




Aromatherapy in nursing students to reduce stress


Aromaterapia en estudiantes de enfermería para reducir el estrés

Johanna Alexandra Tipan Cando

<https://orcid.org/0000-0002-6001-5162> 

Graduate Researcher, Faculty of Health Sciences.
Technical University of Ambato, Ecuador

Ana Pamela Pachucho Flores

<https://orcid.org/0000-0002-2142-9549> 

University Professor, Faculty of Health Sciences.
Technical University of Ambato, Ecuador
ap.pachucho@uta.edu.ec (correspondence)

ABSTRACT

Background. The use of traditional and complementary medicine is the result of unifying two types of ancestral medicines, which covers part of the professional practices, one of them is aromatherapy, which is a complementary health therapy, using essential oils as the main therapeutic agents, can be applied through inhalation and massage. In the inhalation mechanism, essential oils can communicate signals to the olfactory system and stimulate the brain. **Objective.** To evaluate the effect of aromatherapy with lavender essence to reduce stress in nursing students. **Methodology.** Quantitative approach, quasi-experimental design and correlational scope, with a sample of 28 Nursing students. The analysis of the quantitative data was processed through tabulation in the Excel platform and statistically analyzed in the SPSS version 29.0 software program and using the student t test. **Results.** The normality of the pre- and post-test values was checked, whose significance values of the Shapiro Wilk test were > 0.05 , determining a normal distribution of the data. Therefore, the parametric Student's T test for related samples was applied, yielding a significance value of $0.00 < 0.05$. **Conclusion.** The researcher's alternative hypothesis was accepted, that is, that aromatherapy does reduce students' stress.

Keywords: Aromatherapy; alternative treatments to stress; nursing students; mental health;

ARTICLE HISTORY

Received: 2024-04-30

Revised Version: 2024-06-17

Accepted: 2024-06-30

Published: 2024-07-07

Copyright: © 2024 by the authors

License: CC BY-NC-ND 4.0

Document type: Article

ARTICLE INFORMATION

Main topic:

Stress in nursing students

Main practical implications:

This article offers valuable insights on stress among nursing students, especially relevant for developing countries as it provides a low-cost solution to this overlooked issue.

RESUMEN

Antecedentes. El uso de la medicina tradicional y complementaria es el resultado de unificar dos tipos de medicinas ancestrales, lo cual abarca parte de las practica profesionales, una de ellas es la aromaterapia que es una terapia complementaria de la salud, utiliza aceites esenciales como principales agentes terapéuticos, se puede aplicar mediante inhalación y masaje. En el mecanismo de inhalación los aceites esenciales pueden comunicar señales al sistema olfativo y estimular al cerebro. **Objetivo.** Evaluar el efecto de la aromaterapia con esencia de lavanda para reducir el estrés en estudiantes de Enfermería. **Metodología.** Enfoque cuantitativo, diseño cuasi experimental y alcance correlacional, con una muestra de 28 estudiantes de la Carrera de Enfermería. El análisis de los datos cuantitativos fue procesado por medio de una tabulación en la plataforma Excel y analizados estadísticamente en el programa software SPSS versión 29.0 y mediante la prueba t de Student. **Resultados.** Se comprobó la normalidad de los valores del pre y post test, cuyos valores de significancia de la prueba de Shapiro Wilk fueron $> 0,05$, determinando una distribución normal de los datos. Por consiguiente, se aplicó la prueba paramétrica T de Student para muestras relacionadas, arrojando un valor de significancia $0,00 < 0,05$. **Conclusión.** Se aceptó la hipótesis alterna del investigador, es decir, que la aromaterapia si disminuye el estrés de los estudiantes.

Palabras clave: Aromaterapia; tratamientos alternativos al estrés; estudiantes de enfermería; salud mental.

INTRODUCTION

The use of traditional and complementary medicine is the result of unifying two types of ancestral medicines, which covers part of the professional practices (Rodríguez et al., 2019) according to the World Health Organization (WHO) has been used to maintain health, treat diseases and put an end to certain chronic diseases (Tácula et al., 2020). Traditional medicine may be based mainly on the medication and administration of herbal medicines, animal parts or minerals; In addition, interventions without resorting to medication as occurs in acupuncture. In countries where allopathic medicine predominates or where traditional medicine is not incorporated into the national healthcare system, it is often called complementary, alternative or non-conventional medicine (López et al., 2019).

The World Health Organization (WHO) has been carrying out systematic work that leads the general population to have knowledge of the active management of traditional and complementary medicine, quality, safety, appropriate use and effectiveness; in addition to the regulation of its products, practices and professionals; promoting universal health coverage through appropriate integration of Traditional Complementary Medicine (TCM) services. Embodied in the "WHO Strategy on Traditional Medicine 2014-2023" manual (Tácula et al., 2020).

Among these is aromatherapy, which is a complementary health therapy, it uses essential oils as the main therapeutic agents (Soto et al., 2019) (Campos et al., 2022), it has been adopted by many countries for years, this Medicine can be applied through inhalation and massage, in the inhalation mechanism essential oils can communicate signals to the olfactory system and stimulate the brain to secrete serotonin and dopamine neurotransmitters, these agents relieve psychiatric disorders (Gong et al., 2020). In Europe, aromatherapy has been carried out for some time, while in our environment it is just beginning to be implemented. In rural areas of several countries, aromatic plants are used for primary health care, in such a way that 80% of Rural populations in developing countries use these traditional resources (Montero et al., 2019). In this way we find aromatherapy as a therapy that is based on natural and synthetic aromas, where aromatic plants become medicinal, constituting a therapeutic method, known as simple and cheap medicine, which are a complement of strategies for coping with academic stress, allowing to reduce levels of anxiety, insomnia and stress (Soto et al., 2019).

According to Montibeler et al. (2018) in their study of the effectiveness of aromatherapy massage on the stress of the nursing team of the surgical center, carried out in Brazil, with the objective of verifying the effectiveness of aromatherapy with lavender and geranium essential oils for relieving stress. Nursing staff reported a statistically significant reduction in heart rate and blood pressure levels after the massage sessions. On the other hand, Cervantes et al. (2023) in their study of the Effects of Aromatherapy with lavender essence to reduce work stress in Nursing personnel, a positive effect was obtained on nursing professionals, achieving a reduction in the level of work stress.

Stress is a response of the body that allows us to act in situations such as threats; However, if it is not treated properly it becomes pathological stress, affecting the individual's health and becoming a mental health problem (Jimenez et al., 2024). This is why, lately, the use of aromatherapy has aroused academic interest due to various studies. They point out how aromatherapy can affect the brain, regulating emotions, moods and reducing stress (Soto et al., 2019).

In another study carried out in Mexico on the effects of aromatherapy in situations of stress and pressure presented by university students, specifically in the areas of health. According to Silva et al. (2020) found a significant association between the level of stress and the study program that the students take, observing that students studying Petrochemistry and Nursing have a higher level with a percentage of 97% and 88.1%. Moreover, within a University in the South of Chile, with 314 participants from different careers in the health area (Kinesiology, Nutrition, Dietetics, Speech Therapy and Nursing), it was evident that 98% of the participants are affected by academic stress (Silva et al., 2020),

In the same sense, in Colombia, María et al. (2022) investigated the use of aromatherapy during the postpartum, with the aim of knowing the management of aromatherapy in the puerperium, concluding that the use of aromatherapy, preferably lavender in the form of inhalation, massages, acupressure and immersion generates well-being in postpartum women; In addition, some help improve aspects related to postpartum pain because it produces positive effects to counteract postpartum anxiety and depression. In Ecuador, 80% of the population uses traditional medicine, known for being a multicultural country and having high biodiversity, according to Cruz et al. (2022) in their study of Ancestral Medicine in the Sierra and its Application to health care, with the aim of preserving the ancestral knowledge of medicine in the Sierra region of Ecuador, taking into account the synthesis of different cultures that knew treat pathologies through the Andean worldview.

Aromatherapy is important due to its various psychological benefits, it has an effect that facilitates mental peace and relaxation, in such a way that it is intended to demonstrate how it helps students concentrate to reduce stress levels, and thus avoiding subjecting students to pharmacological treatments, seeking adequate mental health through natural alternatives. In addition, implement knowledge about traditional and complementary medicine (Gualotuña et al., 2022). Therefore, the objective of this study is to evaluate the effect of aromatherapy with lavender essence to reduce stress in Nursing students.

METHODOLOGY

The present study has a quantitative approach, since it provides objectivity, precision and collects information through a structured instrument (Cuchca and Trujillo, 2021). Of longitudinal quasi-experimental design, that is, information was collected before and after treatment (Acosta Faneite, 2023) and correlational in scope, allowing the relationship between the study variables to be sought (Manterola et al., 2019). This research was carried out in the province of Tungurahua, Ambato canton, at the Technical University of Ambato, during the ordinary academic period September 2023-August 2024. The population was made up of students of the Nursing Career of the Technical University of Ambato. Taking into account the following inclusion criteria: students legally enrolled in the fifth semester in the integrative health and complementary medicine chairs of parallel A and students who signed the informed consent. Those students with a history of hypersensitivity reactions to lavender essence and those who did not attend on the date of information collection were excluded, achieving a sample of 28 students, to whom the measurement instrument was applied on a census basis.

The collection of information was carried out in two phases, which consisted of a pre-test and a post-test; For the pre-test, the SISCO Academic Stress Inventory (IEA) instrument was used, with a Cronbach's alpha of 0.90. To validate the necessary dose of oil, a study was carried out where the number of drops necessary per square meter was tested. Since there is no data or appropriate literature that provides a guide regarding the dose of oil to be used, a dose and time had to be estimated to carry out the study (Avello et al., s. f.), then the placement was carried out. of aromatherapy 2 drops (0.1ml) in total of the lavender essence in the lower part of a diffuser that has the capacity of ½ liter where together with the water it humidifies the classroom on parallel A, of (approximately 5 by 8 meters), this was carried out for two months (Avello et al., s. f.), then a post test was applied, where the instrument of the SISCO inventory of Academic stress (IEA) was used, finally a comparison was made with the results of a before and after of the investigation.

Data collection was carried out starting with the approval of the relevant authorities and the application of informed consent, taking into account the ethical aspects mentioned in the Helsinki agreement, such as respect, given that there was no discrimination of color or sex of the research participants. Furthermore, absolute privacy and confidentiality of the participants was maintained. Finally, autonomy was applied because each person decided whether or not to participate in the research, the objective of the research was made known and they were informed that they could withdraw from the study at any time (Mazzanti Di Ruggiero, 2015). The analysis of the quantitative data was processed through tabulation in the Excel software and statistically analyzed in the statistical program SPSS (Statistical package for Social Sciences), version 29.0, using the Student T test for related groups, where The means of the pre- and post-test applied were compared. (Castillo et al., 2018).

RESULTS AND DISCUSSION

Demographic characteristics

Of the sample of 28 participants in this study, the minimum age was 21 and maximum 28 years, with a average of 22.3 and standard deviation of 1.72 years. In addition, Table 1 describes the variables sex and responsibility of the students. (Table 1).

Table 1. Demographics

Variables	Categories	Frequency	Percentage
Sex	Men	7	25
	Women	21	75
Total		28	100
Responsibility	Only studies	21	75
	Study and work	7	25
Total		28	100

Source: own elaboration with the research data

Analysis: According to the data collected, it was identified that most of the participants are female, revealing a high percentage (75%). Regarding age, the majority had an average age of 21 and 24 years: While, in terms of occupation, it was identified that almost all of them only study. These results are similar to the study by Castillo et al. (2018) where their sample was made up mostly of women and the average age was 21 years. In this regard, Malusin Guamán (2021) in his study mentions that the most marked stereotype remains for the female figure because there is a greater amount of participation in the hospital area, taking in a strange way the male image in the performance of work. . care of the nursing professional.

Pre-test

Table 2. Moments of worry or nervousness

	Frequency	Percentage
Valid SI	28	100

Source: own elaboration with the research data

Analysis: The results of Table 2 reflect that all participants present moments of worry and nervousness due to academic pressure. These findings agree with the study by Guzmán et al. (2022) where he mentions that in the face of stressful situations, everyone reacts in the same way, since there are physiological, cognitive or behavioral activation reactions that are considered signs of stress due to the persistence of time.

Table 3. Level of worry or nervousness

	Frequency	Percentage
Low	7	25
Valid High	21	75
Total	28	100

Source: own elaboration with the research data

Analysis: The following table refers to the level of worry or nervousness, which reveals that there is a high percentage (75%), due to their academic work. Such results are similar to what was expressed by (Sierra and Moreno, 2023) in their study of strategies for coping with academic stress in university students. This research revealed that students deal with high levels of academic stress, directly related to levels of anxiety, self-harm, insecurity or lower perception of academic abilities, among other problems, affecting the health and well-being of students.

Table 4. Sisco Inventory Pre-test of academic stress

PRE - TEST						
Components	Never	Rarely	Sometimes	Almost Always	Always	
Academic activity	Competence	(2) 7.1%	(10) 35.7%	(8) 28.6%	(7) 25%	(1) 3.6%
	Homework and works				(14) 50%	(14) 50%
	Character	(1) 3.6%	(1) 3.6%	(11) 39.3%	(11) 39.6%	(14) 14.3%
	Examens jobs				(14) 50%	(14) 50%
	Consultation and trials			(1) 3.6%	(16) 57.1%	(11) 39.3%
	Noy understanding the topics		(3) 10.7%	(13) 46.4%	(7) 25 %	(5) 17.9%
	Participation in classes		(5) 17.9%	(8) 28.6%	(12) 42.9%	(3) 10.7%
Time and limitation		(1) 3.6%	(4) 14.3%	(13) 46.4%	(10) 35.7%	
Physical Reactions	Insomnia or nightmares	(1) 3.6%	(5) 17.9%	(7) 25%	(10) 35.7%	(5) 17.9%
	Permanent tiredness		(5) 17.9%	(7) 25%	(11) 39.3%	(5) 17.9%
	Headache	(2) 7.1%	(5) 17.9%	(4) 14.3%	(12) 42.9%	(5) 17.9%
	Digestive problems	(3) 10.7%	(12) 42.9%	(5) 17.9%	(6) 21.4%	(2) 7.1%
	To bite nails	(5) 17.9%	(3) 10.7	(11) 39.3%	(5) 17.9%	(4) 14.3%
Need to sleep		(1) 3.6%	(7) 25%	(9) 32.1%	(11) 39.3%	
Psychological Reactions	Inability to relax	(1) 3.6%	(4) 14.3%	(8) 28.6%	(10) 35.7%	(5) 17.9%
	Depression and sadness		(5) 17.9%	(11) 39.3%	(5) 17.9%	(7) 25%
	Anxiety and anguish		(4) 14.3%	(8) 28.6%	(8) 28.6%	(8) 28.6%
	Problems and concentration		(4) 14.3%	(10) 35.7%	(9) 32.1%	(5) 17.9%
	Feeling of Aggression		(4) 14.3%	(7) 25%	(9) 32.1%	(4) 14.3%
Behavioral Reactions	Conflicts		(6) 21.4%	(6) 21.4%	(11) 39.3%	(5) 17.9%
	Isolation from others	(4) 14.3%	(7) 25%	(7) 25%	(5) 17.9%	(5) 17.9%
	Reluctance to carry out tasks	(2) 7.1%	(8) 28.6%	(8) 28.6%	(5) 17.9%	(5) 17.9%
	Increase or reduction in food consumption	(1) 3.6%	(7) 25%	(8) 28.6%	(7) 25%	(5) 17.9%
Personality behaviors	Ideas or feelings without harming another	(1) 3.6%	(6) 21.4%	(6) 21.4%	(13) 46.4%	(13) 46.4%
	Plan and execute your tasks		(5) 17.9%	(10) 35.7%	(10) 35.7%	(3) 10.7%
	Praise yourself	(5) 17.9%	(8) 28.6%	(7) 25%	(4) 14.3%	(4) 14.3%
	Religiosity	(2) 7.1%	(7) 25%	(7) 25%	(8) 28.6%	(4) 14.3%
	Information search	(4) 14.3%	(4) 14.3%	(9) 32.1%	(7) 25%	(4) 14.3%
	Ventilation and confidence.	(2) 7.1%	(11) 39.3%	(10) 35.7%	(3) 10.7%	(2) 7.1%

Source: own elaboration with the research data

In table 4 we can analyze 5 dimensions that correspond to academic activities: physical reactions, psychological reactions, behavioral reactions, and assertive skills. In the dimension of academic activities that correspond to the tasks that are carried out during the academic periods, in this context we can observe that the majority percentages are the development of consultations and essays with 57.1%, with a frequency of almost always and 50% in exams and assignments with a frequency of always. These results are similar to those described by Romero et al. (2022) in their study of academic stress in university and pre-university students. The results demonstrated that work overload actually corresponds to one of the most frequent factors of academic stress in medical students. In addition, Flores and Trujillo (2022), who also carried out studies on academic stress in health sciences students, in the distance education modality in times of Covid -19, found that students present stressful moments when their teachers request tasks with little clarity, as a consequence of the teachers' methodological deficiencies; since they have not adapted to the new teaching modality.

For the dimension of **physical reactions**, it is observed that 42.9% with a frequency of almost always trigger headaches and even migraines, as well as it is important to highlight that 42.9% with a frequency of rarely present digestive problems, clearly we are under the presence of somatic diseases, which are physical reactions triggered by stress, as reflected by Castillo et al. (2018) in their study of Academic stress in nursing students, where they mention that the factor that causes the most stress in students is academic overload, because it produces headaches, migraines, anxiety, anguish or despair and also mood disorders. a decrease or increase in intake.

In the **psychological reactions** dimension, it is observed that the appearance of the most common feelings such as depression and sadness that is sometimes generated, being one of the highest percentages (39.3%); in accordance with Pérez et al. (2020) in their study of academic stress in students in a nursing program; They affirm that there is a high percentage of students who are stressed during the development of their training practices and that because of this they express symptoms such as feelings of depression and sadness.

Regarding behavioral reactions, it is important to highlight that 39.3%, with a frequency of almost always, which corresponds to the conflicts that are commonly generated by pressure when completing a task; which agrees with Macías and Gualé (2019) in their research on anxiety and its relationship with students' academic performance, where they explain the different types of reactions that exist as physical reactions produced by the activity of the autonomic nervous system such as tachycardia, respiratory distress, dry mouth, nausea and diarrhea.

Cognitive reactions refer to the way they manifest information, affecting perception, memory and, above all, thinking; presenting mental restlessness, fear, difficulty concentrating and general pessimism. behavioral actions, which are observable manifestations that are generally motor, such as facial muscle contraction, tremors of hands, arms and legs, irritability, alertness, jaw tension, nail biting, among others.

Finally, the dimension of **personality behaviors**, assertive ability, leads the table with 46.4%, this strategy always being chosen to face the situation that causes concern and nervousness; Therefore, a greater incidence was obtained in the assertive skill where students defend their preferences, ideas or feelings without harming others. These results contrast with the findings of Castillo (2019) in his study of coping strategies in the descriptive profile of academic stress of university students, revealing that in a generalized situation there is a lack of self-regulation ability on the part of students; Therefore, when faced with a problematic situation, they choose to avoid it instead of solving it. While, those who do focus on the problem try to resolve the situation through actions of concentration and organization.

Table 5. Post – Test moments of worry or nervousness.

		Frequency	Percentage
Valid	SI	28	100

Source: own elaboration with the research data

Analysis: Table 5 showed that all students present moments of worry or nervousness due to their academic activity routines, this coincides with what was expressed by Macías and Gualé (2019) in their study of Anxiety and its relationship with performance. academic of the students of the psychology major at the Technical University of Manabí, where he mentions that psychological characteristics and abilities are very essential in students to obtain knowledge during their studies; since, from their point of view, obtaining a good average is everyone's goal; However, they state that there are situations that cause worry, tension, irritability and also a lot of stress.

Table 6. Post – Test level of worry or nervousness

		Frequency	Percentage
Valid	Low	18	64.3
	High	10	35.7
	Total	28	100

Source: own elaboration with the research data

Analysis: In table 6, it is observed that the majority of the students presented a high level of worry and nervousness, coinciding with the study by (Kloster Kantlen & Perrotta, 2019) of academic stress in university students from the city of Paraná, where observed that most students experienced a moderate level of stress with high or moderately high intensity. This finding agrees with the study by (Adom et al., s. f.) of academic stress among professors and students of higher institutions. He also observed that stress can be beneficial if it exists in minimal quantities, but when it is exceeded it affects the levels of tolerance occurring a negative response in the learning capacity, academic performance, physical and mental health of students.

Table 7. SISCO academic stress inventory post-test.

POST - TEST						
Components	Never	Rarely	Sometimes	Almost Always	Always	
Academic activity	Competence	(2) 7.1%	(10) 35.7%	(14) 50%	(1) 3.6%	(1) 3.6%
	Homework and works			(10) 35.7%	(14) 50%	(4) 14.3%
	Character		(10) 35.7%	(12) 42.9%	(1) 3.6%	(4) 14.3%
	Examens jobs			(14) 50%	(1) 3.6%	(13) 46.6%
	Consultation and trials			(15) 53.6%	(8) 28.6%	(5) 17.9%
	Noy understanding the topics	(7) 25%	(13) 46.6%	(1) 3.6%	(3) 10.7	(4) 14.3%
	Participation in classes	(2) 7.1%	(8) 28.6%	(8) 28.6%	(8) 28.6%	(2) 7.1%
Time and limitation		(4) 14.3%	(5) 17.9%	(10) 35.7%	(9) 32.1%	
Physical Reactions	Insomnia or nightmares	(1) 3.6%	(10) 35.7%	(7) 25%	(5) 17.9%	(5) 17.9%
	Permanent tiredness		(2) 7.1%	(14) 50%	(11) 39.3%	(1) 3.6%
	Headache	(5) 17.9%	(2) 7.1%	(10) 35.7%	(6) 21.4%	(5) 17.9%
	Digestive problems	(12) 42.9%	(9) 32.1%	(5) 17.9%	(1) 3.6%	(1) 3.6%
	To bite nails	(10) 35.7%	(11) 39.3%	(3) 10.7	(3) 10.7	(1) 3.6%
Psychological Reactions	Need to sleep	(1) 3.6%	(8) 28.6%	(8) 28.6%	(11) 39.3%	
	Inability to relax	(4) 14.3%	(7) 25%	(10) 35.7%	(5) 17.9%	(2) 7.1%
	Depression and sadness	(5) 17.9%	(3) 10.7	(8) 28.6%	(5) 17.9%	(7) 25%
	Anxiety and anguish	(13) 46.6%	(13) 46.6%	(1) 3.6%	(1) 3.6%	
	Problems and concentration		(9) 32.1%	(9) 32.1%	(1) 3.6%	(5) 17.9%
Behavioral Reactions	Feeling of Aggression	(7) 25%	(7) 25%	(10) 35.7%	(4) 14.3%	
	Conflicts	(16) 57.1%	(4) 14.3%	(4) 14.3%	(3) 10.7	(1) 3.6%
	Isolation from others	(7) 25%	(6) 21.4%	(7) 25%	(7) 25%	(1) 3.6%
	Reluctance to carry out tasks	(2) 7.1%	(8) 28.6%	(8) 28.6%	(5) 17.9%	(5) 17.9%
	Increase or reduction in food consumption	(1) 3.6%	(7) 25%	(8) 28.6%	(7) 25%	(5) 17.9%
Personality behaviors	Ideas or feelings without harming another	(11) 39.3%	(4) 14.3%	(6) 21.4%	(3) 10.7	(4) 14.3%
	Plan and execute your tasks	(10) 35.7%	(9) 32.1%	(5) 17.9%	(3) 10.7	(1) 3.6%
	Praise yourself	(8) 28.6%	(9) 32.1%	(8) 28.6%	(2) 7.1%	(1) 3.6%
	Religiosity	(8) 28.6%	(9) 32.1%	(7) 25%	(2) 7.1%	(2) 7.1%
	Information search	(8) 28.6%	(6) 21.4%	(6) 21.4%	(5) 17.9%	(3) 10.7
	Ventilation and confidence.	(9) 32.1%	(10) 35.7%	(5) 17.9%	(4) 14.3%	

Source: own elaboration with the research data

Table 7 shows that the post test contains the same 5 dimensions. In the dimension of **academic activities**, the majority percentages are the development of consultations and essays (53.6%), with a frequency of sometimes and 50 % in competitions with a frequency of a few times. Also, with the same percentage (50%) we have assignments and assignments with a frequency of almost always, likewise 50% present exams-assignments with a frequency of sometimes. These results coincide with the study by Cruz et al. (2022) of stress and academic performance in nursing students, where it was observed that first-year students used coping strategies and that what also demands the most from the environment are teachers' evaluations; since it generates greater stress, followed by overload of homework and school work. Furthermore, Hernández et al. (2023), in their study of academic stress in medical students, mentions that university students present average levels in the perception of unpleasant stimuli coming from education, which are acquired by the number of tasks, unforeseen exams, and by the demands for the delivery of tasks. In the dimension of **physical reactions**, it is observed that 50%, with a frequency of sometimes being permanently tired, as well as 42.9% with a frequency of never had digestive problems, these somatic diseases being a product of stress, this agrees with the findings by Vargas and Rojas (s. f.) in their study where they state that the effects of academic stress include physical symptoms such as sweating, muscle tension in the legs and arms, accelerated heart rate, insomnia, breathing problems, neck pain, head, digestive problems and fatigue; which leads to reluctance to do school work, as well as developing conflicts, arguing or arguing. Regarding the dimension of **psychological reactions**, the appearance of anxiety and anguish is observed, which is generated rarely and never, being one of the highest

percentages (46.6%); similar to the study, where it mentions that in relation to the symptoms of stress there is a predominance in physical states, these being chronic fatigue and drowsiness, in emotions we have (restlessness, anxiety or despair) and in cognitive states we have (difficulty concentrating).) causing systemic instability; while, in the dimension of **behavioral reactions**, it is important to highlight that 57.1%, with a frequency of never, which corresponds to the conflicts that are commonly generated in students when performing a task; This is similar to what was expressed by Hernández et al. (2023) in their study of academic stress in medical students, who mention that a high level of stress alters the cognitive, motor and psychological response system of the human being. This alteration negatively influences academic performance, since there is a decrease in the students' exam grades. And finally, it is important to mention the dimension of **behavioral reactions** where 39.3% stood out, frequently in never, which corresponds to ideas or feelings without harming others. These results contrast with the study by Valdivieso et al. (2020) from Strategies for coping with university academic stress, who mentions that, when students apply the development of a coping plan to stressful situations, the consequences are modulated, that is, they return to their normal state, being effective at the time of control stressful situations in the academic field, at the end of the study it was observed that there is a considerable variation in relation to the percentages. In the pre-test table there are high values in the options of sometimes, almost always and always, while after applying aromatherapy in the post-test the majority values were in the options of never, rarely and sometimes, giving understand that the effect of aromatherapy to reduce stress is effective.

Statistical analysis

Hypothesis formulation. For the study of this research, two hypotheses were proposed:

H1: Aromatherapy reduces students' stress

H0: Aromatherapy does not reduce students' stress

For this purpose, the normality of the difference between the pre- and post-test values was checked, whose significance value of the Shapiro Wilk test $0.574 > 0.05$ determined a normal distribution of the data. Therefore, the parametric Student's T test was applied for 2 related samples, yielding a significance value of $0.00 < 0.05$.

The results of this research were able to determine that nursing students at the Technical University of Ambato face stressful situations in the educational field, affecting their learning and well-being. In the present study, the demographic characteristics of the sample show a predominance of the female sex, this coincides with several studies carried out with nurses, which mention that it is a profession made up mostly of women (Tácuna et al., 2020).

The effect that aromatherapy has on reducing stress in nursing students turns out to be positive, since before the implementation of the intervention they presented high percentages of stress when carrying out their academic activities, and it was verified that after the application of the essence of lavender Based on its properties, it provides satisfactory effects to reduce stress, agreeing with the Gualotuña study where he mentions that in his study the use of aromatherapy showed effectiveness by improving concentration and memory in stressful situations on how to solve mathematical calculations, exams. or clear the mind (Gualotuña et al., 2022).

According to Cervantes in their study, the application of aromatherapy with the essence of lavender turns out to be effective in reducing work stress since it has an effectiveness of 60.75% Cervantes et al. (2023), as in the present study, there is a reduction in stress in students when using aromatherapy as an effective way to reduce stress, while there are also alternative mechanisms such as acupuncture plays an important role in the response to stress and anxiety, however, it is important to take note that although this is effective, not everyone will respond in the same way, the results may vary depending on the individual and its severity (Tácuna et al., 2020).

In a clinical trial, the use of aromatherapy with the use of lavender to reduce the stress levels of nurses was investigated, which identified a statistically significant reduction in stress levels from the second day of inhalation of essential oil during the during the work at a concentration of 3% Montibeler et al. (2018). This result agrees with what was found in the present study due to the application of aromatherapy with the essence of lavender during the course of the classes, good results were obtained from the application that began, reducing different symptoms such as headaches, insomnia, fatigue, etc.

CONCLUSIONS

Aromatherapy is known as an alternative medicine; since it provides relaxation to students during their academic activities, making its use feasible. They also have the effect of feeling better, providing well-being. In the present study, aromatherapy was applied to nursing students at the Technical University of Ambato with the use of lavender essential oil for

therapeutic purposes, which determined that the essential oils used in the study were effective because there was a decrease in stress in the majority of participants. The effect of aromatherapy with the essence of lavender to reduce stress turned out to be positive; since its components are very effective.

The significance value of the Student's T test $0.00 < 0.05$, therefore, the researcher's alternative hypothesis is accepted, that is, that aromatherapy does reduce students' stress. The following results provide a solid basis for future research that experiments with the effect of aromatherapy in nursing students to reduce stress, as well as for different interventions that address this problem comprehensively.

In terms of theoretical limitations, the study focuses only on the effect of aromatherapy on nursing students to reduce stress, without exploring other alternatives that could influence these variables. Furthermore, the lack of information about the research prevents the existence of a better information enrichment in research.

Finally, with respect to methodological limitations, we can mention the inability to obtain a greater amount of information from reliable data due to the limited time available, which affected the ability to carry out a more exhaustive analysis of the research.

REFERENCES

- Acosta Faneite, S. F. (2023). Los enfoques de investigación en las Ciencias Sociales. *Revista Latinoamericana Ogmios: RLO Científica*, 3(8), 236-246.
- Adom, D., Chukwuere, J., & Osei, M. (s. f.). *Academic Stress among Faculty and Students in Higher Institutions*.
- Álvarez-Silva, L. A., Gallegos-Luna, R. M., Herrera-López, P. S., Álvarez-Silva, L. A., Gallegos-Luna, R. M., & Herrera-López, P. S. (2018). Estrés académico en estudiantes de tecnología superior. *Universitas-XXI, Revista de Ciencias Sociales y Humanas*, 28, 193-209.
- Avello, M., Pastene, E., Fernández, P., Vargas, P., Rioseco, M., Castillo, C., Monsalve, C., Guíñez, B., & Inzunza, P. (s. f.). *Efectos de la Aromaterapia en el Servicio Medicina del Hospital las Higueras, Talcahuano Chile*.
- Campos Arroyo, A. G., Castro Calderon, C., & González Cabrera, J. C. (2022). Aromaterapia, alternativa complementaria para algunos trastornos que afectan la salud mental. *Milenaria, Ciencia y Arte*, 20, 31-33.
- Castillo Ávila, I. Y., Barrios Cantillo, A., & Alvis Estrada, L. R. (2018). Estrés académico en estudiantes de enfermería de Cartagena, Colombia. *Investig. enferm*, 1-11.
- Castillo, H. G. (2019). Estrategias de afrontamiento en el perfil descriptivo del estrés académico de los estudiantes universitarios. *Revista Científica del Sistema de Estudios de Postgrado de la Universidad de San Carlos de Guatemala*, 2(01), Article 01. <https://doi.org/10.36958/sep.v2i01.14>
- Cervantes Juárez, A. Y., Murillo Hernández, N. L., & Pérez Pedroza, L. P. (2023, mayo 2). *▷ El estrés laboral*. Ocronos - Editorial Científico-Técnica. <https://revistamedica.com/estres-laboral-ocupacional/>
- Cruz, K. Z. de la, Sandoval, J. A., & Orosio-Méndez, M. A. A. (2022). Estrés académico y rendimiento académico en estudiantes de enfermería de la Universidad del Istmo. *Revista Cubana de Tecnología de la Salud*, 13(3), Article 3.
- Cruz Gavilanes, Y. de la N., Cruz Gavilanes, M. T., Muñoz Cruz, A. G., & Quintana Cruz, D. N. (2022). La Medicina Ancestral en la Sierra y Su Aplicación al Cuidado de la Salud. *Dominio de las Ciencias*, 8(Extra 3), 746-760.
- Cuchca, E. M., & Trujillo, B. P. S. (2021). Enfoque cualitativo y cuantitativo de la evaluación formativa. *Revista de Ciencias Humanísticas y Sociales (ReHuso)*, 6(3), 1-13.
- Flores, E. R., & Trujillo, M. de los Á. S. (2022). Estrés académico en estudiantes de Ciencias de la Salud en la modalidad de educación a distancia en tiempos de Covid-19. *Revista de estudios y experiencias en educación*, 21(45), 51-69.
- Gong, M., Dong, H., Tang, Y., Huang, W., & Lu, F. (2020). Effects of aromatherapy on anxiety: A meta-analysis of randomized controlled trials. *Journal of Affective Disorders*, 274, 1028-1040. <https://doi.org/10.1016/j.jad.2020.05.118>
- Gualotuña-Bauz, L. E., Mejía-Campaña, M. B., & Sánchez-Garrido, A. (2022). Aceites esenciales como tratamiento para el estrés. *Revista Arbitrada Interdisciplinaria de Ciencias de la Salud. Salud y Vida*, 279-285.
- Guzmán-Castillo, A., Bustos N., C., Zavala S., W., & Castillo-Navarrete, J. L. (2022). Inventario SISCO del estrés académico: Revisión de sus propiedades psicométricas en estudiantes universitarios. *Terapia psicológica*, 40(2), 197-211. <https://doi.org/10.4067/S0718-48082022000200197>
- Hernández León, M. de L., Cruz Martínez, I., Téllez Veranes, T., & Rodríguez Fernández, M. del C. (2023). Estrés académico en estudiantes de Medicina diagnosticados en la Unidad de Orientación Estudiantil. *MEDISAN*, 27(2). http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=S1029-30192023000200007&lng=es&nrm=iso&tlng=es
- Jiménez, D. A., Medina, M. E., Ortigoza, A., & Barrios, C. J. C. (2024). Estilos de vida de los estudiantes de Enfermería de una institución pública de Tucumán, Argentina. *Ibero-American Journal of Health Science Research*, 4(1), 52-58.
- Kloster Kantlen, G. E., & Perrotta, F. D. (2019). Estrés académico en estudiantes universitarios de la ciudad de Paraná. *Tesis de Licenciatura. Pontificia Universidad Católica Argentina. Facultad Teresa de Ávila, 2019*. <https://repositorio.uca.edu.ar/handle/123456789/9774>
- López Puig, P., García Millian, A. J., Alonso Carbonell, L., Perdomo, J., Segredo Pérez, A., López Puig, P., García Millian, A. J., Alonso Carbonell, L., Perdomo, J., & Segredo Pérez, A. (2019). Integración de la medicina natural y tradicional cubana en el sistema de salud. *Revista Cubana de Salud Pública*, 45(2). http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=S0864-34662019000200006&lng=es&nrm=iso&tlng=es
- Macías, E. I. P., & Guale, L. C. C. (2019). La ansiedad y su relación en el rendimiento académico de los estudiantes de la carrera de Psicología de la Universidad Técnica de Manabí. *Espirales revista multidisciplinaria de investigación científica*, 3(28). <https://www.redalyc.org/journal/5732/573263327006/>
- Malusin Guamán, A. M. (2021). *Esterotipos y roles de género del profesional de enfermería según la percepción de una comunidad en Ambato, Ecuador*. <https://repositorio.uta.edu.ec/8443/jspui/handle/123456789/32540>
- Manterola, C., Quiroz, G., Salazar, P., & García, N. (2019). Metodología de los tipos y diseños de estudio más frecuentemente utilizados en investigación clínica. *Revista Médica Clínica Las Condes*, 30(1), 36-49. <https://doi.org/10.1016/j.rmcl.2018.11.005>

María, A. N. A., Morales, L. S. M., & Tunjano, N. C. (2022). USO DE LA AROMATERAPIA DURANTE EL POSPARTO: REVISIÓN DE LA LITERATURA USE OF AROMATHERAPY DURING POSTPARTUM: A REVIEW OF THE LITERATURE. *Enfermería Investiga*, 7(2), Article 2. <https://doi.org/10.31243/ei.uta.v7i2.1613.2022>

Mazzanti Di Ruggiero, M. D. L. Á. (2015). Declaración de Helsinki, principios y valores bioéticos en juego en la investigación médica con seres humanos. *Revista Colombiana de Bioética*, 6(1), 125. <https://doi.org/10.18270/rcb.v6i1.821>

Montero-Recalde, M., Morocho-Núñez, M. J., Avilés-Esquivel, D., Carrasco-Cando, Á., & Erazo-Gutierrez, R. (2019). Eficacia antimicrobiana del aceite esencial de eucalipto (*Eucalyptus* spp) sobre cepas de *Escherichia coli* y *Staphylococcus aureus* subsp. *Aureus*. *Revista de Investigaciones Veterinarias del Perú*, 30(2), 932-938. <https://doi.org/10.15381/rivep.v30i2.16099>

Montibeler, J., Domingos, T. da S., Braga, E. M., Gnatta, J. R., Kurebayashi, L. F. S., & Kurebayashi, A. K. (2018). Effectiveness of aromatherapy massage on the stress of the surgical center nursing team: A pilot study. *Revista Da Escola De Enfermagem Da U S P*, 52, 03348. <https://doi.org/10.1590/S1980-220X2017038303348>

Pérez, Y. J. L., Herrera, J. L. H., Galvis, D. Y. H., Gómez, M. P., & Choperena, C. I. P. (2020). Estrés académico en estudiantes de un programa de Enfermería—Montería 2019. *Revista Cuidarte*, 11(3), Article 3. <https://doi.org/10.15649/cuidarte.1108>

Rodríguez Lado, D. C., Sori Díaz, Y., & Barceló Tellería, J. A. (2019). Necesidad de un protocolo integrado de Medicina Natural y Tradicional dirigido al paciente oncológico. *Medicentro Electrónica*, 23(1), 75-78.

Romero, A. D. T., Groso, C. S., & Arce, A. M. S. (2022). ESTRÉS ACADÉMICO EN UNIVERSITARIOS Y PREUNIVERSITARIOS DE MEDICINA DE LA UNIVERSIDAD NACIONAL DE ASUNCIÓN, 2018. *Discover Medicine*, 6(1), Article 1. <https://doi.org/10.2300/dm.v6i1.3611>

Sierra Ramirez, P. D., & Moreno Valencia, A. M. (2023). *Estrategias de afrontamiento frente al estrés académico en estudiantes de odontología práctica clínica*. <https://hdl.handle.net/20.500.12494/52124>

Silva-Ramos, M. F., López-Cocotle, J. J., & Meza-Zamora, M. E. C. (2020). Estrés académico en estudiantes universitarios. *Investigación y Ciencia*, 28(79), 75-83.

Soto Vásquez, M. R., Alvarado García, P. A. A., Rosales Cerquin, L. E., Rengifo Penadillos, R. A., & Sagástegui Guarniz, W. A. (2019). Composición química y efecto del aceite esencial de las hojas de *Lippia alba* (Verbenaceae) en los niveles de estrés académico de estudiantes universitarios. *Arnaldoa*, 26(1), 381-390. <https://doi.org/10.22497/arnaldoa.261.26119>

Soto Vásquez, M. R., Alvarado García, P. A. A., & Sagastegui Guarniz, W. A. (2019). Aromaterapia en la salud mental: Una breve revisión. *Medicina naturista*, 13(1), 21-25.

Tácuna-Calderón, A., Moncada-Mapelli, E., Lens-Sardón, L., Huaccho-Rojas, J., Gamarra-Castillo, F., Salazar-Granara, A., Tácuna-Calderón, A., Moncada-Mapelli, E., Lens-Sardón, L., Huaccho-Rojas, J., Gamarra-Castillo, F., & Salazar-Granara, A. (2020). Estrategias de la Organización Mundial de la Salud en Medicina Tradicional y Reconocimiento de Sistemas de Medicina Tradicional. *Revista del Cuerpo Médico Hospital Nacional Almanzor Aguinaga Asenjo*, 13(1), 101-102. <https://doi.org/10.35434/rcmhnaaa.2020.131.633>

Vargas, P., & Rojas, M. (s. f.). *Estrategias de afrontamiento frente al estrés académico en estudiantes de la Universidad Cooperativa de Colombia, Campus Arauca*. Recuperado 26 de marzo de 2024, de <https://repository.ucc.edu.co/entities/publication/6babe693-79f6-4dde-8d87-52ee2dad9d22>

Contribution of each author to the manuscript:

Task	% of contribution of each author	
	A1	A2
A. theoretical and conceptual foundations and problematization:	50%	50%
B. data research and statistical analysis:	50%	50%
C. elaboration of figures and tables:	50%	50%
D. drafting, reviewing and writing of the text:	50%	50%
E. selection of bibliographical references	50%	50%
F. Other (please indicate)	-	-

Indication of conflict of interest:

There is no conflict of interest

Source of funding

There is no source of funding

Acknowledgments

There is no acknowledgments