

## Investigating the Effect of Lavender Essential Oil on Sleep Quality in Patients Candidates for Angiography

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Inadequate sleep quality is one of the most common problems in patients admitted to Cardiac care units (CCUs). Therefore, this research aimed to investigate with the effect of lavender essential oil in sleep quality in candidates for angiography who were hospitalized in an CCU in Iran. This randomized clinical trial was conducted in 60 patients undergoing angiography who were hospitalized in the CCU of a hospital in Ilam City, Iran. Patients were randomly assigned 1:1 to either a case group or a control group (each group, n = 30). Data were collected using the St. Mary's Hospital Sleep Questionnaire, which was completed before and after the intervention. The case group received 15 drops of lavender essential oil 24 hours prior to angiography and every 8 hours thereafter; the control group received its previous routine care. After the intervention, the data were analyzed via descriptive and inferential statistical tests using SPSS statistical software v19. The demographic characteristics of the case and control groups were similar ( $P>0.05$ ). There was no statistically significant difference before the intervention in sleep quality between the case group and the control group ( $P>0.05$ ). Additionally, no statistically significant difference was observed in the case or the control group with respect to sleep quality before and after the intervention ( $P>0.05$ ). Due to the lack of effect shown by lavender essential oil in sleep quality, further studies should be conducted to the effects of lavender and other essential oils.

**Keywords:** Sleep Quality, Lavender, Angiography.

### INTRODUCTION

Inadequate quality of sleep, one of the most common problems in patients admitted to the critical care unit (CCU), also plays an important role on the health of patients with heart disease<sup>1</sup>. Sleep is necessary to maintain physical appearance, bolster energy levels, and ensure overall well-being; lack of sleep has a strong adverse impact on physical and mental functioning<sup>2</sup>. Sleep deprivation increases heart rate and elevates myocardial oxygen demand<sup>3</sup>. Furthermore, the results of recent studies have found a relationship between sleep disorders and cardiac events. The risk of myocardial

infarction in those with sleep disorders is greater, and insomnia is associated with increased incidence of ischemic heart disease<sup>4</sup>.

It is estimated that between 30% and 45% of the world's population experiences insomnia, a risk that increases with aging<sup>5</sup>. Certain diseases are known to reduce sleep quality<sup>6</sup>. Sleep-onset disorders are an independent risk factor in the development of cardiac events in men. In addition, there is a significant relationship between inadequate sleep and many clinical signs of coronary artery disease, including angina, hypertension, cardiac arrhythmias, respiratory

problems, risk of myocardial infarction, and sudden death<sup>7,8</sup>. Most patients who have been admitted to the CCU experience sleep disorders to varying degrees, particularly those who are undergoing angiography<sup>9</sup>. Various studies have demonstrated that patients in the CCU may be awake approximately 30% to 40% of the time during their expected sleeping hours<sup>10</sup>.

Results of previous studies have indicated that nursing care that incorporates appropriate precautionary measures could provide increased sleep quality. Some potential measures that have been considered include the use of nursing models and education by nurses<sup>11, 12</sup>, the use of relaxation<sup>13</sup>, a protocol including Quiet Time Protocol<sup>14</sup>, and the use of complementary medicine such as aromatherapy<sup>9, 15</sup>. The use of complementary & alternative medicines in nursing care is increasing, and aromatherapy is an example of such a treatment that is low-risk, easy, and affordable while being associated with a low rate of side effects<sup>15</sup>. Lavender, with the common scientific names of *Lavandula angustifolia* and *Lavandula stoechas*, belongs to the family Labiatae<sup>9, 16</sup>; it has sedative effects and is one of the commonly used aromas in aromatherapy.

Previous studies of the effects on sleep quality of aromatherapy with lavender include studies in patients with chronic insomnia<sup>17</sup>, patients undergoing hemodialysis<sup>16</sup>, in recovery of heart rate and sleep quality in middle-aged women<sup>18</sup>, and improvement of sleep quality in women hospitalized in the CCU<sup>9</sup>. Given the importance of sleep quality in patients who are candidates for angiography and hospitalized in the CCU, the present research aimed with investigate the effect lavender based on sleep quality in this group.

## MATERIALS AND METHODS

This clinical trial was conducted in 2015 in Ilam City, Iran. According to previous studies, 60 candidates for angiography were enrolled in the present research. A convenience sampling method was used, and patients were randomly assigned 1:1 to a case group (n=30) or a control group (n=30). The research was conducted in the CCU of Shahid Mostafa Khomeini Hospital in Ilam, Iran. The environmental and physical conditions were the same for all patients. In order to avoid the impact of environmental factors on sleep disorders, environmental uniformity was enforced, including

**Table 1: Demographic characteristics: Patients with Candidates for Angiography**

Variable	Group		P value
	Experimental Group	Control Group	
Gender			0.47
Male	17(56.7)	15(50)	
Female	13(43.3)	15(50)	
Education			0.85
illiterate	9(30)	9(30)	
Diploma and low literate	17(56.7)	16(53.3)	
Collegiate	4(13.3)	5(16.7)	
Income			0.16
Less than 500 thousand Rials	6(20)	9(30)	
500 to 1 million	19(63.3)	14(46.7)	
More than 1 million	5(16.7)	7(23.3)	
Marital status			0.27
Single	15(50)	12(40)	
Married	15(50)	18(60)	
Age(M&SD)	62.03(8.87)	59.23(9.22)	0.23

control of light, sound, and movement in the CCUs. In addition, the patients in case and control groups had no keep in touch.

Inclusion criteria were: within age range of 18 to 75 years; absence of neuropathy; absence of asthma or allergies; absence of severe pain as a cause of sleep disturbances; e"48 hours of hospitalization in CCU; no sedatives or analgesic drugs taken within 5 hours of bedtime. Patients were free of sleep disorders such as sleep apnea and chronic insomnia; psychological disorders or drug addiction; and a familial history of angioplasty in first-degree relatives. Exclusion criteria were the need for mechanical ventilation; the consumption of complementary medicine during the past week; the intake of sedative drugs during aromatherapy; the need for cardio-pulmonary resuscitation during the hospital stay; sleeping more than 2 hours during the day before the intervention; and unwillingness to participate in the study.

The St. Mary's Hospital Sleep Questionnaire (SMHSQ) was used in this study. This survey includes 11 question on sleep quality, agreement or disagreement with which are measured using a four-point Likert scale (1 = not at all and 4 = very much), with a score range of 11 to 44. Scores <11 indicated a lack of sleep disorders; a score of 12 to 22 indicated a low-level sleep disorder; 23 to 33 indicated moderate sleep disorder; and, finally, scores >34 indicated the presence of a severe sleep disorder<sup>15</sup>.

The present study was conducted with the approval of the University Deputy of Medical Sciences and of respected authorities of Shahid Mostafa Khomeini hospital. The questionnaire was completed using interviews by researchers that

were conducted at two times—before the intervention (48 hours after hospitalization of the patient in the ICU) and after intervention (on the morning of the day when the angiography was performed). Patients in the case group received lavender essential oil as aromatherapy, while the patients in the control group took placebo 3 times, in which the final administration was before sleep. For both groups, 15 drops that had the same shape and appearance (either of lavender or the placebo solution) were administered to patients<sup>15</sup>.

Ethical considerations in this research included approval of the research ethics committee of University of Medical Sciences in Ilam, explanation of the research objectives for patients, random assignment of the patients to the case or control groups, lack of imposing costs to the patient, compliance with the Declaration of Helsinki and the Belmont Report, and written informed consent to participate in the research. After the intervention, data were analyzed via descriptive and inferential statistical tests using SPSS statistical software, v19.

## Results

Result table 1 shows that there were no significant differences ( $P > .05$ ) in demographics between the control and the experimental group in Patients with Candidates for Angiography (Table 1).

In Result Table 2, the means and standard deviations (M&SD) are shown for sleep quality before and after the experiment. Statistical tests showed that the No differences ( $P > .05$ ). between the sleep quality control and the experimental group (Before and After experiment) in Patients with Candidates for Angiography.

**Table 2: Comparison of the mean and standard deviations (M&SD) of sleep quality before and after the intervention**

Outcome Measure	Group	Experimental Group		Control Group	
		Mean(SD)	P value	Mean(SD)	P value
Sleep Quality	Before	22.46(6.43)	0.87	23.73(7.26)	0.6
	After	22.93(4.54)		23.63(5.89)	

## DISCUSSION

The present study showed that lavender aromatherapy has no statistically significant effect on sleep quality in candidates for angiography hospitalized in the CCU. In the assessment of Lytle et al. of the effect of lavender essential oil in sleep quality patients in the CCU using the Richards-Campbell Sleep Questionnaire, the average sleep score in the intervention group was higher than in the control group and sleep quality improved, but the difference between the scores on the test scale were not statistically significant<sup>19</sup>. In addition, in the study of Borromeo et al. investigating the effect of lavender essential oil in sleep quality patients CCU unit, no significant difference was observed in the patients' sleep quality<sup>20</sup>, which is consistent with the results of this study based on the lack of effect of lavender essential oil on sleep quality. Various studies have investigated the effect of lavender essential oil on patients' sleep. The study of Chang et al. concluded that aromatherapy with a combination of lemon juice and lavender had no significant effect on sleep latency and increasing sleep duration for night shift nurses<sup>21</sup>. The study of Ghods et al. that assessed the impact of lavender essential oil on nurses' sleep quality similarly showed no significant effect<sup>22</sup>. Lee et al., in a study on the quality of sleep of mothers after birth, also found no significant effect with the use of lavender essential oil on the duration of sleep, the number of waking episodes at night, and maternal sleep satisfaction<sup>23</sup>, consistent with the results of this study.

On the other hand, the findings of other studies have indicated that aromatherapy could potentially be effective in improving sleep quality. Babaei et al. investigated the effect of Damask rose essential oil in the sleep quality of patients in

cardiac CCUs and showed a positive effect<sup>24</sup>. The results of Chien et al. indicated that lavender aromatherapy significantly decreased insomnia and number of waking episodes while increasing sleep duration in patients admitted to cardiac CCUs<sup>18</sup>. These results are inconsistent with those of the present study.

Potential limitations of this study include the psychological condition of patients and their pre-existing sleep habits. Patients with known psychological symptoms were excluded from the study, but one cannot exclude the potential that new psychological symptoms would emerge due to the presence of a stressful situation such as an CCU admission for angioplasty. These limitations will need to be controlled for in future studies.

## CONCLUSION

Due to the lack of effect of lavender essential oil on sleep quality in candidates for angiography who were hospitalized in an CCU, further studies are recommended to determine whether it is possible (as shown in some previous work) that such an effect exists. Other methods to improve sleep quality (effective nursing care models such as Continuous Care Model<sup>11</sup>; techniques such as Quiet Time Protocol<sup>14</sup> for restful sleeping time) should also be utilized.

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