

CHAPTER I

INTRODUCTION

1.1 Research Background

Menstruation is a natural process in adolescents involving the discharge of blood and uterine tissue through the vagina. This process typically lasts between 3 to 7 days each month, except during pregnancy. Menstruation is often accompanied by pain commonly experienced by women of various ages, known as dysmenorrhea.¹

Dysmenorrhea is a medical condition during menstruation, characterized by pain, cramping, and discomfort in the abdominal or hip areas. It is highly prevalent worldwide with more than 50% of women across various countries experiencing it. In Indonesia, the incidence of dysmenorrhea is estimated to affect approximately 55% of women of reproductive age, significantly disrupting their daily lives². The persistent pain often leads women to seek relief through analgesic medications³.

A non-steroidal Anti Inflammatory Drug (NSAID) is a non-steroidal anti-inflammatory medication that has anti-inflammatory, analgesic, and antipyretic effects. NSAIDs work by inhibiting the production of prostaglandins and effective acute and chronic pain⁴. NSAID are commonly used to reduce dysmenorrhea pain in women. The percentage of women who experienced decreased pain after taking NSAID was 67%. The use of NSAIDs causes many side effects, especially in the gastrointestinal tract. These effects include nausea, vomiting, heartburn, diarrhea, and even liver damage and hypertension⁵. The side effects of using chemical drugs

¹ Chandrayani, Marry H. Rimpok, and Irne Wida Desiyanti, "Pengaruh Senam *Dismenore* Terhadap Penurunan *Dismenore* Pada Remaja Putri," *Jurnal Sains dan Kesehatan* 6, no. 1 (June 1, 2022): 07–11.

² Ibid.

³ Erlina Rustam, "Gambaran Pengetahuan Remaja Putri Terhadap Nyeri Haid (*Dismenore*) dan Cara Penanggulangannya," *Jurnal Kesehatan Andalas* 4, no. 1 (January 1, 2015).

⁴ F Siusanto Hadi, Florence Pribadi, and Arini Dyah Saputri, "Menggagas Pengaruh Nsaid Terhadap Keberhasilan Penyembuhan Dari Asam Urat (Gout) Dan Covid-19," *Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal* 12, no. 4 (2022): 785–794.

⁵ Ni Made Maharianingsih and Ni Made Dewi Poruwati, "Pengaruh Pemberian Aromaterapi Kayu Manis terhadap Intensitas Nyeri *Dismenore* Primer Pada Remaja," *Jurnal Ilmiah Medicamento* 7, no. 1 (March 31, 2021): 55–61.

can be mitigate with other alternatives, one of which is by using herbal plants. Herbal plants can be used as a treatment for dysmenorrhea or as an alternative to avoid the side effects of chemical drugs. Basically, every disease has a cure.

حَدَّثَنَا هَارُونُ بْنُ مَعْرُوفٍ، وَأَبُو الطَّاهِرِ، وَأَحْمَدُ بْنُ عِيسَى، قَالُوا حَدَّثَنَا ابْنُ وَهْبٍ،
أَخْبَرَنِي عَمْرُو، - وَهُوَ ابْنُ الْحَارِثِ - عَنْ عَبْدِ رَبِّهِ بْنِ سَعِيدٍ، عَنْ أَبِي الزُّبَيْرِ، عَنْ جَابِرٍ،
عَنْ رَسُولِ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ أَنَّهُ قَالَ " لِكُلِّ دَاءٍ دَوَاءٌ فَإِذَا أُصِيبَ دَوَاءُ الدَّاءِ بَرَأَ
بِإِذْنِ اللَّهِ عَزَّ وَجَلَّ " .

Jabir narrated from the Messenger of Allah (ﷺ) that he said: "Every sickness has a cure, and if the cure is applied to the sickness, it will be cured with the permission of Allah⁶". Menstruation can be considered a condition that requires a remedy. Islam teaches that Allah has created both diseases and their cures. Therefore, it is important for humanity to seek halal treatments for every revealed ailment⁷.

Herbal plants that can be used to treat dysmenorrhea include citronella (*Cymbopogon nardus*). This plant belongs to the Poaceae family and contains cellulose, hemicellulose, lignin, and essential oils. It has several pharmacological activities, such as antifungal, antibacterial, anti-inflammatory, and analgesic properties⁸. Citronella is commonly used in daily food preparations and as an industrial raw material in the form of processed essential oil. The components found in citronella oil include trimethyl (2-methyl-1-propenylidene) and cyclopropane

⁶ "Sahih Muslim 2204 - The Book of Greetings - كتاب السلام - Sunnah.Com - Sayings and Teachings of Prophet Muhammad (صلى الله عليه و سلم)", accessed December 30, 2023, <https://sunnah.com/muslim:2204>.

⁷ Aldi Ramdan et al., "Menstrual Period in Qur'an: Interpretation of Al-Baqarah verse 222," *Journal of Ulumul Qur'an and Tafsir Studies* 2, no. 1 (April 10, 2023): 25–30.

⁸ Yatim R Widodo et al., "Peningkatan Nilai Tambah Minyak Sereh Wangi Melalui Pembuatan Balsem Sitronella," *Jurnal Pengabdian Nasional* 1 (2020): 1–7.

compounds, which have analgesic properties that may help alleviate pain⁹. To enhance the therapeutic benefits of citronella essential oil, it can be formulated into various pharmaceutical preparations. One example is an aromatherapy liniment.

Liniment preparations, commonly known as liniments, are liquid formulations that contain analgesics and substances with warming properties. They are applied topically on uninjured skin. When applied, liniments penetrate pain receptors (nociceptors) to help alleviate pain by blocking the effects of prostaglandins. Prostaglandins are compounds that stimulate uterine muscle contractions; during menstruation, they play a role in the release of menstrual blood. High levels of prostaglandins can lead to dysmenorrhea, or menstrual pain¹⁰. Additionally, liniments containing essential oils can produce a distinctive aroma, contributing to a practice known as aromatherapy.

Aromatherapy is a method that uses the aromas of essential oils to help treat various ailments. One common technique is inhalation. Aromatherapy can alleviate pain because the volatile molecules in essential oils reach receptor cells in the nose. This triggers electrochemical signals that travel to the brain via the olfactory tract and continue to the limbic system. As a result, the hypothalamus releases endorphins and serotonin, hormones that promote feelings of relaxation and reduce tension, thereby helping to relieve pain.¹¹

Based on the above background, this was conducted to evaluate the effectiveness of citronella essential oil (*Cymbopogon nardus*) in dysmenorrhea pain therapy in adolescents in the form of *liniment* preparations.

1.2 Research Problems

The research problems in this study are:

⁹ Bayu Indri Atmoko, "Analisis Nilai Tambah Produksi Minyak Atsiri Serai Wangi" (Thesis, Universitas Islam Negeri Syarif Hidayatullah Jakarta, 2017).

¹⁰ Wojciech Leppert et al., "Transdermal and Topical Drug Administration in the Treatment of Pain," *Molecules* 23, no. 3 (March 17, 2018): 681.

¹¹ Afrilia Dhea Putri and Yelfi Anwar, "Pengaruh Inhalasi Aromaterapi terhadap Nyeri Haid pada Remaja," *Jurnal Kesehatan Indonesia* 1, no. 1 (2022).

1. What are the quality evaluation results of citronella (*Cymbopogon nardus*) essential oil aromatherapy *liniment* preparation?
2. What is the effect of citronella (*Cymbopogon nardus*) essential oil aromatherapy *liniment* preparation for dysmenorrhea therapy?

1.3 Research Objectives

The objectives of this study are:

1. Knowing the quality evaluation results of citronella essential oil (*Cymbopogon nardus*) aromatherapy *liniment* preparation.
2. Knowing the effectiveness of citronella essential oil (*Cymbopogon nardus*) aromatherapy *liniment* preparation for dysmenorrhea therapy.

1.4 Research Benefits

1. Theoretical Benefits

The findings of this study serve as a reference for further research on the effectiveness of citronella essential oil (*Cymbopogon nardus*) as a treatment for dysmenorrhea.

2. Practical Benefits

These results are intended to provide valuable insights to women who experience dysmenorrhea, specifically by utilizing citronella essential oil. Additionally, this research may influence the pharmaceutical industry to consider the use of citronella essential oil as a remedy for dysmenorrhea.

1.5 Authenticity of Research

Several researchers have conducted studies on the effects of citronella essential oil in pain therapy, as summarized in Table 1 below.

Table 1 Authenticity of Research

Research Title	Research Method	Variable	Results	Research Difference
Formulation and Evaluation Test of Stick Balm Preparation from citronella	Experimental	Independent: Variation of citronella (<i>Cymbopogon nardus</i>) essential oil concentration	Testing using GC-MS revealed that the essential oils did not contain citronellal, citronellol, or geraniol. However, compounds from the aldehyde and alcohol	Independent: Variation of citronella (<i>Cymbopogon nardus</i>) essential oil concentration in aromatherapy

Research Title	Research Method	Variable	Results	Research Difference
essential oil (Cymbopogon citratus) as Analgesic and Aromatherapy Relaxant ¹²		in <i>Stick Balm</i> dosage form. Dependent: GC-MS test and quality test results of <i>stick</i> preparation	groups were detected. Additionally, the analgesic and aromatherapy test results for stick balsam at concentrations of 25% and 30% indicated potential analgesic and relaxing therapeutic effects.	liniment dosage form. Dependent: Quality evaluation of <i>liniment</i> preparation and effectiveness test as dysmenorrhea treatment
Application of Reflexology and Lemongrass Oil on Rheumathoid Pain in Elderly in Kemiling Raya Bandar Lampung ¹³	Experimental	Independent: Reflexology technique with citronella oil. Dependent: Qualitative and quantitative data from phytochemical screening and KLT test on flavonoids	The implementation of reflexology on the feet using lemongrass essential oil in patients with rheumatoid arthritis complaints has an effect on relieving and reducing pain in patients..	Independent: Variation of citronella (<i>Cymbopogon nardus</i>) essential oil concentration in aromatherapy liniment dosage form. Dependent: Quality evaluation of <i>liniment</i> preparation and effectiveness test as dysmenorrhea treatment
Formulation and Test of Antistress Effectiveness of Citronella Essential Oil Aromatherapy Candle in Mice ¹⁴	Experimental	Independent: Variation of citronella essential oil concentration in Aromatherapy Candle dosage form. Dependent:	Aromatherapy candle formulations from citronella essential oil (<i>Cymbopogon nardus</i>) have stable quality evaluation results. At concentrations of 2%, 4%, and 6% have antistress effectiveness against male mice (<i>Mis musculus</i>).	Independent: Variation of citronella (<i>Cymbopogon nardus</i>) essential oil concentration in aromatherapy liniment dosage form. Dependent:

¹² Ellyza Audhina Rachman, Titi Agni Hutahaen, and Ainu Zuhriyah, "Formulasi Dan Uji Evaluasi Sediaan Stick Balsem Dari Minyak Atsiri Serai Wangi (*Cymbopogon citratus*) Sebagai Analgesik Dan Aromaterapi Relaksan," *Pharmacy Medical Journal* 6, no. 2 (2023): 95–103.

¹³ Prima Dian Furqoni, Triyoso Triyoso, and Deny Eka Liasari, "Penerapan Pijat Refleksi dan Minyak Serai terhadap Nyeri Rheumathoid pada Lansia di Kemiling Raya Bandar Lampung," *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)* 5, no. 9 (September 4, 2022): 3166–3180.

¹⁴ Tamzil Azizi Musdar and Nurjannah Supardi, "Formulasi Dan Uji Efektivitas Antistress Lilin Aromaterapi Minyak Atsiri Serai Wangi Pada Mencit," *Jurnal Kesehatan Tambusai* 5 (2024): 252–266.

Research Title	Research Method	Variable	Results	Research Difference
		Antistress effectiveness test on mice		Effectiveness test as dysmenorrhea treatment

