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# A Randomized Trial of Aromatherapy To Reduce Anxiety before Abortion

**CONTEXT.** Interest in the use of alternative therapies to reduce anxiety in patients undergoing medical interventions is increasing. We sought to assess the effectiveness of aromatherapy involving essential oils in reducing preoperative anxiety in women undergoing abortions.

**SETTING.** An urban, free-standing abortion clinic in Vancouver, BC.

**PATIENTS.** 66 women waiting for surgical abortions.

**DESIGN.** A double blind, randomized trial.

**INTERVENTION.** Ten minutes spent sniffing a numbered container with either a mixture of the essential oils vetivert, bergamot, and geranium (treatment arm) or a hair conditioner (placebo).

**OUTCOME MEASURES.** Anxiety was measured before and after the intervention by using a verbal anxiety scale from 0 to 10.

**RESULTS.** The anxiety score was reduced by 1.0 point (5.0 to 4.0) in the aromatherapy group and by 1.1 points (6.1 to 5.0) in the placebo group ( $P=0.71$ ). The 95% CI on the 0.1 greater decrease in anxiety for the placebo group extends from 0.55 less (favors aromatherapy) to 0.75 greater (favors placebo).

**CONCLUSION.** Aromatherapy involving essential oils is no more effective than having patients sniff other pleasant odors in reducing preprocedure anxiety.

Although physicians have traditionally relied on pharmacologic methods to reduce anxiety in patients undergoing medical procedures, interest in using alternative therapies is growing.<sup>1,2</sup> Such alternative, or “complementary,” therapies include relaxation audiotapes, self-hypnosis, music therapy, therapeutic touch and massage, and reflexology. These techniques have been used in attempts to reduce anxiety and to improve outcomes in patients undergoing procedures ranging from cardiac surgery to dental and other ambulatory surgical procedures.<sup>3-6</sup> Although there are relatively few careful trials of such interventions, alternative therapies may make medical procedures more tolerable to patients and reduce the need for post-operative pain medications.<sup>7</sup>

One increasingly popular type of alternative therapy is aromatherapy. With aromatherapy, patients sniff essential oils for various therapeutic effects, including anxiety reduction. Numerous essential oils are used in aromatherapy, including eucalyptus, geranium, lavender, orange, and rosewood. However, although aromatherapy is pleasant, inexpensive, and has no side effects (except for rare allergies), there is no evidence that it is effective in patients undergoing medical interventions. For this reason, we performed a randomized clinical trial to assess whether aromatherapy is more effective than placebo in reducing preoperative anxiety in women undergoing abortions.

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## Methods

We performed a double-blind, placebo-controlled, randomized trial at an urban free-standing abortion clinic. Patients were recruited from women waiting for surgical abortions. The only exclusions were allergies to perfumes or an inability to understand the consent form. No one withdrew from the study after signing the consent form.

To ensure that patients had no memory associations with the aroma and that they were blinded, we selected unfamiliar substances for the treatment and placebo groups. Patients in the treatment arm sniffed a mixture of essential oils recommended by an aromatherapist for their relaxation properties. The mixture consisted of three drops of vetivert, six drops of bergamot, and four drops of geranium in cold-pressed soya oil. These oils were inexpensive, costing \$11.99, \$12.99 and \$14.99 (Can), respectively, for 10 mL each, and only a few drops were used for each session. Although it is an essential oil reported to cause relaxation, lavender was not used because many people recognize its scent. For the placebo arm, we used a hair conditioner containing Brazil nut oil, a substance with an odor similar to that of the treatment but that contains no essential oils. We did not use water or another odorless compound because patients would be aware that they had received the placebo.

After the routine counseling session but before lorazepam was administered (given to all patients 30 to 60 minutes before the procedure), women were asked to sniff a numbered container for 10 minutes. These containers were opaque bottles that had been randomized according to a table of random numbers and were numbered sequentially by someone not involved in gaining consent or collecting the data. The counselors and patients were blinded to the treatment.

Our outcome measure was preoperative anxiety, scored on a linear scale. Before and after the intervention, the counselors asked the women, "On a scale of 0 to 10, where 0 is no anxiety and 10 is the most anxious you have ever been, how anxious are you feeling right now?" The sample size was calculated to give an 80% power of

detecting a 1-unit difference in the change in anxiety scores between the treatment groups. The alpha level was two-tailed 0.05. The data were entered into SPSS statistical software (SPSS, Inc., Chicago, Illinois) and analyzed by using two-sample *t*-tests and Mann-Whitney tests.

## Results

There were 36 participants in the aromatherapy group and 30 in the placebo group. As shown in **Table 1**, these groups were similar with respect to age and number of previous births and abortions. Patients in the aromatherapy group had a slightly lower gestational age than those in the placebo group (58 vs. 63 days,  $P = 0.04$ ). There was a trend toward lower baseline (before the study intervention) anxiety in the aromatherapy group (5.0 vs. 6.1 in the placebo group,  $P = 0.07$ ), but this difference was not statistically significant.

**Figure 1** shows that, with administration of the study intervention, anxiety scores decreased significantly in both the aromatherapy group (from 5.0 to 4.0,  $P < 0.01$ ) and the placebo group (from 6.1 to 5.0,  $P < 0.01$ ). However, the net decrease in preoperative anxiety scores did not differ between the two groups (1.0 vs. 1.1,  $P = 0.71$ ). As shown in **Figure 2**, the 95% CI on the 0.1 greater decrease in anxiety for the placebo group extends from 0.55 less (favors aromatherapy) to 0.75 greater (favors placebo).

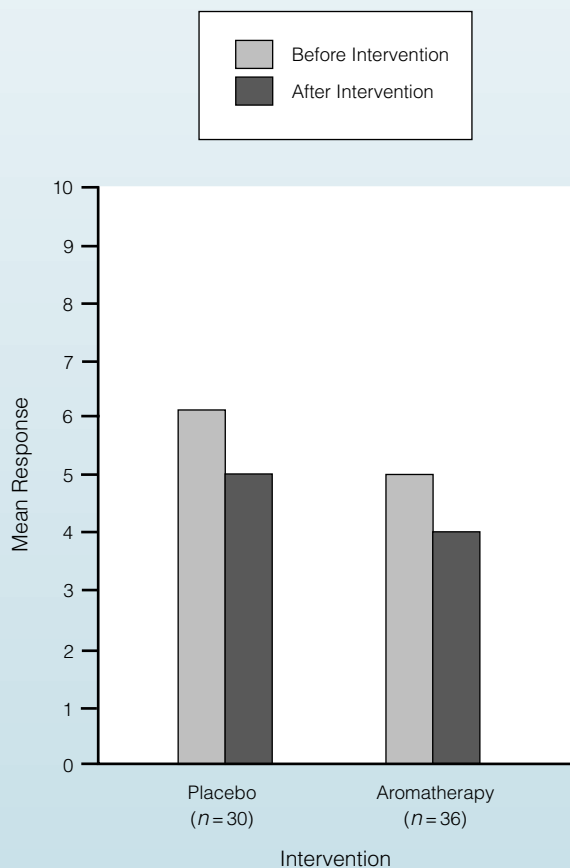
## Discussion

This is the first reported randomized clinical trial that assesses the value of aromatherapy in reducing anxiety in patients undergoing a medical procedure. Although anxiety scores fell after aromatherapy involving essential oils, the decrease was similar to that in patients receiving the placebo (hair conditioner). Thus, there was no evidence that aromatherapy is more effective in reducing preprocedure anxiety than having patients sniff other pleasant scents. Anxiety scores may have diminished in

**TABLE 1**  
**Baseline Characteristics**

CHARACTERISTIC	PLACEBO (n=30)	AROMATHERAPY (n=36)	P VALUE
Maternal age, yr	26.1	26.9	>0.2
Gestational age, d	63.4	58.0	0.04
Previous births	0.5	0.7	>0.2
Previous abortions	0.6	0.7	>0.2

"On a scale of 0 to 10, where 0 is no anxiety and 10 is the most anxious you have ever been, how anxious are you feeling right now?"



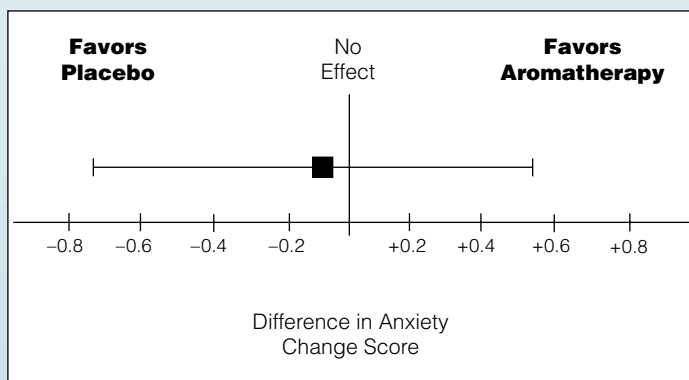
**FIGURE 1. Mean anxiety scores before and after the intervention.** Although the decrease in anxiety in both groups is significant ( $F < 0.01$ ), the difference between the two groups is not significant ( $F = 0.71$ ).

both groups simply because the study intervention is distracting. Alternatively, sitting down for 10 minutes

while focusing on a pleasant scent—or perhaps even an odorless compound—may be relaxing in itself.

Although the therapeutic value of aromatherapy remains unclear,<sup>5</sup> previous studies have examined its effects in various medical and nonmedical contexts. In one trial, 40 patients were randomly assigned to inhale lavender or rosemary. Before and after inhaling the scents, the participants were assessed with electroencephalograms, mood questionnaires, and math computations.<sup>8</sup> Lavender was associated with relaxation and rosemary with increased alertness. In another randomized trial involving 20 men, aerosolized lavender did not affect blood pressure or pulse measurements before or after exercise.<sup>9</sup> Nine patients with rheumatoid arthritis were given massages with or without lavender oil in an unblinded crossover trial.<sup>10</sup> There was no difference in pain scores between the two groups. Four patients with dementia and disturbed behavior were treated in a crossover trial with aromatherapy using aerosolized lavender.<sup>11</sup> Only one patient had significant improvement.

It is important to consider potential limitations in our study. First, the trend toward a difference in baseline anxiety scores between the two groups raises the possibility of inadequate randomization and thus confounding. However, given the simplicity of our randomization scheme, we suspect that the differences in baseline anxiety are attributable to chance alone. Moreover, imperfect randomization would not be expected to affect the differences in anxiety before and after the study intervention, our primary outcome measure. Second, some may argue that the intervention was flawed. For example, our selection of essential oils used in this study was guided by expert opinion, not empirical evidence. It is possible that other oils or different combinations of oils could be more effective at reducing anxiety. Also, selecting the right placebo is difficult. An odorless compound (e.g., water) would be recognized as placebo by study participants,



**FIGURE 2. Difference between aromatherapy and placebo in the anxiety change score, 95%CI.**

who would then be unblinded. Conversely, by using a fragrant substance for the control group (we used hair conditioner), it is possible that the study outcome was influenced by our choice of placebo. Finally, our study relied on a single anxiety measure, assessed on a scale of 0 to 10. We employed this scale because it is simple to use; easy to understand; and unlike other anxiety measures, useful for identifying changes in anxiety from one point in time to another. Although similar scales for measuring pain are well validated,<sup>12</sup> their use for quantifying anxiety is less well described.

Like music, art, or beautiful scenery, pleasant odors may be relaxing for many patients. Because aromatherapy is relatively inexpensive and essentially risk free, there is no reason to discourage its use in medical practice. However, there remains no evidence that essential oils are crucial to the value of aromatherapy.

### Take-Home Points

- Aromatherapy involving essential oils is increasing in popularity; however, its therapeutic value has not been carefully assessed.
- We performed a double-blind, placebo-controlled trial to determine the effectiveness of aromatherapy for reducing anxiety in women awaiting surgical abortions.
- Aromatherapy and sniffing a placebo were equally effective—each reduced anxiety scores by about 1 point (on a scale from 0 to 10).
- Although there is no reason to discourage the use of aromatherapy, essential oils are no more effective than other pleasant-smelling substances.

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