

# Acupuncture Reduces Pain, Alleviates Depression

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Memorial Sloan Kettering Cancer Center (New York, USA) and University of York (York, UK) researchers conclude that acupuncture is “more effective than both usual care and sham acupuncture” for the treatment of chronic pain. The researchers state that their conclusion is based on “robust evidence from high-quality trials on acupuncture” with a sample size of approximately 18,000 patients. Specifically, the researchers find acupuncture effective for alleviating pain due to knee osteoarthritis, low back pain, headaches, and migraines. [1] They add, “Acupuncture was also found to be better than standard medical care for all of these chronic pain conditions.” Moreover, the researchers find acupuncture a cost-effective treatment modality for the alleviation of both knee pain and depression. The researchers note, “Our research also provides a valuable basis for considering the potential role of acupuncture as a referral option in health care and enabling providers and policy-makers to make decisions based on robust sources of evidence.” [2]



*Patient receiving acupuncture therapy*

## Health Policy

Cost efficiency can have a dramatic impact public policy in regards to healthcare recommendations. The efficacy of acupuncture has been well studied for a variety of conditions but its cost efficiency has widely overlooked. To that end, the National Institute for Health Research (UK) conducted a massive meta-analysis in which they examined the efficacy and cost efficiency of acupuncture for a range of conditions:

musculoskeletal pain of the neck and low back, osteoarthritis of the knee, headache and migraine, and depression. They synthesized data for nearly 18,000 patients with chronic pain and depression and found that acupuncture was more effective than both sham acupuncture and usual care for all the conditions studied. In addition, when considering high quality studies, acupuncture was found to be cost efficient for osteoarthritis of the knee. In a randomized controlled trial of acupuncture and counseling in comparison to standard care for the treatment of depression (in which half the patients experienced comorbid pain), the researchers found that acupuncture is equally effective as counseling and that acupuncture is more cost efficient than counseling. These results provide policymakers and healthcare professionals a more nuanced perspective for recommending acupuncture as an alternative or adjunct treatment for chronic pain and depression.

Pain is the most common reason that patients seek acupuncture — primarily musculoskeletal complaints, followed by headaches and migraines. [3] “Although acupuncture is widely used for chronic pain, there is limited understanding of how it works, which in turn fuels some of the uncertainty as to its potential role as a treatment modality.” [4] While patients may independently seek out acupuncture as an alternative for chronic pain, doctors require proof of its efficacy to recommend it to their patients, and policymakers in charge of healthcare funding allocation require proof that it is cost efficient.

### **Chronic Pain Mechanism**

In regards to the efficacy of acupuncture for chronic pain, studies comparing true and sham acupuncture show statistically significant differences between their effects, indicating that acupuncture is not a placebo. [5] Among the mechanisms that explain the effect of acupuncture on chronic pain, one is called gate theory. “This suggests that the pathway associated with acupuncture involves the A delta fibres entering the dorsal horn of the spinal cord, which inhibit pain impulses that are carried in the slower, unmyelinated C fibres. Descending inhibition of C fibre pain impulses is also enhanced through neural connections in the midbrain. Additional mechanisms have been proposed for acupuncture’s effect on pain, which are not necessarily in contradiction to the gate theory; for example, acupuncture stimulates

release of endogenous opioids and other neurotransmitters” that mediate pain. [6] “At least in acupuncture trials for chronic pain, in which the research question has been related to efficacy rather than effectiveness, the sham needle has been widely used as a control for ‘placebo’ effects.” [7] Sham acupuncture is used as a control for these trials because they are designed to prove that true acupuncture has specific effects not seen in sham trials; the evidence from such studies provides good evidence for the efficacy of acupuncture for chronic pain. However, effectiveness is more than just efficacy.

### **Cost Effective Acupuncture**

For a treatment to be a good alternative, it must also be cost efficient. Some patients may still opt to pay more for the treatment modality they prefer, but state funding will only be allocated to more expensive treatments if they are also more effective. The data for cost-efficiency of chronic pain is limited, but this study at the National Institute for Health Research found that acupuncture is both cost-efficient and effective. “The results of the network meta-analysis show acupuncture to be more effective than usual care with respect to reducing pain and improving HRQoL [health-related quality of life].” [8] In addition, “acupuncture has close to a 100% probability of being cost-effective in patients with osteoarthritis of the knee and musculoskeletal pain types, and an 86% probability of being cost-effective for the headache/migraine indication, assuming a threshold of £20,000 per QALY [quality-adjusted life-year],” a value which can be compared to the threshold of £20,000 – £30,000 conventionally applied in England and Wales for cost-efficiency. [9]

### **Arthritis**

In patients with osteoarthritis of the knee, a UK review of qualitative studies regarding pharmaceuticals revealed a considerable reluctance among patients to taking medicine; there is a clear preference for taking as few drugs as possible. [10] As a result, “many knee osteoarthritis patients want non-pharmacological treatments for pain relief. The use of physical (i.e., non-pharmacological) treatments such as acupuncture is therefore likely to be attractive for patients seeking alternatives, particularly for a condition such as osteoarthritis of the knee for which there is currently no cure.” [11]

## **Remarkable Acupuncture Therapy**

“Remarkably, across all physical therapies for osteoarthritis, there are more high-quality trials of acupuncture with a sham comparator than of any other physical therapy. Therefore, the limitations in the existing literature on physical therapies for chronic pain are less in acupuncture trials, allowing us to draw conclusions with more certainty than for other physical therapies.” [12] While osteoarthritis of the knee is not a recommended application of acupuncture by all recommending bodies, the evidence provided by this analysis shows that 8 out of 22 interventions produced a statistically significant reduction in pain as compared with standard care: interferential therapy, acupuncture, TENS, PES, balneotherapy, aerobic exercise, sham acupuncture, and muscle-strengthening exercise. [13] “Of these eight, only two interventions were represented by more than three trials in the sensitivity analysis of better-quality studies: acupuncture (11 trials) and muscle-strengthening exercise (nine trials), with acupuncture having statistically significantly better outcomes.” [14]

Additionally, acupuncture was found to be cost efficient for osteoarthritis of the knee. “In the all-trials analysis, interferential therapy followed by acupuncture, TENS, PES and t’ai chi offered the largest benefit in terms of the EQ-5D [Euro Quality of Life - 5 dimensions], based on point estimates of the effect size alone.” [15] However, while “muscle-strengthening exercise and acupuncture are associated with the least uncertainty,... TENS and interferential therapy are considerably more uncertain when the evidence is restricted to trials with adequate allocation concealment reporting in between 3 and 13 weeks.” [16] While TENS is the most cost efficient based on all studies, when only non-biased studies are consulted, “reductions in the efficacy of TENS and increases in the duration of benefit of acupuncture resulted in acupuncture becoming the cost-effective treatment.” [17] While former studies may not be wrong, they may be incomplete, and a more thorough analysis indicates that acupuncture is both an effective and cost efficient alternative to standard care for osteoarthritis of the knee.

## **Depression**

The researchers also considered the effect of acupuncture for the treatment of depression; for this they conducted their own randomized

controlled trial to compare the effects of acupuncture with counseling and standard care. Depression is a major public health concern globally. “Depression involves more than just everyday mood fluctuations; it also involves feelings of severe sadness, anxiety, hopelessness and worthlessness. Those affected individuals lose interest in the activities that they used to enjoy and often have physical symptoms such as chronic pain, fatigue and insomnia.” [18] Severe depression is also a considerable cause of morbidity. [19] Usual care for depression generally involves antidepressants but they do not work well for over half of patients. [20] Moreover, many patients are concerned about the side effects of, and dependency on, antidepressants, and have expressed an interest in non-pharmaceutical therapies to their doctors. [21] [22] Counseling is widely considered as an alternative or adjunct therapy to antidepressants, but “a Cochrane review of counseling for mental health and psychosocial problems in primary care found short-term but not long-term benefits from counseling.” [23] Meanwhile, “a Cochrane review of acupuncture for depression was inconclusive on whether or not acupuncture is an effective intervention for depression, in part because of the high risk of bias in the majority of studies.” [24]

The researchers at the National Institute for Health Research responded to the lack of unbiased studies by conducting their own randomized controlled trial. They recruited 755 patients, with 266 in the acupuncture group and 231 in the counseling group, the largest study of acupuncture for depression to date. “The aims of this study were to determine the clinical effectiveness and cost-effectiveness of short courses of either acupuncture or counseling compared with usual care for patients with depression. We also planned to compare acupuncture and counseling on the basis that there would be structural equivalence regarding time and attention.” [25] When controlling for both time and attention, there were no substantial differences in the clinical outcomes between the counseling and acupuncture groups.

The researchers also considered two opposing manifestations of depression. “Participants’ experiences of depression varied considerably between those with comorbid pain and those with depression alone. Those participants with depression and comorbid pain commonly experienced a number of other physical symptoms concurrently such as fatigue, low energy and sleep problems. For some this meant withdrawing from social and day-to-day activities. This reduced ability to engage in social activity was one of the factors that led

to this group having less in the way of internal and external resources available to manage their depression effectively. The majority in the no-pain comparator group were in full- or part-time employment, or were relatively affluent retired professional people. For many, their experience of depression concerned feelings of low self-esteem brought about by high expectations of themselves within their working life or hectic social schedules.” [26] At 3 months, patients with acupuncture or counseling were more likely to report a partial or full relief of their anxiety or depression as compared with usual care, indicating that both may be effective alternatives to standard care. [27] When acupuncture was compared with counseling for patients with comorbid pain, “participants in the pain group receiving acupuncture found that their pain reduced markedly in the first 3–6 months compared with those in the other two groups, but by the end of the 12-month trial these differences disappeared.” [28] Pain may be a cause of depression, or depression may be a cause of pain, but because of its efficacy in treating pain, acupuncture may provide faster relief than counseling even though both are effective at treating both pain and depression when provided with sufficient time. The efficacy of acupuncture herein may also be due to the physical approach to treatment taken by the acupuncturists, who placed direct focus on treating the concurrent physical symptoms. [29] Additionally, many patients were able to decrease their pharmaceutical use. “Among all patients, the majority (68.7%) were taking antidepressants at baseline and prescribed antidepressant utilisation decreased steadily by an average of 12% over the 12-month study period, a rate comparable between trial arms. Around half of patients (47.9%) were taking analgesics at baseline, which decreased on average to 41.0% over 12 months.” [30]

To understand whether acupuncture and counseling are a good use of healthcare resources, the researchers also conducted a cost efficiency analysis of both treatments compared with usual care. “When comparing acupuncture, counseling and usual care, acupuncture was found to be the cost-effective alternative with an ICER [incremental cost-effectiveness ratio] of £4560 per additional QALY compared with usual care alone... Counseling resulted in higher costs and benefits than acupuncture, with an ICER of £71,757 per additional QALY compared with acupuncture.” [31] This shows that while acupuncture and counseling are both equally effective for depression and comorbid pain

over 12 months, acupuncture is more cost efficient than both usual care and counseling, and can provide faster relief for associated pain.

By using a network meta-analysis for the first time to compare acupuncture with other physical therapies, the researchers have found new evidence on both the clinical impact and cost-effectiveness of acupuncture for chronic pain and depression. [32] While patients may seek out whatever treatment best suits them, policymakers must consider the most efficient allocation of public funds when recommending alternative treatments. “By comparing acupuncture in an unbiased way with other ‘competing’ physical or psychological therapies, we are providing the very evidence on clinical effectiveness and cost-effectiveness that is of most value to policy-makers and commissioners. Finally, it is in the interests of patients to have available well-informed results based on high-quality evidence to make decisions about their health care.” [33]

## Notes

1 MacPherson, H., Vickers, A., Bland, M., Torgerson, D., Corbett, M., Spackman, E., Saramago, P., Woods, B., Weatherly, H., Sculpher, M. and Manca, A., 2017. Acupuncture for chronic pain and depression in primary care: a programme of research. Memorial Sloan Kettering Cancer Center (New York, USA), University of York (York, UK).

2 – 5 Ibid.

6 Ibid., 3.

7 Ibid., 150.

8 Ibid., 77.

9 Ibid., 75.

10 – 11 Ibid., 39.

12 Ibid., pg 150.

13 – 14 Ibid., pg 55.

15 Ibid., pg 102.

16 Ibid., pg 104.

17 Ibid., pg 115.

18 – 25 Ibid., pg 119.

26 Ibid., pg 133.

27 Ibid., pg 137.

28 Ibid., pg 144.

29 Ibid., pg 143.

30 Ibid., pg 132-3.

31 Ibid., pg 141.

32 Ibid., pg 149.

33 Ibid., pg 151.