

**Review:**

Integrating acupuncture: are there positive health outcomes for women?

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Abstract: The key health issues for women tend to be primarily associated with the female reproductive system. There are also other gender priorities and consequences associated with ageing, which require effective interventions. Acupuncture is used worldwide and its evidence base is increasing on both mechanisms of action and its effectiveness in clinical care. Although acupuncture may be a valuable addition to healthcare for some conditions, it is rarely fully integrated into mainstream Western medicine clinical practice. Inadequate design and poor reporting of clinical trials have been barriers. Additionally systematic reviews and meta-analyses have tended to be equivocal and have reported that there is insufficient evidence for its recommendation. Future research should focus on ensuring good trial design including cost effectiveness and qualitative data and using a more pragmatic stance which reflects acupuncture in clinical practice. Undoubtedly, effective interventions are always needed to ensure the best health outcomes and address preventable deaths, morbidities, and disabilities among women but integration will be compromised unless underpinned by good evidence.

Key words: Acupuncture; Women's health; Evidence-based medicine; Acupuncture mechanisms of action; Integration; Health outcomes

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1 Introduction

It is recognised that to improve population health outcomes a multifactorial approach is required. Such an approach may be directly related to government policy and societal structures, as well as inequalities in access to and quality/coverage of health services within and between countries (Wisdom *et al.*, 2005; Temmerman *et al.*, 2015). However, many other factors also impact on public health such as education, employment, nutrition, income, genetic predisposition, and gender (Commission on Population and Development, 2014).

A recent article synthesised the World Health Organization (WHO) evidence reviews in order to

identify gender differentials in mortality and morbidity (Temmerman *et al.*, 2015). It identified that the emerging priorities for women's health were women's cancers (especially breast and cervical cancers), mental disorders, chronic obstructive pulmonary disease, maternal health, smoking, harmful use of alcohol, and illicit drugs. Women also make up the greater proportion of older adults and there are also additional health consequences associated with ageing. However, the main health issues that arise for women are those primarily associated with the female reproductive system, especially menstrual and reproductive disorders, with a third of the burden of disease for women aged 15–44 years resulting from poor sexual and reproductive health. These issues may also have a psychosocial component with stress and anxiety playing a role in how disorders manifest, so there is an obvious and explicit link to mental

health (Farr *et al.*, 2011). Improving the health of women of reproductive age extends beyond focusing on pregnancy and birth outcomes and there is a need to improve continuity of care beyond pregnancy (Barfield and Warner, 2012). Approaching women's health from a life course perspective offers an opportunity to reduce illness and mortality and to eliminate disparities by enhancing health promotion and disease prevention (Collins *et al.*, 2009).

2 Use of traditional medicine

The most recent *WHO Traditional Medicine Strategy: 2014–2023* emphasised the need for all countries to have a stronger recognition of the role of traditional medicine and encouraged discussions on the necessary steps for their integration (World Health Organization, 2013; Burton *et al.*, 2015). Many therapies and products that are considered as traditional medicine in one part of the world are being used in others as complementary medicines. Discussions on integrating traditional medicines into healthcare systems need to take into account their potential role and benefits in terms of cost effectiveness, and address the critical issues of regulation and qualifications of professional training and qualifications (Robinson *et al.*, 2012; Xue *et al.*, 2015).

Acupuncture is likely to be a valuable addition to healthcare for some conditions, but it is rarely integrated into mainstream Western medicine clinical practice, even though it provides an important opportunity to promote person-centered medicine (Giovanardi *et al.*, 2015). Defining integrated care presents other problems (Hu *et al.*, 2015). In addition, there is little research on the effect of acupuncture being integrated into Western medicine.

Of all the complementary medicines, acupuncture as a therapeutic intervention is increasingly used in the West, particularly for women's health problems. A survey of acupuncture practitioners in the UK suggested that treating women for fertility-related issues was very common for 80% of the 816 practitioners responding to the questionnaire (Bovey *et al.*, 2010). This may in part be due to perceived growth in evidence or the fact that women are delaying before starting a family and experience problems with conception as a result. However, much of the re-

search on acupuncture used for women's health issues has focussed on pregnancy and birth outcomes and rarely on its use for health promotion and disease prevention.

3 Acupuncture as an intervention

A recent conference in Bologna, Italy, highlighted the need to consider various methodological issues in acupuncture research if the effectiveness of acupuncture is to be demonstrated (Giovanardi *et al.*, 2015). The issues to consider include not only developing an understanding of the mechanisms of action, and how these can be enhanced, but also those that could encourage better clinical trial design (Qu *et al.*, 2012). The issue of the placebo continues to be a problematic area for acupuncture (Appleyard *et al.*, 2014). Although acupuncture research has been increasing steadily over the years (Han and Ho, 2011), there is still a lack of rigorous trials to provide systematic evidence of cost benefit through meta-analysis. The issue of cost effectiveness now deserves greater attention given the pressure on health services, a pressure which is evident in many countries. With an ageing population, the complexities of multi-morbidity and polypharmacy become even more problematic in terms of improving health outcomes and making person-centred healthcare even more important.

4 Acupuncture and female reproductive disorders

The health issues experienced by women usually result from female reproductive system dysfunction and are usually associated with conditions such as pregnancy, gynaecological disorders, menopausal symptoms, benign breast disease, and female cancers. Medical interventions are increasing in developed countries for all aspects of labour and birth, and promotion of more normal birth is now being advocated (Gibbons *et al.*, 2010). Complementary approaches may offer increased options such as pain relief and research is important to inform healthcare providers and women's decisions to use such modalities but further research is needed (Levett *et al.*,

2014). These approaches to health become more commonly used during maternity to support various aspects of birth (Adams *et al.*, 2011; Betts *et al.*, 2012).

5 Evidence base for acupuncture and female reproductive disorders

A narrative literature research explored the literature up to June 2013 on acupuncture and its mechanism of action and its use and impact on female reproductive disorders (Cochrane *et al.*, 2014). The synthesis demonstrated that data extracted from 204 papers provided clinical data which indicated that acupuncture may improve menstrual problems and women's abilities to fall pregnant. The 114 documents identified provided evidence of acupuncture's mechanism of action. Conversely, clinical research has been criticised for methodological flaws. Many systematic reviews have not been able to include studies because of poor design and reporting, and this is borne out by the Cochrane reviews on acupuncture and women's health (as detailed below).

Scrutiny of the Cochrane Database, purportedly the highest form of evidence and consisting of high-quality, independent systematic reviews, only identified nine reviews which directly related to acupuncture and women's reproductive health (Yu *et al.*, 2005; Zhang *et al.*, 2010; Lim *et al.*, 2011; Smith *et al.*, 2011a; 2011b; 2013; Zhu *et al.*, 2011; Cheong *et al.*, 2013; Dodin *et al.*, 2013). These registered reviews assessed acupuncture for premenstrual syndrome (Yu *et al.*, 2005), uterine fibroids (Zhang *et al.*, 2010), polycystic ovary disease (Lim *et al.*, 2011), dysmenorrhea (Smith *et al.*, 2011a), endometriosis (Zhu *et al.*, 2011), pain in labour (Smith *et al.*, 2011b), induction of labour (Smith *et al.*, 2013), menopausal hot flushes (Dodin *et al.*, 2013), and assisted reproductive technology (Cheong *et al.*, 2013). Of these nine reviews, three had no included studies (Yu *et al.*, 2005; Zhang *et al.*, 2010; Lim *et al.*, 2011) and eight were carried out between 2010 and 2013. The review by Smith *et al.* (2011a) included ten trials (944 women) on acupuncture for dysmenorrhoea and provided some indication of reduction in period pain and similarly her review for management of pain during labour (13 trials, 1986 women) indicated that acupuncture may have a role in pain reduction

and patients reported increased satisfaction and a reduction in the use of pharmacological management (Smith *et al.*, 2013).

Although 20 trials (4544 women) were included in the Cochrane review of acupuncture for assisted reproduction (Cheong *et al.*, 2013), the different study designs, controls and timing of acupuncture were too variable to provide sufficient evidence to substantiate the use of acupuncture. Of the 16 studies (1155 women) included for the review on acupuncture for hot flushes, evidence was too low-quality to make any recommendations (Dodin *et al.*, 2013). These reviews do not provide convincing evidence for the use of acupuncture or highlight the need for well designed, double blind randomised controlled trials with tracking of adverse events. However, this lack is likely to be due to a variety of issues, including the focus of the research question, the selection and quality of studies available for inclusion, the date of included studies, and the need to update with more recent studies. The need for improving quality of studies in this field has previously been highlighted (Qu *et al.*, 2012; Qu and Robinson, 2015).

6 Acupuncture and mechanism of action

Basic research suggests that acupuncture may regulate uterine and ovarian blood flow mediated as a reflex response via the ovarian sympathetic nerves (Napadow *et al.*, 2008). This enhanced blood flow may encourage the development of a thicker uterine wall which may in turn encourage embryo implantation (Stener-Victorin *et al.*, 1996). In the case of polycystic ovary syndrome (PCOS), electroacupuncture appears to restore adipose tissue gene expression, and improve insulin sensitivity, thereby modulating gene expression (Mannerås *et al.*, 2008). There is also some evidence that acupuncture has a significant effect in suppressing high serum estradiol, resulting in the enhanced expression of receptivity markers (Fu *et al.*, 2011). The mechanism of reproductive dysfunction has been discussed in an overview but the review suggests that it is still poorly investigated (Stener-Victorin and Wu, 2010).

An acupuncture effect on β endorphin levels is widely accepted and may affect menstrual pain by providing anti-inflammatory signals (Zhu *et al.*,

2011). Three potential mechanisms for acupuncture's effects on fertility are outlined in a paper by Al-Inany (2008). In brief, these are neurotransmitters' inhibition of central sympathetic nerve activity or the production of endogenous opioids. There is also some evidence to suggest that acupuncture may have an effect on lowering stress hormones. This may also act to boost fertility (Magarelli *et al.*, 2009).

For example, PCOS, the most common reproductive and metabolic disorder which affects >10% of women of reproductive age with associated menstrual irregularities, is associated with high sympathetic nerve activity (Stener-Victorin and Wu, 2010). Acupuncture is thought to decrease the sympathetic nerve activity and in turn stimulate the return of ovulation as a result. A recent systematic review (Qu *et al.*, 2016) which included 9 randomized controlled trials suggested that acupuncture significantly improved the recovery of the menstrual cycles and decreased body mass index and luteinizing hormone in PCOS women, but as with the Cochrane reviews reported above, the methodological quality of studies was poor.

7 Conclusions

Historically Chinese medicine has long recognised gynaecology as a specialty and the issues surrounding women's menstrual health and its effects. Women commonly consult for and are treated with acupuncture for a variety of health issues specifically related to their gender. The issues of the use of acupuncture for psychological effects, cancers specific to women, use of stimulants and specific symptoms associated with the above conditions have not been addressed in this paper as the topic is too large, but these are equally important for health and well-being.

Acupuncturists worldwide believe that acupuncture is a valuable intervention for women because of the increasing frequency of consultations for the above health issues. However, in partial answer to the question 'Would integrating acupuncture provide positive health outcomes for women?' it is clear that many health issues experienced by women may not be fully addressed by Western healthcare. This may provide a case for integrating acupuncture

as well as various other approaches into routine healthcare.

This review highlights several directions for future research, which is needed to substantiate the need for integration. This includes collecting longitudinal, observational, and qualitative data to document women's patterns of acupuncture use over time and changes in wellbeing and symptomatology. However, although the scientific evidence (for both experimental data and clinical trials) is growing for acupuncture and its use for women's health issues, cost effectiveness, qualitative data, and nested within trials are needed. There is also a lack of evidence whether or how acupuncture regulates menstrual cycles and this is yet to be assessed. Future studies certainly need to address these gaps and perhaps take a more pragmatic stance regarding this complex intervention. It is clear that the implementation of effective interventions is needed at clinical, environmental, social, economic, and political levels in order to ensure the best health outcomes and address preventable deaths, morbidities, and disabilities among women.

Compliance with ethics guidelines

Nicola ROBINSON declares that she has no conflict of interest.

This article does not contain any studies with human or animal subjects performed by the author.

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中文概要

题目：辅助针刺：是否对女性健康起促进作用？

概要：在生理、心理、社会、性别和年龄等因素作用下，以生殖系统疾病为代表的多种疾病影响着女性健康，需要有效的治疗。针灸是中国传统医学的代表，在全球范围内得到了应用。虽然关于针灸循证医学的证据和疗效的报道越来越多，但是针灸还未融入西方主流医学。本文从当前女性健康状况和寻求辅助方法治疗女性疾

病的必要性着手，阐述针灸在女性健康方面的作用、优势和机制，针灸在国外的发展现状和机遇，以及针灸实验研究的现状和存在的问题。本文还探讨了阻碍针灸发展的原因：临床实验的设计缺陷和参差不齐的报告质量是阻碍针灸发展的障碍；系统性综述和 meta 分析结果模棱两可，没有足够的推荐理由。同时，本文从实验设计的严谨性包括成本效益和定性数据以及客观的评估疗效等方面，对未来的针灸研究提出了希冀，以期对广大临床医生和科研人员有所启示。

关键词： 针灸；女性健康；循证医学；针灸作用机理；结合医学；健康情况

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Introducing editorial board member:

Nicola ROBINSON, Professor of Traditional Chinese Medicine (TCM) and Integrated Health at London South Bank University, UK, is one of the editorial board members of *Journal of Zhejiang University-SCIENCE B (Biomedicine & Biotechnology)*. Following her PhD in immunology at Manchester University, she studied acupuncture, becoming a registered acupuncturist in 1982 and was awarded Fellowship of the British Acupuncture Council in 2008. In 2004, Nicola was the recipient of a Winston Churchill Traveling Fellowship to visit China, to explore educational and research initiatives in TCM. She is Editor in Chief of the *European Journal of Integrative Medicine* (Elsevier) and Chair/Trustee of the Research Council for Complementary Medicine, UK, and sits on the advisory group of the UK's Medicines and Healthcare products Regulatory Agency (MHRA).

Nicola has written over 200 scientific articles in peer reviewed journals frequently presenting nationally and internationally. She has experience in health services research and has conducted research using TCM interventions (particularly acupuncture and Tai Chi) on a variety of topics: musculoskeletal disease, women's health, mental health, diabetes, human immunodeficiency virus (HIV), and cystic fibrosis. She supervises PhD and postdoctoral students in UK and China and has developed various international research collaborations.