

Aromatherapy Management to Reduce Stress

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Abstract. *Background:* Stress is a major health threat. According to the 2022 adolescent mental health survey, 15.5 million (34.9 percent) adolescents experience mental problems and 2.45 million (5.5 percent) adolescents experience mental disorders. The results of a survey at the University of Indonesia showed that 50% of students who were doing their thesis experienced stress. This can be overcome with non-pharmacological therapy using peppermint incense aromatherapy to reduce stress levels when preparing a thesis for "X" University students. *Method:* The research design used in this study was quasi-experimental with a pre-test-post-test approach with a control group. The sampling technique used was probability sampling with a simple random sampling method and obtained 58 respondents. *Results:* Based on analysis using SPSS 24.0, the average value (mean) of the reduction in stress levels in the experimental group was 2.76, while the reduction in stress levels in the control group was 0.00. Apart from that, the results of the paired t test in the experimental group obtained a value of $P_v = 0.000$ ($\alpha = 0.05$) which shows the influence of peppermint incense aromatherapy on reducing stress levels when preparing a thesis for students at "X" University, while in the control group the value $P_v = 1,000$ ($\alpha = 0.05$) which indicates there is no effect on the control group. Apart from that, the results of the Man Whitney test obtained a value of $P_v = 0.000$ ($\alpha = 0.05$) which shows that there are differences between the experimental group and the control group. *Conclusion:* Based on the research above, it can be concluded that there is an influence of incense aromatherapy.

Keywords: aromatherapy, management, stress

1. INTRODUCTION

Mental health is as important as physical health. Therefore, this cannot be considered trivial because it can have serious consequences. The prevalence of stressful events in the world is quite high, more than one billion people in the world experience mental and behavioral disorders (WHO, 2019). Stress is a major health threat (Khwarizmi, 2022). According to the Indonesia-National Adolescent Mental Health Survey 2022, 15.5 million (34.9 percent) teenagers experience mental problems and 2.45 million (5.5 percent) teenagers experience mental disorders (Kompas, 2023). One in four people or around 25 percent of Central Java residents experience mild mental disorders (jatengprov.go.id, 2023). The Surakarta City Government of Surakarta released data that 2,095 of its residents experienced serious mental disorders, while the rest experienced mild mental disorders. Women face more mental problems than men (detikhealth, 2016).

The results of Alvin's research (2023) show that there is a relationship between stress and sleep quality in students who are writing their thesis. The results of Livina's research (2023) with 48 students as subjects showed that the majority of students when writing their theses were at a moderate level of stress with a response that was difficult to rest, easily restless and

irritable. The results of Riski's research (2023) with subjects of 171 students, students who are writing their theses are advised to prepare themselves better for their final assignment (thesis) and students need to continue to think positively so they can control negative emotions.

A thesis is a written report of the results of research conducted by an undergraduate student with the guidance of a thesis supervisor to be defended before the court as a requirement for obtaining a bachelor's degree. A thesis is original research or evidence that can renew, develop, discover and confirm theories or facts within the scope of its scientific discipline which can be basic research, applied research or a combination of both.

Students who are able to write a thesis are considered capable of combining knowledge and skills in understanding, analyzing, describing and explaining problems related to the scientific field they are taking. A thesis is a requirement to obtain undergraduate status at every state and private university in Indonesia. The thesis only uses seven letters to form the word, but it takes thousands, maybe even millions of letters to make the thesis into a complete form that can not only be seen, touched but also worthy of accountability. The thesis becomes the gateway to the future that exists after leaving the big house of study called campus.

Apart from the stress of thesis problems, there are also social disparities between communities which lead to depression and mental disorders. For example, when a student is working on a thesis with various problems, there are many people outside who do not understand the situation and condition of the student who is completing the thesis, including family, friends, the environment and the community who ask about the thesis or even comment on the thesis, while the environment does not know what happened to him. thesis problems that are being resolved (Weni, 2022).

The results of a preliminary study carried out by administering the Depression Anxiety Stress Scale 42 (DASS 42) questionnaire which was given to 5 students at "X" University who were writing their thesis showed that 2 people (40%) experienced mild stress on a scale of 15-18 and 3 people (60%) experienced moderate stress on a scale of 19-25. Stress is a dynamic condition where a person is faced with a confrontation between opportunities, obstacles or requests for what he wants and the results are perceived as uncertain and important (Widayani, 2016). Koizer (2010) states that there are several ways that can be done to reduce stress, for example yoga, breathing relaxation, laughter therapy and aromatherapy. Based on research by Aini (2016), yoga exercise therapy can reduce stress by 26.6%. Elliya's research (2021) shows that breath relaxation therapy can reduce stress by 12.2%. Erika's research (2021) shows that laughter therapy can reduce stress by 10.6%. Research conducted by Widia (2021) shows that peppermint aromatherapy can reduce stress by 10.7%.

Aromatherapy is a therapy that uses essential oils or pure oil extracts to help improve or maintain health, raise the spirit, refresh and soothe the body and soul (Utami, 2016). Peppermint incense aromatherapy is aromatherapy that uses modified peppermint essential oil in the form of incense (aromatic incense sticks), this incense aromatherapy is used by burning it at the end. The results of burning this aromatic incense stick will produce an aroma that will stimulate the work of the brain's neurochemical cells. A pleasant aroma will stimulate the thalamus to release enkephalin which produces a feeling of calm and is believed to be able to influence parts of the brain that are directly related to mood, emotions and memory (Medfort, et al, 2012). The advantage of incense aromatherapy compared to other aromatherapy is that the aroma produced can last in the room for approximately 30-45 minutes. Apart from that, aromatic incense sticks (incense) are very easy to get and the way to use them is also more practical, they don't spill easily and the price is affordable. Therefore, researchers chose to use aromatic incense sticks (incense) to reduce stress levels in this study.

The results of interviews conducted with 5 students at "X" University regarding handling stress found that 2 people handled stress by laughing with friends. 2 people listening to music and 1 person relaxing deeply breathing. According to them, this method can reduce stress levels but is only temporary and less effective with a success rate of 52% because by using this method they still experience stress.

The general aim of this research is to find out whether there is an effect of peppermint incense aromatherapy on reducing stress levels when preparing a thesis for undergraduate students at "X" University.

2. LITERATURE REVIEW

Peppermint aromatherapy (mint leaves) is a complementary therapy using peppermint essential oil. The mechanism by which aromatherapy works begins with the absorption of molecules that evaporate through the nasal mucosa. The odor molecules are then transmitted to chemical signals that move through the olfactory system and trigger receptors in the nasal epithelium, thereby stimulating the nervous system and thalamus to release endorphins and serotonin, interacting with neuropsychology to produce psychological characteristics and effects that ultimately give rise to the perception of freshness and comfort. The aroma of peppermint essential oil can influence serotonin which causes a person to be in a relaxed and comfortable state, where this condition will suppress stressful stimuli which causes the body to feel comfortable (Desi, 2022).

Peppermint incense aromatherapy can reduce stress levels and is also confirmed by research by Sunaeni (2022), that giving peppermint aromatherapy can reduce stress levels in pregnant women. Peppermint functions as an anti-convulsant. One of the anti-convulsive mechanisms is spasmolytic or anti-convulsive muscle contraction.

Peppermint has antispasmodic properties that reduce muscle tension. The antispasmodic mechanism of action of lavender oil was confirmed by the results of Lis Bachim's research. According to him, lavender's antispasmodic action mediates the release of enzymes that reduce muscle contractions. The mode of action of linalool, one of the dominant components in lavender, provides a sense of calm. According to him, lavender's mode of action is the same as peppermint oil. This is confirmed by research by Chaera (2023), that inhaling peppermint essential oil aromatherapy can trigger the secretion of endomorphins and relieve stress and pain. This mechanism is because peppermint essential oil is useful for relieving anxiety and stress, because peppermint essential oil contains monoterpenes, sesquiterpenes and lavanoides which can improve the nervous system of benzodiazepine receptors, the anxiolytic content of peppermint is useful for reducing anxiety. The main compound of peppermint, namely carvone limonene, affects the kappaopioid receptor which calms the mind.

3. METHODS

The research design used in this study was quasi-experimental with a pre-test post-test with control group approach. The sampling technique used was probability sampling with a simple random sampling method and obtained 58 respondents. The data analysis method for this research is the paired t test for paired tests and Man Whitney for unpaired tests. This research was conducted at "X" University.

4. RESULTS AND DISCUSSION

	Treatment	N	Average +d	Difference + d	IK 95%	P
<i>Pre Test</i>	<i>Peppermint</i>	29	20.97 + 3.246	2.759 + 2.502	3.710-1.807	.0000
<i>Post Test</i>	<i>Peppermint</i>	29	18.21 + 2.305			
<i>Pre Test</i>	Plasebo	29	21.48 + 3.269	0.000 + 1.165	0.443-0.443	1.000
<i>Post Test</i>	Plasebo	29	21.48 + 2.824			

Table 1: Pair T Test results for two paired groups

Based on the results of the Pair T Test, the sig value in the experimental group was 0.000 and alpha 0.05, so it can be concluded that ($P_v < 0.05$) so H_a is accepted, H_0 is rejected. So there is an effect of peppermint incense aromatherapy on reducing stress levels when preparing a thesis for undergraduate students at "X" University. Meanwhile, the sig value in the control

group is 1,000 and alpha 0.05, so it can be concluded that ($P_v > 0.05$), so H_a is rejected. H_0 is accepted. So it can be concluded that there is no effect on the control group. Based on the normality test, it was found that the data distribution was not normal, so the hypothesis test for unpaired groups used the Mann Whitney test.

	Treatment	N	Mean + d	p
Category	<i>Peppermint</i>	29	2.76 + 2.502	0.000
Decline	Plasebo	29	0.00 + 1.165	
	Total	58		

Gambar 2: Hasil uji mann whitney.

Based on the mean value, there is a difference between the experimental group, the mean value is 2.76 and the control group, the mean value is 0.00. To find out significant differences, look at the results of the Mann Whitney test. Based on the results of the Mann Whitney test, the sig (2-tailed) value is 0.00, if the alpha value is 0.05 then $p < 0.05$. So H_a is accepted and H_0 is rejected. So it can be concluded that there are differences in the experimental group and the control group.

Based on the univariate test in the experimental group, it was found that the average value for reducing stress levels was 2.76. Meanwhile, the normality test using Kolmogorov Smirnov showed that the data distribution was normal with the pre-test P_v value being 0.090, while the post-test P_v value was 0.200, so it could be said that the data distribution was normal because $P_v > \alpha$. So the hypothesis test for paired groups uses the Pair T Test. It is known from the Pair T Test results that the P_v value is 0.000, if the alpha value is 0.05 then $P_v < 0.05$ so H_a is accepted and H_0 is rejected. It can be concluded that there is an effect of peppermint incense aromatherapy on reducing stress levels when preparing theses for students at "X" University.

Peppermint is a wild plant in humid and temperate areas, such as Europe, Asia and North America. Flowering peppermint is perennial, but mostly appears in July to August. Peppermint oil is produced from extracting the stems, leaves and flowers (Christa, 2019). Based on the results of the research above, it can be concluded that peppermint incense aromatherapy can be used as a technique for reducing stress. There is an effect of giving peppermint incense aromatherapy on reducing stress levels when preparing a thesis for students at "X" University. This is because peppermint incense aromatherapy is a therapy that uses incense (aromatic incense sticks) containing peppermint essential oil, one of the ingredients contained in peppermint is the apotogen found in peppermint which helps regulate cortisol levels in the blood thereby triggering the body's natural response to reduce stress. . Inhaling peppermint essential oil can immediately release serotonin in the blood which is a neurotransmitter well known for relieving stress and symptoms of depression.

This is confirmed by research by Astuti (2021) that peppermint can reduce stress. This is because after the subject inhales peppermint, the aromatherapy molecules and particles will enter through the respiratory tract (nose) and then be forwarded by the nerve receptors to be received as a good signal and then represented as a pleasant aroma and in the final stage the aroma stimulus will enter and affects the limbic system as the center of a person's emotions so that feelings become more relaxed. Feeling calm will enable a person to think calmly to overcome stressors, thus creating adaptive coping. Adaptive coping allows a person to accept his condition well and not experience increasing anxiety.

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This study used the DASS questionnaire with the results that only the peppermint group felt relaxed and the rosemary group tended to feel more alert. The advantage of the aromatic incense stick is that it is easy to use, does not spill easily, and the aroma or odor produced can last 30-45 minutes. The molecules from burning peppermint incense evaporate easily so they will directly hit the olfactory receptors in the nasal cavity. Apart from that, aromatic incense sticks (incense) are also easy to obtain because they are widely circulated in the community (Widayani, 2016).

5. CONCLUSION

Before administering peppermint incense aromatherapy, the average score in the pre-test for the experimental group was 20.97, while the pre-test for the control group had an average score of 21.48 and after administering peppermint incense aromatherapy, the average score for the post-test in the experimental group was 18.21, while the post-test for the control group average value 21.48.

After conducting a hypothesis test to find out whether there is an effect of peppermint incense aromatherapy on reducing stress levels when preparing a thesis for students at "X" University, the results of the paired T test show that $P_v = 0.000$, if the alpha value = 0.05, then H_a is accepted, H_0 is rejected. So, there is an effect of peppermint incense aromatherapy on reducing stress levels when preparing a thesis for students at "X" University.

REFERENCES

- Alvin, R. P., Fathana, G., & Adi, F. (2023). Hubungan antara stres dengan kualitas tidur pada mahasiswa yang sedang menyusun skripsi di Universitas "X". *Jurnal Ilmiah Wahana Pendidikan*, 9(22), 80–89.
- Chaera, M. S., Herawati, T., & Sunarya, C. E. (2023). Effects of peppermint aromatherapy in cardiovascular disease patients: A literature review. *Jurnal Ilmiah Ilmu Keperawatan Indonesia (JIKI)*, 13(1).

- Christa, S., Darwis, I., & Graharti, R. (2019). Peppermint (*Mentha piperita*) sebagai pengobatan alternatif pada irritable bowel syndrome (IBS). *Jurnal Majority*, 8(1), 211–219.
- Desi, U., Masthura, S., & Desreza, N. (2022). The effect of oil aromatherapy (mint leaves) on decreasing the severity of nausea and vomiting among pregnant women in the working area of Krueng Barona Jaya Public Health Center in 2022. *Journal of Healthcare Technology and Medicine*, 8(2).
- Dewi, E. U. (2018). Terapi tertawa terhadap tingkat stres pada lansia di RW 06 Kelurahan Darmo Surabaya. *Jurnal Keperawatan*, 7(1).
- Faridah, A., Dietha Septi Dyah K. D., L. P., & Novitasari, D. (2016). Pengaruh senam yoga terhadap tingkat stres pada remaja dalam persiapan menghadapi ujian nasional. *Jurnal Ilmiah Kesehatan*, 9(2).
- Janet, M., et al. (2012). *Kebidanan Oxford*. Jakarta: EGC.
- Khoizer. (2010). *Fundamental Keperawatan*. Jakarta: EGC.
- Khwarizmi, A. (2022). *Manajemen Stres*. Jakarta: Menara Ilmu.
- Livina, P. H., & Sri, M. (2023). Tingkat stres mahasiswa dalam menyusun skripsi. *Journal of Health Guidance and Counseling*, 1(1).
- Ni Komang, T. W., Sutrisno, & Riniasih, W. (2022). Pengaruh aromaterapi dupa lavender terhadap penurunan tingkat stres penyusunan skripsi pada mahasiswa S1 Keperawatan Stikes An Nur Purwodadi. *Jurnal The Shine Cahaya Dunia Kebidanan*, 7(2).
- Rahma, E., Sari, Y., & Chrisanto, E. Y. (2021). Keefektifan relaksasi nafas dalam terhadap penurunan stres pada lansia di UPTD Pelayanan Sosial Lanjut Usia Tresna Werdha Natar Lampung Selatan. *Journal Malahayati Nursing*, 3(1), 50–60.
- Riski, D. A., Prihatin Idris, F., Gobel, F. A., Asrina, A., & Rahman, H. (2023). Faktor yang berhubungan dengan tingkat stres mahasiswa dalam menyusun skripsi. *Journal Window of Public Health*, 4(4), 567–577.
- Sri, U. (2016). Efektivitas aromaterapi bitter orange terhadap nyeri post partum sectio caesarea. *Journal of Public Health Unnes*, 5(4).
- Sunaeni, D., & Sentuf, D. (2022). Pengaruh aromaterapi peppermint terhadap kejadian emesis gravidarum. *Jurnal Kebidanan Sorong*, 1(2).
- Weni, K., & Setyaningsih, R. (2022). Manajemen stres pada mahasiswa tingkat akhir dalam penyusunan skripsi. *Jurnal An-Nur: Kajian Pendidikan dan Ilmu Keislaman*, 8(1).
- Widia, A., Meirita, D. N., & Novianty, T. (2021). Pengaruh aromaterapi peppermint terhadap tingkat kecemasan perawat di masa pandemi COVID-19. *Jurnal Ilmu Kesehatan*, 9(2).

Website

<https://health.detik.com/berita-detikhealth/d-3308131/2-095-warga-solo-alami-gangguan-jiwa-760-orang-termasuk-kategori-berat>

<https://jatengprov.go.id/publik/25-persen-warga-jateng-alami-gangguan-jiwa-ringan/>

<https://www.kompas.id/baca/humaniora/2023/10/10/saatnya-kesehatan-karyawan-di-tempat-kerja-kian-diperhatikan>

<https://www.kompas.id/baca/humaniora/2023/02/01/cita-cita-indonesia-2045-terhalang-masalah-kesehatan-mental-remaja>