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# **Is acupuncture a beneficial therapy for the treatment of alcohol dependence?**

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A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

In Partial Fulfillment of the Requirements For

The Degree of Master of Science

In

Health Sciences – Physician Assistant

Department of Physician Assistant Studies  
Philadelphia College of Osteopathic Medicine  
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## ABSTRACT

**OBJECTIVE:** The objective of this selective EBM review is to determine whether or not acupuncture is a beneficial therapy for the treatment of alcohol dependence.

**STUDY DESIGN:** Review of three randomized controlled trails (RCTs) which were published in 2007, 2015, and 2016.

**DATA SOURCES:** All articles were presented in English and taken from peer reviewed journals found on PubMed.

**OUTCOMES:** The various symptoms of alcohol dependence; from withdrawal, cravings, and use were assessed through various methods. Alcohol withdrawal symptoms were assed using the alcohol-withdrawal syndrome scale, alcohol craving was assed using a Visual Analogue Scale, and alcohol use was measured using the Drug Use Disorders Identification Test with added items to measure alcohol use along with utilization of addiction serveries.

**RESULTS:** Kunz et al. found that there was no statistically significant difference in withdrawal symptoms between acupuncture and aromatherapy as treatment for alcohol dependent patients.<sup>1</sup> Lee et al. found a statistically significant reduction ( $p < 0.01$ ) in alcohol cravings in patients treated with real Zhubin (K19) acupuncture needles compared to the placebo needles placed in the same anatomical locations.<sup>2</sup> Ahlberg et al. found that there was no statistically significant difference in alcohol use between the National Acupuncture Detoxification Association (NADA) protocol, a local acupuncture protocol, and relaxation techniques in alcohol dependent patients.<sup>3</sup>

**CONCLUSIONS:** Two out of the three randomized controlled trials found that there was no statistically significant difference in the symptoms of alcohol dependence between acupuncture therapy and either aromatherapy or relaxation. However, Lee et al. found that there was a significant difference seen in alcohol cravings between patients treated with Zhubin acupuncture and its placebo.<sup>2</sup> This study however was limited to only male patients and used a different acupuncture protocol compared to the other two studies. With this information, it cannot be concluded that acupuncture is an effective treatment in alcohol dependence and further studies are warranted in order to find a protocol that is effective.

**KEYWORDS:** acupuncture, alcohol dependence

**INTRODUCTION:**

Alcohol dependence is a psychiatric diagnosis in which a person becomes physically and psychologically dependent upon alcohol. This occurs when the brain's neurons adapt to the repeated and excessive exposure to alcohol, to the point where the brain can only function normally in the presence of the drug in order not to feel withdrawal symptoms. Patients with alcohol dependence can demonstrate a variety of symptoms from multiple organ systems. These patients may present with evidence of injury or trauma, anxiety, depression, suicidality, comorbid substance-use disorders, hypertension, gastrointestinal symptoms, cardiac symptoms, neurologic symptoms, electrolyte disturbances, sleep disturbances, increased liver enzymes, bone marrow suppression, and social or legal problems.

According to the World Health Organization there is an estimated 75 million people who suffer from alcohol abuse and its associated dependence worldwide.<sup>6</sup> Within the United States, the National Institute on Alcohol Abuse and Alcoholism found that 7.2% of the American adult population suffers from this illness, while the prevalence in primary care settings dealing with this disorder and its associated complications ranges from 20-36%.<sup>5</sup> Due to the nature of the illness and the variety of symptoms it can manifest as, on average the annual economic cost of alcohol use injuries and illnesses is estimated to be over \$250 billion.<sup>5</sup> This has resulted in almost 40% of all drug-related emergency visits, and 1 in 10 deaths from excessive drinking per year.<sup>7</sup> While the exact cause of alcohol dependence is unknown, there is thought to be a mixture of genetics, environmental influences, specific personality traits, and cognitive functioning that contribute to the high prevalence of this disease.<sup>4</sup> The patient population that is most likely to fall within these risk factors are Native American young adult males,<sup>4</sup> however, alcohol dependence can be identified in a wide range of patient populations. Researchers have also found that there might be

some link to drinking alcohol and how different people’s brains respond to it on a pathophysiological level.<sup>4</sup>

Since alcohol dependence is identified as a psychiatric illness, it is diagnosed based on the DSM 5 criteria.<sup>4</sup> The list of criteria is included in the Table 1 below.<sup>4</sup> The severity of someone’s illness can be further broken down based on how many of the criteria that they meet.<sup>4</sup> Mild dependence is shown if two to three of the criteria are met, moderate is seen if four to five criteria are met, and severe dependence is seen if six or more of the criteria are met.<sup>4</sup> Prior to reaching full dependence it is important for primary care providers to screen for unhealthy alcohol use to prevent the development of dependence. Screening tools like the Alcohol Use Disorders Identification Test (AUDIT) are used to identify potential problems and help the provider as well as the patient reflect on ways they can correct these problems before the it becomes worse.<sup>4</sup>

Table 1. – DSM 5 Criteria for Alcohol Dependence

Recurrent drinking resulting in failure to fulfill your obligations
Recurrent drinking in hazardous situations
Continued drinking despite alcohol-related social or interpersonal problems
Evidence of tolerance
Evidence of alcohol withdrawal or use of alcohol for relief or avoidance of withdrawal
Drinking in larger amounts over longer periods than intended
Persistent desire or unsuccessful attempts to stop or reduce drinking
Great deal of time spent obtaining, using, or recovering from alcohol
Important activities are given up or reduced because of drinking
Continued drinking despite knowledge of physical or psychological problems caused by alcohol
Craving for alcohol

There are two different ways in which the treatment of alcohol dependence can be approached. One of these approaches is through pharmacologic therapy with drugs like naltrexone, disulfiram, topiramate, and gabapentin.<sup>6</sup> These drugs have been found to reduce a patient’s craving for alcohol as well as the euphoric effects that they might experience from its use.<sup>6</sup> However, as with all drug use, there comes many side effects as well as contraindications to ensure their safe

administration. Contraindications such as hepatitis, liver disease and cardiovascular disease along with side effects such as depression and elevated liver enzymes have been found with the use of these medications.<sup>6</sup> This poses a potential problem for these patients since many of them already have these comorbid conditions. Another approach to the treatment of this illness is through supportive psychotherapy.<sup>6</sup> This includes individual and group therapy sessions, as well as inpatient & residential treatment centers.<sup>6</sup> While there is no cure for alcohol dependence many of the medications and therapies listed above help to retrain the brain to reduce its alcohol craving while helping to treat the side effects of withdrawal.

Acupuncture is a holistic traditional Chinese medicine technique that stimulates specific points on the body by inserting needles into the skin. It has been used to help ease chronic pain from arthritis and migraines. The National Acupuncture Detoxification Association (NADA) is the first group that has developed a protocol for treating more psychologic illnesses like addiction, stress, and trauma through ear acupuncture. Acupuncture offers a more holistic and cost effective approach to the treatment of alcohol dependence without many of the side effects and contraindications the medications listed above have.

### **OBJECTIVE:**

The objective of this selective EBM review is to determine whether or not acupuncture is a beneficial therapy for the treatment of alcohol dependence.

### **METHODS:**

The criteria for selection included males or females over the age of 18 with a diagnosis of alcohol dependence. The intervention used was acupuncture therapy. The intervention was compared to another form of holistic therapy. This included placebo needle acupuncture, aromatherapy, and relaxation by listening to soft music in a quiet, dimly lit room. The outcomes

measured were patient oriented and focused on alcohol withdrawal symptoms, cravings, and use. Alcohol withdrawal symptoms were assessed using the alcohol-withdrawal syndrome scale, alcohol craving was assessed using a visual analogue scale, and alcohol use was measured using the Drug Use Disorders Identification Test with added items to measure alcohol use along with utilization of addiction services.

The three randomized controlled trials were chosen from PubMed. The keywords used to search these articles were “alcohol dependence” and “acupuncture.” The three studies selected were written in English and published in peer reviewed journals between the years 2007-2016. All of the studies had inclusion criteria of adults with a diagnosis of alcohol dependence based on either the DSM-V criteria, the International Classification of Diseases (ICD 10) or had ongoing patient status at the Addiction Center. The specific exclusion criteria, as well as other individual study characteristics are displayed in Table 1. The statistics reported in the studies and utilized for the review were RRR, ARR, NNT, p-values, and mean change from baseline.

Table 2. – Demographics & Characteristics of Included Studies

<b>Study</b>	<b>Type</b>	<b># Pts</b>	<b>Age (yrs)</b>	<b>Inclusion Criteria</b>	<b>Exclusion Criteria</b>	<b>W/D</b>	<b>Interventions</b>
Ahlberg, 2016	RCT	280	18-65	18-65 years of age and ongoing patient status at the Addiction Center (AC)	Nickel-allergy, ear infection, or heart disease	70	Auricular acupuncture using NADA and local protocols
Kunz, 2007	RCT	109	18-65	Patients had to meet International Classification of Diseases (ICD 10) Criteria for alcohol dependence	- refusal to be randomized - current drug abuse - pregnancy - clinically evident cognitive impairment unrelated to current alcohol intoxication - active psychotic status	35	Auricular acupuncture

					-current additional medical conditions requiring treatment - severe coagulation disturbances - age <18 or > 65 years		
Lee, 2015	Double blinded RCT	20	44.5 +/- 7.9 years	Patients had to meet the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) criteria for alcohol dependence	- current drug abuse - clinically evident cognitive impairment - current medical and neurological disorders - history of other axis I disorder - current use of psychotropic medications	N/A	Acupuncture on Zhubin (K19) acupoint

### **OUTCOMES MEASURED:**

This review examined the different levels of alcohol dependence from use, to cravings, to withdrawal symptoms using a variety of different methods. Kunz et al. measured the severity of withdrawal symptoms with the alcohol-withdrawal syndrome scale.<sup>1</sup> This scale covered the medical and psychiatric symptoms of alcohol withdrawal with scores ranging from 0 to 9.<sup>1</sup> The higher the score, the more severe the patient's symptoms.<sup>1</sup> This rating was performed both before and after treatment by a trained research assistant.<sup>1</sup> Patients were also given self-assessments of emotional valence, arousal, and dominance and well as the visual analog scale (VAS).<sup>1</sup>

Lee et al., measured alcohol craving using the visual analogue scale, similar to Kunz et al.'s study.<sup>2</sup> Each subject was given an ounce of 25% distilled liquor to recall good memories related to alcohol and provoke their craving.<sup>2</sup> They sipped on the alcohol once every thirty seconds for three minutes and this was done twice.<sup>2</sup> Their alcohol cravings were then measured by having the subjects mark a point on a horizontal line.<sup>2</sup> The line was 120 mm long, with the left end of the

line representing no craving for alcohol and the right representing a maximum craving.<sup>2</sup> The VAS score was determined by measuring from the left end of the line to where the subject marked.<sup>2</sup> These scores were measured each week during their treatment.<sup>2</sup>

Ahlberg et al., measured alcohol use by utilizing the Alcohol Use Disorders Identification Test (AUDIT).<sup>3</sup> This assessed each patient's alcohol use before treatment was initiated.<sup>3</sup> These scores were then compared to the Drug Use Disorders Identification Test-Extended (DUDIT-E), which had added items to measure alcohol use during each follow up assessment.<sup>3</sup>

## **RESULTS:**

Kunz et al. conducted a randomized controlled trial of 109 patients, 89 of which were male and 20 of which were female, from the alcohol withdrawal unit at the Clinic of Psychiatry and Psychotherapy in Germany.<sup>1</sup> All participants had been drinking within 10 days prior to their enrollment, were over the age of 18, and met the International Classification of Diseases criteria for alcohol dependence.<sup>1</sup> This study examined alcohol withdrawal symptoms of alcohol dependent patients after initiation of ear acupuncture according to the National Acupuncture Detoxification Association protocol for 45 minutes a day for 5 consecutive days.<sup>1</sup> Withdrawal symptoms were assessed using the Alcohol-Withdrawal Scale (AWS), which was performed prior to the acupuncture treatment and at the conclusion of the 5 days.<sup>1</sup> At the end of day 5, 35 patients has dropped out of the study leaving 74 total patients who finished the study.<sup>1</sup> In anticipation of dropouts, the researchers utilized an intention to treat principle.<sup>1</sup> The data in this study were presented as continuous, using the change in mean from baseline and an ANOVA model to record their test statistics.<sup>1</sup> “The alcohol withdrawal scale showed a trend toward an interaction between “pre-post” and intervention ( $p < 0.1$ ), with a slightly more pronounced mean decrease in the acupuncture group from pretreatment (2.9) to posttreatment session (1.6) compared to the control

group (2.4-1.8).”<sup>1</sup> However, using ANOVA, the researchers were not able to find a significant difference between other main effects or interactions between acupuncture therapy and aromatherapy in decreasing withdrawal symptoms, as the p-value was greater than 0.05 ( $p > 0.1$ ).<sup>1</sup>

Table 3. – AWS Values Pre and Post Treatment

Group	Pre Treatment (mean values)	Post Treatment (mean values)	Change in Mean
Acupuncture	2.9	1.6	1.3
Aromatherapy (control)	2.4	1.8	0.6

Lee et al., conducted a randomized control trial of 20 male alcohol dependent patients from the Department of Alcohol and Drug Use Disorders at Bugok National Hospital in Korea.<sup>2</sup> All of the patients met the criteria for alcohol dependence based on the DSM 5.<sup>2</sup> The trial began three weeks after their admission to ensure the patients were not intoxicated nor experiencing withdrawal symptoms.<sup>2</sup> The 20 men were divided randomly into two groups, 10 to the treatment group (age 43.0 +/- 6.8 years) and 10 to the placebo group (age 44.5 +/- 7.9 years).<sup>2</sup> The treatment group received real acupuncture needles into both Zhubin spots (above medial malleolus), while the placebo group received acupuncture needles with a plastic base in the same locations.<sup>2</sup> The treatments were performed for 15 minutes twice a week for four weeks after a craving for alcohol was provoked.<sup>2</sup> Alcohol cravings were assessed using the visual analog scale (VAS).<sup>2</sup> This was measured prior to the initial treatment, as well as following weeks one, two, and four. The data in this study were presented as continuous with repeated ANOVA measurements to determine the main and interaction effects of time and group on the outcome measure as well as paired t-tests to assess change of VAS score from baseline in each group.<sup>2</sup> With the statistical significance defined as  $p < 0.05$ , the researchers found a significant effect of time on VAS score ( $df=3$ ,  $F=13.3$ ,  $p<0.01$ ), main effect of group on VAS score ( $df=1$ ,  $F=10.9$ ,  $p<0.01$ ) and time x group interaction ( $df=3$ ,  $F=4.7$ ,  $p<0.01$ ).<sup>2</sup> Paired t-test was performed to evaluate the change of VAS score from baseline in each group “VAS score of the acupuncture treatment group reduced from the 1<sup>st</sup> week after

treatment (baseline 9.8 vs. 1<sup>st</sup> week 3.1,  $t=4.7$ ,  $p<0.01$ ), but that of the control group didn't reduce through 4 weeks after treatment (baseline 8.3 vs. 4<sup>th</sup> week 6.7,  $t=0.9$ ,  $p=0.35$ ).”<sup>2</sup>

Ahlberg et al., conducted a randomized control trial of 280 patients either receiving inpatient (38%) or outpatient (62%) therapy at the Addiction Center (AC) in Sweden.<sup>3</sup> All patients were evaluated by both a psychologist and psychiatrist confirming their substance abuse disorder.<sup>3</sup> The participants who were chosen had to be over the age of 18 and had ongoing patient status at the AC.<sup>3</sup> The specific exclusion criteria is outlined in Table 1. Out of the 280 patients 44% were women and 56% were male with a mean age of 44.5 years.<sup>3</sup> From the original 280 patients only 267 received their assigned intervention of either acupuncture based on the National Acupuncture Detoxification Association (NADA) protocol, a local protocol acupuncture (LP), or the control which was relaxation.<sup>3</sup> The NADA acupuncture was delivered in three phases: one 40 minute treatment per week for the first 2 weeks, then three 40 minute treatments per week for the next 2 weeks, then finishing up with two 40 minutes treatments for the remaining two weeks. The LP acupuncture was given in two phases: three 40 minute treatments per week during the first two weeks, then two 40 minute treatments per week for the next two weeks.<sup>3</sup> The control group of relaxation was given in the same phases as the LP acupuncture group.<sup>3</sup> Self-report questionnaires (DUDIT-E) were given to the patients prior to the start of treatment, at 5 weeks, then again at 3 months.<sup>3</sup> Information was obtained from 163 patients at week 5 and 120 at 3 months, therefore there was a total loss of 160.<sup>3</sup> However, the researchers were prepared for a high number of dropouts and indicated in their study that they were accounted for but did not specify the exact calculation.<sup>3</sup> They were able to determine that the patients who were evaluated at the 3 month mark were older (mean [sd] 47.0[13.4],  $t=2.77$ ,  $df=278$ ,  $p=0.006$ ), were more frequently inpatients (55.8% Chi-square = 27.61,  $df=1$ ,  $p<0.001$ ), and completed more sessions (mean [sd] 10.0[3.7],

$t=5.57$ ,  $df=233$ ,  $p<0.001$ ).<sup>3</sup> Based on the answers to the questionnaires at the end of 3 months, the researchers were able to determine whether or not patients had a relapse in alcohol use.<sup>3</sup> Treatment effects for alcohol use were analyzed using a Chi-square test with p-values  $<0.05$  being considered statistically significant.<sup>3</sup> Based on these analyses, the researchers found no statistically significant difference between patients who received the NADA-acupuncture, acupuncture according to a local protocol, or relaxation.<sup>3</sup> This is illustrated in Table 4. Based on these results, it was determined that alcohol dependent patients using the NADA protocol had 1.04 times greater risk of preventing relapse compared to the control, or a 4.3% lower risk of relapsing, with a 3.8% absolute decrease in relapse rate.<sup>3</sup> Therefore, a PA would need to treat 27 alcohol dependent patients with the NADA protocol to prevent 1 more patient from relapsing.<sup>3</sup>

Table 4. – Relapse in Alcohol Use (%) at 5 Weeks and 3 Months

	<b>NADA</b>	<b>Local Protocol</b>	<b>Control</b>	<b>Total</b>	<b>p-value</b>
<b>5 Weeks</b>	12.7% (n=55)	11.6% (n=43)	12.3% (n=65)	12.3% (n=163)	0.986
<b>3 Months</b>	7.3% (n=41)	14.7% (n=34)	11.1% (n=45)	10.8% (n=120)	0.590

Table 5. – Calculations for Prevention (NNT) NADA Protocol vs. Relaxation

<b>Control Event Rate (CER)</b>	<b>Experimental Event Rate (EER)</b>	<b>Relative Risk Reduction (RRR)</b>	<b>Absolute Risk Reduction (ARR)</b>	<b>Number Needed to Treat (NNT)</b>
88.9%	92.7%	0.043	0.038	26.3 = 27

## **DISCUSSION:**

In this evidence based systematic review, three randomized controlled trials were analyzed in order to determine whether or not acupuncture is effective in treating alcohol dependence. Only one out of the three studies demonstrated a statistically significant improvement in alcohol craving validated by a p value  $< 0.05$ .<sup>2</sup> However, this study was limited to only male patients, had a small sample size, and they only observed its affects for four weeks.<sup>2</sup> The other interesting aspect of this study compared to the other two was that they used a different acupuncture protocol. While Kunz et al. and Ahlberg et al. utilized the National Acupuncture Detoxification Association (NADA)

protocol, which consists of five different ear points,<sup>1,3</sup> Lee et al. used Zhubin acupuncture which is located on the medial malleolus.<sup>2</sup> However, due to such a small sample size and their limited diversity, the measurement of effect is limited towards the overall study as a whole. Another limitation of these studies was that Kunz et al. and Ahlberg et al. had a considerable amount of drops outs. The researchers were prepared for this and noted for them in their statistical data, however, it would have been more beneficial to have more direct patient data, even though the patient population in general is unreliable. Another limitation that was found within these studies was that none of the researchers addressed the fact that anxiety and aversion to acupuncture might provoke a different response in each of the patients. While acupuncture is something that is supposed to stimulate relaxation it might take a while for the participants get used to the idea of needles getting stuck inside them, therefore skewing the results when asked emotional questions too soon.

Acupuncture is beginning to become a more mainstream treatment in healthcare, especially for patients suffering from headaches, lower back pain, nausea from chemotherapy treatment, muscle pain, osteoarthritis, infertility, and asthma.<sup>8</sup> However, like all treatments there are some potential side effects that can happen, like pain and bruising, minor bleeding, upset stomach, dizziness, infection, nerve damage, or punctured organs.<sup>8</sup> For patients seeking acupuncture treatment or for patients whose doctor recommended it, they might have to do some research into where to go. Unfortunately, acupuncture is not covered by all health plans<sup>9</sup> since it is considered a more alternative approach to treating these conditions, compared to the more traditional routes. The patient would have to be responsible for visiting their insurance's website to find a list of acupuncturists in their area that take their insurance.

**CONCLUSION:**

Based on the research conducted on these three studies, acupuncture is not considered a beneficial therapy for treating alcohol dependence. However, it would be interesting to further investigate this idea of the Zhubin acupuncture protocol compared to the already relatively known National Acupuncture Detoxification Association protocol. Even though Lee et al. found the data to be significantly different, their sample size was not diverse nor large enough to call significant compared to the other two studies. Future research may also consider the effect of sex, age, or duration of therapy on efficacy. Lastly, it would also be interesting to compare the different manifestations of the alcohol dependence within one study. Similar to how each of these studies examined at a different aspect, whether it was relapse in use, cravings for alcohol itself, or how well it worked in treating withdrawal symptoms, therefore following patients from the start of their recovery over years to see if its more beneficial during different phases of their journey.

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