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Acupuncture: Cost-Effectiveness Analysis

Acupuncture: études coût-efficacité

1. All Conditions

1.1. Kim 2012

Kim SY, Lee H, Chae Y, Park HJ, Lee H. A systematic review of cost-effectiveness analyses alongside randomised controlled trials of acupuncture. Acupunct Med. 2012. [157436].

Objective	To summarise the evidence on the cost-effectiveness of acupuncture.
Methods	We identified full economic evaluations such as cost-effectiveness analysis (CEA), cost-utility analysis (CUA) and cost-benefit analysis (CBA) alongside randomised controlled trials (RCTs) that assessed the consequences and costs of acupuncture for any medical condition. Eleven electronic databases were searched up to March 2011 without language restrictions. Eligible RCTs were assessed using the Cochrane criteria for risk of bias and a modified version of the checklist for economic evaluation. The general characteristics and the results of each economic analysis such as incremental cost-effectiveness ratios (ICERs) were extracted.
Results	Of 17 included studies, nine were CUAs that measured quality-adjusted life years (QALYs) and eight were CEAs that assessed effectiveness of acupuncture based on improvements in clinical symptoms. All CUAs showed that acupuncture with or without usual care was cost-effective compared with waiting list control or usual care alone, with ICERs ranging from €3011/QALY (dysmenorrhoea) to €22 298/QALY (allergic rhinitis) in German studies, and from £3855/QALY (osteoarthritis) to £9951/QALY (headache) in UK studies. In the CEAs, acupuncture was beneficial at a relatively low cost in six European and Asian studies. All CUAs were well-designed with a low risk of bias, but this was not the case for CEAs.
Conclusions	Overall, this review demonstrates the cost-effectiveness of acupuncture. Despite such promising results, any generalisation of these results needs to be made with caution given the diversity of diseases and the different status of acupuncture in the various countries.

2. Health-Related Quality of Life

2.1. Zhang 2012

Zhang F, Kong LL, Zhang YY, Li SC. evaluation of impact on health-related quality of life and cost effectiveness of traditional chinese medicine: a systematic review of randomized clinical trials. J Altern Complement Med. 2012;18(12):1108-20. [157517].

Background	Traditional Chinese Medicine (TCM), an important part of health care in China and with increased popularity worldwide, has received extensive attention from governments at all levels. With the current emphasis on clinical efficacy and cost-effectiveness, TCM, as indeed do all other treatments, requires rigorous evidence to be considered in reimbursement decision-making. Nevertheless, despite the fact that TCM treatment has always been considered to possess the advantage of improving the health-related quality of life (HRQOL) of patients, there is a lack of systematic study about available evidence to assess the impact of TCM treatments on HRQOL of patients.
Objectives	The current study aimed to perform a review of available literature to evaluate whether sufficient evidence existed to allow an assessment of the impact on HRQOL and cost effectiveness of TCM treatments. This information would support a recommendation for wider use of TCM in the clinical setting as well as its consideration for reimbursement.
Methods	A structured search was performed using data sources including MEDLINE,(®) Cumulative Index for Allied Health and Nursing (CINAHL), PubMed, Cochrane database, EBSCO, SciSearch, Embase, and Google Scholar from 2000 to 2010. The search was supplemented with manual search after relevant articles were retrieved.
Results	After culling, a total 31 articles covering a range of TCM therapies applied to a variety of conditions were retrieved. The measurement tools used in these studies to assess impact in patient's HRQOL were mainly SF-36-based scales, but the results of HRQOL/patient preference studies were inconsistent and inconclusive. Of the 10 articles of cost-effectiveness evaluation of TCM treatments, the majority reported that TCM treatments resulted in better outcomes at a higher cost, but the incremental cost-effectiveness ratio was below the usually recommended thresholds. The overall results showed acupuncture and t'ai chi to be the most studied TCM-related therapies.
Conclusions	The current review showed that there is a relative lack of cost-effectiveness research in TCM. For those few empirical research available, the major emphasis is for acupuncture or t'ai chi showing the acceptance of these branches of TCM that are better understood by the scientific community. The current results also showed the need for studies with better designs and longer duration to ascertain the actual impact of TCM on patients' HRQOL as well as a need for a generic HRQOL instrument that is specific for TCM.

3. Pain

3.1. Ambrosio 2012

Ambrósio EM, Bloor K, Macpherson H. Costs and consequences of acupuncture as a treatment for chronic pain: a systematic review of economic evaluations conducted alongside randomised controlled trials. Complement Ther Med. 2012. 20(5):364-74. [172769].

Background	The economic burden that chronic pain conditions impose on individuals and society is significant. Acupuncture appears to be a clinically effective treatment for some chronic pain conditions. Given the need for policy decisions to be informed by economic evaluations, the objective of this systematic review was to synthesise data from economic evaluations to determine whether acupuncture for the treatment of chronic pain conditions is good value for money.	
Methods	A literature search was conducted using health and economics databases, with additional hand-searching. Economic evaluations conducted alongside randomis controlled trials were eligible.	

Results	Eight economic evaluations were included in this review, seven cost-utility analyses and one cost-effectiveness analysis. Conditions treated included low back pain, neck pain, dysmenorrhoea, migraine and headache, and osteoarthritis. From the seven cost-utility analyses, acupuncture was found to be clinically effective but cost more. The cost per quality adjusted life year (QALY) gained ranged from £2527 to £14,976 per QALY, below the commonly quoted threshold used by the UK National Institute for Health and Clinical Excellence of £20,000 to £30,000. The one cost-effectiveness study indicated that there might be both clinical benefits and cost savings associated with acupuncture for migraine. There was heterogeneity across the eight trials in terms of professional who provided the acupuncture, style of acupuncture, and country of origin.
Conclusion	The cost per QALY gained in all seven cost-utility studies was found to be below typical thresholds of willingness to pay. Acupuncture appears to be a cost-effective intervention for some chronic pain conditions .

4. Breech Presentation

4.1. García-Mochón 2015

García-Mochón L, Martín JJ, Aranda-Regules JM, Rivas-Ruiz F, Vas J.. Cost effectiveness of using moxibustion to correct non-vertex presentation. Acupunct Med. 2015;feb 10:. [170610].

Aims	To analyse the cost effectiveness of using the moxibustion technique to correct non- vertex presentation and to reduce the number of caesarean sections performed at term.
Method	A deterministic model of decision analysis has been developed to analyse the cost of treatment in which heat is applied by moxibustion (the combustion of Artemisia vulgaris) at acupuncture point BL67 for pregnant women with non-vertex fetal position at 33-35 weeks' gestation. This approach was compared with conventional treatment recommendations based on the knee-chest posture technique. The costs were obtained mainly from data provided by the Andalusian Public Health System. Effectiveness data for the baseline analysis were taken from a previous clinical study. A secondary analysis was performed based on a meta-analysis conducted using random effects analysis, by reference to studies published in recent systematic reviews of moxibustion versus conventional treatment, in order to make the results generalisable to other healthcare settings. Deterministic and probabilistic sensitivity analyses were performed under diverse assumptions to assess the uncertainty of the result.
Results	The baseline analysis shows that the application of moxibustion prevents 8.92% of deliveries with non-vertex presentation compared with conventional treatment, with an average cost saving of €107.11 per delivery, mainly due to the cost saving from avoiding the need for caesarean section. The meta-analysis revealed a relative risk of the version of non-vertex presentation at term of 0.34 (95% CI 0.16 to 0.76). The sensitivity analysis showed that moxibustion can avoid 0.34 caesarean sections, with an incremental cost per delivery ranging from €68 to -€640 for moxibustion versus conventional treatment.
Conclusions	Moxibustion treatment applied at acupuncture point BL67 can avoid the need for caesarean section and achieve cost savings for the healthcare system in comparison with conventional treatment.

4.2. Van Den Berg 2010

Van Den Berg I, KaandorP GC, Bosch JL, Duvekot JJ, ArendS LR, Hunink MG. Cost-effectiveness of

breech version by acupuncture-type interventions on bl 67, including moxibustion, for women with a breech foetus at 33 weeks gestation: a modelling approach. Complement Ther Med. 2010;18(2):67-77. [172896].

Objectives	To assess, using a modelling approach, the effectiveness and costs of breech version with acupuncture-type interventions on BL67 (BVA-T), including moxibustion, compared to expectant management for women with a foetal breech presentation at 33 weeks gestation.
Design	A decision tree was developed to predict the number of caesarean sections prevented by BVA-T compared to expectant management to rectify breech presentation. The model accounted for external cephalic versions (ECV), treatment compliance, and costs for 10,000 simulated breech presentations at 33 weeks gestational age. Event rates were taken from Dutch population data and the international literature, and the relative effectiveness of BVA-T was based on a specific meta-analysis. Sensitivity analyses were conducted to evaluate the robustness of the results.
Main outcome measures	We calculated percentages of breech presentations at term, caesarean sections, and costs from the third-party payer perspective. Odds ratios (OR) and cost differences of BVA-T versus expectant management were calculated. (Probabilistic) sensitivity analysis and expected value of perfect information analysis were performed. RESULTS: The simulated outcomes demonstrated 32% breech presentations after BVA-T versus 53% with expectant management (OR 0.61, 95% CI 0.43, 0.83). The percentage caesarean section was 37% after BVA-T versus 50% with expectant management (OR 0.73, 95% CI 0.59, 0.88). The mean cost-savings per woman was euro 451 (95% CI euro 109, euro 775; p=0.005) using moxibustion. Sensitivity analysis showed that if 16% or more of women offered moxibustion complied, it was more effective and less costly than expectant management. To prevent one caesarean section, 7 women had to use BVA-T. The expected value of perfect information from further research was euro0.32 per woman.
Conclusions	The results suggest that offering BVA-T to women with a breech foetus at 33 weeks gestation reduces the number of breech presentations at term, thus reducing the number of caesarean sections, and is cost-effective compared to expectant management, including external cephalic version.

5. Spinal Disorders

5.1. Indrakanti 2012

Indrakanti SS, Weber MH, Takemoto SK, Hu SS, Polly D, Berven SH. Value-based care in the management of spinal disorders: a systematic review of cost-utility analysis. Clin Orthop Relat Res. 2012;470(4):1106-23. [169176].

васкground	Spinal disorders are a major cause of disability and compromise in health-related quality of life. The direct and indirect costs of treating spinal disorders are estimated at more than \$100 billion per year. With limited resources, the cost-utility of interventions is important for allocating resources.
Questions/Purposes	We therefore performed a systematic review of the literature on cost-utility for nonoperative and operative interventions for treating spinal disorders.
Methods	We searched four databases for cost-utility analysis studies on low back pain management and identified 1004 items. The titles and abstracts of 752 were screened before selecting 27 studies for inclusion; full texts of these 27 studies were individually evaluated by five individuals.

Results	Studies of nonoperative treatments demonstrated greater value for graded activity over physical therapy and pain management; spinal manipulation over exercise; behavioraltherapy and physiotherapy over advice; and acupuncture and exercise over usual general practitioner care . Circumferential fusion and femoral ring allograft had greater value than posterolateral fusion and titanium cage, respectively. The relative cost-utility of operative versus nonoperative interventions was variable with the most consistent evidence indicating superior value of operative care for treating spinal disorders involving nerve compression and instability.
Conclusion	The literature on cost-utility for treating spinal disorders is limited. Studies addressing cost-utility of nonoperative and operative management of low back pain encompass a broad spectrum of diagnoses and direct comparison of treatments based on cost-utility thresholds for comparative effectiveness is limited by diversity among disorders and methods to assess cost-utility. Future research will benefit from uniform methods and comparison of treatments in cohorts with well-defined pathology.

6. Neck Pain and Whiplash Syndrome

6.1. Van der Velde 2016

Van der Velde G, Yu H, Paulden M, Côté P, Varatharajan S, Shearer HM, Wong JJ, Randhawa K, Southerst D5, Mior S, Sutton D, Jacobs C, Taylor-Vaisey A. Which interventions are cost-effective for the management of whiplash-associated and neck pain-associated disorders? a systematic review of the health economic literature by the Ontario protocol. Spine J. 2016. 16(12):1582-97. [184901].

Background- context	Whiplash-associated disorders (WAD) and neck pain and associated disorders (NAD) are prevalent conditions that impact society and impose a significant economic burden on health care systems. Health economic evidence on WAD and NAD interventions has been sparse: only three economic evaluations of interventions for NAD were identified by the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders (NPTF). An updated overview is needed to inform health care policy and guidelines.
Purpose	To determine the cost-effectiveness of interventions for grade I-III WAD and NAD in children and adults. Study Design: Systematic review of health economics literature, best-evidence synthesis.
Methods	We systematically searched CINAHL, the Cochrane economic databases (Health Technology Assessment, NHS Economic Evaluation Database), EconLit, EMBASE, MEDLINE, PsycINFO, and Tufts CEA Registry from 2000 to 2015 for economic evaluations of WAD and NAD interventions. We appraised relevant evaluations using the Scottish Intercollegiate Guidelines Network Methodology Criteria for Economic Evaluations. We extracted data, including mean costs [standardized to 2013 Canadian dollars (CAD)] and quality-adjusted life years (QALYs), from studies with adequate methodological quality. We recalculated cost-effectiveness statistics based on the standardized currency using a willingness-to-pay of CAD \$50,000 per additional QALY. Funding was provided by the Ministry of Finance.

F	Results¬	Our search identified 1,616 citations. Six studies fulfilled our selection criteria, including three studies previously reviewed by the NPTF. Structured education appears cost-effective for adults with WAD. For adults with NAD, acupuncture added to routine medical care; manual therapy; multimodal care that includes manual therapy; advice and exercise; and psychological care using cognitive-behavioral therapy appear cost-effective. In contrast, adding manual therapy or diathermy to advice and exercise; multimodal care by a physiotherapist or physician; and behavioral-graded activity do not appear cost-effective for adults with NAD.
	Conclusions	Our review adds to the findings of the NPTF. Recent evidence suggests that structured education is cost-effective for WAD, while advice and exercise and multimodal care that includes manual therapy are cost-effective for NAD. Obtaining more robust health economic evidence for non-invasive interventions for WAD and NAD in children and adults remains an essential research priority.

7. Low Back Pain

7.1. Andronis 2016

Andronis L, Kinghorn P, Qiao S, Whitehurst DG, Durrell S, McLeod H. Cost-Effectiveness of Non-Invasive and Non-Pharmacological Interventions for Low Back Pain: a Systematic Literature Review. Appl Health Econ Health Policy. 2016. [187804].

Background	Low back pain (LBP) is a major health problem, having a substantial effect on peoples' quality of life and placing a significant economic burden on healthcare systems and, more broadly, societies. Many interventions to alleviate LBP are available but their cost effectiveness is unclear.
Objectives	To identify, document and appraise studies reporting on the cost effectiveness of non-invasive and non-pharmacological treatment options for LBP. METHODS: Relevant studies were identified through systematic searches in bibliographic databases (EMBASE, MEDLINE, PsycINFO, Cochrane Library, CINAHL and the National Health Service Economic Evaluation Database), 'similar article' searches and reference list scanning. Study selection was carried out by three assessors, independently. Study quality was assessed using the Consensus on Health Economic Criteria checklist. Data were extracted using customized extraction forms.
Thirty-three studies were identified. Study interventions were categorised a combined physical exercise and psychological therapy, (2) physical exercise only, (3) information and education, and (4) manual therapy. Interventions within each category varied in terms of their components and delivery. In combined physical and psychological treatments, information and education interventions, and manual therapies appeared to be cost effective when continuous the study-specific comparators. There is inconsistent evidence around the effectiveness of physical exercise programmes as a whole, with yoga, but reversise, being cost effective.	
Conclusions	The identified evidence suggests that combined physical and psychological treatments, medical yoga, information and education programmes, spinal manipulation and acupuncture are likely to be cost-effective options for LBP.

7.2. Taylor 2014

Taylor P, Pezzullo L, Grant Sj, Bensoussan A. Cost-effectiveness of acupuncture for chronic nonspecific low back pain. Pain Pract. 2014;14(7):599-606. [170327].

Cost-effectiveness is a major criterion underpinning decisions in mainstream health care. Acupuncture is increasingly used in patients with chronic lower back pain (LBP), but there is a lack of evidence on costeffectiveness. The objective of this study was to assess the cost-effectiveness of acupuncture in alleviating chronic LBP either alone or in conjunction with standard care compared with patients receiving routine care, and/or sham. To determine effectiveness, we undertook meta-analyses which found a significant improvement in pain in those receiving acupuncture and standard care compared with those receiving standard care alone. For acupuncture and standard care vs. standard care and sham, a weak positive effect was found for weeks 12 to 16, but this was not significant. For acupuncture alone vs. standard care alone, a significant positive effect was found at week 8, but not at weeks 26 or 52. The main outcome parameters for our cost-effectiveness analysis were the incremental cost-effectiveness ratio (ICER) of acupuncture treatment presented as cost (A\$) per disability-adjusted life-year (DALY) saved. The WHO benchmark for a very highly cost-effective intervention is one that costs less than gross domestic product per capita per quality-adjusted life-year (QALY) gained or DALY averted, or less than around \$A52,000 in 2009 (the base year for the analysis). According to this threshold, acupuncture as a complement to standard care for relief of chronic LBP is highly cost-effective, costing around \$48,562 per DALY avoided. When comorbid depression is alleviated at the same rate as pain, cost is around \$18,960 per DALY avoided. Acupuncture as a substitute for standard care was not found to be cost-effective unless comorbid depression was included. According to the WHO cost-effectiveness threshold values, acupuncture is a cost-effective treatment strategy in patients with chronic LBP.

7.3. Associação Brasileira de Medicina Física e Reabilitação 2013

Associação Brasileira de Medicina Física e Reabilitação. Chronic nonspecific low back pain: rehabilitation. Rev Assoc Med Bras (1992). 2013;59(6):536-53. [159530].

12. What is the cost-effectiveness of acupuncture for chronic low-back pain? Although acupuncture for the treatment of non-specific low-back pain is associated with a cost increase, 10 sessions at a twice-weekly frequency are recommended, as these improve the patients' quality of life and reduce work absenteeism and thus reduce the individuals' social costs (B). Acupuncture in addition to routine care induced relevant clinical benefits and was found to be cost-effective in patients with chronic low-back pain who were assisted at German primary care centres. Therefore, acupuncture should be considered as a feasible option for the management of patients with chronic low-back pain (B).

7.4. Lin 2011

Lin CW, Haas M, Maher CG, Machado LA, Van Tulder MW. Cost-effectiveness of guideline-endorsed treatments for low back pain: a systematic review. eur spine j. 2011. [155960].

Background	Healthcare costs for low back pain (LBP) are increasing rapidly. Hence, it is important to provide treatments that are effective and cost-effective.
Objectives	The purpose of this systematic review was to investigate the cost-effectiveness of guideline-endorsed treatments for LBP.
Methods	We searched nine clinical and economic electronic databases and the reference list of relevant systematic reviews and included studies for eligible studies. Economic evaluations conducted alongside randomised controlled trials investigating treatments for LBP endorsed by the guideline of the American College of Physicians and the American Pain Society were included. Two independent reviewers screened search results and extracted data. Data extracted included the type and perspective of the economic evaluation, the treatment comparators, and the relative cost-effectiveness of the treatment comparators.

F	Results	Twenty-six studies were included. Most studies found that interdisciplinary rehabilitation, exercise, acupuncture, spinal manipulation or cognitive-behavioural therapy were cost-effective in people with sub-acute or chronic LBP. Massage alone was unlikely to be cost-effective. There were inconsistent results on the cost-effectiveness of advice, insufficient evidence on spinal manipulation for people with acute LBP, and no evidence on the cost-effectiveness of medications, yoga or relaxation.
	Conclusions	This review found evidence supporting the cost-effectiveness of the guideline-endorsed treatments of interdisciplinary rehabilitation, exercise, acupuncture, spinal manipulation and cognitive-behavioural therapy for sub-acute or chronic LBP. There is little or inconsistent evidence for other treatments endorsed in the guideline.

8. Knee Osteoarthritis

8.1. Woods 2017

Woods B, Manca A, Weatherly H, Saramago P, Sideris E, Giannopoulou C, Rice S, Corbett M, Vickers A, Bowes M, MacPherson H, Sculpher M. Cost-effectiveness of adjunct non-pharmacological interventions for osteoarthritis of the knee. PLoS One. 2017;12(3). [117662].

BACKGROUND	There is limited information on the costs and benefits of alternative adjunct non-pharmacological treatments for knee osteoarthritis and little guidance on which should be prioritised for commissioning within the NHS. This study estimates the costs and benefits of acupuncture, braces, heat treatment, insoles, interferential therapy, laser/light therapy, manual therapy, neuromuscular electrical stimulation, pulsed electromagnetic fields, static magnets and transcutaneous electrical nerve Stimulation (TENS), based on all relevant data, to facilitate a more complete assessment of value.
METHODS	Data from 88 randomised controlled trials including 7,507 patients were obtained from a systematic review. The studies reported a wide range of outcomes. These were converted into EQ-5D index values using prediction models, and synthesised using network meta-analysis. Analyses were conducted including firstly all trials and secondly only trials with low risk of selection bias. Resource use was estimated from trials, expert opinion and the literature. A decision analytic model synthesised all evidence to assess interventions over a typical treatment period (constant benefit over eight weeks or linear increase in effect over weeks zero to eight and dissipation over weeks eight to 16).
RESULTS	When all trials are considered, TENS is cost-effective at thresholds of £20-30,000 per QALY with an incremental cost-effectiveness ratio of £2,690 per QALY vs. Usual care. When trials with a low risk of selection bias are considered, acupuncture is cost-effective with an incremental cost-effectiveness ratio of £13,502 per QALY vs. TENS. The results of the analysis were sensitive to varying the intensity, with which interventions were delivered, and the magnitude and duration of intervention effects on EQ-5D.
CONCLUSIONS	Using the £20,000 per QALY NICE threshold results in TENS being cost-effective if all trials are considered. If only higher quality trials are considered, acupuncture is cost-effective at this threshold, and thresholds down to £14,000 per QALY.

9. Hip and/or Knee Osteoarthritis

9.1. Pinto 2012

Pinto D, Robertson MC, Hansen P, Abbott JH. Cost-effectiveness of nonpharmacologic, nonsurgical interventions for hip and/or knee osteoarthritis: systematic review. Value Health. 2012. 15(1):1-12. [166121].

Objective	To investigate the cost-effectiveness of nonpharmacological, nonsurgical interventions for the treatment of hip and/or knee osteoarthritis.
Methods	We identified economic evaluations or cost studies associated with randomized or quasi-randomized controlled trials that assessed nonpharmacologic, nonsurgical interventions for the treatment of hip and/or knee osteoarthritis. Medline, Embase, PubMed, National Health Service Economic Evaluation Database, CENTRAL, EconLit, and OpenSIGLE were searched up to October 1, 2010. Study characteristics extracted include study population, health outcomes, and economic analysis elements. Economic analyses were assessed by using the Quality of Health Economic Studies instrument, and the methodological quality of the randomized controlled trials was graded by using an internal validity checklist. All costs were converted to 2008 US dollars.
Results	Ten economic evaluations and one randomized controlled trial reporting health-care costs met our inclusion criteria. Interventions included exercise programs, acupuncture, rehabilitation programs, and lifestyle interventions. Six of the 11 studies exhibited high risks of bias for the cost and/or effect components of their cost-effectiveness estimate. Six studies used comparators of unknown cost-effectiveness. Four studies reported cost-effectiveness estimates lower than \$50,000 per quality-adjusted life-year. All studies evaluating exercise interventions found the programs to be cost saving.
Conclusions	There is only limited evidence for the cost-effectiveness of conservative treatments for the management of hip and/or knee osteoarthritis. More high-quality economic evaluations of conservative interventions are needed to further inform practice.

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