

## Effectiveness of aromatherapy in reducing test anxiety among nursing students

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Test anxiety is an important factor that negatively affects nursing students' success during the education process. The objective of this study was to identify the effectiveness of aromatherapy in decreasing test anxiety levels in nursing students. This experimental trial study's sample consisted of 2<sup>nd</sup> year nursing students (n=154) at Faculty of Health Sciences, Atatürk University, in the 2013-2014 academic years. Personal information form and State-Trait Anxiety Inventory (STAI 1) were used to collect relevant data. Aromatherapy was applied by the inhalation method to the students in the experimental group during exam. As a result of the study, it was found that State-Trait Anxiety Inventory mean scores of the students in the experimental group was lower than the mean scores of the students in the control group, and the difference between the groups was statistically significant ( $p < 0.05$ ). It was determined that the lavender essential oil has effects on test anxiety. The results of this study can be integrated into education strategies for students who suffer from test-taking anxiety. The results of this study may guide the students and nursing educators to try lavender and other essential oils to reduce test-taking anxiety.

**Keywords:** Test-taking, Anxiety, Nursing students, Aromatherapy

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Test anxiety may be described as the inability to proceed with thoughts and remember in that exam unsuccessful to read the test content untroubled or understand the meaning of test questions<sup>1</sup>. Research has shown that there are two kinds of anxiety, trait anxiety and state anxiety, and that there is distinction between them<sup>2</sup>. Trait anxiety refers to a permanent personality and characteristic, while state anxiety refers to a temporary emotional condition<sup>3</sup>. Test anxiety is a kind of state anxiety, and is the experience of nuisance, concern, or fear before, during, or following a test and may result in worst performance<sup>4</sup>.

Various studies investigated the effectiveness of one of these alternatives, namely aromatherapy, in reducing psychological and physiological responses to a state anxiety situation<sup>5-6</sup>.

Test-taking anxiety effects the students' exam scores negatively. Literature reviews of the existing body of research implicate test anxiety as a potential blockade of students' academic success<sup>7,8</sup>. Test anxiety can be debilitating to any type of student,

regardless of what type of program in which they are registered. Nursing students often complain of and exhibit this particular concern for a number of reasons including the depth, breadth, and volume of material that is presented to them within a short period of time and their general educational investment. There is major importance of knowledge to remembering and using when taking the exam in nursing faculty. Therefore, nursing programs is resulting in high levels of test anxiety. This high-anxiety level may result to the high dropout of school ratios between students<sup>7,9</sup>. Because of this, achievement in nursing faculty can depend on stress management, particularly the stress involved with taking tests and examinations.

Aromatherapy is the medical use of essential oils that are obtained from plants<sup>10</sup>. Aromatherapy is used in various situations, such as stress, anxiety, depression, Alzheimer, epilepsy, memory and cognitive performance<sup>11-13</sup>. It has variety practices such as massage, baths, compress and inhalation. Inhalation aromatherapy is used many different essential oil, for instance lavender, rose, lemon and peppermint<sup>10</sup>. Lavender oil has been used curatively for centuries because of its soothing, sleep-inducing

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and anxiolytic effects<sup>14</sup>. Lavender essential oils are famous for its different uses but especially its psychological effects as an anti-anxiety remedy for moods of impatience, irritability, and panic<sup>15-17</sup>. Additionally, small clinical trials have explored the antidepressant effectiveness of lavender oil, showing that lavender oil used in aromatherapy has a favorable effect on mood and can condense relaxation as observed in the increased beta power in EEG activity and reducing workplace stress-related symptoms<sup>18,19</sup>. Moss *et al.*<sup>20</sup> reported that with the effectiveness of the lavender inhalation aromatherapy, there was important reduced in the level of anxiety of the students. While lavender have showed the ability to decrease all anxiety and stress and encourage vigilance and improved cognition, the effects of these essential oils on test-taking anxiety in nursing students very few have been studied<sup>21,22</sup>. So, this study aims to identify the effectiveness of aromatherapy in decreasing test anxiety levels in nursing students.

## Materials and methods

### Design and sample

This experimental trial study was made among nursing students of Faculty of Health Sciences, Ataturk University, in the 2013-2014 academic years.

The sample for this study consisted of second year nursing students (n=154) at Faculty of Health Sciences, Ataturk University, in the 2013-2014 academic years. The study population consisted of 91 students, who participated on a voluntary basis and have no health problem (asthma, fragrance allergy, rhinitis, upper respiratory tract infection, pregnancy, etc.) or a neurological-psychiatric problem. And, 13 students who want to participate in the study, but had a reaction in allergy test were excluded.

### Assignment

The students, who were the subjects in an exam day, were divided into experimental and control groups by odd and even numbers according to names list in the class. In the study, the groups were assigned to experimental and control groups by casting lots. At the end of the lot, odd numbered students were assigned to the experimental group, and even-numbered students were assigned to the control group. Prior to study, the students in the Department of Nursing were asked to answer "*In your opinion, what is the most difficult lecture you take?*" question; and, since most of the students (64.2%) indicated

"Internal Medicine Nursing" course, the study was conducted during an examination of Internal Medicine Nursing course, by considering that the test anxiety would be higher, since it's one of the main courses of students.

### Instruments

Personal information form (age, gender) and State-Trait Anxiety Inventory (STAI 1) were used to collect relevant data.

The STAI 1 had been development by Spielberg, Gorsuch and Lushene in 1970.<sup>23</sup> The STAI 1, which was used to identify the anxiety levels of the students and was translated into Turkish by Öner and Lecompte<sup>24</sup>. STAI 1 is consist of 20 items used to reflect the individual's state anxiety level. The individual is asked to describe how he or she feels or the strength of his or her feelings by marking one of the following elections in response to a given situation: (1) no, (2) a little, (3) quite, andn(4) completely. The higher total score indicates to a higher level of anxiety.

### Intervention

Aromatherapy was applied by the inhalation method to the students in the experimental group. In this study, lavender oil was preferred since it has both relaxing, anti-anxiety effects and has the least toxic and allergic effects among all the essential oils<sup>25</sup>. Lavender oil delivered by inhalation was found to increase attention and reduce anxiety, provide relaxation, and leads to a reduction in the physical parameters of autonomic nervous system such as pulse rate, respiratory rate and blood pressure<sup>26-29</sup>.

Participants in the experimental and the control groups were tested in the same types of classrooms that have the same size and physical features. Previous to the tests of the students in the experimental group, the exam hall was cleaned and ventilated properly. By considering the size of the exam hall and students' seating plan, non-absorbent cloth with 3 drops of lavender oils were placed on each desk as to leave a 15-20 cm distance from the noses of the students<sup>30,31</sup>. After the placement process, 15 minutes were allowed for the homogeneity of the smell in the atmosphere, and the students were taken into the classroom afterwards<sup>28</sup>.

Prior to the tests of the students in the control group, the exam hall, which was on a distant floor than the students in the experimental group in

order to prevent any contamination, was cleaned and ventilated properly. No intervention was made for the students in the control group.

In order to determine the effect of aromatherapy on the academic achievement, the non-absorbent cloth soaked with lavender oil and placed over the desks of the students in the experimental group were left there during the exam. No additional lavender oil was dropped onto the non-absorbent cloth during this time.

Students not participated in the study were taken into another exam hall that have the same types size and physical features of the exam halls of students in the experimental and the control groups.

### Data collection

A personal information form and STAI 1 was given at 15 minutes after taking the students in the experimental and the control groups into the exam halls prepared specifically for them. The 15 minutes of time were to allow aromatherapy, which was applied by means of inhalation, to show its effect<sup>32,33</sup>. Filling the forms took 10 minutes approximately, and filled forms were collected by the researchers back. After collecting the forms, exam papers were given to students and the exam was started.

### Analysis of data

Statistical analyses for data evaluation were carried out in the Statistical Program for Social Sciences (SPSS) version 18.0 for Windows (SPSS, Inc., Chicago, IL, USA). In the statistical analyses of the data percentages and chi-square test were used. The level of significance was set at  $p < 0.05$ .

### Ethics

The institutional ethics committee at Faculty of Health Sciences, Ataturk University reviewed and confirmed the study and its suitability relating to the protection of human subjects. Students were asked to sign an informed consent prior to the start of the study.

### Results

Looking at the genders and mean ages of the students participated in study, there were no statistically significant difference between the groups and the experimental and the control groups were homogeneous ( $p > 0.05$ , Table 1).

As a result of the study, it was found that State-Trait Anxiety Inventory mean scores of the students in the experimental group ( $39.45 \pm 3.88$ ) was lower than the mean scores of the students in the control group ( $41.44 \pm 4.69$ ), and the difference between the groups was statistically significant ( $p < 0.05$ , Table 2).

In the study, no statistically significant difference was found between mean final exam scores of the students in the experimental group ( $66.90 \pm 10.65$ ) and the mean final exam scores of the students in the control group ( $66.51 \pm 11.31$ ) ( $p > 0.05$ , Table 3) (Fig. 1).

Table 1—Distribution of the descriptive characteristics of the students in the control and the experimental groups

Descriptive Characteristics	Experimental Group	Control Group	Test & p
Age (Mean)	20.12±0.99	20.04±0.87	t: 0.402 p:0.689
Gender			
Female	32 (76.2%)	41 (83.7%)	$X^2=0.798$ p:0.372
Male	10 (23.8%)	8 (16.3%)	

Table 2—Comparison of the State-Trait Anxiety Inventory Mean Scores of the students in the control and the experimental groups

	Experimental Group	Control Group	Test & p
State-Trait Anxiety Inventory	39.45±3.88	41.45±4.70	t:2.186 / p=0.031

Table 3—Comparison of the Mean Exam Scores of the Students in the Control and the Experimental Groups

	Experimental Group	Control Group	Test & p
Mean Exam Scores	66.90±10.65	66.51±11.31	t:0.170 / p=0.865

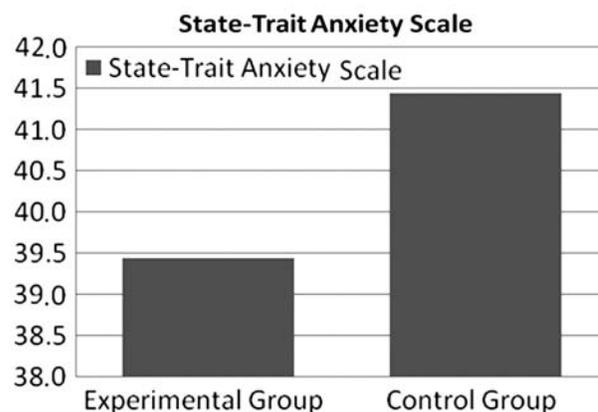


Fig. 1—Comparison of the State-Trait Anxiety Inventory mean scores of the students in the control and the experimental groups

## Discussion

Test anxiety is an important factor that negatively affects nursing students' success during the education process. In his study, Brewer<sup>7</sup> (2002) detected that while every university students experienced anxiety before exams, nursing students had higher levels of anxiety than did the other student groups. Afolayan *et al.*<sup>34</sup> state that generally nursing students expressed anxiety during examination which is seen as physiological, psychological and behavioural changes and abnormality. In recent times, described complementary and alternative medicines, including aromatherapy, have gained in popularity. Barely very few research have been done to evaluate the efficiency of aromatherapy as anti-anxiety therapy.

The findings of the study proved the fact that lavender inhalation has a noticeable effect on the decreasing of test anxiety students. Lyra *et al.*<sup>28</sup> investigated the efficacy of aromatherapy in decreasing stress and anxiety levels in undergraduate health science students. Results of their study found that aroma group showed a significant ( $p < 0.05$ ) decrease in stress and anxiety levels. Kutlu *et al.*<sup>21</sup>(2008) in their randomized, controlled, prospective study detected that lavender inhalation was decreased test anxiety of nursing, midwifery, and health official students and the difference between the experimental and control groups was statistically significant.

Ghiasi *et al.*<sup>35</sup> determined that verified the effect of aromatherapy inhalation (the mixture of lavender and rose) in decreasing the female students' symptoms of anxiety. In their study, Park & Lee<sup>22</sup> found that aroma inhalation made using essential oils of lavender, peppermint, and rosemary could be a highly effective stress and anxiety management technique of nursing students. McCaffrey *et al.*<sup>36</sup> has identified that the use of lavender and rosemary essential oil sachets decreased test-taking anxiety and heart rate in nursing students. Another studies, detected that lavender and rosemary oil inhalation an reduced mental stress and anxiety<sup>37,38</sup>.

## Conclusion

The results of this study have shown that lavender oil inhalation made by using in a non-absorbent cloth can be reduced test-taking anxiety in nursing students. The students and nursing educators can be suggested to try lavender inhalation to reduce test-taking anxiety. If more students can overcome test-taking anxiety, they

will be more probable to pass exam, gain the confidence in their abilities and success, nursing care at a high level. The effect of lavender oil inhalation on other populations should be examined as well.

Aromatherapy inhalation is very cheap and easy method. Aromatherapy should be used not only test-taking anxiety but also in other situations that cause anxiety in nursing faculty. Students have to be selected based on their personal and cultural properties lavender and other essential oils can be used.

The results of this study can be integrated into education strategies for nursing students who suffer from test-taking anxiety. The results of this study may guide the students and nursing educators to try lavender and other essential oils to reduce test-taking anxiety. This nursing research contribute to the study base regarding the of lavender oil inhalation for anxiety.

*What does this paper contribute to the wider global clinical community?*

- The results of this study can be integrated into education strategies for nursing students who suffer from test-taking anxiety.
- The results of this study may guide the students and nursing educators to try lavender and other essential oils to reduce test-taking anxiety.
- This nursing research to contribute to the study base regarding the of lavender oil inhalation for anxiety.

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## Conflict of interest

None.

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