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Effleurage Massage: Alternative Non-Pharmacological Therapy in Decreasing Dysmenorrhea Pain

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ABSTRACT

Background: *Dysmenorrhea* is the most general gynecological problem experienced by women of various ages level. *Dysmenorrhea* is a pain in the lower abdomen, it felt centered in the suprapubic area and can spread to the lower back and the back of the legs. The actions that can be taken to manage menstrual pain include abdominal heat therapy, abdominal massage, exercise, rest and sleep, relaxation techniques and natural diuresis. *Effleurage massage* is a technique with calm rhythmic, gentle pressure distally or downwards. In this research, massage was carried out for 3 minutes. Dysmenorrhea prevalence in Indonesia is very high at 64.25%. Dysmenorrhea interferes with daily activities (14%), affecting the quality of life. Dysmenorrhea can be overcome by non-pharmacological therapy, one of which is Effleurage massage.

Purpose: The purpose of this research was to determine the effectiveness of *Effleurage massage* in decreasing dysmenorrhea in female students of Mojokerto district Junior High School, East Java.

Methods: This research used *quasi-experimental* design with *one group pretest-posttest* with total sample of 25 respondents. The sampling method used nonprobability sampling technique; *purposive sampling*. Data was collected using a demographic data questionnaire and numeric rating scale (NRS) pain scale sheet.

Results: Based on the statistical test, the Wilcoxon signed-rank test showed a value of $p = 0.000$, which means a difference in pain intensity before and after effleurage massage.

Conclusion: Effleurage massage is effective in reducing dysmenorrhea. The success of giving Effleurage massage in dysmenorrhea turned out to increased blood circulation and sensory nerves to prevent pain transmission. This massage also releases endorphins and enkephalins that can reduce pain, increase comfort, relaxation, relax muscles, and reduce anxiety in patients. Endorphin compounds will be released by the body as a natural pain reliever and create a feeling of comfort.

Keywords: *Effleurage massage, complementary therapy, dysmenorrhea*

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BACKGROUND

Menstruation usually begins between the ages of 10 and 16 years, depending on the woman's health, nutritional status and weight relative to height. Physical responses related to the occurrence of menstruation are different for each woman. According to (Akiyama, 1979), the most general female reproductive health problems that occur during menstruation are menstrual abnormalities, including disturbances in the length and amount of menstrual blood (hypermenorrhea, hypomenorrhea), menstrual cycle disorders (polymenorrhea, oligomenorrhea, amenorrhea), menstrual bleeding disorders outside the menstrual cycle (menometrorrhagia) and other disorders related to menstruation (dysmenorrhea, premenstrual syndrome).

Dysmenorrhea is abdominal pain that comes from uterine cramps and lasts for a long time, so it can cause problems for women. In the whole world, Dysmenorrhea prevalence has been reported at 25% to 97% (mean 50%), and in nearly 20% of cases, the pain is excruciatingly debilitating. The prevalence of dysmenorrhea in Indonesia is very high at 64.25%. Based on prevalence, the age of dysmenorrhea starts from 15 to 17 years and reaches its peak at 20 to 24 years. Generally, dysmenorrhea starts a few hours before bleeding until 24-48 hours later, and the pain is felt on the first day of menstruation (Hur et al., 2012).

According to data from the WHO, the incident is obtained by 1,769,425 people, (90%) women experienced dysmenorrhea with 10-15% experiencing severe dysmenorrhea. The prevalence of dysmenorrhea in Asia is approximately (84.2%), with a specific incidence in Northeast Asia (68.7%), in Middle East Asia (74.8%), and almost (50.0%) in Northwest Asia. Prevalence in Southeast Asia, Malaysia estimates that the number of women who experience primary dysmenorrhea is (69.4%), Thailand (84.2%), and Indonesia itself is estimated to be (65%) of reproductive age experiencing primary dysmenorrhea (Wong & Khoo, 2020).

The research results conducted by (Bernardi et al., 2017) showed the effect of warm compresses in decreasing dysmenorrhea were before the intervention, the average pain felt by respondents was 6.5, but after the intervention, it decreased to 4.22. Research conducted by (Raju, 2014) also showed an effect of back abdominal massage on decreasing dysmenorrhea, which indicated that before the intervention, the highest pain experienced by the respondent was severe pain. However, after the intervention, the respondent's pain was only moderate.

The causes of menstrual disorders can be due to the woman's biological abnormalities and psychological disorders. Other factors influencing menstrual disorders are stress, nutritional status, age, and physical activity. Imbalances in hormones, immature reproductive organs, and unstable psychological development are more prone to occur in adolescent girls, so menstrual disorders are more generally experienced (Li et al., 2017).

Dysmenorrhea is divided into primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea occurs in the absence of organic disease, usually from the sixth month to the second year after menarche. The increase in pain occurs at the age of 25 years and decreases after 30 to 35 years or after women become pregnant and give birth vaginally. Secondary dysmenorrhea is associated with organic pelvic diseases, such as endometriosis, pelvic inflammatory disease, cervical stenosis, ovarian or uterine neoplasms, and uterine polyps (Frawley, 2015).

According to (Elden et al., 2016) several self-care measures can be taken for the management of menstrual pain, namely abdominal heat therapy (heating pads, warm baths), massage, exercise, rest and sleep, relaxation techniques (biofeedback, autogenic training, yoga, meditation) and natural diuresis (decreasing salt, plant therapy, vitamins).

Effleurage massage is a non-pharmacological method that is considered effective in decreasing pain. *Effleurage* is a massage technique with calm rhythmic, gentle pressure distally or downwards. *Effleurage* aims to increase blood circulation, apply pressure, warm the abdominal muscles and promote physical and mental relaxation. *Effleurage* is a massage technique that is safe, easy, does not require many tools, does not cost money, has no side effects and can be done alone or with the help of others. *Effleurage massage* can also be done on the back. The main goal is relaxation (Ali & Rizvi, 2010).

Based on the description above, researchers are interested in researching the effectiveness of *Effleurage massage* in decreasing dysmenorrhea to female students of Mojokerto regency Junior High School, East Java.

OBJECTIVE

The purpose of this research was to determine the effectiveness of *Effleurage massage* in decreasing dysmenorrhea to female students of Mojokerto regency Junior High School, East Java.

METHODS

The type of this research was quasi-experimental research with *one group pretest-posttest design*. The population in this research was all female students of Mojokerto regency Junior High School, East Java with 122 respondents with total sample of 25 respondents. The sampling method used nonprobability sampling technique; *purposive sampling*. The inclusion criteria for respondents are as follows: 1) Willing to be respondents. 2) Experiencing primary dysmenorrhea during menstruation. 3) Are on the first or second day of menstruation. 4) Not taking menstrual pain relievers during the study. The data collection was carried out in October 2022. In this study, the data collection tool used was a questionnaire in the form of questions regarding demographic data, namely initials of a name, age and class. The time required to fill the instrument was approximately 1 minute. The researcher used an observation sheet as a measuring tool used to measure the pain scale before and after the intervention, namely the Numeric Rating Scale (NRS) pain scale. The process of collecting data in this study went through several stages. Data collection was carried out after the researcher received a research permit. Researchers first find and determine the respondents who became the research sample. Then at the first meeting, the researcher explained the process during the research and gave an informed consent form to the respondent as evidence that the respondent was willing to participate as a research sample. The researcher asked about the respondent's menstrual cycle and asked for a contact number that could be contacted so that the researcher could contact the respondent. The respondent could immediately notify the researcher when he started to feel dysmenorrhea. At the second meeting, the researcher explained the research procedure, explained how to fill in the NRS (Numeric Rating Scale) and explained the procedure for implementing abdominal effleurage massage to respondents through educational videos made by researchers. Then the researchers gave a demographic data questionnaire and NRS (Numeric Rating Scale) measurement sheet, an abdominal effleurage massage procedure sheet, and a video (via social media WhatsApp) so that respondents could do it independently when the respondent had dysmenorrhea. At the next meeting, the researcher asked for the NRS (Numeric Rating Scale) sheet filled in by the respondent, so that the researcher could find out whether there was an effect of abdominal massage effleurage on the decrease in dysmenorrhea experienced by the respondent. The purpose of this research was to determine the effectiveness of *Effleurage massage* in decreasing dysmenorrhea in female students of Mojokerto regency Junior High School, East Java.

RESULTS

1. Dysmenorrhea Pain Intensity Before Abdominal Effleurage Massage (Pretest)

Dysmenorrhea pain intensity before abdominal effleurage massage on respondents can be seen in table 1.

Table 1. Dysmenorrhea Pain Intensity before Abdominal Effleurage Massage (Pretest)

Variable	Mean	SD	Min-Max
Pain Intensity	4,62	1,572	2-10

Based on table 1, the average intensity of dysmenorrhea pain before abdominal effleurage massage is 4.62. The standard deviation is 1.572, with the lowest pain intensity at 2 and the highest pain at 10.

Table 2. Frequency distribution of Dysmenorrhea pain intensity before Abdominal Effleurage massage

Pain Intensity	Frequency	Percentage
(0) No pain	0	0
(1-3) Mild	5	20
(4-6) Moderate	10	40
(7-9) Severe	8	32
(10) Very Severe	2	8
Total	25	100

Source: Primary Data, 2021

Table 2 showed that most of the pain intensity before Abdominal Effleurage massage was 11 respondents (44%).

2. Dysmenorrhea pain intensity after Abdominal Effleurage massage (Posttest)

Dysmenorrhea pain intensity after abdominal effleurage massage on respondents can be seen in table 3.

Table 3. Dysmenorrhea Pain Intensity after Abdominal Effleurage Massage (Posttest)

Variable	Mean	SD	Min-Max
Pain Intensity	2,28	1,561	0-6

Based on the results, the average intensity of dysmenorrhea pain after abdominal effleurage massage is 2.28. The standard deviation is 1.561, with the lowest pain intensity at 0 and the highest pain at 6.

Tabel 4 Frequency distribution of Dysmenorrhea pain intensity after Abdominal *Effleurage massage*

Pain Intensity	Frequency	Percentage
(0) No pain	5	20
(1-3) Mild	11	44
(4-6) Moderate	9	36
(7-9) Severe	0	0
(10) Very Severe	0	0
Total	25	100

Source: Primary Data, 2021

Table 4 showed that most of the pain intensity after abdominal *Effleurage massage* is 11 respondents (44%).

3. The Differences in Dysmenorrhea Pain Intensity by Performing Effleurage Massage

The data collected were analyzed using the Wilcoxon Signed-Rank test analysis. This analysis is used to analyze the results of paired observations of two data and whether there is a difference. This analysis is used for interval or ratio data types where the data was not normally distributed. The results of the data analysis test in this study can be seen in table 5.

Table 5. The Results of Analysis of Differences in Pain Intensity of Dysmenorrhea Before and After Intervention

Pain Intensity	Pretest		Posttest		Skor Z	P value
	N	%	N	%		
(0) No pain	0	0	5	20	3,321	< 0.001
(1-3) Mild	5	20	11	44		
(4-6) Moderate	10	40	9	36		
(7-9) Severe	8	32	0	0		
(10) Very Severe	2	8	0	0		
Total	25	100	25	100		

Based on the results of data analysis using the Wilcoxon Signed-Rank analysis in table 5, the value is < 0.001. Decision-making is done by looking at the degree of significance ($\alpha = 0.05$) where the value of $\rho < \alpha$, meaning that there is a difference in the intensity of pain felt by respondents before and after doing effleurage massage on students in Mojokerto regency junior high schools, East Java.

DISCUSSION

1. Pain Intensity Before Abdominal *Effleurage massage*

Dysmenorrhea or painful menstruation is characterized as temporary pain before the onset or during menstruation which begins several hours before or simultaneously with

the onset of menstruation and lasts for 48 to 72 hours. Pain located in the suprapubic area, can be sharp, deep, cramping, dull or aching. Often there is a sensation of fullness in the pelvic area or a sensation of heartburn that radiates to the inner thighs and lumbosacral area (Bernardi et al., 2017).

The results showed that the age group of respondents who experienced dysmenorrhea was 12-15 years old, with an average of 19.71 years. Based on the age category according to the Depkes (2009), the age group of the respondents in this research was the Early Adolescent age category. Andrews (2009) said that 50% of women who experience pain during menstruation are women between 15-24 years.

The intensity of pain felt by respondents before doing *Effleurage massage* was different. The most dominant pain intensity is moderate pain, as much as 40%. Respondents reported that the characteristics of the pain they felt were cramps in the lower abdomen and back and interfered with daily activities. (Kulkarni & Deb, 2019), in her research, said that the feeling of pain during menstruation is very subjective to the physical sensations associated with uterine muscle contractions. The differences in the level of menstrual pain in each respondent can also be caused by differences in respondent responses and perceptions of the pain experienced. It follows the opinion of (Aktan et al., 2011) who states that a person's pain experience is influenced by several factors which can then increase or decrease the perception of pain, including tolerance or individual response to pain, namely previous pain experiences, culture, anxiety, gender, age and expectations of pain relief efforts.

Several respondents recounted their previous experience of pain where during dysmenorrhea, they made several efforts to decrease pain by resting, watching or playing games to divert the pain they felt. However, some respondents said they did not make any effort when experiencing dysmenorrhea and chose to lie down until the pain felt decreased. (Czech et al., 2018) statement in research (Dawood, 2006) states that it is easy for someone to Cope with pain depending on past experiences in dealing with pain. Past experiences are influenced by the information obtained.

An increase in prostaglandins causes pain during menstruation. The opinion (Dawood, 2016) states that large amounts of prostaglandins in the uterus during menstruation cause the pain. Excessive release of $PGF_2\alpha$ increases the amplitude and frequency of uterine contractions and causes uterine arteriolar vasospasm, resulting in cyclic lower abdominal ischemia and cramping. Systemic responses to $PGF_2\alpha$ (prostaglandin F_2 alfa) includes back pain, weakness, sweating, gastrointestinal symptoms (anorexia, nausea, vomiting, and diarrhea), and central nervous system symptoms (dizziness, syncope, headache, and poor concentration). The cause of the increased production and release of prostaglandins is unknown (Appiah et al., 2020). However, several stimulating factors include the availability of fatty acid and arachidonic acid precursors, trauma, estrogen, progesterone, cyclic adenosine monophosphate, and luteinizing hormone epinephrine (adrenaline). The research results found that the levels of $PGF_2\alpha$ (prostaglandin F_2 alfa) in menstruating women who experienced dysmenorrhea were twice higher than women who did not experience dysmenorrhea. (Prameswari et al., 2018) also argued that obesity and stress also affect the increase in prostaglandin production. It can increase pain during menstruation.

2. Pain Intensity After Abdominal *Effleurage massage*

One of the actions that can be taken to decrease pain during menstruation is *Effleurage massage*. *Effleurage massage* is a non-pharmacological method in gentle, rhythmic massage technique in distal or downward direction. *Effleurage massage* aims to increase blood circulation, apply pressure, warm the abdominal muscles, and increase physical and mental relaxation (Racz & Noe, 2012a).

Respondents who experienced pain in the mild category reported there was decreased pain after doing *Effleurage massage*. Respondents said they felt more relaxed and comfortable so that the pain they felt was not too disturbing. The results showed that 5 respondents with mild pain did not feel pain anymore after doing *Effleurage massage*. Respondents who experienced moderate and controlled intensity pain also said the same thing. Respondents reported that when doing *Effleurage massage*, respondents felt anxious, and other respondents said they were stressed because of many tasks and were less relaxed when taking action. It is by the statement of (Hur et al., 2012) which states if a person's pain experience is influenced by several factors that can increase or decrease individual perceptions, tolerances, and responses to pain, namely previous pain experiences, anxiety, culture, age, gender, and expectations of pain relief efforts. (Shirvani et al., 2017) also found that stress affects menstrual disorders, especially dysmenorrhea. Where most respondents experience mild stress or severe stress experience dysmenorrhea during menstruation.

3. The Effectiveness of *Effleurage Massage* in Decreasing Dysmenorrhea to Female Students of Mojokerto Regency Junior High School, East Java

Based on the research results, all respondents (100%) reported that after doing *Effleurage massage* during dysmenorrhea, the respondents experienced a decrease in pain intensity. The results of the data analysis test in table 5.6 using *Wilcoxon Signed Ranks Test* analysis test showed the p-value < 0.001 where the decision is made by looking at the degree of significance ($\alpha = 0.05$) where the p-value $< \alpha$, then the hypothesis (H_a) is accepted meaning *Effleurage massage* is effective in decreasing dysmenorrhea to female students of Mojokerto Regency Junior High School, East Java

Massage can decrease pain because the touch stimulus reaches the brain before the painful stimulus; to decrease stress, anxiety, and depression and stimulate immune function (Sakurai et al., 2006). The mechanism of *Effleurage massage* in decreasing pain by closing the door to painful stimuli is known as *the Gate Control Theory*. The pain fibers that carry the pain stimulus to the brain are smaller and the sensation moves more slowly than the large touch fibers. When touch and pain are stimulated simultaneously, the sensation of touch travels to the brain and "closes the gate" in the brain, limiting the amount of pain in the brain feels (Geethanjali et al., 2020). The results of this research are in line with research conducted by (Gebeyehu et al., 2017) by performing the *Effleurage massage* technique on postpartum mothers who have the same characteristics as dysmenorrhea, namely pain. The results showed that *Effleurage massage* can decrease pain due to uterine contractions experienced by respondents, so that provides a sense of comfort, induces relaxation, and stimulates the production of endorphins which relieve pain naturally. The results of this research proved the opinion of, which says that to decrease the intensity of dysmenorrhea pain, it can use non-pharmacological efforts in the form of heat (hot compresses and hot showers), massage, distraction, physical exercise, and adequate sleep to relieve primary dysmenorrhea for some women.

The usual action to decrease pain during menstruation is by taking medication. Most respondents said they did not take any action to deal with menstrual pain and chose to lie down until the pain was decreased. Research conducted by (Mahmudah et al., 2016) found that although complaints of menstrual pain often occur in women, most women rarely go to the doctor and choose to take drugs purchased at pharmacies without a doctor's prescription. It has been researched that 30-70% of adolescent girls treat their menstrual pain by taking over-the-counter pain relievers. We need other easier and safer alternatives to decrease dysmenorrhea pain, such as non-pharmacological methods with abdominal *Effleurage massage* techniques. The results showed that the average pain intensity felt by the respondents before the action was 4.62, with the highest pain intensity

being 7 and the lowest being 2. However, after the action, the average pain intensity felt by the respondents became 2.28, which means there was an average decrease of 2.34 with the highest intensity being 6 and the lowest being 0. This technique can decrease mild pain, moderate pain to severe pain on scale of 7 experienced by respondents during dysmenorrhea.

The *effleurage* technique is done by giving gentle strokes and light pressure on the skin's surface. The use of *Effleurage massage* techniques to decrease menstrual pain has several advantages compared to other non-pharmacological therapy techniques. Massage techniques are suitable for mild, moderate, and severe menstrual pain, do not require much money and do not pose a risk to the client, while other techniques such as warm-cold compresses and acupuncture have some disadvantages. Hot compresses can increase bleeding or edema after an acute injury. Cold compresses are contraindicated in situations related to cold conditions such as urticaria/hypersensitivity, hypertension, Reynaud's phenomenon, and sickle cell anemia, while acupuncture requires experienced therapists, so it cannot be done independently, quoted from (Racz & Noe, 2012b). The decrease in pain that occurs after giving *Effleurage massage* therapy can cause an increase in endorphins. Endorphins act as neurotransmitters and neuromodulators that inhibit the transmission of pain messages to decrease the pain felt. Apart from having no side effects, the non-pharmacological treatment also does not cause systemic allergic reactions.

The research conducted by researchers still has some limitations. The limitations in this study are 1) The number of samples in this study is the minimum number of samples where the sampling in this study is only 20% of the population. 2) The independent action taken by the respondent cannot be observed directly by the researcher because there is still a COVID-19 pandemic in the Mojokerto Regency - East Java.

CONCLUSION

Based on the study results, it can be concluded that the intensity of dysmenorrhea pain in respondents before abdominal effleurage massage was the most in the moderate pain category (44%). Meanwhile, the intensity of dysmenorrhea pain in respondents after abdominal effleurage massage was the most in the mild pain category (44%). Effleurage massage appears to decrease the intensity of dysmenorrhea pain. With gentle rubbing and light pressure on the surface of the skin (*Effleurage massage*), the pain fibers that carry pain stimuli to the brain are smaller and the sensation moves slower than the touch fibers, which are large. When touch and pain are stimulated simultaneously, the sensation of touch travels to the brain and "closes the gate" in the brain, limiting the amount of pain in the brain feels. Therefore, *Effleurage massage* can be used as an alternative to complementary therapy in decreasing dysmenorrhea pain.

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