuncture and the control groups (RR=1.09, 95% confidence interval (CI) 0.94-1.26, p=0.25). No significant differences in the biochemical pregnancy, ongoing pregnancy, implantation rate, live birth, or miscarriage outcomes were found between the acupuncture and the control groups (biochemical pregnancy: RR=1.01, 95% CI 0.84-1.20, p=0.95; ongoing pregnancy: RR=1.20, 95% CI 0.93-1.56, p=0.16; implantation rate: RR=1.22, 95% CI 0.93-1.62, p=0.16; live birth: RR=1.42, 95% CI 0.92-2.20, p=0.11; miscarriage outcomes: RR=0.94, 95% CI 0.67-1.33, p=0.74).
Conclusions	**No significant benefits of acupuncture are found** to improve the outcomes of IVF or ICSI.

1.1.30. Cheong 2010 Ø

Cheong Y, Nardo LG, Rutherford T, Ledger W. Acupuncture and herbal medicine in in vitro fertilisation: a review of the evidence for clinical practice. Hum Fertil (Camb) 2010.13(1):3-12. [48499].

Objectifs	The objectives of this systematic review were to determine the effectiveness of (a) acupuncture and (b) Chinese herbal medicine on the treatment of male and female subfertility by assisted reproductive technologies (ART).
Méthodes	All reports from RCTs of acupuncture and/or Chinese herbal medicine in ART were obtained via searches through The Cochrane Menstrual Disorders and Sub-fertility Group's Specialised Register of controlled trials, and other major databases. The outcome measures were determined prior to starting the search, and comprised: live birth rate, ongoing pregnancy rate, clinical pregnancy rate, the incidence of ovarian hyperstimulation syndrome and multiple pregnancy, miscarriage rate and adverse effects arising from treatment.
Résultats	Overall, 14 trials (a total of 2670 subjects) were included in the meta-analysis.
Conclusions	The results provided no evidence of benefit in the use of acupuncture during assisted conception. Further studies should attempt to explore the potential placebo, as well as treatment, effects of this complimentary therapy. Essential elements for a quality RCT will be the size

1.1.31. Sunkara 2009 Ø

Sunkara SK, Coomarasamy A, Khalaf Y, El-Toukhy T. Acupuncture and in vitro fertilization: updated meta-analysis. Hum Reprod. 2009;24(8):2047-8. [154030].

> We updated our previously published meta-analysis (El-Toukhy et al., 2008), following the recent publication of another randomized controlled study of acupuncture in IVF at the time of embryo transfer (So et al., 2009). Our updated meta-analysis showed no improvement in clinical pregnancy rates with acupuncture at the time of embryo transfer. A restricted meta-analysis using high quality studies that employed sham acupuncture in the control group also failed to show improvement in live birth rates. Despite 14 randomized trials of acupuncture in IVF, some of which are of high quality and nearly 3000 women recruited into these studies, acupuncture has not been shown to improve IVF outcome. Many published studies on the role of acupuncture in IVF recommend that further well designed and sufficiently powered randomized trials to evaluate the impact of acupuncture at the time of embryo transfer on IVF outcome are carried out (Cheong et al., 2008; Pinborg et al., 2008). However, based on current evidence, this recommendation is difficult to justify.

1.1.32. El-Toukhy 2009 Ø

El-Toukhy T, Khalaf Y.. The impact of acupuncture on assisted reproductive technology outcome. Curr Opin Obstet Gynecol. 2009;21:240-6. [152888].

Obective and method	To evaluate the impact of acupuncture on the outcome of in-vitro fertilization treatment using data from published randomized studies. The main outcome measure of interest is the clinical pregnancy rate.
Results	Fourteen relevant trials including 2870 women were examined. Significant clinical and statistical heterogeneity were encountered among the studies. Five trials (n = 877) evaluated in-vitro fertilization outcome when acupuncture was performed around the time of oocyte retrieval and found no difference in the clinical pregnancy rate between the two groups [relative risk (RR) = 1.06, 95% confidence interval (CI) 0.82-1.37, P = 0.65]. Likewise, nine trials (n = 1993) reported in-vitro fertilization outcome when acupuncture was performed around the time of embryo transfer and showed no significant difference in the clinical pregnancy rate (RR = 1.16, 95% CI 0.92-1.48, P = 0.22).

Conclusions	Currently available literature does not provide sufficient evidence that adjuvant acupuncture, whether performed at the time of oocyte retrieval or embryo transfer, improves in-vitro fertilization outcome. On the basis of this evidence, acupuncture should not be recommended during in-vitro fertilization to increase its success rate.

1.1.33. Cheong 2008 ☆

Cheong YC, Hung YU NG E, Ledger WL. Acupuncture and assisted conception. Cochrane Database Syst Rev. 2008. CD 006920.151004

Purpose	To determine the effectiveness of acupuncture in the outcomes of assisted reproductive treatment (ART).
Methods	All reports which describe randomised controlled trials of acupuncture in assisted conception were obtained through searches of the Menstrual Disorders and Subfertility Group Specialised Register, CENTRAL, Ovid MEDLINE (1996 to August 2007), EMBASE (1980 to August 2007), CINAHL Cumulative Index to Nursing & Allied Health Literature) (1982 to August 2007), AMED,National Research Register, Clinical Trials register, and the Chinese database of clinical trials. Randomised controlled trials of acupuncture for couples who were undergoing ART comparing acupuncture treatment alone or acupuncture with concurrent ART versus no treatment, placebo or sham acupuncture plus ART for the treatment of primary and secondary infertility. Women with medical illness deemed contraindications for ART or acupuncture were excluded. **Sixteen randomised controlled trials** were identified that involved acupuncture and assisted conception. Thirteen trials were included in the review and three were excluded. Quality assessment and data extraction were performed independently by two review authors. Meta-analysis was performed using odds ratio (OR) for dichotomous outcomes. The outcome measures were live birth rate, clinical ongoing pregnancy rate, miscarriage rate, and any reported side effects of treatment.
Results	There is evidence of benefit when acupuncture is performed on the day of embryo transfer (ET) on the live birth rate (OR 1.86, 95% CI 1.29 to 2.77) but not when it is performed two to three days after ET (OR 1.79, 95% CI 0.93 to 3.44). There is no evidence of benefit on pregnancy outcomes when acupuncture is performed around the time of oocyte retrieval.
Conclusion	**Acupuncture performed on the day of ET shows a beneficial effect on the live birth rate**; however, with the present evidence this could be attributed to placebo effect and the small number of women included in the trials. Acupuncture should not be offered during the luteal phase in routine clinical practice until further evidence is available from sufficiently powered RCTs.

1.1.34. Manheimer 2008 ☆☆

Manheimer E, Zhang G, Udoff L, Haramati A, Langenberg P, Berman BM, Bouter LM. Effects of acupuncture on rates of pregnancy and live birth among women undergoing in vitro fertilisation: systematic review and meta-analysis. BMJ. 2008 ;336(7643):545-9. [148125].

Purpose	To evaluate whether acupuncture improves rates of pregnancy and live birthwhen used as an adjuvant treatment to embryo transfer inwomen undergoing in vitro fertilisation.

Methods	Design : Systematic review and meta-analysis. Data sources : Medline, Cochrane Central, Embase, Chinese Biomedical Database, hand searched abstracts,and reference lists. Review methods : eligible studies were randomised controlled trials that compared needle acupuncture administered within one day of embryo transfer with sham acupuncture or no adjuvant treatment, with reported outcomes of at least one of clinical pregnancy, ongoing pregnancy, or live birth. Two reviewers independently agreed on eligibility; assessed methodological quality; and extracted outcome data. For all trials, investigators contributed additional data not included in the original publication (such as live births). Meta-analyses included all randomised patients.
Results	**Seven trials with 1366 women** undergoing in vitro fertilisation were included in the meta-analyses. There was little clinical heterogeneity. Trials with sham acupuncture and no adjuvant treatment as controls were pooled for the primary analysis. Complementing the embryo transfer process with acupuncturewas associated with significant and clinically relevant improvements in clinical pregnancy (odds ratio 1.65, 95% confidence interval 1.27 to 2.14; number needed to treat (NNT) 10 (7 to 17); seven trials), ongoing pregnancy (1.87, 1.40 to 2.49; NNT 9 (6 to 15); five trials), and live birth (1.91, 1.39 to 2.64; NNT 9 (6 to 17); four trials). Because we were unable to obtain outcome data on live births for three of the included trials, the pooled odds ratio for clinical pregnancy more accurately represents the true combined effect from these trials rather than the odds ratio for live birth. The results were robust to sensitivity analyses on study validity variables. A prespecified subgroup analysis restricted to the three trials with the higher rates of clinical pregnancy in the control group, however, suggested a smaller non-significant benefit of acupuncture (odds ratio 1.24, 0.86 to 1.77).
Conclusion	**Current preliminary evidence suggests that acupuncture given with embryo transfer improves rates of pregnancy and live birth among women undergoing in vitro fertilisation**.

1.1.35. Ng 2008 ☆

Ng EH, So WS, Gao J, Wong YY, Ho PC. The role of acupuncture in the management of subfertility. Fertil Steril. 2008;90(1):1-13. [149869].

Objective	To review systematically the use of acupuncture in the management of subfertility.
Design	A computer search was performed via several English and Chinese databases to identify journals relevant to the subject.
Result(S)	The positive effect of acupuncture in the treatment of subfertility may be related to the central sympathetic inhibition by the endorphin system, the change in uterine blood flow and motility, and stress reduction. Acupuncture may help restore ovulation in patients with polycystic ovary syndrome, although there are not enough randomized studies to validate this. There is also no sufficient evidence supporting the role of acupuncture in male subfertility, as most of the studies are uncontrolled case reports or case series in which the sample sizes were small. Despite these deficiencies, acupuncture can be considered as an effective alternative for pain relief during oocyte retrieval in patients who cannot tolerate side effects of conscious sedation. **The pregnancy rate of IVF treatment is significantly increased, especially when acupuncture is administered on the day of embryo transfer.** [comporte une méta-analyse sur les FIV].
Conclusion(S)	Although acupuncture has gained increasing popularity in the management of subfertility, its effectiveness has remained controversial.

1.1.36. El Toukhy 2008 Ø

El-Toukhy T, Sunkara S, Khairy M, Dyer R, Khalaf Y, Coomarasamy A. A systematic review and meta-

analysis of acupuncture in in vitro fertilisation. Bjog. 2008;115(10):1203-13. [150015].

Purpose	The objective of this study was to conduct a systematic review with meta-analysis of the trials of acupuncture during IVF treatment on the outcomes of clinical pregnancy and live birth rates.
Methods	Search strategy. Searches were conducted in MEDLINE, EMBASE, Cochrane Library, ISI Proceedings and SCISEARCH. Selection criteria. All randomised controlled trials that evaluated the effects of acupuncture compared with no treatment or sham acupuncture in women undergoing IVF—intracytoplasmic sperm injection treatment were included. Data collection and analysis. Study selection, quality appraisal and data extraction were performed independently and in duplicate. A sensitivity analysis was conducted where the meta-analysis was restricted to trials in which sham acupuncture was used in the control group. Meta-regression analysis was used to explore the association between study characteristics and pregnancy rates.
Results	**Thirteen relevant trials, including a total of 2500 women** randomised to either acupuncture or control group, were identified. No evidence of publication bias was found (Begg's test, P = 0.50). Five trials (n = 877) evaluated IVF outcome when acupuncture was performed around the time of transvaginal oocyte retrieval, while eight trials (n = 1623) reported IVF outcome when acupuncture was performed around the time of embryo transfer (ET). Meta-analysis of the five studies of acupuncture around the time of egg collection did not show a significant difference in clinical pregnancy (relative risks [RR] = 1.06, 95% CI 0.82-1.37, P = 0.65). Meta-analysis of the eight studies of acupuncture around the time of ET showed no difference in the clinical pregnancy rate (RR = 1.23, 95% CI 0.96-1.58, P = 0.1). Live birth data were available from five of the eight studies of acupuncture around the time of ET. Metaanalysis of these studies did not show a significant increase in live birth rate with acupuncture (RR = 1.34, 95% CI 0.85-2.11). Using meta-regression, no significant association between any of the studied covariates and clinical pregnancy rate was found (P > 0.05 for all covariates).
Conclusion	**Currently available literature does not provide sufficient evidence that adjuvant acupuncture improves IVF clinical pregnancy rate.**

1.1.37. Anderson 2007 ☆

Anderson BJ, Haimovici F, Ginsburg ES, Schust DJ, Wayne PM.. In vitro fertilization and acupuncture: clinical efficacy and mechanistic basis. Altern Ther Health Med. 2007;13(3):38-48. [146276].

OBJECTIVE: To provide an overview of the use of acupuncture as an adjunct therapy for in vitro fertilization (IVF), including an evidence-based evaluation of its efficacy and safety and an examination of possible mechanisms of action. DESIGN: Literature review using PubMed, the Science Citation Index, The Cochrane Library (Database of Systematic Reviews and Central Register of Controlled Trials), the New England School of Acupuncture library databases, and a cross-referencing of published data, personal libraries, and Chinese medicine textbooks. RESULTS: Limited but supportive evidence from clinical trials and case series suggests that acupuncture may improve the success rate of IVF and the quality of life of patients undergoing IVF and that it is a safe adjunct therapy. However, this conclusion should be interpreted with caution because most studies reviewed had design limitations, and the acupuncture interventions employed often were not consistent with traditional Chinese medical principles. The reviewed literature suggests 4 possible mechanisms by which acupuncture could improve the outcome of IVF: modulating neuroendocrinological factors; increasing blood flow to the uterus and ovaries; modulating cytokines; and reducing stress, anxiety, and depression. CONCLUSIONS: More high-quality randomized, controlled trials incorporating placebo acupuncture controls, authentic acupuncture interventions, and a range of outcome measures representative of both clinical outcomes and putative mechanistic processes are required to better assess the efficacy of acupuncture as an adjunct for IVF

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1.1.38. Stener 2006 ☆

Stener-Victorin E, Humaidan P. Use of acupuncture in female infertility and a summary of recent acupuncture studies related to embryo transfer. Acupuncture in Medicine. 2006;24(4):157-163. [143845].

During the last five years the use of acupuncture in female infertility as an adjuvant to conventional treatment in assisted reproductive technology (ART) has increased in popularity. The present paper briefly discusses clinical and experimental data on the effect of acupuncture on uterine and ovarian blood flow, as an analgesic method during ART, and on endocrine and metabolic disturbances such as polycystic ovary syndrome (PCOS). Further it gives a summary of recent studies evaluating the effect of acupuncture before and after embryo transfer on pregnancy outcome. Of the four published RCTs, three reveal significantly higher pregnancy rates in the acupuncture groups compared with the control groups. But the use of different study protocols makes it difficult to draw definitive conclusions. It seems, however, that acupuncture has a positive effect and no adverse effects on pregnancy outcome.

1.2. Special Acupuncture Techniques

1.2.1. Comparison of Acupuncture techniques

1.2.1.1. Bin 2025

Bin C, Zhong H, Zhang S, Luo Y, Su J, Li M, Wei S. Effects of acupuncture-related therapies on pregnancy outcomes among women undergoing in vitro fertilization and embryo transfer: a Bayesian network meta-analysis. J Assist Reprod Genet. 2025 May 9. https://doi.org/10.1007/s10815-025-03489-3

Backgound	This network meta-analysis aimed to assess the efficacy of different acupuncture-related therapies in improving pregnancy outcomes among women undergoing in vitro fertilization and embryo transfer (IVF-ET).
Methods	Randomized controlled trials (RCTs) examining acupuncture-related therapies as adjuncts to IVF-ET were systematically searched in eight databases from inception until January 15, 2025. Dichotomous outcomes concerning efficacy were evaluated as odds risk (OR) and continuous data as mean difference (MD) and 95% credible intervals (CrI) utilizing R 4.1.2 and Stata 16.1.
Results	Through a comprehensive literature search, we ultimately identified **96 RCTs that involved 14,736 participants** and 15 interventions in this systematic analysis. Based on the clinical pregnancy rate outcome, warm acupuncture for three menstrual cycles before oocyte retrieval (WA-TTP, OR 3.56, 95% CrI 2.05 to 6.25, low certainty, SUCRA = 89.54%), acupuncture combined with moxibustion for three menstrual cycles before oocyte retrieval (AC + M-TTP, OR 3.31, 95% CrI 1.05 to 11.77, low certainty, SUCRA = 78.70%), and acupuncture for one menstrual cycle before oocyte retrieval (AC-OTP, OR 2.69, 95% CrI 1.76 to 4.09, moderate certainty, SUCRA = 77.98%) demonstrated potential superiority compared to false acupuncture or no treatment (F/N). Significant subgroup differences between clinical pregnancy rates were observed by subgroup analysis.

Conclusion	Acupuncture-related therapies can potentially enhance clinical pregnancy rates among women undergoing IVF-ET, with WA-TTP, AC + M-TTP, and AC-OTP demonstrating potential superiority. AC-TTP demonstrated a greater efficacy in improving live birth rates, increasing endometrial thickness, and reducing pulsation index. Our findings emphasize that acupuncture-related therapies with a limited number of sessions before or after embryo transfer show minimal clinical benefit except auricular acupressure.

1.2.1.2. Luo 2024

Luo MH, Tan Y, Zuo YC, Shi WY, Wang X, Zhang W. Effect of acupuncture and moxibustion as the adjuvant therapy on frozen-thawed embryo transfer: A network meta-analysis: 针灸辅助改善冻融胚胎移植疗效的网状Meta分析. World J Acupunct Moxibustion. 2024 Apr;34(2):103-116.

Objective	To evaluate the clinical effect of acupuncture- moxibustion as the adjuvant therapy on frozen-thawed embryo transfer (FET) using network meta-analysis.
Methods	In PubMed, Embase, Cochrane Library, Chinese National Knowledge Infrastructure (CNKI), Wanfang database (WanFang), VIP database and Chinese Biomedical Literature Database (SinoMed), the randomized controlled trials (RCTs) of the adjuvant therapy of acupuncture-moxibustion for FET were retrieved, from database inception to April 1, 2021. Cochrane risk of bias assessment tool was used to screen and evaluate the quality of the included studies, and RevMan 5.3, GeMTC0.14.3 and Stata16.0 software were adopted to complete the network meta-analysis.
Results	**Twenty-nine RCTs comprising 2880 patients** were finally included, involving 17 interventions and 4 outcome measures. The results of network meta-analysis showed that the top three therapies under each outcome based on the magnitude of SUCRA values were: ① Clinical pregnancy rate (CPR, %): “transcutaneous electrical acupoint stimulation + herbal medicine” (76.4), “moxibustion + herbal medicine” (74.7), “acupuncture + moxibustion” (73.3); ②Biochemical pregnancy rate (BPR): “moxibustion + herbal medicine” (89.3), “acupuncture + moxibustion” (82.1), “acupuncture + herbal medicine” (78.7); ③Endometrial thickness: “acupoint injection + Western medicine” (87.2), auricular therapy (76.8), “acupuncture + herbal medicine” (73.5); ④Type A endometrial morphology rate: “acupoint injection + Western medicine ”(78.3), “moxibustion + herbal medicine” (58.0) and “acupuncture + moxibustion” (52.6).
Conclusion	The combined treatment of acupuncture-moxibustion was superior to single therapy for FET patients. The combined therapy of transcutaneous electrical acupoint stimulation and herbal medicine had the best effect for improving CPR, “moxibustion + herbal medicine” obtained the best average comprehensive effect, and “acupoint injection + Western medicine” was conductive to ameliorate the endometrial thickness and morphology. Due to the limitations of existing studies, more high-quality RCTs are needed in the future to further verify these conclusions.

1.2.2. Integrating acupuncture and herbal medicine

1.2.2.1. Peng 2025

Peng X, Wu B, Zhou S, Xu Y, Ogihara A, Nishimura S, Jin Q, Litscher G. Integrating acupuncture and herbal medicine into assisted reproductive technology: a systematic review and meta-analysis of East Asian traditional medicine. Healthcare (Basel). 2025 Jun 3;13(11):1326. https://doi.org/10.3390/healthcare13111326

Background	Assisted reproductive technologies (ARTs) are essential for infertility treatment but face limited success rates due to implantation failure and suboptimal live birth outcomes. East Asian traditional medicine (EATM), encompassing acupuncture and herbal medicine (HM), has been proposed to enhance physiological responses during ART cycles and improve clinical outcomes.
Objective	To evaluate the effectiveness and safety of integrating acupuncture and herbal medicine into ART for improving clinical pregnancy and live birth rates among women with infertility.
Methods	This PROSPERO-registered review (CRD42023411712) systematically searched 11 databases through March 31, 2023. Eligible studies were randomized controlled trials (RCTs) comparing EATM interventions with control conditions. Data extraction and quality assessment were conducted independently by two reviewers. Meta-analyses were performed using the inverse-variance method in Stata 12.0. A total of 37 RCTs (10,776 women, aged 29–38) were included, addressing infertility causes such as polycystic ovary syndrome, tubal blockage, diminished ovarian reserve, and unexplained infertility. Acupuncture modalities included body, electro-, laser, and auricular acupuncture; herbal treatments were delivered as powders, pills, granules, decoctions, or ointments based on classical Chinese formulas.
Results	EATM interventions significantly improved clinical pregnancy and live birth outcomes. Acupuncture increased clinical pregnancy rate (CPR: RR = 1.316, 95% CI 1.171–1.480) and live birth rate (LBR: RR = 1.287, 95% CI 1.081–1.533). Herbal medicine also enhanced CPR (RR = 1.184) and LBR (RR = 1.147). Subgroup analyses indicated true acupuncture and herbal medicine were superior to sham or placebo treatments. No significant increase in adverse events was observed.
Conclusion	Integrating acupuncture and herbal medicine into ART appears to be a safe and effective complementary approach for improving reproductive outcomes. Standardized treatment protocols and high-quality clinical trials are needed to strengthen evidence and guide optimal integration with ART practice.

1.2.3. Electroacupuncture

1.2.3.1. Zhu 2025

Zhu H, Shang Z, Ji R, Li C, Zhang J, Su Y, Jiang Z, Du J, Li Y, Liu Q, Liu J, Zheng X, Yang J. Effects of different electroacupuncture/ transcutaneous electrical acupoint stimulation parameters on the pregnancy outcomes of in vitro fertilisation-embryo transfer: a systematic review and meta-analysis. BMJ Open. 2025 Aug 8;15(8):e097901. https://doi.org/10.1136/bmjopen-2024-097901

Backgound	Extensive progress has been made in improving pregnancy outcomes for in vitro fertilisation and embryo transfer (IVF-ET) patients through the use of electroacupuncture (EA) and transcutaneous electrical acupoint stimulation (TEAS). However, a clear and suitable recommendation for the parameter selection scheme of EA/TEAS remains elusive.
Objective	To evaluate evidence-based conclusions of different EA/TEAS parameters on improvement of pregnancy outcomes in patients undergoing IVF-ET and evaluate other factors that may affect pregnancy outcomes.

Method	This meta-analysis systematically searched eight databases from inception to 27 August 2024, focusing on randomised controlled trials (RCTs) that evaluated the effectiveness of EA/TEAS in improving IVF-ET outcomes, with the primary outcome defined as clinical pregnancy rate (CPR), and secondary outcomes including biochemical pregnancy rate (BPR) and live birth rate (LBR). We further explored CPR variations associated with EA/TEAS parameters: waveform (dilatational vs continuous wave), frequency (low vs high) and treatment duration (20, 25, 30, 40, 60 min). Additionally, seven subgroup variables were analysed to identify potential influencing factors: routine treatment, intervention dose, intervention modality, mean participant age, control type, randomisation risk and allocation concealment risk.
Results	A total of **27 RCTs (3786 participants)** were included, with the quality of evidence ranging from moderate to very low. Compared with control groups, the use of dilatational waves significantly increased CPR (RR=1.36, 95% CI [1.17 to 1.58], p<0.01, I2=0). Similarly, low-frequency currents demonstrated a significant positive association with CPR (RR=1.38, 95% CI [1.25 to 1.51], p<0.01, I2=0) and a treatment duration of 30 min per session was associated with elevated CPR (RR=1.30, 95% CI [1.19 to 1.42], p<0.01, I2=0). Subgroup analyses revealed that the effect of EA/TEAS on CPRs varied significantly depending on therapeutic dose (p=0.029), with stronger associations observed in studies involving patients receiving high therapeutic dose compared with those receiving low therapeutic dose.
Conclusion	Current evidence suggests that dilatational waves, low-frequency currents and 30-minute treatment duration may improve CPRs, though findings require validation in larger trials. While parameter optimisation shows promise, stronger evidence is needed before standardising protocols. Future research should focus on rigorous RCTs to determine optimal parameters and dose-response relationships.

1.2.3.2. Yang 2022 ★

Yang H, Hu WH, Xu GX, Yin ZH, Yu SY, Liu JJ, Xiao ZY, Zheng XY, Yang J, Liang FR. Transcutaneous electrical acupoint stimulation for pregnancy outcomes in women undergoing in vitro fertilization-embryo transfer: A systematic review and meta-analysis. Front Public Health. 2022 Aug 11;10:892973. https://doi.org/10.3389/fpubh.2022.892973.

Background	Infertility is a common health problem affecting couples of childbearing age. The proposal of in vitro fertilization-embryo transfer (IVF-ET) solves the problem of infertility to a certain extent. However, the average success rate of IVF-ET is still low. Some studies conclude that transcutaneous electrical acupoint stimulation (TEAS) could improve pregnancy outcomes in women undergoing IVF-ET, however, there is a lack of comprehensive synthesis and evaluation of existing evidence.
Objective	To conduct a systematic review and meta-analysis to assess whether TEAS is effective and safe to improve the pregnancy outcomes for women undergoing IVF-ET.

Methods	Eight online databases were searched from inception to 19 November 2021. In addition, four clinical trial registries were also searched, relevant references were screened, and experts were consulted for possible eligible studies. Randomized controlled trials (RCTs) that included patients with infertility who underwent IVF and used TEAS as the main adjuvant treatment vs. non-TEAS or mock intervention controls were included. The clinical pregnancy rate (CPR) was considered the primary outcome. High-quality embryo rate (HQER), live birth rate (LBR), biochemical pregnancy rate (BPR), ongoing pregnancy rate (OPR), early miscarriage rate (EMR), birth defects rate (BDR), and adverse events related to interventions were regarded as secondary outcomes. The selection, data extraction, risk of bias assessment, and data synthesis were conducted by two independent researchers using Endnote software V.9.1 and Stata 16.0 software. The Grading of Recommendations Assessment, Development and Evaluation (GRADE) system was used to evaluate the evidence quality of each outcome.
Results	There were **19 RCTs involving 5,330 participants** included. The results of meta-analyses showed that TEAS can improve CPR [RR = 1.42, 95% CI (1.31, 1.54)], HQER [RR = 1.09, 95% CI (1.05, 1.14)], and BPR [RR = 1.45, 95% CI (1.22, 1.71)] of women underwent IVF-ET with low quality of evidence, and improve LBR [RR = 1.42, 95% CI (1.19, 1.69)] with moderate quality of evidence. There was no significant difference in EMR [RR = 1.08, 95% CI (0.80, 1.45)] and BDR [RR = 0.93, 95% CI (0.13, 6.54)] with very low and moderate quality of evidence, respectively. A cumulative meta-analysis showed that the effective value of TEAS vs. controls was relatively stable in 2018 [RR = 1.52, 95% CI (1.35, 1.71)]. In addition, no serious adverse events associated with TEAS were reported.
Conclusion	Our findings suggest that TEAS may be an effective and safe adjuvant treatment for women undergoing IVF-ET to improve pregnancy outcomes. However, the current evidence quality is considered to be limited, and more high-quality RCTs are needed for further verification in the future.

1.2.3.3. Zhan 2021

Zhan XX, Cai HC, Wang Y, Zhao J, Gou J, Qu W, Mo DS. [Transcutaneous electrical acupoint stimulation improves pregnancy outcomes of in vitro fertilization- embryo transfer : A meta-analysis of randomized controlled trials]. Zhonghua Nan Ke Xue. 2021 Sep;27(9):825-832. https://pubmed.ncbi.nlm.nih.gov/34914260/

Objective	To evaluate the effect of transcutaneous electrical acupoint stimulation (TEAS) on the pregnancy outcomes of in vitro fertilization-embryo transfer (IVF-ET) based on the available clinical evidence.
Methods	We searched PubMed, MEDLINE, EMBASE, Cochrane Library, CNKI, VIP, CBM and Wanfang Database up to February 2021 for published randomized controlled trials (RCT) relevant to TEAS for the improvement of the pregnancy outcomes of IVF-ET. We performed literature screening, data extraction and quality evaluation according to the inclusion and exclusion criteria, followed by a meta-analysis with the RevMan 5.3 software.
Results	A total of **2 206 cases of IVF-ET from 9 RCTs were included**, 1 018 in the TEAS group and 1 188 in the control. The clinical pregnancy rate was significantly higher in the TEAS than in the mock TEAS and non-TEAS control groups (RR = 1.85, 95% CI: 1.42□2.42, P < 0.001; RR = 1.23, 95% CI: 1.10□1.39, P = 0.0004), and so was it before and after oocyte retrieval (RR = 1.50, 95% CI: 1.03□2.17, P = 0.03; RR = 1.47, 95% CI: 1.12□1.92, P = 0.005). The TEAS group also showed dramatically improved embryo implantation rate (RR = 1.49, 95% CI: 1.24□1.79, P < 0.0001) and live birth rate (RR = 1.44, 95% CI: 1.04□1.98, P = 0.03) compared with the control.

Conclusions	As a safe and non-invasive treatment, TEAS can significantly improve the pregnancy outcomes of IVF-ET, with definite effectiveness. .

1.3. Specific outcomes

1.3.1. Anxiety and/or depression during IVF

1.3.1.1. Xu 2025

Xu Q, Wan Z, Xiong Z, Zhu X, Han Q, Wang Y, Zhao J, Yu F. The effects of nursing interventions on anxiety and depression in infertile females undergoing assisted reproduction: a systematic review and meta-analysis. BMC Womens Health. 2025 Dec 24;25(1):607. https://doi.org/10.1186/s12905-025-04146-8

Background	Many studies have investigated the impact of nursing interventions on anxiety and depression in infertile women undergoing assisted reproductive technology (ART), but results have been inconsistent and effects on physiological status variable. This study aimed to summarize and compare outcomes across different nursing interventions.
Methods	A systematic search was conducted in Cochrane, Scopus, PubMed, Medline, Embase, and Web of Science up to June 2025, following PRISMA guidelines. Two reviewers independently screened studies. Mean scores for anxiety and depression with 95% confidence intervals were pooled using a random-effects model in STATA. Publication bias was assessed using funnel plots and Egger's and Begg's tests. Study quality was evaluated with Joanna Briggs Institute critical appraisal tools.
Results	Forty-four studies involving 5,008 infertile women were included. Forty studies reported improvements in anxiety and/or depression following interventions. Interventions included mind–body programs, cognitive behavioral therapy, targeted nursing care, group psychotherapy, Hatha yoga, **acupuncture**, stress management, music therapy, nursing crisis intervention, positive psychological interventions, drug and supplementation therapies, and positive reappraisal coping intervention programs. Overall pooled effects showed significant reductions in depression (SMD −3.16, 95% CI −4.38 to −1.94) and anxiety (SMD −1.23, 95% CI −1.70 to −0.76). Subgroup analyses indicated greater effectiveness when interventions were implemented before ART rather than during or after ART.
Conclusion	Nursing interventions significantly reduce anxiety and depression in infertile women undergoing ART, with greater benefits when applied prior to ART initiation. Development of comprehensive, evidence-based nursing intervention programs is warranted.

1.3.1.2. Hullender Rubin 2022 ☆

Hullender Rubin LE, Smith CA, Schnyer RN, Tahir P, Pasch LA. Effect of acupuncture on IVF-related anxiety: a systematic review and meta-analysis. Reprod Biomed Online. 2022 Jul;45(1):69-80. https://doi.org/10.1016/j.rbmo.2022.02.002

Background	Patients undergoing IVF experience high levels of IVF-related state anxiety. Non-pharmacological interventions such as acupuncture may provide support, but its effect on IVF-related anxiety is unclear.

Objective	This was a systematic review and meta-analysis to examine the effect of acupuncture on IVF-related state anxiety. The primary outcome was state anxiety after embryo transfer or oocyte retrieval as assessed by the State-Trait Anxiety Inventory, Hamilton Anxiety Scale, visual analogue scale or Standard Form 36.
Results	**Eight trials** with **2253 participants** were reviewed, and 1785 participants completed an anxiety assessment. Using the random effects model, the meta-analysis found small but significant effects on state anxiety with acupuncture versus any control (standardized mean difference -0.21, 95% confidence interval -0.39 to -0.04, representing very low certainty evidence). Evidence was limited by the moderate number of included studies of an intermediate median sample size (n = 191). There was also a high risk of performance bias and substantial heterogeneity across trials.
Conclusion	Acupuncture is a drug-free and safe treatment that may benefit those who are burdened with IVF-related anxiety, but more investigation is needed for confirmation.

1.3.1.3. Ye 2021

Jia-Yu Ye, Yi-Jing He, Ming-Jie Zhan, Fan Qu. Effects of acupuncture on the relief of anxiety and/or depression during in vitro fertilization: A systematic review and meta-analysis European Journal of Integrative Medicine. 2021;42. [218119]. doi

Introduction	Although effects of acupuncture on pregnancy outcomes among women undergoing in vitro fertilization (IVF) have been analyzed Using systematic reviews and meta-analysis, few have been focused on psychological issues. The present systematic review and meta-analysis was designed to evaluate the efficacy of acupuncture on relieving anxiety and/or depression during IVF treatment.
Methods	As of November 2020, randomized controlled trials (RCTs) and quasi-RCTs to observe the therapeutic effects of acupuncture used to relieve anxiety and/or depression during IVF treatment were identified from the following databases: Pubmed, Embase, the Cochrane Library, Web of Science; China National Knowledge Infrastructure, Wanfang, VIP and Chinese Biomedicine database. Study selection, data collection and quality assessment were carried out. Study characteristics, results on anxiety and/or depression relief, IVF outcomes and adverse events were summarized. Meta-analysis was performed using Review Manager 5.3 software.
Results	**Twelve studies with 2867 participants** were included. A significant difference (3 studies, 547 participants, MD -9.26, 95%CI −12.01 to -6.51, P<0.01) was observed for the relief of anxiety comparing acupuncture with controls during IVF treatment. No significant difference (9 studies, 1896 participants, RR=1.30, 95%CI 1.03 to 1.64; P=0.02) was found for clinical pregnancy rate. Only 2 out of 12 studies assessed remission of depression but there was no clear effect shown for acupuncture.
Conclusions	Acupuncture may have a positive effect on anxiety relief during IVF treatment, while its effect on depression relief is inconclusive. More standardized, large-size, randomized and multicenter studies should be carried out on whether acupuncture can alleviate the anxiety and/or depression during IVF treatment.

1.4. Special Clinical Forms

1.4.1. Poor Ovarian Response

1.4.1.1. Liu 2026

Liu J, Mai T, Zhu F, Ma J, Liu D, Liu Y, Ouyang X, Wu J. Acupuncture in patients with the poor ovarian

response on IVF-ET: A systematic review and network meta-analysis. Medicine (Baltimore). 2026;105(5):e46728. https://doi.org/10.1097/MD.0000000000046728

Background	Acupuncture has been increasingly studied as an adjunctive treatment strategy for improving pregnancy outcomes in patients with poor ovarian response (POR). However, the effectiveness of different acupuncture types remains controversial. The purpose of this paper was to assess the effects of transcutaneous electrical acupoint stimulation (TEAS), manual acupuncture (MA) and electroacupuncture (EA) on the pregnancy outcomes of patients with POR who underwent in vitro fertilization and embryo transplantation (IVF-ET) in order to clarify the differences in efficacy of the different acupuncture methods and to provide scientific evidence for the clinic.
Methods	We searched 8 databases up to September 10, 2023. We included randomized controlled trials (RCTs) of the use of TEAS, MA or EA before IVF-ET to improve pregnancy outcomes in patients with POR, with the control group using only the conventional controlled ovarian stimulation protocol. The Cochrane Risk of Bias Assessment Tool was used to evaluate the methodological quality of the included studies. Surfaces under the cumulative ranking curves (SUCRAs) were used to provide summary statistics for the cumulative ranking of each outcome indicator.
Results	**Fifteen RCTs (1195 women)** were included in a network meta-analysis. TEAS was superior to EA [mean difference (MD) = 1.85, 95% confidence intervals (CI) = (0.86, 2.84)], MA [MD = 2.31, 95% CI = (1.43, 3.19)] and control [MD = 2.22, 95% CI = (1.59, 2.85)] in increasing the number of oocytes. TEAS was superior to MA [MD = 0.99, 95% CI = (0.32, 1.65)], EA [MD = 1.61, 95% CI = (0.55, 2.67)] and control [MD = 1.46, 95% CI = (1.06, 1.86)] in terms of increasing antral follicle count. MA was superior to control [MD = 0.66, 95% CI = (0.08, 1.25)] in increasing the number of mature oocytes. The results of the remaining treatments were similar when the 2 groups were compared.
Conclusion	From the current evidence, the adjunctive use of acupuncture prior to IVF all have positive effects and a high safety profile in improving pregnancy outcomes in patients with POR, and TEAS appears to be more promising. However, there is still insufficient evidence of differences between acupuncture methods in improving clinical pregnancy rates.

1.4.1.2. Jang 2020

Jang S, Kim KH, Jun JH, You S. Acupuncture for in vitro fertilization in women with poor ovarian response: a systematic review. Integr Med Res. 2020;9(2). [208640]. doi

Background	Poor ovarian response (POR) is one reason for infertility. In vitro fertilization (IVF) is frequently used to help achieve pregnancy, and performing acupuncture before IVF may promote ovulation and reduce egg retrieval pain. The purpose of this systematic review was to evaluate the effectiveness of acupuncture on clinical pregnancy rates (CPR) after IVF in women with POR.
Methods	Eight electronic databases were searched in January 2020, and reference lists of retrieved articles and previous review articles were hand-searched. Randomized controlled trials (RCTs) using any type of acupuncture for women with POR undergoing IVF were considered. Risk of bias was assessed using the Cochrane risk of bias standards.
Results	**Three RCTs** were included in this review. CPR and the number of retrieved oocytes were measured in two studies, while the values of anti-Mullerian hormone (AMH) and antral follicle count (AFC) were only reported in one study. In two studies, CPR was higher in the intervention group than the control group [37.8 % vs 24.3 %]. We did not conduct a meta-analysis, as there was a high level of heterogeneity in interventions among the included trials.

Conclusions	This study suggests that acupuncture may improve CPR, AMH, AFC and the number of retrieved oocytes in women with POR undergoing IVF. However it is difficult to conclude that acupuncture is more effective than conventional treatment. Additionally, more clinical trials are needed to evaluate the effectiveness of acupuncture on CPR and other outcomes of POR.

1.4.2. Polycystic Ovary Syndrome

1.4.2.1. Yi 2026

Yi L, Zhang H, Tian T, Zhang Y, Lou Y, Li J, Liu C, Ma C, Liu P, Li R, Qiao J, Huang S, Yang R. The effect of acupuncture in women with polycystic ovary syndrome undergoing in vitro fertilization: a systematic review and Meta-analysis. Expert Rev Mol Med. 2026 May 4:1-25. https://doi.org/10.1017/erm.2026.10048

Objective	This study was aimed to determine whether acupuncture provides therapeutic benefits to woman with polycystic ovary syndrome (PCOS) during their in vitro fertilization and embryo transfer (IVF-ET) treatment cycles.
Method	Embase, The Cochrane Library, Web of science, PubMed, WanFang database, VIP database, CBM database, China National Knowledge Infrastructure (CNKI database) were investigated from the inception until April 1, 2024. We screened randomized controlled trials (RCTs) using acupuncture undergoing IVF-ET, the population was patients with PCOS.
Results	There is a total of **1,203 patients from thirteen RCTs** were incorporated in this analysis. Results showed that the acupuncture therapy increased the clinical pregnancy rate (P<0.01), high quality embryo rate (P<0.01) and the Live birth rate (P<0.01). The result also indicated that the dose of gonadotrophin (Gn) used (P=0.0002) and days of Gn used (P=0.005) were significantly differed between the acupuncture and the control group. Patients who underwent acupuncture treatment exhibited a markedly reduced occurrence of OHSS relative to the control group patients (P<0.01). No statistically significant difference was observed for the fertilization rate, the number of oocytes retrieved, the thickness of endometrium, the level of progesterone (P), the level of luteinizing hormone (LH), the level of Estrogen (E2), miscarriage rate and the cycle cancellation rate.
Conclusion	Our result showed that acupuncture therapy could increase the high-quality embryo rate, live birth rate and also the clinical pregnancy rate in PCOS patients undergoing IVF. Acupuncture could reduce the dose and duration of Gn. It also decreased the incidence of OHSS. Based on the result of this meta-analysis, acupuncture therapy is suggested in the IVF process for PCOS patients.

1.4.2.2. Li 2024

Li YT, Li CL, Yang H, Huang L, Liu JJ, Zheng XY, Tao XY, Yu Z, Liang FR, Tian XP, Yang J. Correlation between acupuncture dose and pregnancy outcomes in women with polycystic ovary syndrome undergoing in vitro fertilization-embryo transfer: a systematic review. BMC Complement Med Ther. 2024 Nov 26;24(1):407. https://doi.org/10.1186/s12906-024-04695-9

Backgound	Increasing studies focused on the efficacy of acupuncture on pregnancy outcomes in patients with polycystic ovary syndrome (PCOS) undergoing in vitro fertilization-embryo transfer (IVF-ET). However, debatable conclusions have been drawn from different randomized controlled trials (RCTs), which might be related to different doses of acupuncture.
Objective	To evaluate whether acupuncture has a dose-dependent effect on pregnancy outcomes in patients with PCOS undergoing IVF-ET in systematically reviewing.
Methods	Seven electronic databases were searched from inception to October 10th, 2024. The Cochrane Collaboration's tool ROB 2.0 (ROB 2.0) provided an assessment for the risk of bias. The acupuncture dose was extracted, then categorized into high, medium, and low dose according to the scoring system results, the evidence was assessed by Slavin's qualitative best-evidence synthesis approach in a rigours methodological way. Clinical pregnancy rate (CPR) was regarded as the primary outcome.
Results	A total of **953 subjects** met the eligibility criteria in **12 RCTs** were included, among which two studies were low dose, four were medium dose, and six were high dose. The overall quality of included studies was low, 50.00% (6/12) studies were low risk, 16.67% (2/12) studies were some concerns, and 33.33% (4/12) studies were high risk. Comparing the results, the consistent high-dose result among high-quality trials provides strong evidence for a positive correlation between high-dose acupuncture and pregnancy outcomes.
Conclusion	A trend indicates that higher acupuncture doses yield better outcomes for PCOS patients undergoing IVF-ET. Further confirmation through direct comparisons of different doses was needed

1.4.2.3. Yin 2020 ☆☆

Yin Ping. [Effects of acupuncture with assisted reproductive technology on clinical outcome in polycystic ovary syndrome patients: A Meta-analysis and GRADE classification]. China Journal of TCM and Pharmacy. 2020. [212954].

Objective	To systematically evaluate the effects of acupuncture on the outcome of pregnancy in polycystic ovary syndrome (PCOS) women with assisted reproductive technology.
Methods	The experiments of acupuncture in the treatment of PCOS patients with assisted reproductive technology were retrieved from China Knowledge Resource Integrated Database (CNKI), Wanfang Database, VIP Database (VIP), Pubmed and other Chinese medicine related journals. **Seven experimental papers** were analyzed by Meta-analysis using Revman 5. 3 software. The GRADE classification of the clinical pregnancy rate was carried out.
Results	Compared with the control group, acupuncture could significantly improve the IVF clinical pregnancy rate in patients with PCOS, and reduce the incidence of ovarian hyperstimulation syndrome. The clinical pregnancy rate was classified as moderate by GRADE.
Conclusion	The acupuncture can improve the IVF pregnancy outcome of PCOS women.

1.4.2.4. Jo 2017 ☆☆

Jo J, Lee YJ. Effectiveness of acupuncture in women with polycystic ovarian syndrome undergoing in vitro fertilisation or intracytoplasmic sperm injection: a systematic review and meta-analysis. Acupunct Med. 2017. [190586].

Objectives	The aim of this systematic review was to assess the evidence from randomised controlled trials (RCTs) on the efficacy, effectiveness and safety of acupuncture in women with polycystic ovarian syndrome (PCOS) undergoing in vitro fertilisation (IVF) or intracytoplasmic sperm injection (ICSI).
Methods	We searched a total of 15 databases through October 2015. The participants were women with PCOS (diagnosed using the Rotterdam criteria) undergoing IVF or ICSI. Eligible trials were those with intervention groups receiving manual acupuncture (MA) or electroacupuncture (EA), and control groups receiving sham acupuncture, no treatment or other treatments. Outcomes included the clinical pregnancy rate (CPR), live birth rate (LBR), ongoing pregnancy rate (OPR) and incidence of ovarian hyperstimulation syndrome (OHSS) and adverse events (Aes). For statistical pooling, the risk ratio (RR) and its 95% (confidence interval) CI was calculated using a random effects model.
Results	**Four RCTs** including 430 participants were selected. All trials compared acupuncture (MA/EA) against no treatment. Acupuncture significantly increased the CPR (RR 1.33, 95% CI 1.03 to 1.71) and OPR (RR 2.03, 95% CI 1.08 to 3.81) and decreased the risk of OHSS (RR 0.63, 95% CI 0.42 to 0.94); however, there was no significant difference in the LBR (RR 1.61, 95% CI 0.73 to 3.58). None of the RCTs reported on Aes.
Conclusions	**Acupuncture may increase the CPR and OPR and decrease the risk of OHSS in women with PCOS undergoing IVF or ICSI**. Further studies are needed to confirm the efficacy and safety of acupuncture as an adjunct to assisted reproductive technology in this particular population.

2. Overviews of Systematic Reviews

2.1. Hu 2023

Hu XY, Xiu WC, Shi LJ, Jiao RM, Tian ZY, Hu XY, Ming TY, Gang WJ, Jing XH. [Acupuncture for in vitro fertilization-embryo transfer: an overview of systematic reviews]. Zhongguo Zhen Jiu. 2023 Sep 19;43(11):1315-1323.

Objectives	To evaluate the report quality, methodological quality and evidence quality of the systematic reviews and meta-analyses (SRs/MAs) of acupuncture for in vitro fertilization-embryo transfer (IVF-ET).
Methods	The SRs/MAs of acupuncture for IVF-ET were searched electronically from databases of CNKI, Wanfang, VIP, SinoMed, PubMed, Embase, Cochrane Library, from inception of each database to September 27th, 2022. Two reviewers independently screened the literature and extracted the data. Using PRISMA statement, the AMSTAR 2 scale and the GRADE system, the report quality, methodological quality and evidence quality of the included SRs/MAs were assessed.
Results	A total of **28 SRs/MAs** were included, with PRISMA scores ranging from 8.5 points to 27 points. The problems of report quality focused on protocol and registration, retrieval, risk of bias in studies, additional analysis, limitations and funding. The methodological quality of included studies was generally low, reflecting on items 2, 3, 7, 10, 12 and 16. A total of 85 outcome indexes were included in the GRADE system for evidence grade evaluation. Most of the evidences were low or very low in quality. The reasons for the downgrade were related to study limitations, inconsistency, imprecision and publication bias.
Conclusions	Acupuncture therapy improves the outcomes of IVF-ET, but the methodological quality and evidence quality of related SRs/MAs are low. It is recommended to conduct more high-quality studies in the future to provide more reliable evidences.

2.2. Wang 2021

Wang X, Wang Y, Wei S, He B, Cao Y, Zhang N, Li M. An Overview of Systematic Reviews of Acupuncture for Infertile Women Undergoing in vitro Fertilization and Embryo Transfer. Front Public Health. 2021. [218694]. doi

Background	Currently, more and more subfertility couples are opting for combined acupuncture to improve the success rate of in vitro fertilization and embryo transfer (IVF-ET). However, the efficacy and safety of acupuncture in IVF-ET is still highly controversial.
Objectives	The purpose of this overview is to summarize evidence of essential outcomes of systematic reviews (SRs) of acupuncture in IVF-ET and evaluate their methodological quality.
Methods	We conducted a comprehensive literature search for relevant SRs in eight databases from inception to July 31, 2020, without language restriction. We evaluated the methodological quality of the included SRs by using A Measurement Tool to Assess Systematic Reviews 2 (AMSTAR-2), which was the latest available assessment tool. The Risk of Bias in Systematic Review (ROBIS) tool was used to assess the risk of bias in SRs. We assessed the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) score to determine the strength of evidence. We excluded the overlapping randomized controlled trials (RCTs) and performed a re-meta-analysis of the primary RCTs.
Results	This review included 312 original RCT studies and 65,388 participants. By using AMSTAR-2, we found that the methodological quality of 16 SRs was critically low, because they had more than one critical weakness. Our reviews showed that although the GRADE for quality of evidence profile was suboptimal, acupuncture seemed to be beneficial in increasing the pregnancy rate. Our re-meta-analysis suggested that acupuncture was superior to sham acupuncture in improving the clinical pregnancy rate (CPR) of IVF-ET with substantial heterogeneity (RR = 1.31, 95% CI: 1.13-1.52, p = 0.0004, I 2 = 66%). No statistical difference was observed regarding the outcomes of live birth rate (LBR), ongoing pregnancy rate (OPR), biochemical pregnancy rate (BPR), and miscarriage rate (MR) between two groups. When compared with no adjunctive treatment groups, acupuncture improved CPR (RR = 1. 25, 95% CI: 1.11-1.42, p = 0.0003) and OPR (RR = 1. 38, 95% CI: 1.04-1.83, p = 0.03). Acupuncture was more superior than no adjunctive treatment in reducing MR (OR = 1.42, 95% CI: 1.03-1.95, p = 0.03) and BPR (RR = 1.19, 95% CI: 1.02-1.37, p = 0.02).
Conclusions	Although the evidence of acupuncture in IVF-ET is insufficient, acupuncture appears to be beneficial to increase the clinical pregnancy rate in women undergoing IVF-ET. However, there are severe heterogeneity and methodological quality defects, which limit the reliability of results. Further, high-quality primary studies are still needed.

2.3. Xi 2018

Xi J, Chen H, Peng ZH, Tang ZX, Song X, Xia YB. Effects of Acupuncture on the Outcomes of Assisted Reproductive Technology: An Overview of Systematic Reviews. Evid Based Complement Alternat Med. 2018. [177995].

Objectives	To conclude the evidence from systematic reviews (SRs) and meta-analyses assessing the effectiveness of acupuncture to treat couples with subfertility undergoing ART.

Methods	We searched the major databases from their inception to March 2018: PubMed, Embase, The Cochrane Library, China National Knowledge Infrastructure (CNKI), Wanfang Database, Chongqing VIP, and Sino-Med (the Chinese database). The primary outcomes of the overview were live birth and clinical pregnancy, and secondary outcomes were ongoing pregnancy, miscarriage, and adverse events. Study selection, quality assessment, and data extraction were performed independently by two review authors. Review methodological quality was assessed by using the AMSTAR tool, and the quality of the evidence was rated by GRADE methods.
Results	Eleven systematic reviews were included and published between 2009 and 2017. Our study showed that the acupuncture treatment seems to be a useful tool to improve the clinical pregnancy rate in patients who undergo assisted reproduction therapy. However, there was no evidence that acupuncture had any effect on live birth rate, ongoing pregnancy rates, or miscarriage regardless of whether acupuncture was performed around the time of oocyte retrieval or around the day of embryo transfer; this evidence is inconclusive because of the low quality of the included studies.
Conclusions	The evidence for acupuncture to treat couples with subfertility undergoing ART remains unclear. Further research is needed, with high-quality trials undertaken and reported.

3. Clinical Practice Guidelines

⊕ positive recommendation (regardless of the level of evidence reported)
Ø negative recommendation (or lack of evidence)

3.1. European Society of Human Reproduction and Embryology (ESHRE) 2023 Ø

ESHRE Add-ons working group; Lundin K, Bentzen JG, Bozdag G, Ebner T, Harper J, Le Clef N, Moffett A, Norcross S, Polyzos NP, Rautakallio-Hokkanen S, Sfontouris I, Sermon K, Vermeulen N, Pinborg A. Good practice recommendations on add-ons in reproductive medicine†. Hum Reprod. 2023 Sep 25:dead184. https://doi.org/10.1093/humrep/dead184

Acupuncture, Chinese and herbal medicine and other complementary therapies are not recommended.

3.2. American Society for Reproductive Medicine (ASRM, USA) 2017 Ø

Practice Committee of the American Society for Reproductive Medicine. Performing the embryo transfer: a guideline. Fertil Steril. 2017;107(4):882-96. [182135].

There is fair evidence that acupuncture performed around the time of embryo transfer does not improve live-birth rates in IVF. (Grade B). There is insufficient evidence to recommend for or against WS-TCM (Whole-systems traditional Chinese medicine) to improve IVF-embryo transfer outcomes. (Grade C). WS-TCM : can include acupuncture, Chinese herbal medications recommendations., diet, and lifestyle.