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Lavender Aromatherapy on Alleviating Menstrual Pain in Female Teenagers: A Case Study on Polanharjo Klaten

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Abstract: Menstrual pain is lower abdominal pain originating from uterine cramps and occurs during menstruation. Menstrual pain occurs due to an increase of progesterone hormone. Menstrual pain is often experienced by teenagers and is very disturbing daily activities, thus requiring handling to reduce menstrual pain. Aromatherapy lavender is one of the treatments to reduce menstrual pain. This study aims to determine the influence of lavender aromatherapy on alleviating of menstrual pain in teenagers in Polanharjo. The method used in this research was Pre-Experimental with One Group Pre-test Post-test design on the 16 female teenagers who experience menstrual pain. NRS (Numeric Rating Scale) was utilized to assess the scale of pain. The results shown that the mean before lavender aromatherapy was given 3.69 and the mean after given lavender aromatherapy 2.06. Once given lavender aromatherapy there was a decrease in pain 1.63. Result of data analysis got $P = 0,000$, $\alpha = 0,05$. The conclusions of this study indicate that lavender Aromatherapy affected to alleviate of menstrual pain.

1 INTRODUCTION

Reproductive health is a state of physical, mental and social well-being as a whole, not merely free from illness or disability in all matters relating to the reproductive system, as well as its functions and processes. The aim of adolescent reproductive health is to help adolescents to understand and realize such knowledge, so that it has healthy and responsible attitudes and behaviors with reproductive life problems (Widyastuti, 2012).

Adolescent reproductive development takes place at the age of 11-16 years in men and 10-15 years in women. In this development rapid physical growth occurs accompanied by changes and growth of mature reproductive organs. Changes that occur in the growth are followed by the appearance of the primary sign. The primary sex signs in men are wet dreams. While the primary signs in women are menstruation (Proverati, 2010).

Menstruation is the release of blood and body cells from the vagina that come from the uterine wall of the woman periodically. The average menstrual period is between 3-8 days with an average menstrual cycle of 28 days (Wulandari, 2011). Menstrual cycle involves several stages that are controlled by the

interaction of hormones released by the hypothalamus. At the beginning of the cycle, the lining of the uterus will thicken, then the egg will be released from the ovary to the fallopian tube and continue to the uterus. If the egg is not fertilized by the sperm the uterine lining will decay in the form of menstrual blood. During menstruation many women experience physical discomfort and discomfort starting before and during menstrual flow and continue for 48 hours to 72 hours. Women can have various problems with menstruation. The problem is in the form of Pre Menstrual Syndrome (PMS), does not experience menstruation at all (amenorrhea) to menorgia or prolonged heavy menstruation, and menstrual pain (disminorea) (Pilliteri, 2015).

Disminorea is painful during menstruation, usually with a cramping feeling and is concentrated in the lower abdomen. The nature and degree of pain varies. Ranging from mild to severe. Great conditions can disrupt daily activities, forcing sufferers to rest and leave work or daily ways of life for several hours or several days. Almost all women experience a feeling of discomfort in the lower abdomen during menstruation. The uterus or uterus consists of muscles that also contract and relax. Generally, uterine muscle contractions are not felt, but severe

contractions and often cause blood flow to the uterus to be disrupted resulting in pain (Nikjou et al., 2016).

It has been estimated that 7–15% of women suffer from severe pain which causes disturbances in their performance for 1–3 days in a month, and 14–52% of female students miss school because of complaining dysmenorrhea. This issue is associated with decline

in career and educational function and results in disturbed quality of life and emerging economic problems (Nikjou et al., 2016) Whereas in In Indonesia the numbers of prevalence menstrual pain or dysmenorrhea by 64.25% were of 54.89% and

9.36% of primary dysmenorrhoea a secondary dysmenorrhea (Oktri, Hakim, & Juaeriah, 2018) In 2014 PKBI Central Java data, there were 56 young women who consulted about the highest menstruation and numbers. They were consultations about disimnorea, the majority of whom lived in Semarang and the age range consulted was 15 years 19 years (Central Java Provincial Health Office, 2014). The research conducted by Haryanti (Haryanti, 2014) in Karangdowo N 1 High School was 78% experiencing mild pain, 22% experiencing moderate pain.

Menstrual pain or dysmenorrhea can be overcome by pharmacological and non-pharmacological therapy. Pharmacological therapies include analgesic drugs, hormonal therapy, nonsteroidal prostaglandin drugs, and dilatation of the cervical canal. (Pilliteri, 2015) Non-pharmacological therapies include warm compresses, exercise, aromatherapy, Mozart therapy, and relaxation. Lakhan (Lakhan, Sheaffer, & Tepper, 2016) said that aromatherapy directly affects the brain as an analgesic drug.

Aromatherapy is a complementary therapy in nursing practice and uses essential oils from the fragrant smell of plants to reduce health problems and improve quality of life. Smell directly affects the brain like an analgesic drug. For example, kissing lavender will increase alpha waves in the brain and help to relax (Lakhan et al., 2016) Research results the aroma of roses has the greatest effect, then lavender. Lavender as an analgesic, antiseptic, antidepressant, antispasmodic, antiviral, antideuritic, and hypotensive (Dwijayanti, 2014).

Research results according (Nikjou et al., 2016) Lavender Aromatherapy is effective to reduce pain in dysminore. They were use a lavender on adulthood who severe from dysminore. Ou et al. in a research in 2012 reported aromatherapy with lavender, clary sage, and marjoram oils in a 2:1:1 ratio reduced pain intensity of dysmenorrhea, which was statistically significant ($P < 0.001$) (Ou, Hsu, Lai, Lin, & Lin, 2012) whereas aromatherapy with lavender did not decreased the pain of intrauterine device (IUD)

placement in the study of Shahnazi (Shahnazi, Nikjoo, Yavarikia, & Mohammad-Alizadeh-Charandabi, 2012). It was a difference finding of lavender aromatherapy effectiveness. So it could be interesting to finding the effectiveness of lavender aromatherapy toward the menstrual pain.

Research of to Dewi (Dewi & Prima, 2013) Lavender aromatherapy is a therapeutic action that is beneficial to improve physical and psychological conditions. Physically both are used to reduce pain, while psychologically can relax the mind, reduce tension and anxiety and provide calm. A pleasant odor will stimulate the thalamus to expel encephalin which functions as a natural pain reliever and produces a feeling of well-being. Enkefalin is similar to endorphin, an endogenous chemical (produced by the body) that has a structure similar to opioids. Enkefalin is thought to cause presynaptic barriers (neurons that secrete transmitter material) and post synaptic barriers (where the transmitter works) in dorsal horn. The process achieves inhibition by encephalalin, which is the inhibition of substance P so that reduced pain is transmitted to the brain.

About the prevalence of the menstrual pain and the side effects of the current treatments and because of lack of similar studies in this field, we decided to perform a study on the teenagers in Klaten with the aim of determining the effect of lavender aromatherapy on the alleviating the menstrual pain.

METHODS

This research is a quantitative research with Pre-Experiment method with the design of One Group Pretest-Posttest, that is, the respondents carried out an intervention, after being given an intervention, then the second observation (posttest) was conducted (Sugiyono, 2017). This research was conducted at SMA N 1 Polanharjo on May 29 to June 15, 2018. Samples in this study were 16 respondents. The consideration in selecting samples conducted by researchers is to determine criteria which consist of inclusion and exclusion criteria

Lavender aromatherapy is a therapy by using lavender essential oil given by inhalation by dripping 3-5 drops of aromatherapy into the tissue which is done for 5 minutes.

Menstrual pain is an uncomfortable feeling felt by adolescents during the second day of menstruation due to uterine contractions in the lower abdomen. Menstrual pain is measured using the NRS (Numeric Rating Scale).

3 RESULTS AND DISCUSSION

Table 1: Average of age, menarche, duration of menstruation and menstrual cycle.

Variable	Min	Max	Mean	SD
Ages	16	17	16,69	0,479
Menarche ages	12	16	13.50	0.966
Duration of menstruation	5	8	6.31	1.014
Cycle	25	35	28.88	2.473

Based on table 1 the average age of the youngest respondents is 16 years, at most 17 years with an average of 16.69 ± 0.479 years. Based on the average age of the youngest respondents, they were 12 years old, at most 16 years with an average of 13.50 ± 0.966 years. Based on the shortest average length of menstruation for respondents, which is 5 days, the maximum is 8 days with an average of 6.31 ± 1.014 days. Based on the average respondents' shortest menstrual cycle, which is 25 days, the longest is 35 days with an average of 28.88 ± 2.473 days.

Table 2: The average of reduction in menstrual pain.

Variable	Min	Max	Mean	SD
Pre test	2	6	3,69	1,195
Post test	1	5	2,06	1,237

Based on table 2 shows the scale of menstrual pain before being given lavender aromatherapy has an average value of 3.69 ± 1.195 . After being given lavender aromatherapy, the average value was 2.06 ± 1.237 . After being given lavender aromatherapy there was a decrease with an average of 1.63.

Table 3: Analysis of the effect of lavender aromatherapy on respondents.

	Median (Min – Max)	P Value
Pre test	3,00 (2-6)	0.000
Post-test	2,00 (1-5)	

Based on Table 3 shows that the results of the Wilcoxon test analysis obtained $p\text{-value} = 0,000$; $\alpha = 0.05$ which means lavender aromatherapy has an effect on decreasing menstrual pain.

Age is one factor in the occurrence of menstrual pain because menstrual pain usually occurs in

adolescence, and in 2-5 years after menarche. Menstrual pain often occurs in young women because it has not reached biological maturity (especially reproductive organs, which is still imperfect endometrial growth). So that menstruation at a very early age can cause menstrual pain (Ali, 2010).

Research of Yulanda (Yulanda, 2013) states that primary dysmenorrhea generally occurs at the age of 15-30 years and often occurs at the age of 15-25 years which then disappears in the late 20s or early 30s. The incidence of primary dysmenorrhea is strongly influenced by the age of the woman. The pain that is felt a few days before menstruation and during menstruation is usually due to an increase in prostaglandin hormone. The older a person is, the more frequent menstruation and the wider the cervix, the secretion of prostaglandin hormones will decrease. Primary dysmenorrhea will eventually disappear with the decrease in uterine nerve function due to aging.

Based on table 1 shows that the duration of menstruation is at least 5 days, a maximum of 8 days, with an average of 6.31 ± 1.014 . Menstruation is the release of blood and body cells from the vagina that come from the uterine wall of the woman periodically. Menstruation usually begins at the age of 9-12 years. The average period of menstruation is between 3-8 days with an average menstrual cycle of 28 days. Duration of menstruation can be influenced by psychological and physiological factors. Psychologically it is usually related to the emotional level of adolescents who are unstable when they experience menstruation. While physiologically more than the occurrence of excessive uterine muscle contractions due to the endometrium in the secretion phase produce the hormone prostaglandin (Wulandari, 2011).

Based on table 1 shows that the menstrual cycle is the shortest 25 days, the longest is 35 days with an average of 28.88 ± 2.473 . Factors that affect the menstrual cycle include weight, physical activity, environmental exposure and working conditions, hormones and psychology. Normal menstrual cycle 22-35 days, irregular menstrual cycles occur due to abnormalities. Irregular menstrual cycles can be caused by disturbances in the metabolic system and hormones or psychological factors, which can affect the workings of hormones. (Proverati, 2010). Women can have various problems with menstruation. The problem is in the form of hypermenorrhoea, hypomenorrhoea, polymenorrhagia, oligomenorrhoea and dysmenorrhea or menstruation (Mochamad Anwar, Ali Baziad, 2011).

Based on table 4.2 shows menstrual pain before being given lavender aromatherapy has an average value of 3.69 ± 1.195 . After being given lavender aromatherapy, the average value was 2.06 ± 1.237 . After being given lavender aromatherapy there was a decrease with an average of 1.63. Menstrual pain is pain during menstruation, usually with a feeling of cramps and is concentrated in the lower abdomen. Complaints of menstrual pain can vary from mild to severe (Mochamad Anwar, Ali Baziad, 2011). Until now menstrual pain has not known the cause, but in research shows that menstrual pain is influenced by prostaglandins. Prostaglandin stimulates the uterine muscles and affects blood vessels which causes a decrease in blood supply to the uterus through contraction of the myometrium and narrowing of the arteries in the endometrium. Increased levels of prostaglandin occur during the first two days and a decrease in progesterone at the end of the luteal phase results in an increase in myometrial tone and excessive uterine contractions, causing pain in uterine fibers (Wulandari, 2011).

Factors that affect menstrual pain include age, nutritional status, work / schoolwork, parity and constitutional. Menstrual pain can be overcome by pharmacological and non-pharmacological therapy. Pharmacological therapy, among others, administration of analgesic drugs, hormonal therapy, nonsteroidal prostaglandin drugs, and dilatation of the cervical canal (Pilliteri, 2015). Non-pharmacological therapies include warm compresses, exercise, aromatherapy, Mozart therapy, and relaxation. Aromatherapy can be used to relieve pain during menstruation, because aromatherapy is able to provide a sensation that soothes the self and the brain, and the stress that is felt. If the mind is calm and relaxed, it will create a comfortable atmosphere, and menstrual pain can be reduced (Laila, 2011).

Based on table 4.3 The results of the analysis of the influence of lavender aromatherapy on decreasing menstrual pain in adolescents using the Wilcoxon test obtained a value of $p = 0,000$ ($p < 0.05$), indicating that there was a decrease in menstrual pain in adolescents.

Menstruation is periodic and cyclic bleeding from the uterus, accompanied by desquamation of the endometrium. In adolescence it is not uncommon to experience menstrual disorders such as dysmenorrhea. Dysmenorrhea or menstrual pain is a symptom that most often causes young women to go to the doctor for consultation and treatment (Wiknjosastro., 2009).

Menstrual pain is abdominal pain that comes from uterine cramps that occur during menstruation. Pain

arises along with the onset of menstruation and lasts several hours to several days until it reaches peak pain. Primary dysmenorrhea usually occurs within 6 to 12 months after menarche with a duration of pain generally 8 to 72 hours. Primary dysmenorrhea is related to uterine muscle contraction (myometrium) and prostaglandin secretion. Primary dysmenorrhea occurs because of an increase in prostaglandin (PG) F₂-alpha which is a cyclooxygenase (COX-2) which results in hyper tonus and vasoconstriction in the myometrium resulting in ischemia and pain in the lower abdomen. The existence of strong and long contractions in the uterine wall, high prostaglandin hormone and widening of the uterine wall when menstruating blood so that pain occurs during menstruation (Larasati, 2016).

Nutritional problems in adolescent arise because the habit of eating fast food (junk food) has an unbalanced nutrient content that is high in calories, high fat, high sugar, and low in fiber. The fatty acid content contained in fast food can disrupt progesterone metabolism in the luteal phase of the menstrual cycle. As a result, there is an increase in levels of prostaglandin which will cause pain during menstruation. Prostaglandin is formed from fatty acids in the body. After ovulation there is a build-up of fatty acids in the phospholipid portion of the cell membrane. When progesterone levels decrease before menstruation, fatty acids, namely arachidonic acid are released and experience a chain reaction to prostaglandins which can cause pain during menstruation (Larasati, 2016).

Work / school assignments in this factor also affect the condition of dysmenorrhea, if the work / schoolwork is very stressful so that it adds to the pain during menstruation. With its relationship with parity, it turns out nulliparous women suffer from menstrual pain more often, then diminish as soon as giving birth, especially with vaginal delivery. Allegedly this is because the uterus is still small or the uterus is still tense and the uterine is still narrow.

Constitutional influences consist of hyperactivity or excessive responsiveness to pain stimuli and not a low pain threshold. This relates to a person's perception or sensitivity to pain itself (Setiabudi, 2012).

Menstrual pain or dysmenorrhea can be overcome by pharmacological and non-pharmacological therapy. Pharmacological therapies include analgesic drugs, hormonal therapy, nonsteroidal prostaglandin drugs, and dilatation of the cervical canal. Non-pharmacological therapies include warm compresses, exercise, aromatherapy, Mozart therapy, and relaxation (Wiknjosastro., 2009).

Aromatherapy is a therapy using essential oils from plants called essential oils to help improve health, arouse enthusiasm, arouse, refresh, soothe the soul, and stimulate the healing process. Lavender essential oil becomes an adrenocortical stimulant that stimulates menstrual circulation and has anticonvulsive properties. Lavender is also useful as a sedative, relieves pain and changes the perception of pain (Bangun & Nur'aeni, 2013).

Aromatherapy works by affecting the work of the brain, olfactory nerves that are directly related to the hypothalamus, the part of the brain that controls the gland system that regulates hormones that affect body activity, and affects the work of the limbic system associated with blood circulation (Bangun & Nur'aeni, 2013).

Research results of Dewi (Dewi & Prima, 2013) Lavender aromatherapy is a therapeutic action that is useful to improve physical and psychological conditions. Physically it is well used to reduce pain, while psychologically can relax the mind, reduce tension and anxiety and provide calm. A pleasant odour will stimulate the thalamus to expel enkephalin which functions as a natural pain reliever and produces a feeling of well-being. Enkephalin is similar to endorphin, an endogenous chemical (produced by the body) that has a structure similar to opioids. Enkephalin is thought to cause presynaptic barriers (neurons that secrete transmitter material) and post synaptic barriers (where the transmitter works) in dorsal horn. The process achieves inhibition by enkephalin, which is the inhibition of substance P so that reduced pain is transmitted to the brain.

The results of this study prove that the provision of lavender aromatherapy given for 5 minutes when menstrual pain on the second day has significant results to reduce menstrual pain in adolescents. Evident from the analysis using the Wilcoxon test obtained $p = 0,000$ ($\alpha < 0,05$). This study resulted in a scale of menstrual pain in adolescents before being given aromatherapy with an average of 3.69 and after being given aromatherapy with an average of 2.06. After being given lavender aromatherapy there was a decrease with an average of 1.63. The results of the analysis by Pustikawaty (Pustikawati, 2016) "The Effect of Lavender Aromatherapy on the Scale of Menstrual Pain Class X of Senior High School 1 of Ambawang River in Kubu Raya Regency" showed that lavender aromatherapy had an effect on decreasing menstrual pain with ($p < 0,05$).

4 CONCLUSIONS

The average age of the youngest respondents was 16 years, at most 17 years with an average of 16.69 ± 0.479 years. Based on the average age of the youngest respondents, they were 12 years old, at most 16 years with an average of 13.50 ± 0.966 years. The scale of pain before being given aromatherapy with an average of 3.69 and after being given aromatherapy with an average of 2.06. After being given lavender aromatherapy there was a decrease with an average of 1.63. The results showed that lavender aromatherapy had an effect on reducing menstrual pain with a significant value of $P = 0,000$; $\alpha = 0.05$

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