

## Effect of aromatherapy on anxiety and pain in patients undergoing cholecystectomy

Elaheh Seyyed-Rasooli<sup>1</sup>, Mahmood-Reza Amiri<sup>2</sup>, Vahid Zamanzadeh<sup>1</sup>,  
Kobra Peron<sup>1</sup>, Mahdi Aghakeshizadeh<sup>3\*</sup>

<sup>1</sup>Nursing Dept., Tabriz University of Medical Sciences, Tabriz, I.R. Iran;

<sup>2</sup>General Surgery, Tabriz University of Medical Sciences, Tabriz, I.R. Iran;

<sup>3</sup>Student Research Center, Tabriz University of Medical Sciences, Tabriz, I.R. Iran.

Received: 5/Aug/2014 Accepted: 16/Dec/2014

### ABSTRACT

**Background and aims:** Aromatherapy means application of concentrated essences from different types of plants (such as flowers) for treatment of different types of diseases. Aromatherapy works for stress, anxiety, psychosomatic problems, muscular and rheumatic pains, gastrointestinal problems, menopause and postpartum depression. The present study aimed to study the effect of aromatherapy on anxiety and pain in patients undergoing cholecystectomy.

**Methods:** This is a single-blinded clinical trial study which was conducted with participation of 60 patients undergoing cholecystectomy in Sina Treatment Center, Tabriz, Iran in 2012-2013. The patients were randomly assigned using table of random numbers. In intervention group, the patients inhaled 10 drops of rose water with 12% concentration for three minutes 8 and 16 hours after surgery. For control group, routine care continued in the ward. The data were analyzed by SPSS using descriptive statistics and inferential statistics, one-way ANOVA and post hoc Tukey's test).

**Results:** Comparison of changes in pain and anxiety scores between the two group indicated that the developed changes in pain and anxiety level (mean relief of pain and anxiety 8 and 16 hours after surgery) in the aromatherapy group was significantly different from the control group ( $P < 0.001$ ) and the level of relief of pain and anxiety was higher in aromatherapy group than the control group 8 and 16 hours after surgery ( $P < 0.001$ ).

**Conclusion:** The findings indicated the positive effect of rose water-mediated aromatherapy on relief of pain and anxiety in patients 8 and 16 hours after surgery. Aromatherapy could be used as a cheap, noninvasive, complication-free, and non-pharmacologic nursing care.

**Keywords:** Anxiety, Pain, Aromatherapy, General surgery.

### INTRODUCTION

Complementary and alternative medical treatments comprise activities and beliefs which patients apply alongside conventional treatments to prevent and/or cure diseases.<sup>1</sup> Application rate of at least one of complementary

medical treatments varies in different countries.<sup>2</sup>

The need for standardization of complementary medicine is essential because demand for complementary medicine

\*Corresponding author: Student Research Center, Tabriz University of Medical Sciences, Tabriz, Iran, Tel: 00989381926214, E-mail: mehdi3750@yahoo.com

application is growing.<sup>3</sup> Since the approaches of complementary medicine are effective, cheap, low risk, and noninvasive and do not need adherence to specific timing and use of expensive equipment, nurses can implement them easily alongside other nursing care.<sup>4</sup>

Aromatherapy means application of concentrated essences from different types of plants (such as flowers) for treatment of different types of diseases. Aromatherapy works for stress, anxiety, psychosomatic problems, muscular and rheumatic pains, gastrointestinal problems, menopause and postpartum depression.<sup>5</sup>

Pain and anxiety are considered as important issues in postsurgical care.<sup>6</sup> Relief of pain and anxiety not only influences patients' satisfaction, but also is accompanied with manifestations on body organs through affecting most physiological systems of the body directly.<sup>7</sup>

Use of mental and cognitive non pharmacologic approaches like aromatherapy relieves painful activities-associated pain and anxiety effectively.<sup>8</sup> Aromatherapy has been studied in different works.<sup>5, 9-11</sup>

Since inconsistent findings have been obtained, more efficacious and easier approaches are needed, and this area should be further explored, we aim to study the effect of aromatherapy on anxiety and pain in patients undergoing cholecystectomy while eliminating the limitations of previous works.

## METHODS

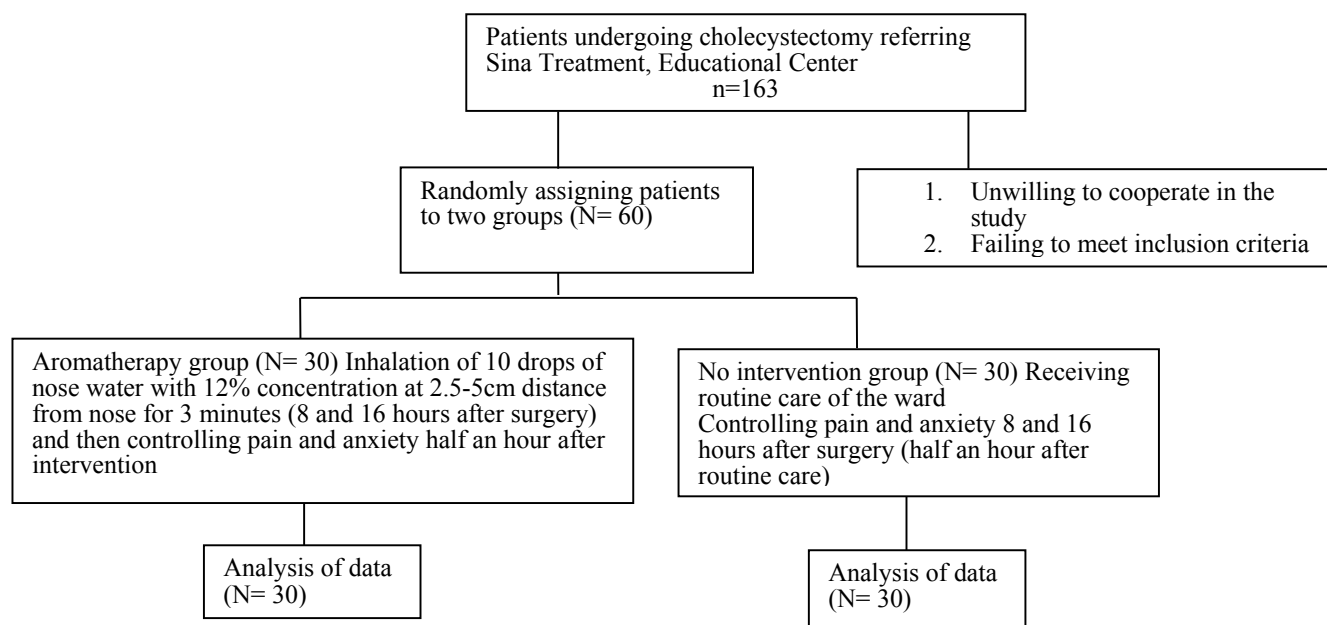
This is a randomized, single-blinded clinical trial study in which the data collector was an individual other than the researcher, who was unaware of the study objectives. This study (with registry no. IRCT201212186918N15) was initiated with participation of the patients undergoing cholecystectomy after Ethics

Committee approval of Tabriz University of Medical Sciences was obtained.

Selection and assignment of the patients into aromatherapy and control groups were done randomly using table of random numbers (RAS). The inclusion criteria included: the age of 15-55 years, undergoing cholecystectomy and conduction of surgery by the same surgeon and exclusion criteria included: administration of anti-anxiety drugs and herbal remedies, drug addiction (by the patient testimony), having any vision or hearing problems and surgery-related complications.

Sampling was done from December, 2013 to March, 2014 in Sina Treatment Center, Tabriz, Iran. To calculate sample size, a pilot study was done on 20 patients undergoing cholecystectomy, considering  $\alpha= 0.05$  and power= 0.9, and the mean  $\pm$  SD of the difference before and after intervention (for anxiety 5.50 $\pm$ 2.99 and 7.70 $\pm$ 2.50 in respectively aromatherapy and control groups) and the sample size was determined as 25 individuals for each group. With regard to the possibility of samples dropout, 30 individuals were assigned for each group and hence totally 60 patients were enrolled. Figure 1 depicts how the clinical trial was conducted.

Within the first session, after the research objectives were explained and written consent was obtained from the patients, intervention was initiated. Firstly, the baseline anxiety of the patients in the two group of study was measured at 9 o'clock p.m. and before surgery using a visual analog scale (VAS) by the researcher. In the aromatherapy group, 10 drops of water rose with 12% concentration (Darrin Golab Co., Kashan, Exploitation license no. Issued by the Ministry of Health: 5333) were dropped on the palms of the patient by the researcher using an eyedropper and the patient was recommended to inhale the smell for three minutes after the palms were rubbed together and while the hands were 2.5 to 5 cm distant from the nose.



**Figure 1:** Process of the study

Then, pain and anxiety of the patients were measured 8 and 16 hours after surgery using VAS while at least three hours had passed since they received parenteral analgesics for the last time. For the control group, routine care continued in the ward.

The instrument for data collection in this study was a questionnaire that included demographic characteristics (age, gender, history of surgery, occupation, marital status, anesthesia, education, income, insurance status, etc).

To determine the level of anxiety and pain in the patients, VAS was used. This scale includes a line of 10 cm long. One side of the line represents no pain and anxiety and the other represents severe pain and anxiety.

After data gathering, data analysis was done by SPSS 13 (Chicago, IL, USA) using descriptive statistics (frequency, percent, mean and standard deviation) and inferential statistics (one-way ANOVA and post hoc Tukey's test).  $P < 0.05$  was considered as the level of significance.

Through studying authentic textbook and articles, we selected the preliminary instrument of data gathering. Then, content validity was used for ensuring scientific validity. For this, 10 faculty members of Nursing and Midwifery Faculty of Tabriz University of Medical Sciences were asked to review the instrument and offer their corrections and recommendations. Finally, the instrument of data gathering was validated in view of the comments and with confirmation of the advisor and supervisor.

## RESULTS

In this study, 60 patients undergoing cholecystectomy were enrolled, of whom 30 (50%) were assigned to control group and the rest to aromatherapy group. Table 1 shows some socio demographic characteristics of the studied patients in aromatherapy and control groups. ANOVA and chi-square indicated that the two aromatherapy and control groups are homogeneous in terms of all characteristics ( $P < 0.05$ ).

The variations caused in pain and anxiety (mean decrease in pain and anxiety 8 hours after surgery) in aromatherapy group were significantly different from those in the control group ( $P < 0.001$ ) and the decrease in pain and anxiety 8 hours after surgery was higher in aromatherapy group than control group, which could indicate the positive effect of aromatherapy on decrease in pain and anxiety 8 hours after surgery.

The variations caused in pain and anxiety (mean decrease in pain and anxiety 16 hours after surgery) in aromatherapy group were significantly different from those in the control group ( $P < 0.001$ ) and the decrease in pain and anxiety 16 hours after surgery was higher in aromatherapy group than control group, which could indicate the positive effect of aromatherapy on decrease in pain and anxiety 16 hours after surgery.

**Table 1:** Comparison of sociodemographic characteristics of the studied patients in aromatherapy and control groups

Variable	Levels of variable	Aromatherapy n (%)	Control n (%)	Statistical test
Gender	Male	16 (16.3)	18 (16.3)	P= 0.26
	Female	14 (13.7)	12 (13.7)	X= 0.73
Marital Status	Single	1(3)	2(3)	P= 0.11
	Married	29 (26.7)	28 (26.7)	X= 7.44
	Divorced	0 (0.3)	0 (0.3)	
Educational level	Illiterate	4 (4)	5(4)	
	Elementary	3 (4.7)	7 (4.7)	P= 0.43
	Guidance	4 (7)	9(7)	X= 7.97
	High school	11(8)	5(8)	
Occupation	University	8 (6.3)	4 (6.3)	
	Jobless	0 (0.3)	0 (0.3)	
	Labourer	1 (1.7)	3 (1.7)	P= 0.77
	Housekeeper	10 (8.7)	7 (8.7)	X= 9.77
	Working at home	3 (4.7)	6 (4.7)	
	Working outside home	4(4)	4(4)	
	Non-public job	5(6)	7(6)	
	Employee	6 (3.3)	1 (3.3)	
Income	Retired	1 (1.3)	2 (1.3)	
	Income and expenditure equal	18 (7.7)	16 (7.7)	P= 0.91
	Income exceeding expenditure	3 (3.7)	4 (3.7)	X= 0.98
	Income less than expenditure	9 (8.7)	10 (8.7)	
Insurance coverage	Yes	22(17)	13(17)	P= 0.05
	No	8(13)	17(13)	X= 5.70
Hospitalization	Yes	15(16)	15(16)	P= .66
	No	15(14)	15(14)	X= 0.80
Type of anaesthesia	Spinal	10 (10.3)	10 (10.3)	P= 0.95
	General	20 (19.7)	20 (19.7)	X= 0.09
Age (years)	Mean	45.3	45.5667	ANOVA
	Standard deviation	6.07	7.54	P= 0.26
	Confidence interval	(43.03 and 47.57)	(42.75 and 48.38)	F=1.34

**Table 2:** Comparison of variations in the level of pain and anxiety (prior to intervention and 8 hours after surgery) in aromatherapy and control groups by ANOVA and intergroup comparison (by post hoc Tukey's test)

ANOVA results				Post hoc Tukey results		
Variable	Group	Mean variations	Statistical test	Group/group	Control	Aromatherapy
Pain	Control	0.8333	P< 0.001	Control	0 *	2.23 *
	Aromatherapy	3.07	D1=2 D2=87 F=59.14	Aromatherapy	1 ** 2.23 *	0.00 ** 0 *
Anxiety	Control	0.6333	P< 0.001	Control	< 0.001** 0 *	1 ** 2.47 *
	Aromatherapy	3.1	D1=2 D2= 87 F=49.47	Aromatherapy	1 ** 2.47 *	0.00 ** 0 *

\* Difference in mean variations between two groups, \*\* P value

**Table 3:** Comparison of variations in the level of pain and anxiety (prior to intervention and 16 hours after surgery) in aromatherapy and control groups by ANOVA and inter-group comparison (by post hoc Tukey's test)

ANOVA results				Post hoc Tukey results		
Variable	Group	Mean variations	Statistical test	Group/group	Control	Aromatherapy
Pain	Control	1.53	P< 0.001	Control	0 *	4.83 *
	Aromatherapy	6.36	D1=2 D2=87 F=235.12	Aromatherapy	1 ** 4.83 *	< 0.001** 0 *
Anxiety	Control	0.76	P< 0.001	Control	< 0.001** 0 *	1 ** 4.93 *
	Aromatherapy	5.7	D1=2 D2=87 F=125.01	Aromatherapy	1 ** 4.93 *	< 0.001** 0 *

\* Difference in mean variations between two groups, \*\* P value

## DISCUSSION

Use of antianxiety and analgesic drugs is not effective for all patients undergoing general surgery. In addition, they cause unwanted side effects frequently and also increase in treatment costs.<sup>12</sup> The research has indicated that use of mental and cognitive non pharmacologic approaches like aromatherapy alongside pharmacologic ones effectively relieved pain and anxiety caused by invasive and painful practices.<sup>8</sup>

In a study, the students were randomly assigned to two case and control groups and examined for anxiety and depression. The

blend of lavender and rose essences was inhaled by case group half an hour per day for four weeks while control group inhaled sesame essence alone. That study indicated that the students receiving inhaled aromatherapy exhibited a significant decrease in symptoms of anxiety and depression at the end of second and fourth weeks in comparison to pretest and control group (P=0.001),<sup>5</sup> which is consistent with the present study.

A systematic review article indicated that aromatherapy had a mild and transient

antianxiety effect and reported aromatherapy effect on anxiety and pain as controversial and unreliable due to lack of accurate measurement and small sample size,<sup>13</sup> which is consistent with the present study.

A clinical trial study examined the effect of lavender essence and lavender perfume (with no sedative property), administered in three stages, on relief of cesarean-derived pain and measured the pain before and after intervention using VAS. In all stages, pain relief was significantly higher in the patients receiving lavender essence-mediated aromatherapy than in the controls. Also, the patients in intervention group reported a significantly higher satisfaction with the treatment.<sup>14</sup> This confirms the present study findings.

In a study, the effect of aromatherapy was investigated on post-breast biopsy surgery in 50 patients. After surgery, intervention group received oxygen and two drops of lavender 2% using face mask and control group received oxygen alone using mask. The examined variables were need for sedatives in intensive care unit and satisfaction (5, 30, and 60 minutes after surgery). The findings indicated no statistically significant difference in post-surgery pain, the need for sedatives, and the time of discharge from recovery room between the groups and only satisfaction was reported higher in intervention group than in control group.<sup>10</sup> These findings are not consistent with the present study, which could be explained by smaller sample size, methodology, the type of surgery, and the approach to assessing the patients.

## CONCLUSION

The findings of the present study indicate that the implementation of aromatherapy could lead to relief of pain and anxiety in the patients undergoing

cholecystectomy. The level of pain and anxiety relief after surgery was higher in aromatherapy group than in control group. Therefore, non-pharmacologic approaches to relieving pain and anxiety including aromatherapy which require no specific timing and expensive equipment could be used in the plans for managing pain and anxiety in the patients undergoing general surgery.

## CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

## ACKNOWLEDGEMENT

Hereby, we gratefully thank Research and Technology Deputy of Tabriz University of Medical Sciences for approving and funding this research and staff of Sina Treatment, Teaching Center of Tabriz, all participating patients, Student Research Center of Nursing and Midwifery Faculty of Tabriz University of Medical Sciences and officials of Darrin Golab Pharmaceutical Company, Kashan.

## REFERENCES

1. Fisher P, Ward A. Complementary medicine in Europe. *BMJ*. 1994; 309(6947):107-11.
2. Schraub S. Unproven methods in cancer: a worldwide problem. *Support Care Cancer*. 2000; 8(1):5-10.
3. Schimpff SC. Complementary medicine. *Curr Opin Oncol*. 1997; 9(4):327-31.
4. Li CY, Chen SC, Li CY, Gau ML, Huang CM. Randomised controlled trial of the effectiveness of using foot reflexology to improve quality of sleep amongst Taiwanese postpartum women. *Midwifery*. 2011; 27(2):181-6.

6. Sahebalzamin M, Khanavi M, Alvi majd H, Mirkarimi S, Karimi M. Effects of inhalation aromatherapy on female students' anxiety and depression settling in dormitory of Tehran University of Medical Sciences. *J Islamic Azad Univ Tehran Branch*. 2010; 2(3):175-181.
7. Wilmore DW, Harken AH, Brennan MF. *ACS surgery*. USA: Webmd Scientific American Medicine Pub; 2007.
8. Patel JM, Lanzafame RJ, Williams JS, Mullen BV, Hinshaw JR. The effect of incisional infiltration of bupivacaine hydrochloride upon pulmonary functions, atelectasis and narcotic need following elective cholecystectomy. *Surg Gynecol Obstet*. 1983; 157(4): 338-40.
9. Song RH, Kim DH. The effects of foot reflexion massage on sleep disturbance, depression disorder, and the physiological index of the elderly. *Taehan Kanho Hakhoe Chi*. 2006; 36(1):15-24.
10. Good M, Anderson GC, Ahn S, Cong X, Stanton-Hicks M. Relaxation and music reduce pain following intestinal surgery. *Res Nurs Health*. 2005; 28(3):240-51.
11. Phipps MA, Carroll DL, Tsiantoulas A. Music as a therapeutic intervention on an inpatient neuroscience unit. *Complement Ther Clin Pract*. 2010; 16(3):138-42.
12. Cooke B, Ernest E. Aromatherapy: a systematic review. *Br J Gen Pract*. 2000; 50(455): 493–96.
13. Wheeler M, Oderda GM, Ashburn MA, Lipman AG. Adverse events associated with postoperative opioid analgesia: a systematic review. *J Pain*. 2002; 3(3):159-80.
14. Cooke B, Ernst E. Aromatherapy: a systematic review. *Br J Gen Pract*. 2000; 50(455):493-6.
15. Sobhani AR, Sharami H, Orang Pour R, Shokohi F, Oodi M. The effect of Lavendula essence on post cesarean pain relief. *J Guilan Univ Med Sci*. 2007; 16 (62): 80-86.

**How to cite the article:** Seyyed-Rasooli E, Amiri MR, Zamanzadeh V, Peron K, Aghakeshizadeh M. Effect of aromatherapy on anxiety and pain in patients undergoing cholecystectomy. *Adv Herb Med*. 2014; 1(1): 1-7.