

## Effect of Cinnamon (*Cinnamomum Burmanni*) Aromatherapy on Primary Dysmenorrhea Pain in Students at Air Batu High School in 2021

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### ABSTRACT

Primary dysmenorrhea is pain that arises from the first day of menstruation and will recover immediately after stabilizing the body's hormones. In addition to pharmacological therapy, one of which is to reduce dysmenorrhea pain without drugs, namely by non-pharmacological therapy, one of which is Cinnamon (*Cinnamomum burmannii*), Cinnamon (*Cinnamomum burmannii*) is a kind of spice-producing tree, the purpose of this study was to determine whether there was an effect of Cinnamon Aromatherapy (*Cinnamomum Burmanni*) on Primary Dysmenorrhea Pain in Students at SMA Negeri 1 Air Batu in 2021. This study used a pre-experimental research type, one group pre and post test design, which involved one group of subjects, the population in this study were all female students of SMA Negeri 1 Air Batu class I with 28 female students, II 30 female students and III female students. 30, which has been collected as many as 80 students, the sample sample with the purposive sampling technique. So the number of samples in this study were 44 students, with the research technique using the Wilcoxon test. The results of this study have a significant effect of giving cinnamon aromatherapy (*Cinnamomum Burmanni*) on primary dysmenorrhea pain in students at SMA Negeri 1 Air Batu in 2021, with the value of statistical test results using the Wilcoxon test obtained  $p = 0.000$  ( $p < 0.05$ ). The conclusions in this study from these results prove that giving cinnamon aromatherapy (*Cinnamomum Burmanni*) can effectively reduce the level of primary dysmenorrhea pain in students at SMA Negeri 1 Air Batu in 2021, Suggestions for health education This study proves that cinnamon aromatherapy can reduce primary dysmenorrhea. Therefore, this research can provide information and the development of nursing science, especially the sexuality block of the benefits of cinnamon aromatherapy on primary dysmenorrhea.

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## 1. Introduction

DP usually lasts for 1-2 days during the ongoing menstrual process (Omidvar et al., 2015). Based on the pathogenesis, dysmenorrhea is divided into two, namely primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is defined as pelvic pain that occurs during menstruation in the absence of pelvic abnormalities. While secondary dysmenorrhea is generally caused by disorders of the reproductive system, such as endometriosis, uterine myomas, adenomyosis, cervical stenosis, pelvic inflammatory disease, and pelvic adhesions (De Sanctis et al., 2015)

WHO (World Health Organization) 2015 stated that hospitals in the UK found the prevalence of dysmenorrhea of 8.8% in the age group of 21-41 years to 94% in the age group of 10-20 years. Another study in 1,018 junior high school students in Japan found that 46.8% had moderate dysmenorrhea and 17.7% had severe dysmenorrhea. The age group most often experiencing dysmenorrhea is the age of 12-15 years. Dysmenorrhea is the main cause of student absence from school (Ibrahim et al., 2015). The incidence of dysmenorrhea in Indonesia reaches 64.25% consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea (Ernawati et al., 2017). Meanwhile, in North Sumatra, of the 175

high school students studied, 93.8% experienced dysmenorrhea, which was dominated by moderate dysmenorrhea as much as 73.1% (Faturahman, 2016). DP in adolescents can provide emotional conflict, tension and anxiety that will affect their skills and abilities. Because DP learning activities in learning can be disrupted, concentration decreases or even does not exist so that the material given during ongoing learning cannot be captured by women who are experiencing DP (Wong, 2018).

*Dysmenorrhea* Primary pain is pain that has arisen since the first day of menstruation and will soon recover after the body's hormones stabilize. Menstrual pain is found without abnormalities in the genital organs and is a normal thing felt by women during menstruation (Ida Mariana, 2020). As a result of dysmenorrhea that is felt in the form of pain, the pain felt varies from mild to severe, the pain felt in the form of spasms in the lower abdomen and can spread towards the waist and thighs. This is caused by uterine muscle spasms where there is insufficient blood flow. This condition certainly greatly affects the activities of adolescents, especially during school and activities (Ida Mariana, 2020).

To relieve pain, students consume Pharmacological Therapy as a treatment option that is often used for pain relief, while the side effects of Pharmacological therapy inhibit the Cyclooxygenase (COX) enzyme which causes inhibition of prostaglandin synthesis, thus affecting kidney function and gastric mucosal defense (Ida Mariana, 2020). In addition to pharmacological therapy, one way to reduce dysmenorrhea pain without drugs is with non-pharmacological therapy, one of which is Cinnamon (*Cinnamomum burmannii*), Cinnamon (*Cinnamomum burmannii*) is a type of spice-producing tree. Including types of spices that are very flavorful, sweet and spicy. Contains essential oils, resins and linders. Efficacious as an analgesic, somatic and aromatic, which is made using aromatherapy (Winkanda, 2016).

The mechanism of action of aromatherapy in the human body takes place through two physiological systems, namely the body's circulatory system and the olfactory system. Fragrances can affect a person's psychological condition, memory and emotions. The organ of smell is a natural means of communication in humans. The smelling process is divided into 3 stages, starting from the reception of odor molecules in the olfactory epithelium. Furthermore, the smell will be transmitted as a message to the olfactory center which is located behind the nose. At that place various neuron cells interpret odors and deliver them to the limbic system which will then be sent to the hypothalamus for processing. Through the delivery of the response carried out by the hypothalamus, all the elements in essential oils will be delivered by the circulatory system and chemical organs to the organs in need (Promadiati, 2017).

Cinnamon is a member of the Lauraceae family which is one of the spices from Indonesia and is one of the oldest herbal medicines. Based on research that has been done on humans and animals, it shows many advantages, one of which is that the oil extracted from cinnamon has anti-inflammatory activity, as a treatment for dysmenorrhea and to stop bleeding. Cinnamon bark has a spicy and sweet taste, smells good, and is warm. Some of the chemicals contained in cinnamon include essential oils, eugenol, safrole, cinnamaldehyde, tannin, calcium oxalate, resin and tanning agents. The pharmacological effects caused by cinnamon are antirheumatic, appetite enhancer and pain reliever (Winkanda, 2015).

The main components of essential oil from cinnamon sticks are Cinnamaldehyde (55-57%) and eugenol (5-18%). Cinnamaldehyde has been reported to have antispasmodic effects. In addition, eugenol can prevent prostaglandin biosynthesis and reduce inflammation. Cinnamon also contains vitamins, such as vitamin A, thiamin, riboflavin and ascorbic acid (Najafi & Khani, 2015). This study is also in line with Tria Anita's (2020) research, namely after being given cinnamon (cinnamon) and honey extract, there was a decrease in the degree of menstrual pain in adolescent girls with primary dysmenorrhea. With pain level indicators using NRS (Numeric Rating Scale) with a value (pvalue = 0.000) and prostaglandin levels (pvalue = 0.003).

This study is also in line with Tarigan's (2018) research, namely the results of the study using an independent t-test statistical test, showing the primary dysmenorrhea scale with an average reduction in pain scale of 1.18 and  $p = 0.000$ . Aromatherapy cinnamon (*Cinnamomum Burmanni*) by inhalation can be used as an alternative to reduce primary dysmenorrhea. Based on the initial survey conducted at Air Batu High School to 10 students in class I as many as 3 people, class II as many as 3 people and class III as many as 4 people, out of 10 students who have been interviewed online who took data through data from schools, 10 students experience dysmenorrhea and at the time of dysmenorrhea they never came to school before the pandemic, the way these students reduce pain is by taking painkillers,

## 2. Method

This study uses a pre-experimental type of research, one group pre and post test design, which

involves one group of subjects. The population in this study were all female students of SMA Negeri 1 Air Batu, class I, 28 female students, II female students, 30 and III female students. 30, which has been collected as many as 80 students, the sample sample using the Purposive Sampling Technique So the number of samples in this study is 44 student, with research techniques using the Wilcoxon test.

### 3. Results and Analysis

#### 3.1 Research Overview

This research was conducted at SMA Negeri 1 Air Batu, Air Batu District, Asahan Regency. SMA Negeri 1 Air Batu is led by the Principal, Mr. Drs. Roban. The number of PNS teachers is 16 people. The number of class X students is 181, class XI students are 171 and class XII students are 166. Based on data collected from students in class X, XI and XII which have been collected as many as 80 students who experience dysmenorrhea wherein class X students who experience dysmenorrhea are 28 30 people, class XI experiencing dysmenorrhea, class XII as many as 22 people. Sampling with Purposive Sampling Technique So the number of samples in this study were 44 students with the criteria of experiencing dysmenorrhea every time they menstruated.

#### 3.2 Research result

##### a. Characteristics of Respondents

This study was conducted on all respondents in this study, namely 44 people who were treated with cinnamon aromatherapy for 15 minutes while experiencing dysmenorrhea. The results obtained through this research are as follows:

**Table 1.**  
Characteristics of Respondents at SMA Negeri 1 Air Batu in 2021

No	Demographic Data	Frequency	Percentage (%)
1	<b>Age</b>		
	15 years	6	13.6
	16 years	20	45.5
	17 years	16	36.4
	18 years	2	4.5
	Amount	44	100
2	<b>Menstrual Cycle</b>		
	27 days	12	27.3
	28 days	21	47.7
	29 days	7	15.9
	30 days	4	9.1
	Amount	44	100

Based on table 1. it is known that the age of most respondents is 16 year old female students (45.5%) with the majority of respondents' menstrual cycles being 28 days, namely 21 female students (47.7%).

##### b. Primary Dysmenorrhea Pain Before Giving Cinnamon Aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021

Primary dysmenorrhea pain data before giving cinnamon aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021 can be seen in table 2 below:

**Table 2**  
Primary Dysmenorrhea Pain Before Giving Cinnamon Aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021

Primary Dysmenorrhea Pain (Pre)	Frequency	%
No Pain	0	0.0
Slight Pain	1	2.3
Somewhat Pain	10	22.7
Annoying pain	21	47.7
Very Annoying Pain	12	27.3
<b>Amount</b>	<b>44</b>	<b>100</b>

Based on table 2 shows that primary dysmenorrhea pain before giving cinnamon aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021 the majority of students experienced disturbing pain, as many as 21 respondents (47.7%).

**c. Primary Dysmenorrhea Pain After Giving Cinnamon Aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021**

Primary dysmenorrhea pain data after giving cinnamon aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021 can be seen in table 3 below:

**Table 3**

Primary Dysmenorrhea Pain After Giving Cinnamon Aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021

Primary Dysmenorrhea Pain (post)	Frequency	%
No Pain	0	0.0
Slight Pain	17	38.6
Somewhat Pain	20	45.5
Annoying pain	7	15.9
Very Annoying Pain	0	0.0
Amount	20	100

Based on table 3 shows that primary dysmenorrhea pain after giving cinnamon aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021 the majority of students experienced a bit of pain as many as 20 respondents (45.5%).

**d. The Effect of Giving Cinnamon (Cinnamomum Burmanni) Aromatherapy to Primary Dysmenorrhea Pain in Students at SMA Negeri 1 Air Batu in 2021**

The results of statistical tests on the effect of giving cinnamon (Cinnamomum Burmanni) aromatherapy to primary dysmenorrhea pain in female students at SMA Negeri 1 Air Batu in 2021 are shown in table 4.4. as follows :

**Table 4.4.**

The Effect of Giving Cinnamon (Cinnamomum Burmanni) Aromatherapy to Primary Dysmenorrhea Pain in Students at SMA Negeri 1 Air Batu in 2021

Primary Dysmenorrhea Pain	Giving Cinnamon Aromatherapy		Ranking Change	p value
	Pre	Post		
	F	F	F	
1. No Pain	0	0	Positive Rating	0
2. Slight Pain	1	17	Negative Rating	42
3. Somewhat Pain	10	20	Ties	2
4. Annoying pain	21	7		
5. Pain is very annoying	12	0		

Description: a) Wilcoxon test

Dysmenorrhea pain changes:

- Negative rating is the change in pain before and after giving cinnamon aromatherapy from "very annoying pain" to "slight pain"
- Positive Ranking is the change before and after from the category of "slight pain" to "very bothersome pain"
- Ties means that there is no change in self-concept before and after

Based on table 4, it was found that the administration of cinnamon aromatherapy (Cinnamomum Burmanni) had an effect on reducing primary dysmenorrhea pain in female students at SMA Negeri 1 Air Batu in 2021, where from the results of the study showed that before giving cinnamon arotherapy, the intensity of primary dysmenorrhea pain was experienced by the majority of students experiencing pain. disturbing, namely 21 people (47.7%) and after giving cinnamon arotherapy, the intensity of primary dysmenorrhea pain decreased to slightly painful students, namely 20 people (45.5%) while those who experienced disturbing pain decreased to 7 people (15.9% ).

Based on the results of statistical tests using the Wilcoxon test, it is known that the p value (0.000) < (0.05) means Ho is rejected, so there are differences in the intensity of dysmenorrhea pretest and posttest in students. These results prove that there is a significant effect of giving cinnamon (Cinnamomum Burmanni) aromatherapy to primary dysmenorrhea pain in female students at SMA Negeri 1 Air Batu in 2021. These results prove that giving cinnamon (Cinnamomum Burmanni) aromatherapy can reduce the level of primary dysmenorrhea pain in children. student at SMA Negeri 1 Air Batu in 2021.

**3.3 Discussion**

**a. Primary Dysmenorrhea Pain Before Giving Cinnamon Aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021.**

Based on the results of the study, the majority of respondents who experienced dysmenorrhea before (pretest) were given cinnamon aromatherapy were at disturbing pain intensity as many as 21 people (47.7%), the rest 12 people experienced very disturbing pain, 10 people experienced mild pain and 1 person experienced a little pain. painful. From the incidence of pain felt by students and even then varied from a little pain to very disturbing pain. The pain is felt in the form of spasms in the lower abdomen and can spread towards the waist and thighs. This is caused by uterine muscle spasms where there is insufficient blood flow. This condition certainly greatly affects the activities of adolescents, especially during school and activities (Ida Mariana, 2020).

To relieve pain, students consume Pharmacological Therapy as a treatment option that is often used for pain relief, while the side effects of Pharmacological therapy inhibit the Cyclooxygenase (COX) enzyme which causes inhibition of prostaglandin synthesis, thus affecting kidney function and gastric mucosal defense (Ida Mariana, 2020).

In addition to pharmacological therapy, one way to reduce dysmenorrhea pain without drugs is with non-pharmacological therapy, one of which is Cinnamon (*Cinnamomum burmannii*), Cinnamon (*Cinnamomum burmannii*) is a type of spice-producing tree. Including types of spices that are very flavorful, sweet and spicy. Contains essential oils, resins and linders. Efficacious as an analgesic, somatic and aromatic, which is made using aromatherapy (Winkanda, 2016). The mechanism of action of aromatherapy in the human body takes place through two physiological systems, namely the body's circulatory system and the olfactory system. Fragrances can affect a person's psychological condition, memory and emotions. The organ of smell is a natural means of communication in humans. The smelling process is divided into 3 levels, It begins with the reception of odor molecules in the olfactory epithelium. Furthermore, the smell will be transmitted as a message to the olfactory center which is located behind the nose. At that place various neuron cells interpret odors and deliver them to the limbic system which will then be sent to the hypothalamus for processing. Through the delivery of the response carried out by the hypothalamus, all the elements in essential oils will be delivered by the circulatory system and chemical organs to the organs in need (Promadiati, 2017).

Research Assumptions Based on the results above, the researcher concluded that most of the pain felt by students was disturbing pain which on this pain scale could interfere with activities and interfere with learning concentration, thus requiring rest and requiring drugs to relieve pain.

**b. Primary Dysmenorrhea Pain After Giving Cinnamon (Cinnamomum Burmanni) Aromatherapy at SMA Negeri 1 Air Batu in 2021.**

Based on the results of the study, the majority of respondents who experienced dysmenorrhea before (pretest) were given cinnamon aromatherapy, the intensity of pain bothered as many as 21 people (47.7%) and after (posttest) they were given cinnamon aromatherapy it changed to a slightly painful condition as many as 20 people. (45.5%). This is because respondents feel distracted due to the effects of aromatherapy that are inhaled for a few minutes. In addition, the effects of cinnamon aromatherapy can reduce the degree of pain felt during menstruation. Changes in the intensity of menstrual pain that occur in female students or young women who experience dysmenorrhea after being given cinnamon aromatherapy, Pain itself is subjective, including menstrual pain, so respondents have different views on the pain they feel. The most dominant menstrual pain felt by the respondent was in disturbing pain and turned into a little pain and turned into a little pain felt by the respondent. Pain itself is subjective, including menstrual pain, so respondents have different views on the pain they feel. The most dominant menstrual pain felt by the respondent was in disturbing pain and turned into a little pain and turned into a little pain felt by the respondent.

This is in line with research conducted by Rica Pustikawati (2015) on students of SMAN 1 Sungai Ambawang, Kubu Raya Regency, that the results before giving cinnamon aromatherapy obtained the highest degree of pain in respondents, namely a moderate pain scale of 68.8%. After giving aromatherapy, the results obtained with the degree of pain in the respondent, namely the degree of mild pain is 75%. Research Assumptions based on the results of research on demographic characteristics of respondents related to age, the majority of respondents in the intervention group were in middle teens ranging from 15 years to 17 years, this is in line with the theory of Yustianingsih (2004), which states that primary dysmenorrhea can be found in young women aged 15 -25 years and will disappear in their late 20s or 30s without finding genital abnormalities on gynecological examination. With increasing age, dysmenorrhea will decrease and disappear by itself, according to Proverawati and Misaroh (2012). This

is because the older the woman, the more often she experiences menstruation, this causes the neck of the uterus to widen (Bare and Smeltzer, 2012). Many things affect why adolescents ranging in age from 15 to 17 years experience dysmenorrhea,

**c. The Effect of Giving Cinnamon (Cinnamomum Burmanni) Aromatherapy to Primary Dysmenorrhea Pain in Students at SMA Negeri 1 Air Batu in 2021**

Based on the results of the study, it was found that giving cinnamon aromatherapy (Cinnamomum Burmanni) had an effect on reducing primary dysmenorrhea pain in female students at SMA Negeri 1 Air Batu in 2021, where from the results of the study showed that before giving cinnamon arotherapy, the intensity of primary dysmenorrhea pain was experienced by the majority of students experiencing pain. disturbing, namely 21 people (47.7%) and after giving cinnamon arotherapy, the intensity of primary dysmenorrhea pain decreased to slightly painful students, namely 20 people (45.5%) while those who experienced disturbing pain decreased to 7 people (15.9% ).

Based on the results of statistical tests using the Wilcoxon test, it is known that the p value (0.000) < (0.05) means  $H_0$  is rejected, so there are differences in the intensity of dysmenorrhea pretest and posttest in students. These results prove that there is a significant effect of giving cinnamon (Cinnamomum Burmanni) aromatherapy to primary dysmenorrhea pain in female students at SMA Negeri 1 Air Batu in 2021. These results prove that giving cinnamon (Cinnamomum Burmanni) aromatherapy can reduce the level of primary dysmenorrhea pain in children. student at SMA Negeri 1 Air Batu in 2021.

The average intensity of dysmenorrhea in the posttest decreased due to the administration of cinnamon aromatherapy, which according to Stagg (2015) essential oil from cinnamon can overcome cramps during menstruation. Meanwhile, before any intervention was given, the respondent's dysmenorrhea intensity tended to remain constant and increase. This is in line with the results of research conducted by Tria Anita (2020), namely after being given cinnamon (cinnamon) extract and honey, there was a decrease in the degree of menstrual pain in adolescent girls with primary dysmenorrhea. The aroma of this essential oil will trigger a reaction in the sense of smell which then sends these messages to the brain, causing a positive relaxing effect and can reduce pain.

Aromatherapy itself, works by way of the body's circulatory system and olfactory system, where odor is a volatile molecule when it enters the nasal cavity through breathing and is then translated by the brain as an olfactory process. Through inhalation, some of the molecules will enter the lungs, then the aromatic molecules will be absorbed by the mucosal lining of the respiratory tract, either in the bronchi or bronchioles where gas exchange occurs in the alveoli. These molecules are transported by the blood circulation system in the lungs. Deep breathing will increase the amount of aromatic substances that are in the body. (Promadiati, 2017). Research Assumptions that The aromatherapy used in this study is cinnamon aromatherapy, where cinnamon aromatherapy can overcome dysmenorrhea, because the aroma of cinnamon has anti-inflammatory activity, as a treatment for dysmenorrhea and to stop bleeding. Cinnamon bark has a spicy and sweet taste, smells good, and is warm. Cinnamon oil is very useful for encouraging contractions and relieving pain so that it can reduce aches or pains during menstruation. (Promadiati, 2017)

**3.4 Research Limitations**

The limitations of this study are the lack of enthusiasm of students in participating in this therapy due to the pandemic period which makes students ineffective in participating in aromatherapy. Pain itself is subjective, including menstrual pain, so respondents have different views on the pain they feel. The most dominant menstrual pain felt by the respondent was in disturbing pain and turned into a little pain and turned into a little pain felt by the respondent so that more intensive therapy was needed for maximum results.

**4. Conclusion**

The conclusions of this study are as follows:

- a. Primary dysmenorrhea pain before giving cinnamon aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021 experienced by the majority of students experienced disturbing pain.
- b. Primary dysmenorrhea pain after giving cinnamon aromatherapy (Cinnamomum Burmanni) at SMA Negeri 1 Air Batu in 2021 experienced by students, namely the majority experienced a bit of pain
- c. There is a significant effect of giving cinnamon (Cinnamomum Burmanni) aromatherapy to primary dysmenorrhea pain in female students at SMA Negeri 1 Air Batu in 2021, with the value of statistical test results using the Wilcoxon test obtained  $p = 0.000$  ( $p < 0.05$ ). These results prove that the

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administration of cinnamon (*Cinnamomum Burmanni*) aromatherapy can effectively reduce the level of primary dysmenorrhea pain in female students at SMA Negeri 1 Air Batu in 2021..

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