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Effects of Peppermint Aromatherapy in Cardiovascular Disease Patients: A Literatur Review

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Abstract

Background: Cardiovascular disease is a non-infectious disease that causes a high mortality rate in the world. The complementary medication reduces symptoms related to cardiovascular disease such as anxiety, stress, sleep quality, fatigue, pain, anxiety, depression, nausea and vomiting. The medication is also to improve the life quality of the patients. Aromatherapy is one of the complementary therapies known as Complementary and Alternative Medicine (CAM) to reduce or relieve symptoms of various diseases and conditions including cardiovascular disease. Peppermint aromatherapy has a refreshing cold aroma that creates a feeling of comfort.
Objectives: To identify the effectiveness of peppermint aromatherapy in improving several conditions, such as anxiety, stress, sleep quality, fatigue, and pain in patients with cardiovascular disease.
Methods: The method uses a literature review with the PRISMA approach with a study database selection process consisting of ClinicalKey, ClinicalKey Nursing, Embase, Pro Quest, Sage Jornal, Science Direct, Scopus, and Springer Link using the keywords peppermint aromatherapy and cardiovascular disease patients.
Results: Based on a review and review of five selected journals, it was found that peppermint aromatherapy helps improve cardiovascular disease disorders through its analgesic, anxiolytic, sedative and sleep enhancing properties.
Conclusion: Cardiologists can use peppermint aromatherapy as an alternative therapy to reduce fatigue, pain, anxiety, nausea, vomiting and improve sleep quality in patients with cardiovascular disease.

Keywords: aromatherapy, cardiovascular disease patient, peppermint aromatherapy

Introduction

Cardiovascular disease is a disease involving the heart and blood vessels, which includes cardiovascular disease including Heart Failure (HF), arrhythmia, cardiomyopathy, Coronary Artery Disease (CAD), heart valve disease, and peripheral arterial disease, considered the highest morbidity and mortality rate in the world.[1] Based on a report by the World Health Organization (WHO), cardiovascular disease causes around 18 million deaths which are more than 30% of all deaths worldwide by 2030.[2] The incidence of cardiovascular disorders has increased in recent years due to increased life expectancy,[3] along with changes in lifestyle and eating habits.[4] Lifestyle, environmental factors, and genetic factors are risk factors for the development of cardiovascular disease.[1] The mortality rate of cardiovascular diseases has dramatically reduced in Western countries, but in developing countries such as Iran and Indonesia, cardiovascular diseases remain a serious health challenge.[5] There are treatment methods with pharmacological management that have serious side effects, as well as use large financial costs in the health care system.[4] Cardiovascular patients could have various psychological and physical problems. Sleep disturbances, fatigue, pain, anxiety, depression, nausea, and vomiting may be experienced due to multi-medication regimens, new medication addiction, and interaction between the medicine and the side effects. One of the beneficial methods for complementary medication is aromatherapy. This therapy, in recent years, gains various more attention from the world than other complementary medications.[6]

Aromatherapy is the most popular-complementary medication for nurses. This therapy is also mostly applied in clinical practices as part of independent nursing intervention.[7] Aromatherapy has the extracted fragrant compound or essential oil from plants, trees, bushes, and herbs.[8,9] These oils can come from various parts of the plant, including flowers, leaves, bark, fruit, and roots.[10] Aromatherapy can be administered in different ways such as through massage, medicated baths, skin absorption, or inhalation.[11] Inhales aromatherapy is a popular method in complementary medication. This medication influences the limbic system and makes individuals relaxed.[12] The researchers found evidence that inhaling essential oil could trigger endomorphism secretion and relieves pain and anxiety.[13] The mechanism of peppermint essential oil is useful to relieve anxiety with the inhaled molecular action mechanism to the limbic system via the olfactory system. This process applied the anxiolytic effect. The sedative compound also stimulates the limbic system. Besides that, the presence of effective compounds, such as monoterpenes, sesquiterpenes, and flavonoids, could improve the extracted impacts on the neural system and the benzodiazepines receptor. This process improves the anxiolytic effect to relieve anxiety.[14] One of the aromatherapy is peppermint essential oil with the scientific name mentha piperita is one of the essential oils used for aromatherapy. Mentha piperita is an aromatic herb with analgesic and tranquilizing effects. The analgesic effect of peppermint can be due to its main compounds like Carvone, Limonene, and Menthol. Menthol in peppermint affects Kappa Opioid receptors and soothes the pain in return. In addition, menthol is effective in soothing pain by increasing the stimulation threshold of cells and decreasing synaptic stimulations and transmits.[13] Menthol is a main component of peppermint and has a spasmolytic effect. This component facilitates the bile flow and saltpeter.[15] The menthol in peppermint relieves the esophageal sphincter tone and relaxes the smooth muscle of the digestive system.[16]

In recent years, many studies have been conducted using aromatherapy with some essential oils as a non-invasive intervention for medicating some diseases. Studies also found that aromatherapy could have positive and therapeutic effects to relieve anxiety, fatigue, nausea, vomiting, and pain. Aromatherapy could also improve sleeping quality for patients with cardiovascular. However, some literature studies about the effect of aromatherapy, especially peppermint essential oil for cardiovascular diseases, are limited. Thus, this research

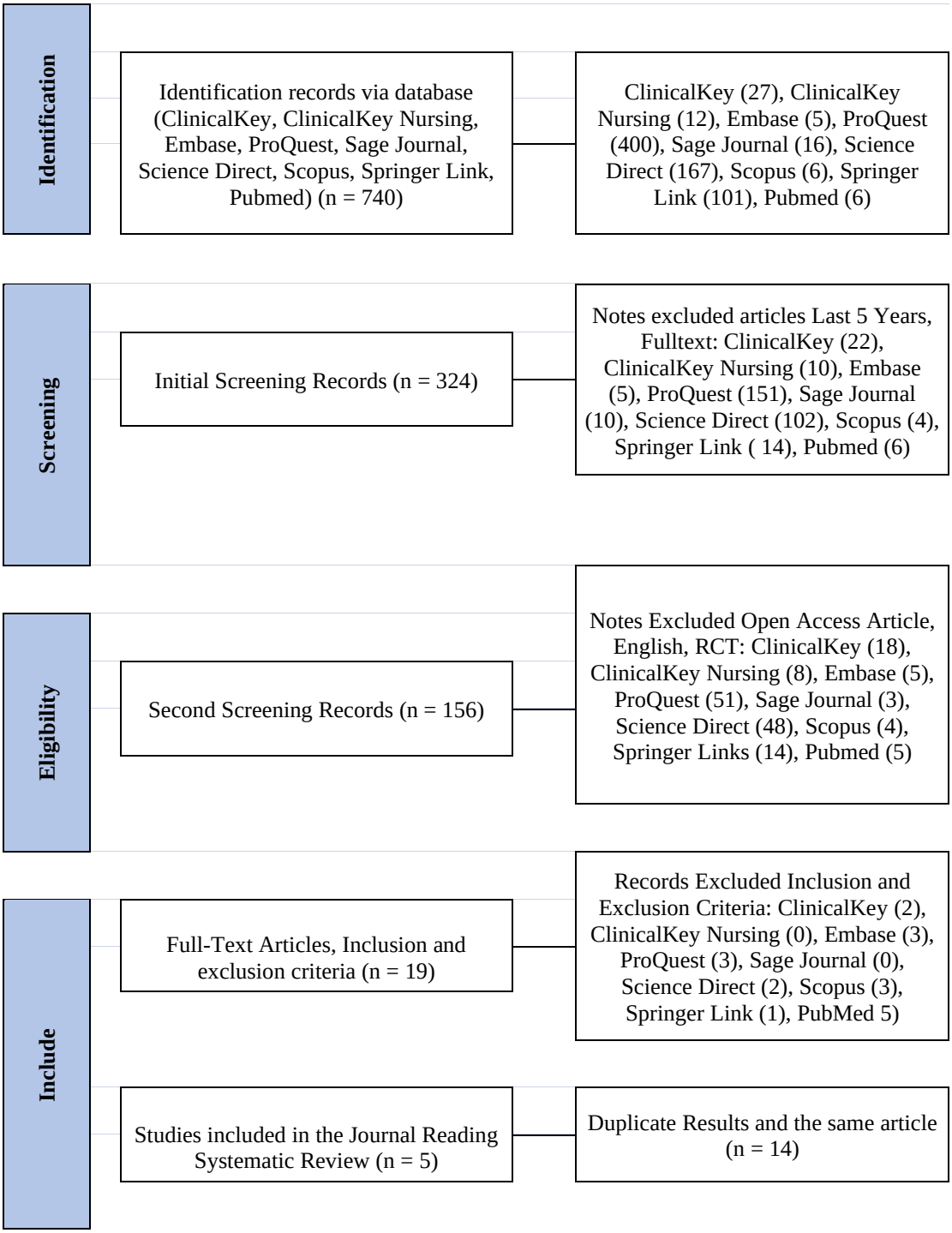
attempted to promote a literature review about the aromatherapy effects of peppermint essential oil to improve some conditions, such as anxiety, fatigue, nausea, vomiting, sleeping quality, and pain for patients with cardiovascular.[17]

Methods

The method used in this literature review uses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow to discuss various topics about the effect of peppermint aromatherapy on cardiovascular disease patients. The ethical agreement was not necessary as the main data have not been collected. The databases used in the study selection process consisted of ClinicalKey, ClinicalKey Nursing, Embase, Pro Quest, Sage Journal, Science Direct, Scopus, Springer Link, and Pubmed. Published from 2017-2022 using the keyword "(peppermint aromatherapy AND cardiovascular disease patients). After searching, 5 articles were found that matched the topics selected based on **the inclusion criteria**, namely: 1) full text, 2) written in English, 3) clearly explaining the aims and research methods, 4) having a relationship with the use of peppermint aromatherapy in patients cardiovascular disease, 5) published between 2017-2022 and 6) foreign publication. **The exclusion criteria**: 1) abstract and title of the review only, 2) not related to the scope of the effects of peppermint aromatherapy in cardiovascular disease patients.

After searching the journal articles from nine databases that were determined to produce 740 articles. They were ClinicalKey (n=27), ClinicalKey Nursing (n=12), Embase (n=5), ProQuest (n=400), Sage Journal (n= 16), Science Direct (n=167), Scopus (n=6), Springer Link (n=101) and Pubmed (n=6). Then the first screening was carried out with initial elimination, namely the published journals were journals published in the last five years and full text (n = 324), then the second screening or compliance assessment was carried out, namely articles with Open Access, the remaining 156 articles (n = 156), then filtered the title/abstract based on inclusion and exclusion criteria, remaining 19 articles (n = 19). After excluding duplicates, five articles (n=5) remain. The PRISMA flow chart for study selection is illustrated in chart 1.

Chart 1. Literature selection process using the PRISMA method



Results

Aromatherapy could influence the body, direct physiological improvement, and psychological and therapeutic prevention.[4] In some recent studies, the most applicable aromatherapy is peppermint essential oil. This aromatherapy receives much attention due to its high esteem, popularity, and broader implementation.[18] Peppermint with *Mentha piperita*, the family of *Lamiaceae* had the primary components, such as menthol, *menthone*, and *mentil acetat*e.[19] The essential oil is an essence for aromatherapy. The inhaled aromatherapy could lead to limbic system change. This system is part of the brain and is correlated to memory and emotion. This matter stimulates the physiological responses of the neural system to secrete endorphins and noradrenaline into the body. This stimulation influences the beat rate, blood pressure, respiration, brain wave activity, and hormonal release to the body.[17]

Improving the Sleeping Quality and Relieving Fatigue

The inhaled peppermint aromatherapy influences the hypothalamus and relieves *corticotropin-releasing hormone* and secret adrenocorticotropin from the pituitary (Gaware, V.M., 2015). The main components of peppermint essential oil are menthol, menthol, and methyl acetate. The primary effects of peppermint are analgesic, anxiolytic, sedative, and improving sleeping quality. Mahdivikian et al., (2020); Mahdivikian et al., (2021) used peppermint aromatherapy and lavender with pure 100% concentration toward the sleeping quality and fatigue of heart disease patients.

The obtained results showed a significant difference, in the PSQI mean scores for each experimental group, before and after the intervention.[18] The same results were also observable in the decreased fatigue mean in the study group. The researchers found no significant differences statistically between the lavender and peppermint groups in terms of the mean score of fatigue after the intervention. However, the researchers found significant differences statistically between the lavender and control groups, $p < 0.001$ while for the peppermint group and control group $p < 0.001$.[11]

Reducing Pain

In addition, Akbari et al., (2019) evaluated the effect of 100% pure peppermint essential oil inhalation aromatherapy on pain and anxiety due to intravenous catheterization of cardiac patients, which were randomly allocated to peppermint aromatherapy and the control group. The Menthol content in peppermint essential oil stimulates the kappa opioid receptors and reduces pain as an effect. In addition, menthol is effective in reducing pain by increasing the threshold for cellular stimulation and decreasing synaptic stimulation and transmission.[12] The intervention in this study was carried out by pouring three drops of peppermint onto a piece of cotton and affixing it to the subject's cloth collar 10 cm from the patient's nose, inhalation continued for 5 minutes. The same process was carried out for the control group with three drops of distilled water (placebo). It is worth mentioning that their study was comparable to this study in terms of the content of peppermint essential oil used, the study design, and the diseases studied.

Anxiety

Soleimani et al. (2022) found the influence of inhaled peppermint aromatherapy on the anxiety of heart-diseased patients (Acute Coronary syndrome) in an emergency unit. Anxiety could improve the concentration of plasma epinephrine and norepinephrine. The plasma influences physiological indicators, such as blood pressure, pulse, respiratory rate, and myocardial oxygen absorption. The results showed significantly relieved anxiety after the intervention, with $p < 0.001$ in the intervention group. The differences were not significant in

the control group. The inhaled peppermint essential oil lasts systematically via nasal mucosa and lungs. For some minutes, after the inhalation of peppermint aroma, the molecules appear in the blood, in the brain, and in the neural system, lipophilic. *Peppermint* is familiar with the features of antispasmodic, analgesic, anti-inflammatory, anti-congestive, and antioxidant to relieve anxiety.[5] This research was equal to other research in terms of the applied essential peppermint oil, the research design, and the investigated disease.

Nausea and Vomiting

Maghami et al., (2020) also found that a 10% peppermint content in aromatherapy influenced the incidents of nausea and vomiting in 60 heart-diseased patients. In the research, the researchers randomly grouped into the peppermint aromatherapy group (n = 30) and the control group (n = 30). The menthol content is the main peppermint component with spasmolytic features to facilitate the bile, esophageal sphincter tone, and saltpeter. The essential peppermint oil has the effects of anticonvulsants and hinders nausea and vomiting due to the disinfectant and anti-spasmolytic effects on the abdomen and colon. The results showed the positive effects of peppermint to relieve nausea and vomiting after open heart surgery.[15] This research was equal to other researchers in terms of aromatherapy, research design, and investigated disease.

Table 1. Details of the results of the top choice journals for literature review

No.	Author/ Year/ Location	Research Title	Journal Name	Research Purposes	Method (Sample)	Intervention	Instrument	Results
1.	Mahdavikian et al. (2020). Western Iran.	Comparing the effect of aromatherapy with peppermint and lavender on the sleep quality of cardiac patients: a randomized controlled trial	Evidence-based Complementary and Alternative Medicine	To compare the effect of aromatherapy with peppermint and lavender essential oils on the sleep quality of heart patients.	Randomized Controlled Trial. 105 cardiac patients were randomly allocated to three groups of peppermint essential oil, lavender essential oil, and control.	In each experimental group, patients inhaled three drops of lavender and peppermint essential oils, while the control group received aromatic distilled water.	Numerical pain rating scale (NPRS) and visual analogue scale for anxiety (VAS-A).	There was a significant difference in the average PSQI score (patient sleep quality) in each experimental group before and after the intervention.
2.	Mahdavikian et al. (2021). Western Iran.	Comparing the Effect of Aromatherapy with Peppermint and Lavender Essential Oils on Fatigue of Cardiac Patients: A Randomized Controlled Trial.	Complementary Therapies in Clinical Practice	To compare the effect of aromatherapy with peppermint and lavender essential oils on fatigue in heart patients	Randomized Controlled Trial	105 cardiac patients. (Randomly divided into three groups: peppermint essential oil (n: 35), lavender essential oil (n:35), and control (n:35).	FSS (Fatigue Severity Scale) was used to collect data (intervention was carried out for 7 nights).	Results showed an average decrease in fatigue in the study group, no statistically significant difference between the two lavender and peppermint groups after the intervention. However, there were statistically significant differences between the lavender and control groups (P <

								0.001), as well as the peppermint and control groups (P < 0.001).
3.	Akbari et al. (2019). Iran.	Effect of peppermint essence on the pain and anxiety caused by intravenous catheterization in cardiac patients: A randomized controlled trial	Journal of Pain Research	To determine the effect of inhaling peppermint juice on pain and anxiety.	Randomized Controlled Trial	80 cardiac patients were selected through easy sampling and randomly allocated to aromatherapy and control groups.	Data collection tools were a numerical pain rating scale and a visual analogue scale for anxiety.	The mean severity of pain in the aromatherapy and control groups was 2.95 ± 0.98 and 3.42 ± 1.33, respectively. The difference is statistically significant (p=0.048). The mean anxiety scores before the intervention in the aromatherapy and control groups were 3.75 ± 1.08 and 4.70 ± 1.43, respectively; these figures after the intervention were 2.32±0.97 and 2.10±1.42 respectively. The two groups did not differ significantly before and after the intervention in terms of anxiety levels. However, the level of anxiety before and after the intervention was significantly

								different in each group (p<0.001).
4.	Soleimani et al. (2022). Iran.	The effect of aromatherapy with peppermint essential oil on anxiety of cardiac patients in emergency department: A placebo-controlled study.	Complementary Therapies in Clinical Practice	To evaluate the effect of peppermint aromatherapy on anxiety in acute coronary syndrome patients in the emergency department.	Randomized Controlled Trial	64 ACS patients who came to the emergency department of Chamran Hospital in Tehran.	Patient anxiety was assessed using Spielberger's State-Trait Anxiety Inventory (STAI), which was completed by the patient before the intervention while the state anxiety subscale was completed again 1 hour after the intervention.	The mean values of trait and state anxiety before the intervention did not differ significantly between the two groups. After the intervention, anxiety was significantly lower in the intervention group (37.72 ± 10.41) compared to the control group (42.62 ± 5.99) (P = 0.021). The results showed a significant decrease in anxiety after the intervention (P < 0.001) in the intervention group. Such differences were not significant in the control group.
5.	Maghami et al. (2020). Iran.	The effect of aromatherapy with peppermint essential oil on nausea and vomiting after cardiac surgery: A randomized clinical trial	Complementary Therapies in Clinical Practice	To test the effect of inhalation of peppermint essential oil on nausea and vomiting in post-cardiac surgery patients.	Randomized Controlled Trial	60 patients were recruited sequentially and by tossing a coin were assigned to the intervention and control	The nausea and vomiting rating scale includes four questions about the severity, frequency, and duration of nausea and frequency of	A total of 85.7% of the patients underwent coronary artery bypass graft surgery. Significant differences were found between the intervention and control groups in terms of frequency of nausea (0.63 ÿ

						groups, 30 patients in each group.	vomiting episodes during the first 12 hours (within the first 4 hours: T1; within the second 4 hours: T2; and within the third 4 hours: T3) after surgery. . Nausea severity scores range from zero (no nausea) to 100 (most severe nausea)	0.81 vs 1.46 ÿ 1.21), duration (3.78 ÿ 5.09 vs 7.97 ÿ 5.55 minutes), and severity (2.43 ÿ 2.84 vs. .4.61 ÿ 2.85), and frequency of vomiting episodes (0.17 ÿ.46 vs. 0.73 ÿ.60) in the first four hours after extubation (P <0.05).

Discussion

This study has several drawbacks because it examines certain oils (peppermint essential oil) and may not be generalizable to other aromatherapy interventions and for use in the clinical field must be adjusted to the patient's preference for the aromatherapy to be used. Peppermint essential oil aromatherapy for some middle and lower-class people is difficult to get because it is associated with costs incurred and has not been covered by health insurance. Side effects from the use of inhalation aromatherapy using peppermint essential oil are rare.

Peppermint essential oil is known as the safest of all essential oils.[19] The use of essential oils for aromatherapy still has minimal side effects for patients with cardiovascular disease. Research conducted by Johnson et al. (2020), explained that the most common allergy that occurs in cases of aromatherapy administration is skin irritation and even that is due to the use of aromatherapy topically, not through inhalation.[10] The findings from this study indicate that the effectiveness of using peppermint essential oil aromatherapy is good, it can be used as an effective intervention to reduce symptoms of anxiety, fatigue, pain, nausea, vomiting, and sleep quality in patients with cardiovascular disease. It is recommended that healthcare providers of cardiovascular disease patients consider nonpharmacological methods for the management of anxiety, fatigue, pain, nausea, vomiting, and sleep quality.

Based on these findings, the essential peppermint aromatherapy administration could be the autonomous intervention for patients with anxiety, fatigue, pain, nausea, and vomiting. The therapy could also improve the sleeping quality of the patients. *Complementary and Medicine Therapy* is a self-directed intervention by administering essential peppermint oil aromatherapy to manage anxiety, fatigue, pain, nausea, and vomiting; and to improve the sleeping quality of patients with cardiovascular diseases. Thus, their life will be better and decrease re-hospitalization incidents.[21]

Patients with heart failure could suffer from anxiety, pain, fatigue, nausea, vomiting, and sleeping problems. These problems limit their activities. Once they have exaggerated activities, their hearts will pump and beat faster. This condition may worsen the patient's condition.[22] The management of fatigue, anxiety, pain, vomiting, nausea, and sleeping problems symptoms on cardiovascular patients should meet the basic necessity of the patients based on Henderson's theory about 14 basic human needs.[23] Virginia Henderson explains that humans, as individuals, require assistance to remain healthy, and free, die peacefully, and be self-directed.[24] The administration of essential peppermint oil became the accurate complementary therapy to apply.

Conclusion

This study reviews systematically the effectiveness of essential aromatherapy oil for patients with cardiovascular diseases. The results found that peppermint was the most frequently applied plant for aromatherapy and significantly improved some diseases and conditions, especially anxiety, fatigue, pain, nausea, vomiting, and sleeping problem. Therefore, the results concluded that most nurses applied peppermint aromatherapy as a complementary and alternative therapy to improve sleeping quality, anxiety, fatigue, pain, vomiting, and nausea. The results suggested further specific studies to promote literature study.

Conflict of Interest Declaration

There is no conflict of interest in this research.

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References

1. Malakar Arup Kr, Choudhury D, Halder Binata, Paul Prosenjit UA, Chakraborty Supriyo. A review on coronary artery disease, its risk factors, and therapeutics. Journal of Cellular Physiology. 2019;234:16812–23. https://doi.org/10.1002/jcp.28350
2. Roth, G. A. et al. Global Burden of Cardiovascular Diseases and Risk Factors, 1990–2019. Journal of the American of Cardiology. 2020;76:2982–3021. https://doi.org/10.1016/j.jacc.2020.11.010
3. Turan, Kavradim S., Yangöz ST. OZ. Effectiveness of aromatherapy inhalation on anxiety and haemodynamic variables for patients with cardiovascular disease: A systematic review and meta-analysis. Int J Clin Pract. 2021; https://doi: 10.1111/ijcp.14593.
4. Aliannezhadi V, Vaghasloo MA, Keshavarz M, Sadeghi S, Ilkhani R. A Review of Aromatherapy for Cardiovascular Disorders : From Persian Medicine to Current Evidence. Crescent Journal of Medical and Biological Sciences. 2021;8(3):1–10. Available from: http://www.cjmb.org/uploads/pdf/pdf_CJMB_496.
5. Soleimani M, Kashfi LS, mirmohamadkhani M, Ghods AA. The effect of aromatherapy with peppermint essential oil on anxiety of cardiac patients in emergency department: A placebo-controlled study. Complementary Therapies in Clinical Practice. 2022;46(August 2021):101533. Available from: https://doi.org/10.1016/j.ctcp.2022.101533
6. Gong M, Dong H, Tang Y, Huang W, Lu F. Effects of aromatherapy on anxiety: A meta-analysis of randomized controlled trials. Journal of Affective Disorders. 2020;274(May):1028–40. Available from: https://doi.org/10.1016/j.jad.2020.05.118
7. Hassanzadeh M, Farsi Z, Sajadi SA. Comparison of the effect of Sedamin and aromatherapy with Lavender on fatigue severity of patients with heart failure: A three arm randomized controlled trial. Journal of Herbal Medicine. 2021;30(December 2020):100514. Available from: https://doi.org/10.1016/j.hermed.2021.100514
8. Plant RM, Dinh L, Argo S, Shah M. The Essentials of Essential Oils. Advances in Pediatrics. 2019;66:111–22. Available from: https://doi.org/10.1016/j.yapd.2019.03.005
9. Mapp CP, Hostetler D, Sable JF, Parker C, Gouge E, Masterson M, et al. Peppermint Oil. 2020;24(2):160–5. https://doi.org/10.1188/20.CJON.160-164.
10. Johnson SA, Rodriguez D, Allred K. A Systematic Review of Essential Oils and the Endocannabinoid System: A Connection Worthy of Further Exploration. Evidence-based Complementary and Alternative Medicine. 2020;2020. https://doi.10.1155/2020/8035301
11. Mohr C, Jensen C, Padden N, Besel JM, Brant JM. Peppermint Essential Oil for Nausea and Vomiting in Hospitalized Patients: Incorporating Holistic Patient Decision Making Into the Research Design. Journal of Holistic Nursing. 2021;39(2):126–34. https://doi.10.1177/0898010120961579
12. Mahdavikian S, Fallahi M, Khatony A. Comparing the Effect of Aromatherapy with Peppermint and Lavender Essential Oils on Fatigue of Cardiac Patients : A Randomized Controlled Trial. Complement Ther Clin Pract. 2021;2021. https://doi.org/10.1155/2021/9925945
13. Akbari F, Rezaei M, Khatony A. Effect of peppermint essence on the pain and anxiety caused by intravenous catheterization in cardiac patients: A randomized controlled trial. J Pain Res. 2019;12:2933–9. https://doi.org./10.2147/JPR.S226312
14. Ahmed HM, Caro DC, Rivera DE, Ocampo Y, Franco LA, Salas RD, et al. Effect of Peppermint Aromatherapy on the Level of Anxiety in Patients Undergoing Colonoscopy. Phyther Res [Internet]. 2019;176(1):139–48. Available from: https://doi.org/10.1016/j.jtcme.2017.08.011
15. Maghami M, Afazel MR, Azizi-Fini I, Maghami M. The effect of aromatherapy with peppermint essential oil on nausea and vomiting after cardiac surgery: A randomized clinical trial. Complement Ther Clin Pract [Internet]. 2020;40(February):101199. Available from: https://doi.org/10.1016/j.ctcp.2020.101199
16. Abril K, Elsabrout K. Treatment of Postoperative Nausea and Vomiting : A Complement to Traditional Pharmacologic Treatments. 2019;28(6):375–81.

17. Almohammed HI, A Alanazi N, Maghrabi EF, A Alotaibi M. Role of Aromatherapy as a Natural Complementary and Alternative Therapy in Cardiovascular Disease: A Comprehensive Systematic Review. Evidence-based Complement Altern Med. 2022;2022. https://doi.10.1155/2022/4543078
18. Mahdavikian S, Fallahi M, Khatony A. Comparing the effect of aromatherapy with peppermint and lavender on the sleep quality of cardiac patients: a randomized controlled trial. Evidence-based Complement Altern Med. 2020; https://doi.10.1155/2021/9925945
19. McDermott K, Nash P, Boyington A, Planell LP, Joe S, Streifel K, et al. Effects of olfactory stimulus on group performance and individual stress responses in university students. Physiol Behav [Internet]. 2022;254(May):113905. Available from: https://doi.org/10.1016/j.physbeh.2022.113905
20. Gaware, V.M. et al. Aromatherapy : Art or science. Int J Biomed Res. 2015;6:869–73.
21. Williams BA. The clinical epidemiology of fatigue in newly diagnosed heart failure. BMC Cardiovasc Disord. 2017;17(1):1–11.
22. Kamal, Musaddad & Herawati T. Potential effectiveness of sleep hygiene and relaxation Benson in improving the quality of sleep in patients with heart failure: Literature review. Int J Nurs Heal Serv. 2019;2(1):101–7. https://doi.10.35654/ijnhs.v2i1.69
23. Alligood MR. Nursing Theorists and Their Works. 8th Ed. Mosby Elsevier, Inc. 2014;
24. Hamid, AY.S & Ibrahim K (Eds). Pakar Teori Keperawatan dan Karya Mereka,.8th Indonesian Edition. Volume 1 dan 2. Elsevier Singapore Pte Ltd. 2017;