



CADTH Reference List

Acupuncture for Substance Use Disorders

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Key Message

We found 3 systematic reviews, 5 randomized controlled trials, and 3 nonrandomized studies about the clinical effectiveness of acupuncture for people with substance use disorders.

Research Question

What is the clinical effectiveness of acupuncture for people with substance use disorders?

Methods

Literature Search Methods

An information specialist conducted a literature search on key resources including MEDLINE, PsycINFO, the Cochrane Database of Systematic Reviews, the International HTA Database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search approach was customized to retrieve a limited set of results, balancing comprehensiveness with relevancy. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. Search concepts were developed based on the elements of the research questions and selection criteria. The main search concepts were acupuncture and substance abuse disorders. No filters were applied to limit retrieval by study type. The search was completed on June 5, 2023, and limited to English-language documents published since January 1, 2018. Internet links were provided, where available.

Selection Criteria and Summary Methods

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in [Table 1](#). Full texts of study publications were not reviewed. The Overall Summary of Findings was based on information available in the abstracts of selected publications.

Table 1: Selection Criteria

Criteria	Description
Population	People with substance use disorders
Intervention	Acupuncture, including needle and electroacupuncture (as adjunctive or monotherapy)
Comparator	No treatment (e.g., waitlist, sham therapy), usual care (e.g., psychotherapy, pharmacotherapy)
Outcomes	Clinical benefits (e.g., psychological symptoms, function, quality of life, relapse, patient satisfaction) and harms (e.g., adverse events)
Study designs	Health technology assessments, systematic reviews, randomized controlled trials, nonrandomized studies

Results

Three systematic reviews,¹⁻³ 5 randomized controlled trials,⁴⁻⁸ and 3 nonrandomized studies⁹⁻¹¹ regarding the clinical effectiveness of acupuncture for people with substance use disorders were identified. No relevant health technology assessments were identified.

Additional references of potential interest that did not meet the inclusion criteria are provided in [Appendix 1](#).

Overall Summary of Findings

Three systematic reviews,¹⁻³ 5 randomized controlled trials,⁴⁻⁸ and 3 nonrandomized studies⁹⁻¹¹ were identified about the clinical effectiveness of acupuncture for people with substance use disorders. Three studies focused on tobacco use disorder,^{1,7,11} 4 on opioid use disorder,^{2-4,10} 2 on alcohol dependency or addiction,^{5,6} and 2 on methamphetamine addiction.^{8,9}

People With Tobacco Use Disorder

Three studies focused on acupuncture for people with tobacco use disorder.^{1,7,11} One systematic review found that there was no significant difference in short-term abstinence or nicotine dependence and daily smoking between acupuncture, sham acupuncture, acupuncture plus auricular pressure, and nicotine replacement therapy (NRT).¹ Acupuncture with auricular acupressure and auricular acupressure alone were considered superior to the other interventions with respect to abstinence rates.¹ One randomized controlled trial found that abstinence, withdrawal, nicotine dependence, and time to relapse was significantly better with the acupuncture group when compared to auricular point pressing at 24 weeks.⁷ The same randomized controlled trial found that acupuncture resulted in a similar abstinence rate as NRT, but it also led to better withdrawal and nicotine dependence measure scores at 24 weeks.⁷ Two adverse events were reported for both acupuncture and NRT.⁷ The nonrandomized study by Hyun et al. (2018) compared the impact of acupuncture with NRT to NRT alone on soldiers with tobacco use disorder.¹¹ They found that the number of individuals who achieved continuous abstinence was significantly higher with acupuncture with NRT compared to NRT alone, while withdrawal scale scores were similar between the 2 groups.¹¹ No adverse events were reported for acupuncture with NRT and NRT alone.¹¹

People With Opioid Use Disorder

Four studies evaluated the effectiveness of acupuncture and/or electroacupuncture (EA) for people with opioid use disorder.^{2-4,10} One systematic review found that for people receiving methadone maintenance treatment (MMT), manual acupuncture was the most effective treatment compared to other forms of acupuncture, traditional Chinese medicine, or MMT alone.² Another systematic review by Chen et al. (2018) found that acupuncture and EA were more beneficial in alleviating cravings and changing in mental health comorbidities compared to sham acupuncture and sham EA, respectively.³ One randomized controlled trial⁴ found that acupuncture with MMT significantly improved methadone dosage, cravings, and insomnia

compared to MMT alone. A case control study¹⁰ found that EA with MMT improved quality of life compared to the control group, in addition to significantly improving sleep quality once the methadone dosage was reduced.

People With Alcohol Dependence

Two randomized controlled trials focused on people with alcohol addiction or dependence.^{5,6} One study found that the total effective rate was higher with acupuncture plus emotional therapy compared to emotional therapy.⁵ At 12 weeks, 36-Item Short Form Survey (SF-36 scores) were significantly different between acupuncture plus emotional therapy and emotional therapy alone, whereas Hamilton Depression Scale scores were significantly different at 3, 6, and 9 weeks after treatment.⁵ However, the same study did not find a significant difference in alcohol consumption between the acupuncture plus emotional therapy and emotional therapy alone.⁵ The study by Krause and colleagues⁶ found that psychiatric comorbidities and abstinence were similar between acupuncture and sham acupuncture or no intervention.

People With Methamphetamine Addiction

Two studies investigated the clinical effectiveness of acupuncture for people with methamphetamine addiction.^{8,9} The studies compared the impact of EA to sham intervention⁸ or paliperidone palmitate long-acting injection with EA.⁹ The randomized controlled trial by Zeng et al. (2018) found that EA improved psychosis, anxiety, sleep, and depressive symptoms during abstinence.⁸ In terms of Positive and Negative Syndrome Scale (PANSS) scores, the same study found that compared to the control group, the positive symptoms score significantly decreased after 1 to 4 weeks of treatment, while the negative symptoms score significantly decreased after 2 and 4 weeks of treatment.⁸ A prospective cohort study found that EA combined with paliperidone palmitate long-acting injection led to significantly less withdrawal symptoms and significant improvements in anxiety and depression after 3 and 6 months of treatment.⁹

A detailed summary of the clinical effectiveness studies included in the report can be found in [Table 2](#).

Table 2: Summary of Included Clinical Effectiveness Studies

Study citation	Study design, population	Intervention and comparators	Relevant outcomes	Authors' conclusions
Systematic reviews				
Dai et al. (2021) ¹	SR and network meta-analysis with 23 RCTs Population: People with tobacco use disorder N = 2,706	Intervention: Acupuncture Comparators: Sham acupuncture therapy, AA, sham AA, acupuncture plus AA, and NRT	Short- and long-term abstinence rates, FTND, daily smoking	There was no significant difference in short-term abstinence rates, FTND scores, or daily smoking between treatment and control groups. Acupuncture plus AA and AA were superior to other interventions when comparing abstinence rates.

Study citation	Study design, population	Intervention and comparators	Relevant outcomes	Authors' conclusions
Wen et al. (2021) ²	SR and network meta-analysis with 20 trials Population: People with OUD receiving MMT N = 1,997	Intervention: Manual acupuncture, and EA Comparator: EA, auricular acupuncture, MMT, traditional Chinese medicine, and TEAS	Effective rate, Modified Himmelsbach Opiate Withdrawal Scale	In pairwise meta-analysis, no significant differences in the effective rates were observed between the treatment and control groups, but manual acupuncture was more effective in opiate withdrawal compared to MMT, EA, and TEAS. The network meta-analysis showed that manual acupuncture was more effective than MMT in opiate withdrawal.
Chen et al (2018) ³	SR and meta-analysis with 9 studies Population: Adults with OUD N = 1,063	Intervention: Acupuncture and EA Comparators: No treatment/sham acupuncture, and sham EA	Opioid craving, insomnia, depression	Acupuncture is more beneficial than no treatment/sham acupuncture for changes in opioid craving, insomnia, and depression. The EA group had differences in alleviating symptoms of craving compared to sham EA group.
Randomized controlled trials				
Wen et al. (2021) ⁴	Study design: Parallel arm RCT Population: Individuals with OUD receiving MMT in China N = 123	Intervention: Acupuncture with MMT Comparator: MMT	Drug cravings (Visual Analog Scale score), and insomnia (Pittsburgh Sleep Quality Index), QALY	Acupuncture with MMT was significantly better in the improvement of daily methadone dosage, drug cravings, and insomnia compared to MMT alone. The QALY of the two groups were similar.
Zhao et al. (2021) ⁵	Study design: RCT Population: Elderly individuals with alcohol dependence N = 60	Intervention: Acupuncture with emotional therapy of Chinese medicine treatment Comparator: Emotional therapy of Chinese medicine treatment	Curative effect, mean alcohol consumption, the 36-item short-form survey score, HAMD scores	The total effective rate was higher with acupuncture and therapy. Alcohol consumption in each group decreased significantly after the treatment but there were no significant differences between the treatment and control group. There was a significant difference in physical function, physical pain, general health, energy, emotional function, and mental health between the treatment and control group. A significant difference in HAMD scores between the two groups was noted at 3, 6, and 9 weeks after treatment.

Study citation	Study design, population	Intervention and comparators	Relevant outcomes	Authors' conclusions
Krause et al (2020) ⁶	Study design: 3-arm RCT Population: Individuals with alcohol addiction undergoing rehabilitation N = 72	Intervention: 30-minute acupuncture (National Acupuncture Detoxification Association) Comparators: Sham acupuncture, no intervention	Craving, depression, anxiety, autonomic control of the heart, HRV, vasculature, sweat glands, and 1-year abstinence.	Psychiatric comorbidities and 1-year abstinence did not differ between the study groups.
Wang et al. (2018) ⁷	Study design: multicentre, active controlled, open-label RCT Population: People with tobacco use disorder N = 300	Intervention: Acupuncture Comparators: Auricular point pressing and NRT	Carbon monoxide confirmed 24-hour point abstinence rate at 24 weeks after quit day, FTND, Minnesota Nicotine Withdrawal Scale scores, time to relapse, and AE.	The 24-hour point abstinence rate with acupuncture was similar to the NRT but was significantly higher than the auricular point pressing group. The FTND score and Minnesota Nicotine Withdrawal Scale score in the acupuncture group were significantly lower than those in the auricular point and the NRT group at 24 weeks. The time to relapse with acupuncture was longer than NRT and auricular point pressing. Two cases of AE were observed in the acupuncture and NRT groups.
Zeng et al. (2018) ⁸	Study design: Single-blind RCT Population: Men with MA addiction N = 68	Intervention: EA Comparator: Sham EA	Positive and Negative Syndrome Scale, HAMA, and HAMD	EA effectively improved psychotic, anxiety, and depressive symptoms. Compared to the control group, the positive symptom score, and general psychopathological symptoms after 1 to 4 weeks of treatment significantly decreased in the group treated with EA. The negative symptoms score significantly decreased after 2 and 4 weeks of treatment. Psychotic anxiety scores were significantly lower in the treatment group compared to the control group. There was a significant reduction in anxiety/somatization and sleep disturbance scores for men treated with EA after 4 weeks.

Study citation	Study design, population	Intervention and comparators	Relevant outcomes	Authors' conclusions
Nonrandomized studies				
Chen et al. (2021) ⁹	Study design: Prospective cohort study Population: People with MA addiction N = 89	Intervention: EA Comparator: Paliperidone palmitate long-acting injection combined with EA	MA withdrawal symptom score, HAMA, and HAMD	After 3 and 6 months of treatment, the withdrawal symptom score, HAMA, and HAMD scores in the group treated with paliperidone palmitate long-acting injection were significantly lower than for the group treated with EA alone.
Chen et al. (2019) ¹⁰	Study design: Case-control study Population: People with OUD undergoing MMT in central Taiwan N = 106	Intervention: EA with MMT Comparator: MMT	Quality of life, and sleep quality	EA with MMT improved quality of life. Only when the methadone dosage was decreased did the group treated with EA and MMT have a significant improvement in sleep quality.
Hyun et al. (2018) ¹¹	Study design: Retrospective cohort study Population: Soldiers with tobacco use disorder in Korea N = 148	Intervention: Auricular acupuncture and NRT Comparator: NRT	Continuous abstinence, Minnesota Nicotine Withdrawal Scale scores, and serious AE	More soldiers in the treatment group achieved continuous abstinence compared to the control group, a significant difference. The Minnesota Nicotine Withdrawal Scale scores decreased in both groups and there was no significant difference between the 2 groups. No serious AE were reported.

AA = auricular acupressure; AE = adverse events; EA = electroacupuncture; FTND = Fagerstrom test for nicotine dependence; HAMA = Hamilton Anxiety Score; HAMD = Hamilton Depression Scale; HRV = heart rate variability; MA = methamphetamine; MMT = methadone maintenance treatment; NRT = nicotine replacement therapy; OUD = opioid use disorder; QALY = quality-adjusted life-year; RCT = randomized controlled trial; SR = systematic review; TEAS = transcutaneous electrical acupoint stimulation.

References

Health Technology Assessments

No literature identified.

Systematic Reviews

1. Dai R, Cao Y, Zhang H, et al. Comparison between acupuncture and nicotine replacement therapies for smoking cessation based on randomized controlled trials: a systematic review and Bayesian network meta-analysis. *Evid Based Complement Alternat Med*. 2021 Jun 16:9997516. [PubMed](#)
2. Wen H, Chen R, Zhang P, et al. Acupuncture for opioid dependence patients receiving methadone maintenance treatment: a network meta-analysis. *Front Psychiatry*. 2021;12:767613. [PubMed](#)
3. Chen Z, Wang Y, Wang R, Xie J, Ren Y. Efficacy of acupuncture for treating opioid use disorder in adults: a systematic review and meta-analysis. *Evid Based Complement Alternat Med*. 2018:3724708. [PubMed](#)

Randomized Controlled Trials

4. Wen H, Wei X, Ge S, et al. Clinical and economic evaluation of acupuncture for opioid-dependent patients receiving methadone maintenance treatment: the integrative clinical trial and evidence-based data. *Front Public Health*. 2021;9:689753. [PubMed](#)
5. Zhao F, Tong X, Wang C. Acupuncture combined with emotional therapy of Chinese medicine treatment for improving depressive symptoms in elderly patients with alcohol dependence during the COVID-19 epidemic. *Front Psychol*. 2021;12:635099. [PubMed](#)
6. Krause F, Penzlin AI, Ritschel G, et al. Randomized controlled three-arm study of NADA acupuncture for alcohol addiction. *Addict Behav*. 11 2020; 110:106488. [PubMed](#)
7. Wang YY, Liu Z, Wu Y, et al. Efficacy of acupuncture is noninferior to nicotine replacement therapy for tobacco cessation: results of a prospective, randomized, active-controlled open-label trial. *Chest*. 2018;153(3):680-688. [PubMed](#)
8. Zeng L, Tao Y, Hou W, Zong L, Yu L. Electro-acupuncture improves psychiatric symptoms, anxiety and depression in methamphetamine addicts during abstinence: a randomized controlled trial. *Medicine (Baltimore)*. 2018;97(34):e11905. [PubMed](#)

Nonrandomized Studies

9. Chen Y, Li M, Ji Q, et al. Clinical study of paliperidone palmitate long-acting injection combined with electroacupuncture in the treatment of methamphetamine addicts. *Front Pharmacol*. 2021;12:698740. [PubMed](#)
10. Chen YL, Lee TC, Chen YT, Lo LC, Hsu WY, Ouyang WC. Efficacy of electroacupuncture combined with methadone maintenance therapy: a case-control study. *Evid Based Complement Alternat Med*. 2019:7032581. [PubMed](#)
11. Hyun S, Huh H, Kang NG. Effectiveness of auricular acupuncture combined with nicotine replacement therapy for smoking cessation. *Tob Induc Dis*. 2018;16:40. [PubMed](#)

Appendix 1: References of Potential Interest

Systematic Reviews

Alternative Intervention

Chen H, Feng J, Chen L, et al. Acupoint stimulation for alcohol use disorder: a systematic review and meta-analysis. *Medicine (Baltimore)*. 2023; 102(1):e32614. [PubMed](#)

Sibbritt D, Peng W, Lauche R, Ferguson C, Frawley J, Adams J. Efficacy of acupuncture for lifestyle risk factors for stroke: A systematic review. *PLoS ONE [Electronic Resource]*. 2018; 13(10):e0206288. [PubMed](#)

Unclear Comparator

Lee EJ. Effects of auriculotherapy on addiction: a systematic review. *J Addict Dis*. Jul-Sep 2022; 40(3):415-427. [PubMed](#)

Ronsley C, Nolan S, Knight R, et al. Treatment of stimulant use disorder: a systematic review of reviews. *PLoS ONE*. 2020;15(6):e0234809. [PubMed](#)

Fathima L, Manipal S, Bharathwaj VV, Rajmohan M, Prabu D. Effectiveness of auricular acupuncture/acupressure for smoking cessation- a systematic review. *Int J Dent Res*. 2019;4(2):85-89. https://www.dentistryscience.com/IJDR_201942_09.pdf
Accessed 2023 Jun 8.

Unclear Population – People with Substance Use Disorder Not Specified

Patnode CD, Henderson JT, Melnikow J, Coppola EL, Durbin S, Thomas R. Interventions for tobacco cessation in adults, including pregnant women: an evidence update for the U.S. Preventive Services Task Force [Internet]. (Report No.: 20-05264-EF-1). Rockville (MD): Agency for Healthcare Research and Quality; 2021: [PubMed](#)

Wang JH, van Haselen R, Wang M, et al. Acupuncture for smoking cessation: a systematic review and meta-analysis of 24 randomized controlled trials. *Tob Induc Dis*. 2019; 17:48. [PubMed](#)

Alternative Population – Patients With Alcohol Withdrawal Syndrome

Liu X, Qin Z, Zhu X, Yao Q, Liu Z. Systematic review of acupuncture for the treatment of alcohol withdrawal syndrome. *Acupunct Med*. 10 2018; 36(5):275-283. [PubMed](#)

Randomized Controlled Trials

Alternative Population

Jackson HJ, Walters J, Raman R. Auricular acupuncture to facilitate outpatient opioid weaning: a randomized pilot study. *Med Acupunct*. 2021;33(2):153-158. [PubMed](#)

Yeung WF, Chung KF, Zhang ZJ, et al. Electroacupuncture for tapering off long-term benzodiazepine use: a randomized controlled trial. *J Psychiatr Res*. 2019;109:59-67. [PubMed](#)

Alternative Comparator – Auricular-point Pressure

Yu K-C, Wei H-T, Chang S-C, Huang K-Y, Hsu C-H. The efficacy of combined electroacupuncture and auricular pressure on sleep quality in patients receiving methadone maintenance treatment. *Am J Addict*. Mar 2021; 30(2):156-163. [PubMed](#)

Alternative Intervention – Auricular Acupressure

Lee EJ. The effect of auricular acupressure and positive group psychotherapy with motivational interviewing for smoking cessation in Korean adults. *Holist Nurs Pract*. Mar/Apr 2020; 34(2):113-120. [PubMed](#)

Unclear Outcomes

Pirnia B, Pirnia K, Mohammadpour S, et al. The effectiveness of acupuncture on HPA functional in depressed patients under methadone maintenance treatment, a randomized double-blind sham-controlled trial. *Asian J Psychiatr*. Aug 2018; 36():62-63. [PubMed](#)

Nonrandomized Studies

Before-and-After Comparison

Ho LF, Ho WK, Wong LL, et al. Acupuncture combined with auricular acupressure for smoking cessation and its effects on tobacco dependence and smoking behavior among Hong Kong smokers: a multicenter pilot clinical study. *Chin Med*. Aug 09 2022; 17(1):92. [PubMed](#)

Zayed S, Tlili R, Azaiez F, Bouhaed L, Laater A, Ben Ameer Y. Predictors of the effectiveness of acupuncture in smoking cessation in coronary patients: a prospective study of 25 patients. *Tunis Med*. Nov 2019; 97(11):1246-1250. [PubMed](#)

Unclear Population — Substance Use Disorder Not Specified

Romani M, Nakkash R, Jawhar S, Salloum RG. Implementation of a free smoking-cessation program in a Lebanese academic medical center. *Tob Induc Dis*. 2020; 18:75. [PubMed](#)

Wang YY, Liu Z, Chen F, et al. Effects of acupuncture on craving after tobacco cessation: a resting-state fMRI study based on the fractional amplitude of low-frequency fluctuation. *Quant Imaging Med Surg*. Jun 2019; 9(6):1118-1125. [PubMed](#)

Review Articles

Shekelle P, Allen J, Mak S, et al. Evidence map of acupuncture as treatment for adult health conditions: update from 2013–2021. (VA Evidence Synthesis Program Project #05-226). Washington (DC): U.S. Department of Veterans Affairs; 2022: <https://www.hsrd.research.va.gov/publications/esp/acupuncture-evidence-map.pdf>. Accessed 2023 Jun 8.
Refer to Table 4- Conclusions Rated as Moderate Certainty of Evidence from Systematic Reviews Included in the Evidence Map (pages 16-18).

Chen P, Li J, Han X, et al. Acupuncture for alcohol use disorder. *Int J Physiol Pathophysiol Pharmacol*. 2018; 10(1):60-69. [PubMed](#)

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Auricular acupuncture in prescription drug dependence detoxification. Stockholm (SE): Swedish Agency for Health Technology Assessment and Assessment of Social Services; 2020: <https://www.sbu.se/en/publications/responses-from-the-sbu-enquiry-service/auricular-acupuncture-in-prescription-drug-dependence-detoxification/>. Accessed 2023 Jun 8.