

Application of Essential Oils: Lavender, Clary Sage, Ginger and Geranium as Aromatherapy through Effleurage Massage for Menstrual Pain

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Abstract: *Menstrual pain is pain that is felt in the pelvis, lower abdomen, lower back, severe lower abdominal cramps, pain that occurs before or during menstruation. This study used true experimental design, and pretest-post-test design with a simple random sampling technique. Treatment group was given aromatherapy lavender, clary sage, Ginger, geranium with a ratio of 1: 1: 1: 1 with a final concentration of 4% mixed with almond oil through massage effleurage and Treatment II was given aromatherapy lavender concentration of 1% mixed with almond oil. Changes pain intensity are measured using a Numerical Rating Scale. **Results:** Based on the Mann Whitney test results obtained between the treatment group I and treatment group II with p-value = 0.001 means that there was a significant difference in the decrease in pain intensity in the groups given essential oils: lavender, clary sage, ginger, geranium with a concentration of 4% mixed with almond oil through massage effleurage and groups that were only given lavender oil 1% and mixed with almond oil through massage effleurage. Lavender, clary sage, ginger and geranium essential oils mixed with almond oil through massage effleurage are more effective in decreasing pain intensity than those who were only given lavender oil.*

Keywords: Essential oils, lavender, Clary Sage, Ginger, Geranium, menstrual pain, massage effleurage

1. Introduction

The high incidence of menstrual pain is a reason for not going to school or college, only a few seek treatment and only seek treatment independently [1]. Research in China showed that 41.9% -79.4% of adolescent girls experience primary menstrual pain, with details of 31.5% -41.9% occurring at the age of 9-13 years and 57.1%-79.4% occurring at ages 14-18 years [2]. Menstrual pain is one of the most common gynecological problems experienced by women of various age levels [3,4]. Pain prevalence varies between 15.8% -89.5%, with the highest prevalence in adolescents [5,4].

Many therapies are used in the treatment of pain, pharmacologically and non-pharmacologically. Pharmacologically nonsteroidal anti-inflammatory drugs (NSAID) such as ibuprofen, naproxen, mefenamic acid, and aspirin are used as initial therapy for menstrual pain [6,7,8]. But if used repeatedly without medical supervision will cause unexpected side effects. The impact of using NSAID, other alternatives are needed to overcome and reduce pain with the use of natural ingredients. Various studies have been conducted to find replacement therapies or alternative therapies that are safer when compared to the use of NSAID, namely, non-pharmacological therapy. This therapy is to reduce pain such as TENS (Transcutaneous Electrical Nerve Stimulation), meditation, visualization, emotional support, warm and cold compresses, breathing techniques, hypnosis, skin stimulation techniques (back massage), yoga and acupuncture [9,10], therapy supplementation, acupressure therapy, and inhaled aromatherapy [11,12,13], massage and aromatherapy combined [14,15,16,17,18,19,20]. Aromatherapy is the administration of essential oils through massage, topical ointment or lotion, inhalation bath douches (used to enter the flow in the body for medical reasons), compresses (hot or cold) to soothe and reduce pain and

increase relaxation and comfort [10]. Various essential oils are used for aromatherapy, such as Melissa, eucalyptus, and lavender. The oil is relaxing, reduces pain, stress, and improves health [17]. Essential oils that are commonly used for pain management are Chamomile, Clary Sage, Fennel, Geranium, Ginger, Lavender, and Neroli [21].

Effleurage massage is a gentle and soothing stroking motion when starting and ending a massage, the purpose of which is to flatten the oil and warm the muscles to relax [22]. Effleurage is a gentle and gentle stroking motion, short or long sequencing with the entire palm of the hand serves to push blood to the heart and increase blood flow, relaxation, calm nerve endings and relieve pain [23].

Preliminary studies found that students of Stikes Hang Tuah Tanjungpinang using a questionnaire obtained data on 51.1% experiencing a moderate pain scale, 16.6% on a severe pain scale, 32.2% on a mild pain scale. 98.8% had never used aromatherapy during menstrual pain, based on interviews 25% of female students were permitted to leave class because of menstrual pain. Based on the problems above, researchers are interested in conducting research using Lavender, Clary Sage, Ginger and Geranium essential oils in a ratio of 1: 1: 1: 1 to the final concentration of 4% mixed with almond oil.

2. Methods

This study used a true experimental design with a randomized pretest-posttest design, which compares subjects before and after being given essential oils for menstrual pain. Inclusion and exclusion criteria was in table 1

Table 1: The Inclusion and Exclusion Criteria

Inclusion	Ekclusion
Medium-severe pain scale	Mild menstrual pain
Menstrual pain the first day, the second and the third day	Students who have asthma and allergies to use aromatherapy oils
Doesn't experience sense of smell and allergic to scents.	
Not using a pain reliever on the market during the course of therapy.	
Students at Stikes Hang Tuah Tanjungpinang	

The study was conducted on female students of Stikes Hang Tuah Tanjungpinang who experienced menstrual pain in April-July 2019. The implementation phase included the following steps:

Preparation step, first step, the researcher prepares essential oils. Essential oil for therapy is put into a roll-on bottle as much as 8 ml and given a label of each bottles. The Implementation step was the treatment group I and treatment group II carried out massage effleurage for 3 minutes calculated from the beginning of the massage at minutes 5,10,15 and minutes 25 then measured the pain scale using the Numeric Rating Scale (NRS) 0-10.Final Step. Data was collected by measuring the scale of the respondent's pain before being given therapy (pretest) and after being given therapy (posttest). Furthermore, researchers conducted data analysis using statistical methods then ended with the preparation of the final report and presentation of research results.

3. Results and Discussion

This study was conducted on female college students who experienced menstrual pain who had met the inclusion and exclusion criteria. There were 84 female students participated in this study, consisting of 42 respondents in treatment groups I and 42 respondents in treatment groups II.

Table 2: The Test Analysis the Effect of Essential Oils: Lavender, Clary Sage, Ginger and Geranium Against the Intensity of Menstrual Pain in Treatment Group I

Treatment	Intensity pain		
	Median	Min-Max	<i>p value</i>
Before	3	3-4	0.001
After	2	1-3	

Table 2 the result showed the effect of the Essential Oil treatments: Lavender, Clary Sage, Ginger, and Geranium mixed with almond oil as Aromatherapy Through Massage Effleurage was the Wilcoxon test because the data are not normally distributed. Obtained p-value 0.001 <0.05 so that (Ho Rejected), it can be interpreted that in the treatment group I using lavender, clary sage, Ginger, geranium Essential Oil with a ratio of 1: 1: 1: 1 with a final concentration of 4% there was a difference in significant pain intensity between before and after given essential oils through massage effleurage.

Table 3: Analysis of Tests of Effect of Lavender Essential Oil dissolved with Almond Oil Through Massage Effleurage on Menstrual Pain Intensity in Treatment Group II

Treatment	Intensity Pain		
	Median	Min-Max	<i>p value</i>
Before	3	3-4	0.046
After	3	2-4	

Result showed effect on the group given essential oil therapy: Lavender dissolved Almond oil through Massage Effleurage using the Wilcoxon test. Obtained p-value 0.046 <0.05 (Ho Rejected) so that it could be concluded that in the treatment group II who were given lavender essential oil dissolved with almond oil there was a decrease in pain intensity between before and after being given essential oils through massage effleurage.

Table 4: Analysis of the difference Test or Comparison between Treatment Group I and Treatment II Against Menstrual Pain Intensity

Groups	Median (Min-Max)	<i>p-value</i>
Treatment I (n=42)	2 (1-3)	0.001
Treatment II (n=42)	3 (2-4)	

Table 4 showed the differences in the two groups was the Mann-Whitney test because the data from the two groups are not normally distributed. Mann-Whitney test analysis obtained p-value of 0.001 (p <0.05), so it could be interpreted statistically there was a significant difference between the treatment group I given essential oils of lavender, clary sage, ginger, and geranium dissolved with almond oil and the treatment group II who only used lavender essential oil dissolved with almond oil through massage effleurage.

Effects of Lavender, Clary Sage, Ginger, Geranium Essential Oil dissolved with Almond oil through Massage Effleurage for Menstrual Pain in the Treatment group I

Table 2 obtained p-value 0.001 <0.05 so that (Ho Rejected), it could be interpreted that in the treatment group I using lavender, clary sage, ginger and geranium essential oils with a ratio of 1: 1: 1: 1 with a final concentration of 4% which dissolved with almond oil through massage effleurage there is a significant effect of decreasing pain intensity between before and after given essential oil through massage effleurage.

Massage effleurage was cutaneous stimulation in the form of gentle flowing strokes [32]. Massage effleurage is a movement using the entire surface of the hands attached to the parts of the body that are rubbed lightly and soothingly. Effleurage massage aims to improve blood circulation, warm the abdominal muscles, and increase physical and mental relaxation. Effleurage massage is a relaxation technique that is safe, easy, no need for money, no side effects can be done alone or with the help of others [25].

Massage is quite effectively chosen in reducing pain due to its relaxing effect. So when someone feels the sensation of pain by providing relaxation it is expected that the perception of the pain can be reduced or even disappear [26] Other studies state that massage can provide a relaxing

effect because it increases the circulation of oxygen to the tissue so that it could reduce pain [17].

One of the effective massage techniques in reducing dysmenorrhea is aromatherapy massage. Through aromatherapy massage, the content of essential oils that have healing power can be optimally absorbed by organs that require treatment. Types of oil that can be used to rub on the stomach are a mixture of cinnamon oil, rose, clove, also lavender in almond oil, and there are no reports of side effects in dealing with pain [19]

The use of lavender aromatherapy oil applied to the abdominal area can reduce pain from 82.38% to 51.13% compared to placebo with soft paraffin oil [17]. Several studies on the application of aromatherapy for pain topically or inhaled can be absorbed by blood vessels and the oil content can last up to 90 minutes [20]. Other studies have found that the average effect given is 19 minutes after application and work on plasma to provide a relaxing effect and it is believed that the effect given by essential oils for aromatherapy is a short-term effect and does not accumulate in body tissues [27].

Lavender aromatherapy contains main ingredients namely linalyl acetate and linalool, where linalyl acetate functions to relax and relax the nervous system and muscles that experience tension while linalool acts as a relaxation and sedative so as to reduce menstrual pain [28].

The use of lavender essential oil in dysmenorrhea cases also showed success in reducing the symptoms of menstrual pain in respondents aged 18 to 24 years with the results of different pain scores of almost 50% of lavender oil applied together with massage [20].

The main ingredients of Clary Sage are linalool, linalyl acetate, alpha-terpineol, germacrene D, and geranyl [29]. Clary Sage shows a variety of therapeutic properties, in women used for the uterus and problems related to the uterus, regulating menstruation, relieving tension and muscle cramps. In the study clary sage is one of the essential oils combined with other oils for the management of menstrual pain through abdominal massage, based on the study the duration of pain was significantly reduced from 2.4 to 1.8 days after aromatherapy intervention in the essential oil group [15]. The reduction in menstrual pain was significantly higher in the treatment group than in the acetaminophen group [18]

Ginger and peppermint aromatherapy like the research that was done to adolescents with moderate to severe dysmenorrhea. It is said that the administration of ginger or peppermint aromatherapy oil which is smeared for 15 minutes can reduce the sensation of pain and its location. Peppermint is known to have an effect on the duration of pain, relieve anorexia or digestive problems such as diarrhea or constipation, and affect mood. The effect given by ginger aromatherapy is reducing nausea, dizziness, and headaches [30]. In line with Sari et al study, 2018 analgesic therapy, acupressure, a combination of acupressure and ginger drink significantly reduce menstrual pain or dysmenorrhea [31]

Geranium oil was known an antidiabetic, anticancer, antibacterial and antimicrobial agent [32, 33, 34, 35]. Geranium is one of the aromatherapies combined for the reduction of menstrual pain through abdominal massage, the results of the study showed that the reduction in menstrual pain was significantly higher in the treatment group than in the acetaminophen group [18].

Researchers concluded that the combination of essential oils (lavender, clary sage, ginger, geranium) and dissolved with almond oil through massage effleurage had a very good effect on female students who experience menstrual pain.

Effect of Lavender Essential Oil dissolved with Almond Oil Through Massage Effleurage in Treatment Group II

Table 3 obtained p value 0.046 <0.05 (Ho Rejected) so that it could be concluded that in the treatment group II who were given lavender essential oil dissolved with almond oil there was an effect of decreasing pain intensity between before and after being given essential oils through massage effleurage.

Measures that could be used to reduce the pain of dysmenorrhea felt by respondents are massage effleurage using aromatherapy oils, be it sweet almond oil or rose oil. Through massage effleurage using aromatherapy oils, hypoxia that occurs in the tissue will be reduced because the oxygen content in the tissue increases so that the perceived pain is reduced. In addition, it can also increase blood circulation, reduce stress and relieve stiff muscles. After being given a massage, there will be an endorphin release which can increase the pain threshold so that the pain will decrease [19].

This research was in line with what was done by Nurul et al(2018). The result was a decrease in the intensity of pain felt by respondents after being given an effleurage massage using aromatherapy oil. The majority of respondents experienced mild pain as many as 16 people (66.67%) and the rest experienced moderate pain and did not feel pain each as many as 4 people (16.67%). The difference in the intensity of dysmenorrhea pain was more significant in the group treated with effleurage massage using rose aromatherapy oil than sweet almond oil [36].

The results of other supporting studies were those that have been done by Sun, et.all. (2012) which aims to explore the effects of aromatherapy on menstrual cramps and dysmenorrhea symptoms. The study was conducted on 67 student respondents who experienced menstrual cramps, divided into 3 groups: 25 respondents were a group given 2 drops of lavender aromatherapy, 1 drop of clary sage, 1 drop of rose plus 5 cc of almond topically smeared and massaged on the stomach. In the placebo group consisting of 20 respondents were given the same treatment as the intervention group, but only topically applied with almond oil and massaged. The control group consisting of 22 respondents did not take any action. Measured using a visual analog scale. The results showed that dismenorea pain in the aromatherapy group showed a significant reduction compared to the placebo group and the control group [37]

Researchers concluded that in the treatment group II the therapy was effective but for the level of influence of lavender essential oil dissolved with almond oil through massage effleurage gave a decrease in the intensity of the pain for a long time and gave a not too significant effect.

Differences or Comparison of Effects between Treatment Group I (Lavender, Clary Sage, Ginger and Geranium) and Treatment Group II (Lavender)

Test results of the two groups using the Mann-Whitney test obtained a p value of 0.001 ($p < 0.05$), so that it could be interpreted statistically there is a significant difference between the treatment group I given lavender, clary sage, ginger and geranium essential oils through massage effleurage with treatment group II given lavender essential oil dissolved with almond oil through massage effleurage. Could be seen from the median value of the two groups where group I with a median pain intensity at 1-3 (Mild) while in group II the median pain intensity value was 2-4 (Moderate).

Based on research conducted by Kim et al (2011), there was a lower intensity of dysmenorrhea pain ($p = 0.001$) in the group given abdominal massage using a mixture of absolute rose essential oil (*Rosa centifolia*), otto rose (*Rosa damascene*), rose geranium (*Pelargonium graveolens*), clary sage (*Salvia sclarea*) and ginger (*Zingiber officinale*) dissolved in almond oil, jojoba oil and primrose oil in an 8: 1: 1 ratio with a final concentration of essential oil as much as 3% compared to the group given only sweet almond oil only [16]

In line with research conducted by Marzouk et al (2013) which showed a significant decrease in the intensity of dysmenorrhea pain ($p = 0.007$) in the group given abdominal massage with essential oils with a duration of 10 minutes for 7 consecutive days in the menstrual cycle. The essential oil used was a mixture of roses, cloves, cinnamon and lavender dissolved in sweet almond oil, which is sweet almond oil with a final concentration of 5% compared to the group that is only given sweet almond oil. This proves that the administration of effleurage massage using a mixture of rose aromatherapy oil and other oils can also reduce the intensity of painful dysmenorrhea [19]

The mechanism of decreasing the intensity of pain in dysmenorrhea by administering an effleurage massage using aromatherapy involves two actions: aromatherapy triggers the limbic system that plays a role in reducing pain, and massage effleurage using essential oils can expedite blood circulation and reduce spasms that cause pain. In addition, the effects of roses as analgesics and antispasmodics. When aromatherapy oils are used in the massage process, aromatherapy oils are not only inhaled through the sense of smell but can also be absorbed through the skin and then enter the tissues and circulatory system which are then distributed to organs that require treatment so that the pain felt will be reduced [19]

It can be concluded that the administration of lavender, clary sage, ginger and geranium essential oils dissolved with almond oil through massage effleurage gives a better effect compared to lavender essential oil dissolved with almond oil

through massage effleurage to reduce the intensity of pain in college students.

4. Conclusions

- a) The treatment group I before and after giving the p value = 0.001 < 0.05 which means that there was a significant influence in giving lavender oil, clary sage, ginger and geranium as aromatherapy through massage effleurage to decrease the intensity of menstrual pain.
- b) The treatment group II before and after the given value p value = 0.046 < 0.05 which means that there was an influence of lavender essential oil through massage effleurage to reduce the intensity of menstrual pain.
- c) There was a significant difference between the treatment group I who were given lavender, clary sage, ginger and geranium essential oils through massage effleurage with treatment group II who were only given essential lavender through massage effleurage, based on the results of the MannWhitney test p value = 0.001 was obtained.
- d) Lavender oil, clary sage, ginger and geranium as aromatherapy through effleurage massage were more effective in reducing the intensity of menstrual pain.

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