

The Efficacy of Aromatherapy on Pain and Anxiety During Needle-Related Procedures in Adults: A Systematic Review and Meta-Analysis [Letter]

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Dear editor

We read with interest the systematic review and meta-analysis, “The Efficacy of Aromatherapy on Pain and Anxiety During Needle-Related Procedures in Adults: A Systematic Review and Meta-Analysis” by Sun et al.¹ This study synthesises multiple randomised controlled trials using rigorous statistical methods, providing the first high-level evidence synthesis for non-pharmacological adjunctive management of needle-related procedures in adults. The study emphasises the potential benefits of aromatherapy in alleviating pain and anxiety associated with medical procedures. It is acknowledged that the present study has been conducted with the utmost dedication and commitment, and as such, we hereby offer preliminary reflections and observations in the hope that they will contribute to future research on this important topic.

The Absence of Long-Term Safety and Tolerability Data is a Salient Issue

Whilst the study conclusions support the use of aromatherapy as an adjunctive intervention, it should be noted that all of the included studies focused solely on the immediate effects of single applications. It is evident that the issue of long-term safety and the potential changes in efficacy resulting from repeated use were not addressed in the given discourse. In clinical practice, a significant number of patients requiring needle procedures, including those with diabetes or undergoing haemodialysis, receive long-term, frequent treatment. A primary concern for clinicians deliberating on the adoption of this therapy pertains to the potential for adverse effects arising from long-term, repeated exposure to concentrated essential oils, including olfactory fatigue and skin sensitisation, or the development of tolerance. As demonstrated in the systematic review by Liva et al.² although serious adverse events are rare, aromatherapy has been observed to cause adverse reactions, including skin allergies and respiratory irritation. Furthermore, data on long-term tolerance remains scarce. It is strongly recommended that high-quality randomised controlled trials (RCTs) be incorporated into future research endeavours. These trials should be designed with the intention of evaluating long-term sequences of multiple interventions, wherever such sequences can be identified. In addition, there is a necessity to collect and report adverse events systematically in order to address the current lack of evidence regarding safety.

The Placebo-Controlled Group Design Demonstrates Heterogeneity

It is observed that in subgroup analyses, the placebo control group was treated as a homogeneous category. However, placebos utilised across various studies – such as distilled water versus odourless carrier oils – may exhibit sensory differences. Such variations have the potential to compromise the integrity of blinding. The study by Benedetti et al.³ demonstrated that the sensory characteristics of placebos have a substantial impact on subjects' expectations and

subsequent outcome assessments. The present analysis may not have adequately disentangled potential biases arising from different placebos. In future systematic reviews, conducting more detailed subgroup analyses or sensitivity analyses based on placebo type would enable more precise interpretation of results.

The Clinical Significance of Effect Sizes Requires Further Elucidation in Light of Individual Variations

The study unequivocally demonstrates that aromatherapy exerts a statistically significant effect on pain reduction; however, the discussion on the clinical significance of this finding remains somewhat restricted. As Myles et al⁴ established, the minimum clinically important difference (MCID) for VAS scores in acute pain is 1.0–1.5 points. Whilst the patient data demonstrate that the mean difference (MD) is –1.82, the heterogeneity of the data may obscure significant variability in individual patient responses. It is recommended that future studies calculate the proportion of responders, as this metric offers a more clinically relevant interpretation of effect size that aligns with real-world practice.

The Heterogeneity of Anxiety Treatment Efficacy Necessitates in-Depth Analysis of Psychological Moderating Factors

In order to address the inconsistencies observed in the effects of aromatherapy on anxiety, it may be advantageous to refer to studies that explore its psychological mechanisms. As demonstrated in the systematic review by Charlesworth et al⁵ the efficacy of placebos, even in cases where they are not intentionally misleading, is attributable to the manifestation of significant therapeutic effects through psychological mechanisms. Psychological factors, including patients' trait anxiety levels and prior beliefs about aromatherapy, have been demonstrated to significantly moderate intervention outcomes. The incorporation of psychological moderators into the discussion section would facilitate the establishment of a more comprehensive theoretical framework to explain observed clinical heterogeneity.

Personalised Interventions and the Integration of Chinese and Western Medicine Represent Pivotal Future Research Directions

In the clinical practice of Traditional Chinese Medicine, it has been observed that patients' preferences for specific essential oils are highly correlated with their personal experiences, which may have a significant impact on the therapeutic outcomes of their treatment. In this case study, an elderly cancer patient who required frequent venous blood draws was found to associate the scent of lavender with unpleasant memories from her youth. This association resulted in elevated levels of anxiety upon exposure to the lavender. The transition to the utilisation of sweet orange essential oil, a personal preference of the subjects, yielded substantial enhancements in two key domains: treatment compliance and reported anxiety levels. This case suggests that a universal approach to essential oil selection may not be optimal. It is imperative that the implementation of aromatherapy does not overlook the crucial factors of individual scent preferences and emotional memories. It is suggested that future clinical practice and research should explore the possibility of conducting simple scent preference screenings prior to interventions. The purpose of such screenings would be to enhance compliance and efficacy. Furthermore, we are contemplating the potential integration of essential oil application methodologies with Traditional Chinese Medicine's acupoint theory. In addition, we are investigating whether the compounding of essential oils, derived from single oils that are efficacious in alleviating pain and anxiety, could further augment therapeutic outcomes. These findings signify promising avenues for future exploration.

In conclusion, we would like to reiterate our profound gratitude to Sun and his team for their exceptional contributions. It is evident that the present study has established a novel paradigm within this discipline. The aforementioned observations are presented with the objective of contributing to the academic discourse in a constructive manner. Should any component be considered unsuitable, we respectfully request your guidance.

Disclosure

The authors report no conflicts of interest in this communication.

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