

## ORIGINAL ARTICLE

## IMPACT OF AROMATHERAPY ON POST-OPERATIVE DEPRESSION IN PATIENTS UNDERGONE CORONARY ARTERY BYPASS GRAFT SURGERY

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**Objectives:** The objective of the current study was to compare the effect of aromatherapy with lavender and damask rose on depression in patients after coronary artery bypass graft surgery (CABG).

**Methodology:** In this randomized clinical trial study, 97 patients undergoing CABG were randomly assigned to interventions or control groups. This study was performed in Guilan province during 2017-2018. The intervention groups were further divided into two groups of lavender and damask rose. These patients randomly before bedtime, at night from 9.00 p.m. to 11:00 p.m., for five nights. The control group got routine nursing care in consistency with the hospital procedure. The data were achieved through demographic- clinical and Beck Depression inventory questionnaires.

**Results:** During the five-night intervention period, showed that the overall mean of depression of lavender, damask rose and control groups before the intervention were 32.5, 20.47, and 26.48, respectively, and after the intervention were 29.92, 18.66, and 25.42, respectively. The mean score of depression after intervention did not differ significantly between the three groups (p-value=0.47). The results showed that the comparison of the mean score of depression in both groups of damask rose and lavender before and after the intervention was significantly different (p-value=0.05 and p-value=0.000 respectively).

**Conclusion:** Aromatherapy with damask rose essential oil and lavender had a positive effect on relieving postoperative depressive symptoms. However, no superiority was found between the two intervention groups in terms of effectiveness.

**Keywords:** coronary artery bypass, surgery, aromatherapy, depression

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### INTRODUCTION

Coronary artery bypass graft (CABG) and revascularization are among the treatments patients suffering from multivessel disease leads to the decrease of long-term mortality, incidence of myocardial infarction.<sup>1</sup> Depressive symptoms happen in 25% of patients after CABG and predict cardiovascular morbidity.<sup>2</sup>

During the recent years, some antidepressants and selective serotonin-norepinephrine reuptake inhibitors have been regarded as effective drugs in treating major depression.<sup>3,4</sup> Nevertheless, such drugs cause side effects in these patients including digestive problems, neurological and cardiovascular disorders, and sexual dysfunction.<sup>5</sup>

Therefore, due to the increasing number of patients with depression, researchers turned their attention to non-pharmacological treatments such as complementary and alternative therapies.<sup>6,7</sup>

Aromatherapy is one of these treatments that can be mentioned. This treatment is a cheap and non-invasive method and improves mental health in people with psychiatric disorders. The medicinal effects of this essential oil are commonly used however it remains unknown.<sup>8</sup>

Another plant that is effective in aromatherapy is damask rose (*Rosa Damascena*),<sup>9</sup> which has anti-depression effects with two substances of citronella and 2-phenylethyl alcohol and This fragrance is based on the central nervous system effect improves neurological stress and tension and sedative anti-depression.<sup>10,11</sup>

Regarding to non-pharmacological methods can be used for recovery process in patients after surgery. As for depression improving is very common among patients with heart diseases, and according to the controversial results of research in order to find effective and safe non-pharmaceutical methods and reducing the cost of treatment. Therefore, this

investigation was purposed to compare the efficacy of damask rose and lavender on the depression of subjects after CABG. These two fragrances may be used as alternatives or complementary therapies for the promotion of the depression in these patients.<sup>12</sup>

## METHODOLOGY

This randomized clinical trial was conducted in three groups, the first group was based on aromatherapy with lavender, the second group was based on aromatherapy with damask rose, and the third group was hospitalized in the surgical wards of Rasht Specialized Heart Hospital, without intervention after open heart surgery.

Inclusion criteria were being diagnosed with: age 65 years or less than, patient's tendency to participate in the study, Non-use of antidepressants and narcotic drugs, talking to patients in Persian, having clear verbal ability, having no history of known psychological diseases, having no history of allergic rhinitis and other respiratory and sinusitis problems, having no history of systemic or chronic diseases affecting the sense of smell or hearing and relying on the lack of drugs and sedatives usage. In this study, the researcher could not match the samples based on sex, because that CABG is more successful in men rather than women. As far as possible, the same conditions for patient care, control of light, sound, and entry into the desired sections were provided. Since the nature of the interventions limited the possibility of implementation in a common room environment, the decision was that the rooms were randomized based on 6 random blocks and to eliminate Probable confusion, the randomization of rooms was changed in three steps and the intervention were performed in eligible patients in each room. The number of samples required in the groups, based on the results reported in Najafi et al.<sup>13</sup> assuming  $\alpha = 0.05$ ,  $\beta = 0.20$ , and considering 20% correction for missing data and correcting the number of samples relative to the number of comparisons in the three groups, at least 30 samples in each study group were estimated. Of 112 patients were enrolled about the trial; five patients didn't meet inclusion criteria; ten patients did not want to participate; and 97 patients were randomly allocated to aromatherapy. These patients were divided into three groups. Of which, 34 patients under the aromatherapy of lavender, 32 patients under the aromatherapy of damask rose and 31 patients were examined as controls. The flowchart of the patients included in the study is shown in Figure 1.

At first, a written consciously satisfaction form was taken from the patients and explained to the individual for the method of implementation and interventions but before entering the study, the individual did not

know the type of his intervention. Before intervention in literate individuals, Beck Depression Inventory was completed by the patient himself, and was completed by the researcher in illiterate people.

The essence of lavender and damask rose has been licensed by the Ministry of Health and was provided with Barij essence from Kashan. Mixtures of essence of damask rose was (Citronellol, Nerol, Geranolol, phenethylalcohol) and Mixtures of essence of lavender was (Linalool acetate, Terpinin, Lavendilol acetate, Lavendolol, Alpha terpinolol). Subjects under the intervention of lavender and damask rose, Each night, at bedtime, during the 5 consecutive nights, at the time of 21-23, exposed to the inhalation of the lavender and damask rose that is sliced as much as three drops on a piece of cloth connected to the their pillow. The subjects were monitored in the department by a co-worker and his companion and night care nurse. Then on the morning of the sixth day, the researcher completed the Beck Depression Inventory questionnaire. In the control group, without any intervention, the morning of the day after entering the surgery department and the morning of the 6th day, the Beck Depression Inventory was completed.

For collecting data, two questionnaires were used: Clinical Information Questionnaire and the Beck Depression Inventory (BDI). BDI is a self-report questionnaire that generally includes 21 items related to different symptoms and the participants should respond based on a four-point scale from 0 to 3. Reliability and validity of this scale was assessed and reported good. The internal consistency of this scale is 0.7 and its retest reliability is 0.85.<sup>14</sup>

**Ethics:** The present study was approved by the Ethics and Research Committee of Guilan University of Medical Sciences, IR.GUMS.REC.1396.450 was registered at the Iranian Center for Clinical Trials with IRCT20180205038626N1 code.

**Statistics:** Mean  $\pm$  SD was used to report quantitative variables and number (%) was used to report qualitative variables. One-way ANCOVA, one-way ANOVA, paired t-test, and Chi-square tests at the significance level of 0.05 were used to analyze the data. To investigate the normality assumption, Kolmogorov-smirnov test and for investigate the homogeneity of variance assumption, Leven test was used. Data analysis was performed using SPSS-21 software.

## RESULTS

Of 112 patients after open heart surgery who met the entry conditions, 97 patients provided consent for participation in the study. Reasons for

nonparticipation included declined to participate (6 patients) and a dislike of the fragrances (7 patients). The 97 participants were randomly divided into 34 patients under the aromatherapy of lavender, 32 patients under the aromatherapy of damask rose and 31 patients for the control group. None of the participants withdrew their participation from the study after randomization (Figure 1).

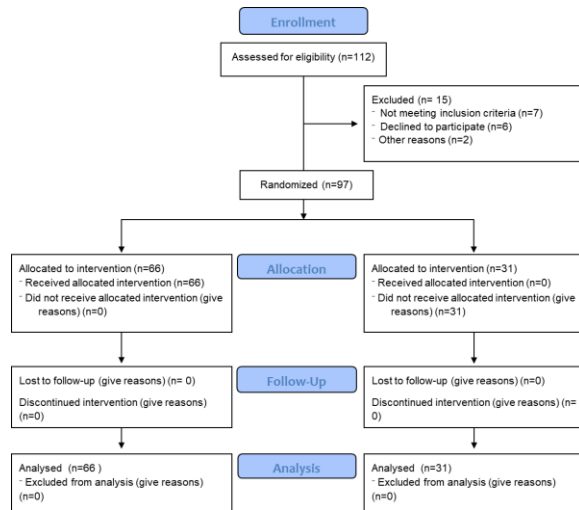


Figure 1. Consort flow diagram

In Table 1, the demographic information of the study participants was reported. In the lavender, damask rose and control groups, 41.2%, 34.4%, and 41.9% of the participants were female and 58.8%, 65.6%, and 58.1% were male respectively. The mean age of participants in the three groups of lavender, damask rose and control was 59.15, 61, and 60.13 years, respectively. Also, the overall mean of depression of lavender, damask rose and control groups before the intervention were 32.5, 20.47, and 26.48, respectively, and after the intervention were 29.92, 18.66, and 25.42, respectively.

Table 1: Demographic characteristics of study participants

	Group		
	Lavender Group	damask rose Group	Control Group
<b>Gender</b>			
Female	14(41.2%)	11(34.4%)	13(41.9%)
Male	20(58.8%)	21(65.6%)	18(58.1%)
<b>Age (years)</b>	59.15±8.08	61±8.69	60.13±9.76
<b>Marital status</b>			
Married	28(82.4%)	28(87.5%)	25(80.6%)
Single	6(17.6%)	4(12.5%)	6(19.4%)
<b>Education</b>			
Illiterate	12(35.3%)	18(56.3%)	15(48.4%)
Literate	22(64.7%)	14(43.7%)	16(51.6%)
<b>Hypertension</b>			
Yes	26(76.5%)	25(78.1%)	27(87.1%)

No	8(23.5%)	7(21.9%)	4(12.9%)
<b>Diabetes Mellitus</b>			
Yes	19(55.9%)	14(43.8%)	14(45.2%)
No	15(44.1%)	18(56.3%)	17(54.8%)
<b>Hyperlipidemia</b>			
Yes	12(35.3%)	13(40.6%)	12(38.7%)
No	22(64.7%)	19(59.4%)	19(61.3%)
<b>Tiroeid</b>			
Yes	1(2.9%)	1(3.1%)	2(6.5%)
No	33(97.1%)	31(96.9%)	29(93.5%)
<b>Others</b>			
Yes	1(2.9%)	5(15.6%)	1(3.2%)
No	33(97.1%)	27(84.4%)	30(96.8%)
<b>Overall Result BDI</b>			
Before Intervention	32.53±9.27	20.47±6.73	26.48±7.53
After Intervention	29.92±9.4	18.66±8.91	25.42±7.58

In Table 2, the Mean ± SD depression score of the study participants before and after the intervention in the three groups, separately for men and women was reported. According to the reported values, the mean score of depression after the intervention was less than before the intervention (Except for the control group). Also, the change in the mean score of depression in both groups of damask rose and lavender in the group of females was more than males (5.5 and 4.14 in women and 3 and 1.55 in men, respectively). Also in this table, the mean of lavender and damask rose groups before and after the intervention using Paired sample t-test method, by gender and in general is compared. There was a significant difference between the two groups before and after the intervention in all cases (P-value < 0.05).

Table 2: The depression score in three groups separately for gender

Group	Depression Score After Intervention	Depression Score Before Intervention	P-value
<b>Female</b>			
Damask rose (11)	17.09±8.89	22.63±7.42	<0.001
Lavender (14)	27.5±8.51	31.64±8.22	<0.001
Control (13)	23.38±6.21	23.85±5.18	-
<b>Male</b>			
Damask rose (21)	16.86±8.59	19.86±6.46	<0.001
Lavender (20)	31.6±9.83	33.15±10.1	<0.001
Control (18)	26.89±8.29	26.55±8.85	-
<b>Overall</b>			
Damask rose (32)	18.66±8.91	20.47±6.74	0.09
Lavender (34)	29.91±9.4	32.53±9.27	<0.001
Control (31)	25.42±7.58	26.48±7.53	-

In comparison of the mean score of depression in the three groups after the intervention with adjustment of the depression score before the intervention (one-way ANCOVA) in the three groups, was reported at a significant level of 0.05. The results of the one-way

ANCOVA showed that the mean score of depression after intervention did not differ significantly between the three groups ( $p$ -value=0.47).

## DISCUSSION

Aromatherapy is among the complementary and integrated methods extensively used in many countries and is part of comprehensive nursing care. Though several studies have indicated the healing characteristics of the two fragrances of lavender and Damask rose on various diseases, while the comparison of these two fragrances was less.<sup>15</sup> That is why the researchers were searching for the comparison of the impact of Lavender and damask rose on the depression of subjects after CABG. Based on the findings, a significant difference was found between the three groups in terms of change in depression after the intervention.

In addition, Ali Tayebi et al., showed that depression and stress among hemodialysis patients decreased by aromatherapy with lavender essential oil.<sup>5</sup> Thus, this method can be applied as a substitute method to enhance the quality of life in such patients. However, the results of another study are contrary to the present study. In this study, the inhalation aromatherapy was used on patients who went under radiotherapy using lavender, bergamot, and cedar wood essential oils. Finally, he found inhalation aromatherapy to be non-effective in the decrease of anxiety and depression among the patients undergoing radiotherapy. As a result, it is recommended to conduct more studies in this area with more sample sizes and intervention periods.

In a study conducted by Alireza Kasra Dehkordi et al.<sup>12</sup> effectiveness of the damask rose aroma on the depression scores in hemodialysis patients was studied. In this way, the comparison of the mean scores in the two groups before and after the intervention indicated that the depression scores significantly reduced in the damask rose group after intervention, ( $P < 0.05$ ). Furthermore, Kianpour et al.<sup>16</sup> indicated that aromatherapy was effective in decreasing the risk of depression in females. Further, the findings of this study are consistent with the findings of previous studies.

The findings of present survey emphasize the significance of positive effects aromatherapy the progression of symptoms and severity of depression disorders so that using the findings of this research in health, medical and educational services can play an important role in advancing the goals of improving the health of patients. So, considering that providing scientific applications to a research is the most

important goal of doing research, solutions from the results of this investigation are presented in the field of clinical nursing services and nursing research services.

**Limitations:** One of the limitations of this study can be mentioned in the number of samples and the short duration of intervention. In this study, the intervention period was considered to be 5 nights in order to access the patient in the department and control the implementation of the intervention. It seems that according to the observed improvement in interventional groups, in future studies, to confirm the significance of the statistical effect of interventions, a longer period of interventions with more samples should be considered. Also, in future studies, the effect of type, concentration of consumed doses, and as well as the method of implementing the aromatherapy interventions on the effectiveness of these interventions can be considered. In addition, confounding factors such as successful surgery can also affect the outcome of research and should be considered in future studies.

## CONCLUSION

The Aromatherapy of lavender and damask rose has a positive effect on the control of depressive symptoms of the patients undergoing coronary artery bypass graft surgery but, there was no superiority between the two intervention groups in terms of impact.

## AUTHORS' CONTRIBUTION

JK, AES, and AS: Concept and design, data acquisition, interpretation, drafting, final approval, and agree to be accountable for all aspects of the work. AS, ZN, SSM, and ZA: Data acquisition, interpretation, drafting, final approval and agree to be accountable for all aspects of the work.

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