

Aromatherapy as the Intervention of Anxiety: Systematic Review

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Keywords: Aromatherapy, Anxiety, Adult, Patients, Randomized Controlled Trial.

Abstract: Background: Anxiety is a common problem that patients often experience in both the Hospital and the Community. Aromatherapy is used as an intervention to lower anxiety levels cause safely, easily, cheaply and without side effects. There are differences in method, type, dose, duration and technique of aromatherapy intervention so that require further study. Methods: The search of literature from various online databases obtained 10 RCT research journals to be analyzed according to the inclusion and exclusion criteria. Results: All of 10 articles significantly decreased anxiety. Inhalation method was used in 9 of 10 studies and 1 study used massage. The essential aromatherapy type of lavender oil or its combination is used in 8 articles (7 significantly decreased anxiety), 1 using bargamot and 1 using satureja. Duration of giving aromatherapy between 5-40 minutes at most 30 minutes (3 studies). A dose of aromatherapy 2 drops in 5 studies. Provision of intervention 1 times most used (5 studies), most intervention is 12 times (1 study). The longest intervention time is 4 weeks (2 studies). Conclusions: Generally recommend the use of lavender aromatherapy (*lavandula angustifolia*) intervention through inhalation method with a dose of 2 drops within 30 minutes to effectively decrease the anxiety.

1 INTRODUCTION

Anxiety is an emotional status experienced by clients in the community especially treated in hospitals particularly those receiving surgical or invasive procedures (Karaman et al. 2016).

Anxiety is a psychological and physiological condition with cognitive, somatic, emotional, and behavioral characteristics. This type of anxiety disorder has symptoms such as increased blood pressure, elevated high heart rate, sweating, fatigue, discomfort, pain, tension, irritability, and worried (Lee et al. 2011).

Anxiety basically is a normal reaction in humans, but if not done the right action it will be develop into chronic problems and become a habit (Soto-Vasques & Alvarado-García 2017). Anxiety is experienced in 11% - 80% of adult surgical patients (Labrague & Mcenroe-petitte 2016). Anxiety disorder symptoms experienced 4-6% of the entire population and if left untreated, 40-50% will become depressed and decided to commit suicide (Lee et al. 2011).

Pharmacologically, clients may be given sedatives such as Benzodiazepines, but it can cause side effects such as difficult of concentrating, decreased visual function, impaired mobility and activity due to hyperactivity, long-term amnesia, and decreased of cognitive function (Wood et al. 1993; Sonnenberg et al. 2012).

Non-pharmacological therapy that can be developed by the nurse is aromatherapy. Aromatherapy has several advantages for instance safely intervention, easily, cheaply, and without side effects (Ziyaeifard et al. 2016).

From the 10 recent studies (the last 10 years) about the effects of aromatherapy on anxiety after reviewed, the result showed the contradictions about the method, dose and duration as well as the resulting size. Through this systematic review we attempt to re-analyze the findings to formulate aromatherapy in order to obtain more effective results of adult clients with anxiety.

The systematic purpose of this review is to illustrate the various methodological variations

on approaches used besides the dosage and duration to analyzed the determining of standard aromatherapy interventions used to improve the effectiveness of aromatherapy interventions to reduce anxiety in adult clients in different areas of medical surgical nursing.

2 METHODS

The method used in this article was a systematic review of previous studies related to aromatherapy intervention on client with anxiety.

Aromatherapy in the context of this review was the provision of fragrances through smelling (inhalation) and massage using 100% essential oil of natural ingredients or pure essential oil that efficacious calm (anxiolitik) such as lavender, bargamot and citrus. Aromatherapy interventions were defined as fragrances or scents that gave to patients during the scheduled treatment and performed to produce the objectives.

2.1 Journal Searching Strategy

Most of the research articles are derived from searched from online computers by utilizing the following database: Science Direct, Pubmed, Ebscohost, Proquest, SAGE and Google Scholar.

Keywords were created using PICOT method analysis (Population, Intervention, Comparison, Outcome, Time). The PICOT format was used to answer research questions (Riva et al. 2012).

From the method obtained the following keywords such as : P= Patients, Adult; I= Aromatherapy; C= Randomized Controlled Trial; O= Anxiety; T=2008-2018.

2.2 Inclusion Criteria

To limit the relevant research to this systematic review then some inclusion criteria were determined:

1. The research population is an adult client both in the hospital and in the community.
2. Intervention given was used of aromatherapy.
3. Have a comparison or control, either aromatherapy with different essential oils, not aromatherapy or not treated.
4. The observed results include anxiety and can add to other things such as: pain, vital

Table 1: Jadad research score.

Author	Score			Total Score
	Random	Blind	One Data Account	
Bikmoradi et al	2	2	1	5
Cho et al	1	0	1	2
Franko et al	2	2	1	5
Hozumi et al	2	2	1	5
Karaman et al	2	2	1	5
Ni et al	2	0	1	3
Soto-vasques et al	2	1	1	4
Tang & Tse	1	0	1	2
Wu et al	2	0	0	2
Ziyaefard et al	2	2	1	5

signs (blood pressure, pulse, respiration) and hemodynamic status.

5. The result used Randomized Controlled Trial (RCT).
6. Research from the last 10 years (2008-2018).
7. The research reported in English.

2.3 Selection of Relevant Study

After searched the articles, followed by screen and selected then assessed the eligibility and selected articles that meet the inclusion criteria so obtained the relevant articles. Incompatible articles were removed.

After conducted to literature search, 10 research that met the inclusion criteria were set to be reviewed in this systematic review.

2.4 Research Quality

All the studies used were experimental research design with RCT (Randomized Controlled Trial).

2.5 Measuring Instrument

Out of 10 research 6 of them used measuring instrument STAI (State Trait Anxiety Inventory) to measure the anxiety level of pre and post intervention.

STAI is a 20 item questionnaire using 4-point Likert scale. STAI is a widely used instrument with high reliability and validity (Twiss et al. 2006). The STAI is considered gold standard for assessing anxiety and has been used in more than 1000 peer reviewed studies (Franco 2016).

VAS measuring instrument (Visual Analogue Scale) or VASA (Visual Analogue Scale for Anxiety) was used in 1 study (Karaman et al. 2016).

Numeric Rating Scale as a measurement scaled tool using numbers used to measure anxiety or pain. NRS was used in 1 study (Hozumi et al. 2017)

Depression Anxiety Stress Scale (DASS 21) as a measuring tool for assessing depression, anxiety and stress levels was used in two studies (Bikmoradi et al. 2015; Tang & Tse 2014)

3 RESULTS

3.1 Study Description

Research journal searched from various databases until February 2018 obtained 236 Journal results. 196 SAGE journals, 11 Proquest, 5 Science Direct and 24 EBSCOHOST journals. From 236 were selected until remain 42 journals which relevant. Out of the 42 journals, the feasibility study were screened for 10 studies that met the eligibility criteria and accordance to inclusion criteria.

From 10 RCT studies were reviewed, all studies (100%) showed results that patients receiving aromatherapy interventions experienced a statistically significant decrease in anxiety levels.

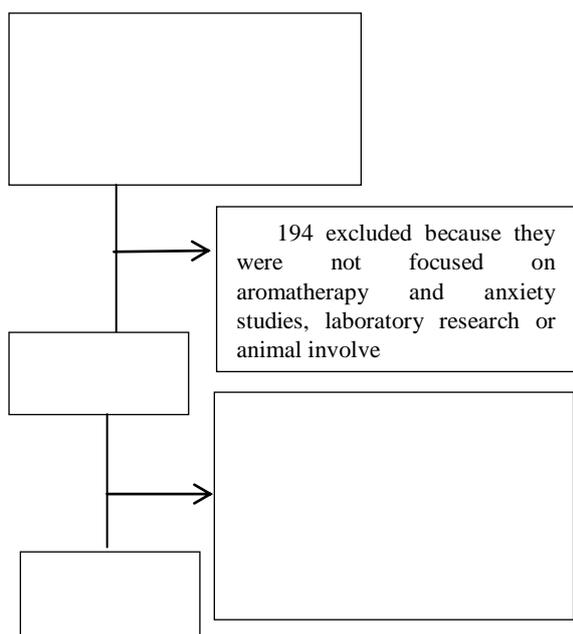


Figure 1: Flowchart selection process.

3.2 Research Sample

From 10 reviewed studies, the total sample size were 1,075 respondents. The number of samples was 25

respondents in the study and most of them were 361 respondents (Hozumi et al. 2017).

Research samples were recruited from various scopes of medical and surgical nursing areas such as postoperative CABG (Coronary Angiography By Pass), Coronary Angiography (CA), Intensive Care Unit (ICU), Pre ambulatory operations, Women with ADHD children (Attention Deficit Hyperactivity Disorder), Pre Breast Surgery, Surgery Room, Colonoscopy, Geriatric in the community and Psychotherapy Center.

3.3 Type of Aromatherapy

On research the used of aromatherapy with various kind of essential oil ingredients were :

- a. Lavender (Lavandula Angustifolia) totals of 4 studies using essential lavender oil (Bikmoradi et al. 2015; Ziyaeifard et al. 2016; Karaman et al. 2016; Franco 2016).
- b. The combination of Lavender and other essential oils such as chamomile, citrus, bergamot, jojoba, osmantus (Olive) and grape fruit in 4 other studies (Tang & Tse 2014; Wu et al. 2014; Hozumi et al. 2017; Cho et al. 2013).
- c. Bargamot, 1 research study using essential oil bargamot (Ni et al. 2013).
- d. Satureja used in 1 study (Soto-Vasques & Alvarado-García 2017) species of satureja boliviana and satureja brevicalyx.

Most of the researchers specify essential oils and there was no research provides a choice of essential oil ingredients to the client, so in the sample determination, if the client was allergic or does not like the scent the prospective respondents were excluded (Bikmoradi et al. 2015; Ziyaeifard et al. 2016; Karaman et al. 2016; Tang & Tse 2014; Franco 2016; Hozumi et al. 2017).

3.4 Aromatherapy Method

From the total 9 out of 10 (90%) studies reviewed using inhaled aromatherapy methods, 3 dropped (on cotton, kassa and aroma stones), 3 using evaporation (diffuser), 2 with oxygen masks and 1

Table 1.2: Comparisons of Randomized Controlled Trials Using Aromatherapy for Anxiety.

No	Author	Year	Study	Σ Sample	Type	Dosage	Duration	Method	Media	Instrument	Σ Test	Σ Group
1.	Ziyaefard et al	2017	Coronary Angiography	80 I=40 C=40	Lavender 5 drops	1 times	5'	Inhalation, 5 cms from nose	Swab cotton	Spielberger	2 times ; 30' pre & post intervention	2 groups
2.	Bikmoradi et al	2015	Post CABG	60 I=30 C=30	Lavender 2 drops 2%	2 times; -day 2 post op -day 3 post op	@20'	Inhalation	Oksigen face mask	DASS 21	4 times ; 60' before & after aromatherapy	2 groups
3.	Karaman et al	2016	Venous cannulation underwent surgery	101 I=51 C=50	Lavender 2 drops 1%	1 times	5'	Inhalation	Drops in gauze	VAS	before & 2' after intervention	2 groups
4	Soto-Vasques et al	2016	Integral Psychotherapy Center	108 I=@18 C=18	-Satureja Boliviana -Satureja Brevicalyx 2 drops (2%)	12 times 6 x 1 weeks (Monday until saturday) for 2 weeks	@30'	Inhalation	Diffuser	STAI	2 times Pre-post	6 groups
5.	Cho-M.Yeon	2013	ICU Before and after PCI	56 I=28 C=28	Lavender: Chamomile: Citrus (6:2:0,5) 2 drops	3 times ; -before PCI (10 DBE) -After PCI (10 DBE) -Aroma Stone under pillow	@30' Following morning	Inhalation	Drops in aroma stone	STAI	3 times -day 1 admission -pre & post PCI	2 groups
No	Author	Year	Study	Σ Sample	Type	Dosage	Duration	Method	Media	Instrument	Σ Test	Σ Group
6.	Ni et al	2013	Pre op ambulatory surgery	109 I=53 C=56	Bergamot	1 times	30'	Inhalation Vapor	Diffuser	STAI	2 times Pre-post	2 groups
7	Tang &	2014	Older in	82	Lavender:	4 weeks	20'	Inhalation	Aromatic	DASS-21	2 times	2 groups

	TSe		community	I=44 C=38	bergamot : lavender hidrolat 2 : 1 : 2,5	4 times and (PRN)s			spray		Pre-post	
8	Wu et al	2014	Females whose children ADHD	25 I=13 C=12	20 ml jojoba oil mix lavender 2%	4 weeks 8 session	40'	massage	-Efflurage -Friksi -Petrissage -Vibrasi	STAI	2x Pre-post intervention	2 groups
9	Franko et al	2016	Breast Surgery	93 I=47 C=46	Lavender 2 drops 2%	1 times	10'	Inhalation	Oksigen face mask	STAI	2 times Pre-post	2 groups
10	Hozumi et al	2017	Colonoscopy	361 I=71-75 C=74	-Osmantus -Lavender -Grafe fruit -Combination	1 times	During Colonoscopy	Inhalation vapor	Diffuser	NRS (1-10)	2 times Pre-post	5 groups

ICU = Intensive Care Unit; PCI = Percutaneous Coronary Intervention ; ADHD = Attention Deficit Hyperactivity Disorder ; DBE = Deep Breathing Exercise

sprayed study. One study (10%) using massage method.

3.4.1 Inhalation Techniques

Methods by dropping inhalation were done in 3 studies but with different techniques that were by dripping essential oil on cotton and placed 5 cm from the nose and then inhaled the aroma (Ziyaeifard et al. 2016). Another technique was dripped on the gauze and then inhaled with the sitting position (Karaman et al. 2016), another way was done by dripping on the aroma stones and the aroma was inhaled (Cho et al, 2013). Vaporation method used a diffuser were chosen by 3 studies (Soto-Vasques & Alvarado-García 2017; Ni et al. 2013)(Soto-Vasques & Alvarado-García 2017). (Ni et al 2013 and Hozumi et al 2017). Inhalation with oxygen mask were performed in 2 studies (Bikmoradi et al; Franco et al, 2016). Aromatic spray method was used in 1 study (Tang & Tse, 2014)

3.4.2 Massage technique

Only 1 study of 10 reviewed massage methods (Wu et al 2014). Massage was done with several techniques such as massage (efflurage), rubbing (friction), kneaded (petrissage) and vibration.

3.5 Dosage

The dosage of aromatherapy intervention was relatively varied from 1 until 12 times. A single-dose aromatherapy intervention study was conducted on 5 studies that showed the most use in the study of Ziyaeifard et al 2017, Karaman et al 2016, Ni et al 2013; Franko et al 2016 and Hozumi et al 2017. Dosage of intervention 2 times in the study of Bikmoradi et al, 2015. 3 times dosage set in the research of Cho et al 2013. Dosage of at least 4 times (Tang & Tse et al 2014). 8 times dosage (Wu et al 2014) and 12 times dosage in the study (Soto Vasques et al 2016).

3.6 Duration

3.6.1 Duration of Aromatherapy Action

The duration of giving aromatherapy varies from the shortest time of 5 minutes and the longest 40 minutes. Of the 10 studies reviewed, the duration of the most used is 30 minutes. Thirty minutes were the time of aromatherapy defined by 3 studies (Soto

vasques et al., 2016; Cho et al, 2013; Ni et al 2013). Two studies set the time for 20 minutes and 2 other studies set a time of 5 minutes. One study 40 minutes and the other one study set time of 10 minutes. One study (Hozumi, 2017) did not provide time limits of minutes, since interventions were given during colonoscopy action.

3.6.2 Duration of Research Intervention

The shortest duration of hours were conducted in 5 studies (Ziyaeifard et al. 2016; Karaman et al. 2016; Ni et al. 2013; Franco 2016; Hozumi et al. 2017). 2 days (Cho et al. 2013), 3 days (Bikmoradi et al. 2015), 2 weeks (Soto-Vasques & Alvarado-García 2017). The longest duration intervention was 4 weeks (Tang & Tse 2014; Wu et al. 2014).

4 DISCUSSIONS

Aromatherapy is claimed to be beneficial for mental, psychological, spiritual, and social aspects, although the quantity is less quantifiable. Aromatherapy is relatively free from the side effects compared to conventional medicine (Lee et al. 2011). No complaints about side effects of aromatherapy were reported in 361 respondents (Hozumi et al. 2017).

Essential oil is used in therapeutic, cosmetic, aromatic, fragrance / perfume, and spiritual use. Aromatherapy uses essential oil as a major therapeutic agent that is said to have a high concentration of substance that has been extracted from flowers, leaves, stems, fruits and roots and filtered from the resin (Ali et al. 2015).

4.1 The Comparison of Aromatherapy Types and Methods

The most widely used aromatherapy ingredient in reducing anxiety and depression is Lavender (*Lavandula Angustifolia*). In this systematic review of 8 studies using lavender, 4 of them are pure lavender and 4 other studies combine lavender with other ingredients such as bergamot essential oil, jojoba, citrus, osmantus and grape fruit by 4 studies. 7 of 8 lavender studies showed statistically that lavender can significantly decrease anxiety levels.

Lavender essential oil contains linalool and linalyl acetate. Linalool showed sedative effects and linalyl acetate showed a narcotic effect (Ali et al. 2015). Both effect cause lavender is widely used to overcome anxiety, sleep pattern disorders and improve mood.

Buckle (1998) suggests the use of lavender (*lavandula angustifolia*) for relaxation by inhalation or topical methods. Lavender has 3 species that have different effects of *lavandula angustifolia* effect relaxant, *lavandula latifolia* effect the opposite of stimulants and *lavandula stoechas* are neurotoxic, so need to be careful with recognizing and determining the type of lavender especially if the process itself (Buckle 1998).

Conflicting findings the effects of lavender on anxiety reduction was found in (Hozumi et al. 2017). This study was compared the effectiveness of 3 essential oil ingredients of olive, grape and lavender flowers. The result showed that olive oil and grapes significantly lower anxiety rather than lavender oil.

There are various methods used to benefit from aromatherapy with small doses for instance by inhalation, massage, applied to the skin surface and very rarely to used directly inserted into the internal body (Ali et al. 2015).

Inhalation methods is widely selected because of the pathways are relatively safe from possible allergies over the topical path (massage) or drunk (Ali et al. 2015). In terms of practicality, dropped way is very simple and easy to apply because without used a special tool. The evaporation method is chosen because of it volatile essential oil properties especially when exposed to extreme temperatures or by heating (Ali et al. 2015). The use of oxygen masks further maximize the quantity of essential oils that is inhaled in breath directly (Bikmoradi et al. 2015; Franco 2016). The method of spraying the scent is used for reasons of convenience to the user at home (community setting), as the respondent is the elderly (over 65 years) with the possibility of deterioration of various body functions (Tang & Tse 2014).

Only 1 out of 10 studies were reviewed using the massage method. Massage method is used because it is believed to increase lymphocyte and brain development, thus improving immunity and brain function (Wu et al. 2014). Massage was done with several techniques such as massage (efflorage), rubbing (friction), kneaded (petrissage) and vibration (Wu et al. 2014).

4.2 The Comparison of Aromatherapy Dose and Duration

Effective aromatherapy should be given only with recommended dosage, in order to produce maximum effect for the treatment of anxiety, fear and panic (Butje et al. 2008) recommend the using 5 drops of Lavender, 5 drops of Sandalwood or 2 drops of

bargamot by inhalation with doses several times a day when anxiety happens.

From 4 studies using lavender, 3 research were used 2% lavender with dose as much as 2 drops, while the one other study using dose of lavender 5 drops. The dosing also varies from 1 to 12 interventions per respondent.

The duration used varied from 5 minutes to 40 minutes per intervention with the most used average was 30 minutes in 3 studies. Duration of study intervention was varying, the fastest in a few hours to the longest 4 weeks. The study intervention duration was influenced by place setting or nursing area, the type of client's illness or medical treatment.

5 CONCLUSION

The result of aromatherapy research indicate that aromatherapy with lavender or it is combination can decrease patients anxiety in various treatment settings. Aromatherapy is a safe, cheap and easy modality in managing client anxiety levels.

Generally recommend the use of lavender aromatherapy (*lavandula angustifolia*) intervention through inhalation method of 2 drops dose within 30 minutes to reduce client anxiety effectively.

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