

Research Article

The Effectiveness of Lemongrass Aromatherapy (*Cymbopogon Nardus*) Aromatherapy on the Level of Labour Pain in Active Phase 1

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ABSTRACT

Background: Labour pain causes hyperventilation, increasing the need for oxygen and blood pressure and reducing intestinal motility and urinary bladder. These conditions will interfere with uterine contractions, which can cause uterine inertia, prolonged labour, inadequate baby oxygenation that results in foetal distress, and maternal and/or foetal death. if labour pain is not treated. Aromatherapy is a therapeutic action that uses essential oils. which is beneficial in improving one's physical and psychological condition to be better. Each essential oil has unique pharmacological effects, such as antibacterial, antiviral, sedative, and stimulates the adrenals.

Methods The type of research used in this research is quantitative with a quasi-experimental research design. The research design used was a two-group prepost-test design, a research activity that gave an initial test (pretest) before treatment, after treatment, and then a final test (post-test). The population in this study were all 29 primigravida mothers. The sample was 21 mothers with primigravida. The independent variable in this study was lemongrass aromatherapy, which was measured using standard operating procedures for aromatherapy. The dependent variable in this study was the reduction in pain measured using the NRS scale. The data analysis technique used was univariate data analysis using frequency descriptions and bivariate statistical tests using Wilcoxon signed.

Results: The value of $p = 0.002$ ($\alpha < 0.05$) was obtained. Therefore, it was concluded that there were differences in pain changes before and after the lemongrass aromatherapy group. Giving lemongrass aromatherapy to pain in the first stage of labour is effective.

Conclusion: A woman giving birth during the first active phase needs support to maintain her motivation to birth normally and cope with any discomfort she may experience. Lemongrass aromatherapy, given as a gift, can be used to ease the discomfort of labor, improving both the mother's experience and her ability to trust the process.

Keywords: Effectiveness, Labour, Lemongrass, Pain

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Introduction

Pain relief labour occurs in 85-95% of all deliveries and only 10-15% of deliveries that take place without pain. Perception of pain or tolerance to pain varies depending on each individual, the intensity of pain during labour affects the psychological condition of the mother, the delivery process, and the welfare of the foetus [1]. This contraction causes pain in the waist, abdominal area, and radiates to the thighs [2]. Labour pain also causes hyperventilation, increasing the need for oxygen and blood pressure, and reducing intestinal motility and urinary bladder. These conditions will interfere with uterine contractions, which can cause uterine inertia, prolonged labour, inadequate baby oxygenation that results in foetal distress, and maternal and/or foetal death. if labour pain is not treated [2]

As many as 80% of the causes of maternal death in Indonesia are caused by pregnancy, childbirth, and puerperium complications. Pain can also be classified to the highest degree compared to other pain and can result in prolongation during the first stage of labour. Excessive pain and also for too long will cause anxiety and psychological pressure, so it can affect the physical condition of the mother who is born [3].

The consequences caused by pain are that many women cannot accept pain so the mother will request the delivery process be accelerated, and some women will ask to receive painkillers, even women because they fear feeling pain will ask for surgery during the delivery process[4].

In 2018 the causes of death worldwide due to prolonged labour have decreased, replaced by other causal factors, namely heart disease, kidney disease, cancer, tuberculosis, and others. This was not compensated for by a decrease in deliveries by operative surgery[5]

According to the WHO, the average delivery by caesarean section is 5% -15% per 1000 births worldwide; this incidence rate increases yearly in both public and private hospitals. In addition, prevalence in developed countries, namely Asia, Europe, China, and America, has reached 25% per year. For Indonesia, the incidence of caesareans according to data from the Ministry of Health in 2018 indicated 927,000

out of 4,039,000 deliveries. Caesarean deliveries have increased by 30-80% of total deliveries [6].

In the province of East Java, the 2017 Riskesdas data show that the number of deliveries by caesarean section is 78.6% and in 2020 the proportion tends to increase to 90%. From January to December 2021 at Bangkalan General Hospital, caesarean section deliveries reached 203 of 535 total deliveries. [7].

Pain in labour is part of the discomfort of physiological responses, namely the process of receiving pain impulses to the central nervous system and psychological responses which include recognition of sensations, interpretation of pain, and responses to the results of interpretation of pain [7]. The pain response results in an increase in the activity of the sympathetic nervous system which then causes an increase in blood pressure, pulse, respiration, pallor, nausea, vomiting, and diaphoresis. In addition, pain also causes affective changes in the form of increased anxiety accompanied by narrowing of the perceptual field, groaning, crying, and intense muscle tension throughout the body [8]

Effective management of labour pain is necessary to reduce pain due to stages of the labour process because pain makes the woman tired and affects labour progress in the first and second stages [9]. This pain is strongly influenced by the social environment, psychosocial factors, and knowledge of labour pain, and ultimately has an impact on the individual's interpretation of pain. Women with a severe category of labour pain have low self-efficacy before giving birth and high anxiety sensitivity [10]. On the contrary, if the mind is well focused on childbirth, accepts and trusts health workers who help with childbirth and performs pain management techniques well, it will have a high level of pain[11]. Efforts to reduce the anxiety experienced by pregnant women can use pharmacological and non-pharmacological methods [12].

The pharmacological way in question is through antidepressant treatment. But antidepressant drugs cause side effects on the mother and baby if used continuously. According to the results of a 2016 study by Alan S. Brown, MD, MPH, professor of psychiatry at Columbia University Medical Centre, it is stated that children

will be at risk of experiencing speech disorders if born to depressed pregnant women and taking antidepressants. Meanwhile, non-pharmacological methods are safer treatments and do not require drugs to reduce anxiety levels [12].

Non-pharmacological therapy includes relaxation, hypnotherapy, imagination, biological feedback, psychoprophylaxis, therapeutic touch, hydrotherapy, yoga and distraction techniques [13–16]. The distraction technique is a diversion from the focus of one's attention to another stimulus so as to reduce awareness of pain. The distraction technique of listening to music is effective in diverting attention from excessive anxiety. In medicine, music therapy is also known as complementary therapy [17]

Aromatherapy is a therapeutic action using essential oils. which is beneficial for improving one's physical and psychological condition to be better. Each essential oil has unique pharmacological effects, such as antibacterial, antiviral, diuretic, vasodilator, sedative and stimulates the adrenals [17–19]. The chemical content of lemongrass essential oil contains the components linalyl acetate (40.76%), linalool (24.60%), cis- β Ocimene (4.85%), β -caryophyllene (4.40%), trans β Ocimene (3.64%), terpinene-4-ol (3.57%), 1.8 cineole (0.71), lavandulol (0.71%), and camphor (0.30%) [19].

The essential oil of citronella flower extract is used as aromatherapy and provides relaxing, antineurodepressive, and sedative effects to people experiencing insomnia which improves mood, reduces anxiety levels, and increases alertness [19,20]. The biopharma centre explained that the polyphenolic compounds contained in lavender flowers have the potential as antioxidants, inhibiting free radical activity, anti-burn, antiviral, anti-cancer and heart-related diseases, where the highest content is linalyl acetate and linalool, which can provide a relaxing effect.

Aromatherapy is a treatment that uses essential oils and stimulates the olfactory system to reduce stress and create a sense of calm. One of the types of aromatherapies used to treat anxiety is lemongrass[20]. Linalool and linalyl acetate in lavender can have a calming effect and help reduce stress and pain. Various efforts have been made to reduce labour pain, both

pharmacologically and non-pharmacologically [21].

Several methods that can be used to reduce physiological pain include anaesthesia, warm compresses, warm baths, massage, music-based relaxation techniques, and aromatherapy. Because there is still a high incidence of labour pain in the first stage, at the Klampis Health Centre, the authors will intervene to reduce pain using aromatherapy and music for mothers in the first active phase of labour [22].

The aforementioned background, thus, the aim of the study is the effectiveness of lemongrass aromatherapy (*Cymbopogon Nardus*) on the pain level of phase 1 labour.

Materials and Methods

The type of research used in this research is quantitative with a quasi-experimental pre-post-test design[23]. This design is a research activity that gives an initial test (pretest) before receiving treatment, after receiving treatment, and then gave a final test (post-test) [24]. The population in this study was all 29 mothers of primigravida with HPL between February and May 2023 at the Klampis Health Center. The sample of 21 respondents in this study was a portion of mothers with primigravida who gave birth in active phase I. In this study, the technique used randomisation with inclusion criteria: primigravida's with gestational age 37 – 41 weeks, inpartu opening 4 cm, and mother does not have drug allergies.

The research was conducted at the Klampis Health Centre. The research will be carried out in February-May 2023.

Lemongrass aromatherapy products were made naturally using a distillation process (steam distillation) to extract essential oils. The process of extracting essential oils consists of sorting, washing, size reduction (slicing), drying, and steam distillation (distillation).

The independent variable in this study was lemongrass aromatherapy, which was measured using standard operating procedures for aromatherapy. The standard operating procedures of aromatherapy consist of 1) preparing the water in the diffuser, 2) dropping 5-10 drops of essential lemongrass aromatherapy, 3) turning on the diffuser, 4) ensuring a safe

distance from the patient, and 5) encourage the patient to inhale the aromatherapy for 5-10 minutes repeatedly.

The dependent variable in this study was measured using the Nursing Rate Scale (NRS) questionnaire. It consists of no pain (score 0), mild pain (score 1-3), moderate pain (score 4-6), severe pain (score 7-9), and very severe pain (score > 10) [25]. Data collection techniques used primary and secondary data collection. Furthermore, the processing was carried out, namely editing, scoring, tabulating, coding, data entry, and cleaning. The data analysis technique was univariate data analysis

using frequency descriptions and bivariate statistical tests using Wilcoxon signed[26].

Result and Discussion

The distribution of characteristics

Based on Table 1, the majority of mothers aged 21 to 35 years are 90.9% (19 respondents) and those aged > 35 years are 9.5% (2 respondents). Mother's education data show that most mothers have secondary education 81% (17 respondents) and those with basic education 4.8% (1 respondent). Most mothers work as housewives (IRT) up to 71.4% (15 respondents) and the lowest are those who work as civil servants up to 9.5% (2 respondents).

Table 1. Distribution of characteristics

Characteristics	Lemongrass Aromatherapy n=21	
	F	(%)
Age		
<20	0	0
21-35	19	90.5
>35	2	9.5
Education		
Elementary	1	4.8
High school	17	81
College	3	14.3
Employment		
Housewife	15	71.4
Private employees	4	19
Civil servant	2	9.5
Gestational age (weeks)		
37-38	16	76.2
39-40	5	23.8

Homogeneity test

According to Table 2 shows the average age of the research subjects (SD = 0.301) years. The statistical test results showed that the difference was insignificant ($\rho=0.20$).

The educational level of the research subjects was mostly high school. The results of the

statistical tests showed that the distribution of the levels of education was not significant ($\rho=0.24$). The most common type of work is housewifery (IRT), but the statistical test results did not show significance ($\rho=0.11$).

Table 2. Homogeneity test

Characteristics	Lemongrass Aromatherapy n=21	ρ value
Age		
Mean± SD	2.09±0.301	0.20*
Median: Min-Max	2.00: 2-3	

Education		
Elementary	1	0.24**
Middle	17	
College	3	
Job		
Housewife	15	0.11**
Private employees	4	
Civil servant	2	
Gestational age		
Mean± SD	1.23±0.436	0.230***
Median: Min-Max	1: 1-2	

Based on the above data, it can be concluded that the demographic characteristics of the research subjects in the intervention and control groups were homogeneous. This shows that the researcher succeeded in controlling the existing characteristics; If there is a change in the dependent variable, it is not caused by a confounding variable, so it does not have a biased effect on the results of the analysis.

Data normality test

Based on Table 3 shows the p-value on the results of the data normality test shows a value of 0.00. The p-value <0.05, which means that the data are not normally distributed, so it is continued with the Wilcoxon signed test.

Table 3 Normality test.

	n	(Pre)		(Post)		p
		%	n	%		
No Pain	0	0	6	28.6	0.00	
Mild pain	0	0	1	4.7		
Moderate pain	18	86	14	66.7		
Severe pain	3	14	0	0		
Very severe pain	0	0	0	0		
Total	21	100	21	100		

Effectiveness of lemongrass aromatherapy (Cymbopogon Nardus) to labour pain levels in active phase 1

Based on the results, it was concluded that there were differences in pain changes before

and after the lemongrass aromatherapy group. The effectiveness of lemongrass on the intensity of labour pain during the first stage of the active phase was proven after therapy.

Table 4. Effectiveness of lemongrass (Cymbopogon Nardus) aromatherapy

Lemongrass Aromatherapy	Mean	Median	SD	Min	Max	p-value
Pre	3.14	3	0.35	3-4	4	0.002
Post	2.28	3	0.295	1-3	3	

Changes in pain levels before and after lemongrass aromatherapy administration were shown by the mean value before lemongrass aromatherapy administration of 3.24 and SD (0.35) and after lemongrass

aromatherapy administration at 2.28 and SD (0.295).

This is in line with Sagita’s research on reducing pain intensity, stating that the pain intensity of mothers in BPM Solo who had

received aromatherapy had decreased significantly ($p = 0.000$, and the mean value decreased from 8.8 to 7.7 [27].

Sari's research (2020) stated that the average pain level in the first active phase of labour before receiving lavender aromatherapy was 7.19. The average level of pain in the first active phase of labour after receiving lavender aromatherapy was 5.50, so it can be concluded that the administration of lavender aromatherapy had an effect on reducing labour pain in the active phase of the first stage of labour for mothers in the working area of the Rogan Ilir Health Centre, Rogan Ilir Regency, with a p-value of 0.00 [6]

The application of the method of giving lemongrass aromatherapy to mothers about to give birth is very influential. Mothers who received lemongrass aromatherapy during labour experienced a lower intensity of labour pain compared to before the mother did not receive therapy during labour. By giving lemongrass aromatherapy, the pain experienced by the mother during labour will decrease.

The results of this study are consistent with research conducted by Putri [18] on the effectiveness of lemongrass aromatherapy in reducing postoperative pain. Based on the research that has been done and the provision of aromatherapy in the provision of interventions, it has been proven that the use of lemongrass aromatherapy in reducing pain in the delivery process is effective.

This study has several limitations. First, the number sample size was slightly small, further study should use a longer time or multicentre. Second, there was no control group. A control group is recommended for future study.

Conclusion

There is an effectiveness of citronella (*Cymbopogon Nardus*) aromatherapy in labour pain levels in active phase 1. A mother who gives birth during the first active phase should be accompanied so that she has the motivation to give birth normally and be able to deal with pain. The gift of lemongrass aromatherapy can be used as a way to reduce labour pain, so the quality and confidence of the mother who gives birth will be greater.

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