Effectiveness of a combination of lemon peppermint and murottal for postoperative nausea, vomiting, and anxiety after general anesthesia

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Effectiveness of a combination of lemon peppermint and *murottal* for postoperative nausea, vomiting, and anxiety after general anesthesia

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Abstract

Background: Nausea, vomiting, and anxiety are the most common complications after surgery with anesthesia in the first 24 hours after surgery. Handling this problem can be provided with complementary therapy in the form of lemon peppermint and murottal aromatherapy which is able to have a psychological effect on emotions, thoughts, suggest calm and reduce anxiety, and is absorbed by the central nervous system, autonomic nervous system or endocrine system. system in the brain to provide a relaxing effect.
Purpose: Explains the effectiveness of the combination of lemon peppermint and murottal aromatherapy against nausea, vomiting and anxiety in post-operative patients under general anesthesia.
Method: The research design uses a Quasi Experiment study with Pre-Post Test with Control Group Design. The sample size was 70 participants with each group consisting of 35 participants, using consecutive sampling technique. Analysis of this research data used the Repeated ANOVA test and the General Linear Model test to test differences between groups ($\rho<0.05$), followed by the Post-Hoc test to find out which group had the most influence.
Results: It shows that from the 2 groups, it was found that the combined intervention of lemon peppermint and murottal aromatherapy was more influential and effective in reducing nausea, vomiting and anxiety with a p-value of 0.000.
Conclusion: The combination of lemon peppermint and murottal aromatherapy was more effective in reducing nausea, vomiting and anxiety in post-operative patients under general anesthesia compared to other groups.

Keywords: Anxiety; Aromatherapy; Lemon; Murottal; Nausea; Peppermint; Vomiting.

INTRODUCTION

Surgery or surgery is a medical procedure that is performed with an incision to open or display the part of the body that will be treated. The World Health Organization (WHO) states that the number of clients undergoing surgery has increased very significantly every year. Every year 165 million surgical procedures are performed worldwide. It was recorded that in 2020 there were 234 million clients in all hospitals in the world. Operations/surgical procedures in Indonesia in 2020 reached up to 1.2 million people1. Based on data from the Indonesian Ministry of Health in 2021, surgical procedures are ranked 11th out of 50 disease treatments in Indonesia, 32% of which are surgical procedures (World Health Organization, 2020; Data and information center of the Ministry of Health of the Republic of Indonesia, 2021).

Surgery is carried out under anesthesia or anesthesia, where the administration of anesthesia or anesthesia is divided into local, regional or general anesthesia. Carrying out this surgical procedure can result in dangerous disorders or

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complications for the patient starting from the pre-operative, intra-operative to post-operative stages (Briggs, Hawrylack, & Mooney, 2016; Suresh, Polaner, & Coté, 2019; Wright, Ralston, & Slade, 2020).

Post-operation is an event after surgery problems that can arise, especially after surgery, are pain, nausea, vomiting, physiological response disorders, depression, anxiety, loss of control, disturbed body image, activity limitations (Amirshahi, Behnamfar, Badakhsh, Rafiemanesh, Keikhaie, Sheyback, & Sari, 2020). Nausea, vomiting and anxiety are the most common complications after surgery under anesthesia in the first 24 hours after surgery. Where the prevalence of postoperative nausea and vomiting ranges from 27.7% to 59.3%, this incident was found in 30% of inpatients who were not at risk and 70% in inpatients with high risk during the 24 hours after surgery (Amirshahi et al., 2020). The incidence of perioperative anxiety is reported to be between 11% - 80% in adult patients (Caumo, Schmidt, Schneider, Bergmann, Iwamoto, Bandeira, & Ferreira, 2001).

Nausea, vomiting is an effect that often occurs after surgery. This is due to the influence of anesthetic medication during surgery which stimulates or stimulates the chemoreceptors in the medullary area of the brain. Even though the effects of the anesthetic will disappear within 24 hours, if it is not treated seriously it will cause new problems for the patient, including dehydration, electrolyte imbalance, bleeding, hypertension and esophageal rupture. Further impacts if nausea and vomiting are not treated immediately can increase hospitalization time and hospital costs as well as increasing stressors (Denholm, & Gallagher, 2018).

Management of post-operative nausea, vomiting and anxiety can be done in several ways, including pharmacological and non-pharmacological methods. Pharmacological ways to reduce nausea and vomiting are by administering drugs such as anti-emetic drugs in the 5HT3 receptor antagonist class, namely ondansetron, granisetron. However, this drug has side effects such as lethargy, dysrhythmia, shallow breathing, decreased oxygen saturation, coughing disorders, atelectasis, pneumonia, impaired motor skills, changes in behavior, prolongation of the QT interval on the ECG. Another alternative that can be used to treat nausea, vomiting and anxiety is non-pharmacological therapy.

RESEARCH METHOD

The type of research that will be carried out is quantitative research with a quasi-experimental design to reveal the effectiveness of the combined intervention of Lemon Peppermint Aromatherapy and Murottal on nausea, vomiting and anxiety in post-operative patients under general anesthesia. The research design used was a pre-posttest with control group design.

The population in this study were patients who experienced nausea, vomiting and anxiety after surgery under general anesthesia in the inpatient recovery ward at the Muhammadiyah Community Welfare Development Hospital Yogyakarta from July to September 2023. With inclusion criteria; Patients on the first day of surgery, patients in the surgical care ward after 6 hours after surgery (Aldrete score > 8), BMI < 30, age range 11-60 years, patients are cooperative and willing to be participants, and with minor and major operations. Exclusion criteria; Patients who are allergic to the scent of lemon peppermint, patients with taste and hearing disorders, post-operative patients who have ETT and NGT installed, and patients with post-operative emergencies. The sampling technique used consecutive sampling, and 70 samples were obtained which were divided into 2 groups, namely 35 intervention groups and 35 control groups. The intervention group took a combination of lemon peppermint aromatherapy and murottal listening, while the control group received standard hospital therapy with ondansetron 4 mg.

Data collection during research was carried out using sheets observe the incidence of nausea and vomiting with RINVR (Rhodes Index Nausea Vomiting and Retching). This instrument consists of 8 questions with a minimum score of 0 and the highest score is 32 points and has high validity and reliability, where the Cronbach's alpha value is 0.912-0.968 (Rhodes, & McDaniel, 2001). The level of anxiety uses the Zung self-Rating Anxiety Scale (ZS-RAS). This instrument consists of 20 questions where the score for each statement is a maximum of 80 and a minimum of 20, with 4 levels, namely: no anxiety (20-44), low anxiety (45- 59), medium anxiety

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(60-74), and severe anxiety (75-80). The ZS-RAS instrument was designed to examine anxiety levels, then several modifications were made according to research needs (Zung, 1971; Nursalam, 2013).

Before providing intervention to patients in each group, nausea, vomiting and anxiety were measured. The intervention group took 2 drops of aromatherapy essential oil dripped on a tissue while listening to the murottal of Surah Ar-Rahman for 15 minutes and then observed for nausea, vomiting and anxiety after 2 hours of intervention. Meanwhile, the control group took treatment and medical procedures according to hospital service standards, namely pharmacological therapy of ondansetron 4 mg without any complementary interventions. After the intervention was carried out in each group, nausea, vomiting and anxiety were measured 2 hours and 6 hours later.

The normality test uses the Kolmogorov-Smirnov test because the sample is > 50 participants, if the p value is > 0.05 then the data is normally distributed. Data with normal normality test results use the Repeated ANOVA test and the General Linear Model to test differences between groups. Next, it was analyzed using the Statistical Package for the Social Science (SPSS) 25.0 for Window program. The multivariate analysis used is the Manova test which aims to analyze counfounding data that influences nausea, vomiting and anxiety.

This research has been declared ethically appropriate in accordance with the 7 (seven) WHO 2011 Standards from the Research Ethics Committee of the Education and Training Secretariat of the Yogyakarta Muhamadiyah Community Welfare Development Hospital with number 00293/KT.7.4/XII/2023.

RESEARCH RESULTS

Table 1. Characteristics of Participants

Variables	Group	
	Intervention(n=35)	Control (n=35)
Age (Mean±SD)(Range)(Year)	(30.31±8.231)(14-60)	(29.68±9.151)(13-60)
Age (n/%)		
11-19 years old	4/11.4	6/17.1
20-39 years old	30/85.7	28/80.0
40-60 years old	1/2.9	1/2.9
Gender (n/%)		
Male	13/37.1	18/51.4
Female	22/62.9	17/48.6
Body Mass Index (n/%)		
Underweight (10-18.5 kg/m^2)	0/0	1/2.9
Normal (18.6-22.9 kg/m^2)	18/51.5	16/45.7
Overweight (23.0-24.9 kg/m^2)	6/17.1	3/8.6
Obesity (25.0-29.9 kg/m^2)	11/31.4	15/42.8
Operation Type (n/%)		
Minor	15/42.8	7/20.0
Mayor	20/57.2	28/80.0
Nausea Vomiting (n/%)		
Pre-test:		
Low	3/8.6	4/11.4
Medium	32/91.4	31/88.6

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Post-test 1:		
Low	27/77.1	15/42.8
Medium	8/22.9	20/57.2
Post-test 2:		
Not Nauseous	7/20.0	0/0
Low	28/80.0	35/100.0
Anxiety (n/%)		
Pre-test:		
Not Anxiety	8/22.8	5/14.3
Low	22/62.9	19/54.3
Medium	5/14.3	11/31.4
Post-test 1:		
Not Anxiety	21/60.0	11/31.4
Low	14/40.0	19/54.3
Medium	0/0	5/14.3
Post-test 2:		
Not Anxiety	35/100	29/82.9
Low	0/0	6/17.1

The table above shows that the age in the intervention group with a mean and standard deviation (30.31 ± 8.231) with an age range between 14 and 60 years. while in the control group the results were mean and standard deviation (29.68 ± 9.151) and ranged from 13 to 60 years. Based on gender, the majority of the intervention group was female, namely 22 (62.9%), while in the control group the majority was male, namely 18 (51.4%). Based on their body weight, the majority fell into the normal category in both the intervention and control groups, 18 (51.4%) and 16 (45.7%), respectively, while based on the type of surgery, the majority in the intervention and control groups had undergone major surgery, namely 20 (57.2%) and 28 (80.0%).

Most cases of nausea and vomiting in participants from both the intervention and control groups in the pre-test were in the moderate category, namely 32 (91.4%) and 31 (88.6%) respectively. In post-test 1, the majority of nausea and vomiting in the intervention group was in the mild category, namely 27 (77.1%), while in the control group the majority was in the moderate category, namely 20 (57.2%).

Post-test 2 showed the majority of nausea and vomiting in the group. intervention and control were in the low category, namely 28 (80.0%) and 35 (100.0%). In the intervention group, there were 7 (20.0%) who did not feel nausea. For anxiety levels in both the intervention and control groups, it is known that most of the anxiety levels before treatment were in the low category, 22 (62.9%) and 19 (54.3%) respectively. In the first post test, the majority in the intervention group were no anxiety, namely 21 (60.0%) and in the control group the majority were still low anxiety, namely 19 (54.3%). After carrying out the second posttest, it was discovered that the entire intervention group stated that they were no anxiety, while the majority of the control group were no anxiety, namely 29 (82.9%).

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Tabel 2. Differences in Nausea Vomiting and Anxiety

Variable	Group		Difference	95% CI	p-value
	Intervention (n=35)	Control (n=35)			
Nausea Vomiting (Mean±SD)					
Pre-test	(10.57±1.89)	(10.66±2.24)	0.09	-0.904-1.075	0.863
Post-test 1	(6.17±1.87)	(7.4±2.10)	1.22	0.279-2.178	0.012
Post-test 2	(2.46±1.09)	(3.94±1.19)	1.48	0.941-2.030	0.000
Anxiety (Mean±SD)					
Pre-test	(52.69±7.30)	(53.6±8.78)	0.94	-2.909-4.795	0.627
Post-test 1	(39.89±6.57)	(47.6±8.36)	7.71	4.129-11.300	0.000
Post-test 2	(34.57±4.47)	(37.85±5.97)	3.29	0.770-5.801	0.011

Based on the results in table 2, it is known that the mean difference in the first measurement before administering the combination of lemon peppermint and murottal aromatherapy was 0.09 with a p-value of 0.863 (>0.05), which means that there was no difference in nausea and vomiting in the pre-test between the intervention and control groups. Likewise, the difference in mean anxiety in the first measurement was 0.094 with a p-value of 0.627 (> 0.05), which means that between the intervention group and the control group there was no difference in anxiety. Furthermore, in post-test 1 and post-test 2 it was discovered that there was a significant difference in nausea, vomiting and anxiety between the intervention group and the control group as evidenced by a significance value of <0.05. The average value also shows that the nausea, vomiting and anxiety scores in the intervention group were lower than those in the control group. This means that the major hypothesis in this study which states that the combination of lemon peppermint aromatherapy and murottal is more effective in the incidence of nausea, vomiting and anxiety in post-operative patients under general anesthesia is accepted by the results of empirical research.

DISCUSSION

In research The results of the analysis of the effect of the combination intervention of lemon peppermint aromatherapy and murottal on the frequency of nausea and vomiting using the repeated ANOVA test resulted in a p-value <0.05, which means that the combination intervention of lemon peppermint aromatherapy and murottal had a significant effect on nausea and vomiting in patients after surgery under anesthesia. general. The group of participants took the combination intervention of Peppermint Lemon Aromatherapy and Murottal experienced a reduction in nausea and vomiting by 4.4, from a mean score of 10.57 which indicated the patient experienced moderate nausea and vomiting to a mean of 6.17 in the measurement after the post-operative intervention which indicated mild nausea and vomiting. For participants in the control group, there was a decrease of 3.26 from the mean score in the first post-operative measurement of 10.66 to 7.4 in the second measurement.

Participants who received the combination intervention of Peppermint Lemon Aromatherapy and Murottal experienced a significant decrease in nausea and vomiting scores from the first measurement to the second measurement or from pre-test to post-test. Meanwhile, in the control group participants, the decrease in nausea and vomiting scores was the same in the first and second observation measurements. This research is in line with research conducted at Teaching Hospital, Kashan, Iran which stated that inhaling peppermint essential oil had a beneficial effect in reducing nausea and vomiting after open surgery (Maghami, Afazel, Azizi-Fini, & Maghami, 2020).

Research in Iran states that lemon inhalation aromatherapy can reduce the frequency of lemon inhalation aromatherapy reducing the frequency of administration of antiemetic drugs in the recovery room (P=0.04) and 16 hours after surgery (P=0.03)

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(Rambod, M., Pasyar, N., Karimian, Z., & Farbood, 2023). Conclusion This study shows that aromatherapy reduces pain intensity, nausea, vomiting and postoperative pain.

The vomiting center, lateral to the reticularis in the medulla oblongata, mediates the gag reflex. This part is very close to the nucleus of the tractus solitarius and the area postrema. There are two anatomical areas in the medulla that play a role in the vomiting reflex, namely the chemoreceptor trigger zone (CTZ) and the central vomiting center (CVC). Chemoreceptor Trigger Zone (CTZ) is located in the area postrema. Peripheral and central stimuli can stimulate both the vomiting center and the CTZ. Afferents from the pharynx, GI tract, mediastinum, kidneys, peritoneum, and genitals can stimulate the vomiting center. Central stimulation of the cerebral cortex, upper cortical and brainstem centers, the nucleus tracture solitarius, CTZ, and the vestibular system in the ear and the visual center can also stimulate the vomiting center. The efferent signal from the CTZ is sent to the CVC and then via the vagus nerve as an efferent pathway, a series of sympathetic-parasympathetic reactions occur which ends with the gag reflex (Guyton, & Hall, 2012).

Handling post-operative nausea and vomiting with complementary therapy can be done by administering a combination of lemon peppermint and murottal aromatherapy, because the aromas and sounds captured by the cranial nerves are responsible for the sense of smell and hearing which function as receptors. These receptors use neuron cells to interpret these molecules to the limbic system. Where the limbic system is the center of pain, anger, fear, depression and various other emotions. Next, the response is sent to the amygdala, hypothalamus, to be processed, then sent to the circulatory system. Messages sent throughout the body will be converted into an action by releasing neurochemical substances in the form of feelings of happiness, relaxation, calm, or arousal (Price, & Price, 2021).

Aromatherapy is a method of treating disease that uses the aroma of essential oils produced from medicinal plants. Peppermint aromatherapy is an aroma therapy containing 1.2%–1.5% essential oil, consisting of 30%–70% menthol and menthol esters and more than 40 other ingredients such as flavonoids (12%), polymerized polyphenols (19%), carotene, tocopherol, and beta-thioculi. Menthol is the main component of peppermint and has spasmolytic properties. It also facilitates bile flow, reduces esophageal sphincter tone, and facilitates belching. Peppermint essential oil has anticonvulsant effects and can inhibit nausea and vomiting (Thangaleela, Sivamaruthi, Kesika, Bharathi, Kunaviktikul, Klunklin, & Chaiyasut, 2022; Kim, Kim, Ha, Kim, & Ryu, 2020; Liang, Zhang, Chi, Liu, Jing, Cao, & Kong, 2023).

The results of research at the Pondok Tinggi Community Health Center, Jambi, showed that the average score decreased after taking peppermint aromatherapy, namely (3.20) to (2.13), which means that giving peppermint aromatherapy had an effect on nausea and vomiting in first trimester pregnant women (Silvia, & Halawa, 2023). Another study regarding peppermint and lemon aromatherapy, entitled "The effect of combined inhalation aromatherapy with lemon and peppermint on nausea and vomiting of pregnancy" concluded that the combination of lemon and peppermint aromatherapy can reduce the intensity of mild to moderate nausea and vomiting in pregnancy (Safajou, Soltani, Taghizadeh, Amouzeshi, & Sandrous, 2020).

Nausea, vomiting and post-operative anxiety are common problems in nursing services. Nausea and vomiting that is not treated immediately will make the patient feel uncomfortable, in the worst case it can cause dehydration and tension in the surgical area due to vomiting (Bhattacharya, Hwang, & Ko, 2020). During healing, patients need a nurse's touch to fulfill their needs and to increase their sense of comfort.

Post-operative patients under general anesthesia with complaints of nausea, vomiting and anxiety in several hospitals in Indonesia have not widely used lemon peppermint aromatherapy as an intervention in providing nursing care in dealing with nausea, vomiting and anxiety in post-operative patients. However, several hospitals have implemented aromatherapy and murottal, including Muhammadiyah Community Welfare Development Hospital Yogyakarta. The type of aromatherapy used at the hospital is lavender aromatherapy to treat nausea and vomiting.

Management of nausea, vomiting and anxiety can be done with complementary therapy as a health

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effort that can be carried out by medical personnel and nurses. Complementary therapy that can be used to prevent and reduce nausea, vomiting and post-operative anxiety is by using lemon peppermint aromatherapy and Al-Quran murottal.

Providing a combination of lemon peppermint and murottal aromatherapy intervention is a nursing action that prioritizes patient recovery and is applied to reduce discomfort resulting from nausea, vomiting and anxiety. This is related to Kolcaba's Comfort Theory, where the main focus of this theory focuses on individual comfort in carrying out activities. By providing a combination of lemon peppermint and murottal aromatherapy, it can provide aroma stimulation to the limbic system which is known as a pleasant and calming aroma so that the hormones serotonin and dopamine are produced in the bloodstream. Serotinin and dopamine can reduce cortisol levels in the blood so that lymphocytes increase and the amount of β-endorphin in the body increases. This reaction will increase the feeling of comfort and reduce nausea, vomiting and anxiety felt by the patient.

In its application, the intervention providing a combination of Lemon Peppermint Aromatherapy and Murottal is targeted at reducing the incidence of nausea, vomiting and anxiety in post-operative patients under general anesthesia.

CONCLUSION

There is effectiveness of the combination intervention of lemon peppermint and murottal aromatherapy against nausea, vomiting and anxiety in post-operative participants under general anesthesia. The incidence of nausea and vomiting after the lemon peppermint and murottal aromatherapy intervention was reduced significantly. The level of anxiety after taking the combination intervention of lemon peppermint and murottal aromatherapy decreased significantly.

SUGGESTION

For future researchers, if they want to carry out the same research, it is recommended to carry out other combinations to produce diverse research and increase the number of research samples so that the results can be generalized.

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