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Effectiveness of Abdominal Stretching and Effleurage Massage in Reducing Dysmenorrhea in Adolescent Girls at Muhammadiyah 10 Senior High School Surabaya.

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ABSTRACT Dysmenorrhea is a common menstrual pain complaint experienced by adolescent girls and can interfere with learning activities and overall quality of life. The management of dysmenorrhea encompasses not only pharmacological interventions but also non-pharmacological strategies, which are regarded as safer alternatives with minimal adverse effects. Among such approaches, physical therapy—including abdominal stretching and effleurage massage—has garnered attention. This study aims to evaluate the efficacy of abdominal stretching and effleurage massage in alleviating dysmenorrhea among adolescent girls. The research design employed was a pre-experimental method utilizing a two-group pretest-posttest framework, consisting of two intervention groups without a control group. A total of 32 female students from Muhammadiyah 10 Senior High School Surabaya who experienced dysmenorrhea were selected using purposive sampling. The results showed a significant decrease in pain scale before and after the intervention in both groups. The group receiving effleurage massage showed a faster reduction in pain intensity compared to the abdominal stretching group. The average pain scale after treatment decreased significantly in both groups. Respondents reported feelings of relaxation and comfort after the intervention. No side effects were found during or after the therapy. Effleurage massage yielded more effective results in a shorter time. In conclusion, abdominal stretching and effleurage massage are effective in reducing dysmenorrhea in adolescent girls. These therapies can serve as safe and practical non-pharmacological treatment alternatives. This study is expected to be a reference for healthcare professionals and educators in providing education and holistic management of menstrual pain in adolescents.

INDEX TERMS Dysmenorrhea, Menstrual Pain, Abdominal Stretching, Effleurage Massage, Adolescent Girls.

I. INTRODUCTION

Menstruation is a woman's puberty process that is a sign of changes in the body's function to be able to reproduce which begins with menarche or the first menstruation when they are 10-17 years old. Menstruation is a periodic uterine bleeding. The length of menstruation is about 14 days after ovulation which lasts on average every 28 days but can also last more according to the cycle.[1] The health of young women is still a problem that needs attention. Adolescent health is not only about sexual issues but also concerns issues of all aspects of female reproduction, especially for adolescent girls. Among them are secondary sex development which includes voice changes, enlarged breasts, enlarged hip area, so that it doesn't look like a child anymore, and also menarche. Besides that, fine hairs will begin to appear on the armpits and genitals. [2]

Dysmenorrhea refers to the pelvic pain experienced during menstruation, typically encompassing discomfort from the lower abdomen to the lower back. This condition is primarily attributed to the elevated synthesis of prostaglandins, which can lead to abdominal cramps, as well as an imbalance in the hormone progesterone [3] Dysmenorrhea, commonly referred to as menstrual pain, is characterized by a complex of

symptoms, including abdominal pain, cramps, and back pain. This condition manifests as a physical disorder marked by heightened intensity, frequency, and duration of pain, cramps, and uterine contractions, which may occur independently of underlying reproductive abnormalities [4]

Dysmenorrhea is recognized as one of the most common menstrual disorders affecting women. In Indonesia, data indicates that the prevalence of primary dysmenorrhea stands at 54.89%, while the incidence rate of secondary dysmenorrhea is documented at 9.36%. These statistics underscore the substantial impact that dysmenorrhea has on women's health in this region [5] Meanwhile, in East Java, the incidence rate of primary dysmenorrhea in fertile women aged 15-35 years is 71.30%. In addition, it is also proven in research conducted in the Surabaya area, East Java, that the incidence rate of dysmenorrhea reaches 1.07-1.31% of the number of visits for dysmenorrhea sufferers.[6]

Dysmenorrhea is divided into two main types: primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea involves menstrual pain caused by increased production of prostaglandins in the endometrium during the ovulatory phase of the menstrual cycle. This overproduction

leads to myometrial hypertonicity and vasoconstriction of the blood vessels, which results in abdominal pain. In contrast, secondary dysmenorrhea is attributed to various diseases and conditions, including infections and ovarian disorders [7]

Some women feel menstrual pain which can be in the form of a faint pain, but for some other women it can feel very painful and can even make activities interrupted. Women experiencing severe pain during menstruation can see a significant impact on their daily activities, with studies indicating that up to 50% of women of reproductive age and 85% of adolescent girls are affected [8]. A reported study indicates that dysmenorrhea exerts negative effects on individuals in both the short and long term. The short-term implications include an elevated risk of decreased physical activity, as well as increased susceptibility to conditions such as hip strain, back pain, and headaches. Dysmenorrhea has a negative impact on adolescents, as many as 88.3% of adolescents with primary dysmenorrhea experience a decrease in academic ability, namely 80% do not go to school, 66.8% lose concentration in studying, 21% cannot do homework and 31.7% limit themselves from daily activities.[7] In the long term, dysmenorrhea has the potential to contribute to infertility. Moreover, dysmenorrhea stemming from various pathological causes may also lead to similar detrimental effects on fertility.[9]

Dysmenorrhea can be affected by many aspects such as lifestyle. Sleep patterns are closely related to life. Everyone has their own sleep patterns and schedules according to their habits and routines. Differences in everyone's sleep schedule are called chronotypes. Chronotype is the waking and sleeping phases. Chronotypes can reflect changes in a person's circadian rhythm. [10] Contypes are divided into three types: morning, afternoon, and intermediate. Disruption of circadian rhythms increases the risk of health problems because the human body's internal clocks are designed to be active during the day and sleepy at night. The circadian system plays a role in regulating tissue metabolism and hormone secretion. Therefore, if the circadian rhythm is disrupted, hormone secretion and function of the reproductive system can be disrupted.[7]

There are several alternative modalities available for the alleviation of dysmenorrhea, specifically pharmacological and non-pharmacological approaches. Pharmacological approaches, such as analgesics, can be employed in the management of pain, whereas non-pharmacological methods. [9] One of them is with physical exercise, namely *abdominal stretching*. *Abdominal stretching* is a combination of six exercises: *cat stretch*, *lower trunk rotation*, *hip stretch*, *abdominal strengthening (curl up)*, *lower abdominal strengthening and the bridge position*. [10] This exercise improves muscle strength, endurance, and flexibility in the abdominal area. The muscles become relaxed, stretched, and dilated, helping to facilitate blood and oxygen circulation in the abdominal muscles, which causes less pain.[11]

In experimental studies that have been carried out, it has been proven that *abdominal stretching* can reduce dysmenorrhea. The results of the study stated that physical exercise such as *abdominal stretching* can reduce abdominal cramps, and improve blood circulation so that in the end reduce the intensity of pain in adolescents with dysmenorrhea. *Abdominal stretching* is a non-pharmacological therapy that is suitable for adolescents because it is proven to reduce the level of menstrual pain.[11]

One of the advantages of physical exercise is its capacity to stimulate the synthesis of endorphins within the central nervous system. Endorphins, which are neuropeptides produced by the pituitary gland, are associated with the modulation of mood and can elicit sensations of tranquility while also enhancing resilience against negative emotional states. (Intiyaswati & Primiastuti, 2024). To help lower the level of menstrual pain, exercise *Stretching* pelvis with pelvic movements, knee-to-chest position, and chest breathing techniques.[12]

Other techniques that are easy and safe to use to reduce dysmenorrhea are *Massage Effleurage* (massage massage). *Massage* (massage) or massage includes cutaneous stimulation, which is stimulation of the skin that is done to relieve pain. [13] This approach can enhance endorphin release, which helps block pain signals. Effleurage, a commonly used massage technique, consists of slow, rhythmic movements performed carefully. This method uses both hands to gently press on the abdomen's surface, usually in a circular motion.[13] *Effleurage* aims to improve blood circulation, provide pressure, warm the abdominal muscles, and promote physical and mental relaxation. It is a safe, easy technique of back massage that does not require a lot of tools, money, side effects, or assistance. It can be done alone or with the help of others.[14]

The study results indicate that therapy *Touch Massage* effectively reduces dysmenorrhea pain by relaxing the abdominal muscles. Specifically, the *Massage Effleurage* technique alleviates stress, aches, and tension minimizing.[15] Quoted from [16] Said that this study's results align with other theories and research. There is a decrease in the intensity of menstrual pain (dysmenorrhea) due to *abdominal stretching*. *Respondents can follow well and relax*, so that it stimulates the production of endorphin hormones and can reduce pain. However, there are still individuals who maintain the same intensity during abdominal stretching. This persistence can be attributed to suboptimal conditions in the execution of the stretching exercises, in conjunction with various contributing factors.[17]

Quoted from [18] Research indicates a notable impact of effleurage massage treatment on dysmenorrhea pain in adolescents, both before and after the procedure girls. And quoted from [14], *Massage Effleurage* may help alleviate dysmenorrhea by stimulating the parasympathetic nervous system, resulting in the dilation of previously constricted blood vessels vasodilate. The perception of pain will be

modified and endorphin release occurs so that the pain felt turns into a feeling of relaxation and calm when the body is stimulated. *Massage Effleurage* can be utilized because this therapy is easy, effective, without cost and side effects.[19]

The findings from an initial study carried out by the researcher at SMA Muhammadiyah 10 Surabaya indicate that counseling on treatment has never been provided dysmenorrhea. As health workers, nurses have a role as educators. So it can be concluded that SMA Muhammadiyah 10 Surabaya still needs management such as providing education on the treatment of dysmenorrhea using *Abdominal Stretching* and *Effleurage Massage* for reproductive health in adolescence, using lecture and leaflet methods. It is hoped that education can increase the knowledge of adolescent girls about the treatment of dysmenorrhea, especially reproductive health in adolescence.

This background supports the need to conduct a study on the *Effectiveness of Abdominal Stretching and Effleurage Massage* in reducing Dysmenorrhea Pain in Adolescents at SMA Muhammadiyah 10 Surabaya.

Research comparing the effectiveness of abdominal stretching and effleurage massage for alleviating dysmenorrhea is currently limited. Although both methods have individually been shown to help relieve menstrual pain through muscle relaxation and improved blood circulation, few studies have evaluated which is more effective or whether a combination of both yields better outcomes. This lack of comparative research presents an opportunity for further studies to establish a stronger scientific basis for determining the most effective non-pharmacological approach to managing menstrual pain.

II. METHODS

This research was carried out systematically through three main stages: the preparation stage, the implementation stage, and the completion stage.

1. Preparation Stage

At the initial stage, the researcher prepared a research proposal as the foundation for conducting the study. Subsequently, the researcher drafted a letter requesting permission to collect preliminary data as well as a research permit addressed to SMA Muhammadiyah 10 Surabaya. These letters were formally submitted to the school as an official request to conduct the study. The researcher then coordinated with the student affairs department to obtain data on female students who would serve as respondents. Preparations for tools and materials were also made, including the provision of stationery, questionnaires, leaflets, and educational videos to be used during the intervention process.

2. Implementation Stage

The implementation stage was divided into two sections according to the two intervention methods applied, namely *Abdominal Stretching* and *Effleurage Massage*.

a. Data Collection Procedure for Abdominal Stretching

The researcher identified potential respondents who met the inclusion criteria. The researcher then visited the designated classrooms, as determined by the school, to explain the purpose and objectives of the research and distribute the consent forms for participation. Respondents completed an initial questionnaire via Google Form to serve as baseline data. Informed consent was also obtained from all participating students.

Before the intervention, the respondents filled out the pretest questionnaire together in class. Educational materials on *Abdominal Stretching* were delivered using leaflets and video media. Afterwards, observation sheets using the Visual Analogue Scale (VAS) were distributed to assess pain after the educational session. The intervention was then administered to students experiencing menstrual pain, either at school or at home, with documentation including photos and the completion of both the questionnaire and observation sheets. The *Abdominal Stretching* was performed for three consecutive days, starting from the first day of menstruation, for 20 minutes during pain episodes or once every 24 hours. After the intervention, the respondents completed the post-intervention observation sheets.[20]

b. Data Collection Procedure for Effleurage Massage

The steps for this intervention were similar to those of the previous method. It began with identifying eligible respondents, providing a research explanation, distributing consent forms, completing an initial questionnaire via Google Form, and obtaining informed consent. The pretest was conducted in the classroom before the intervention began. Educational materials on *Effleurage Massage* were presented using leaflets, followed by the distribution of observation sheets employing the VAS to measure pain levels.

Students experiencing dysmenorrhea then performed *Effleurage Massage*, either at school or at home, with documentation in the form of photos and the completion of questionnaires and observation sheets. The intervention was conducted for three consecutive days, starting from the first day of menstruation, for 15 minutes during pain episodes or once every 24 hours. Following the intervention, the respondents completed the posttest observation sheets.

Include a clearer breakdown of the intervention duration and frequency, such as "Each intervention was administered over three consecutive days, starting from the first day of menstruation.

3. Completion Stage

After the intervention stage was completed, the researcher reviewed the completeness of the data collected from both the educational sessions and the posttests. All gathered data were then tabulated and analyzed to obtain the final results of the study. The data were systematically processed to describe the effectiveness of the *Abdominal Stretching* and *Effleurage Massage* interventions in reducing menstrual pain among the female students of SMA Muhammadiyah 10 Surabaya.

III. RESULTS

The result of this study, the general data included adolescent age, age at menarche, family history, and menstrual cycle.

A. General Data

1. Characteristics of Adolescents

Table 1. Characteristics of Female Adolescent Respondents at SMA Muhammadiyah 10 Surabaya

Characteristics		Abdominal Stretching Group		Effleurage Massage Group	
		F	%	F	%
Teenage Age	16 years	4	25	10	62,5
	17 years	12	75	6	37,5
	Total	16	100	16	100
Age and menarche	<12 years	3	18,75	5	31,25
	>12 years	13	81,25	11	68,75
	Total	16	100	16	100
Family History	Yes	5	31,25	6	37,50
	No	11	68,75	10	62,50
	Total	16	100	16	100
menstrual cycle	Regular	7	43,75	13	81,25
	Irregular	9	56,25	3	18,75
	Total	16	100	16	100
Exercise	Regular	4	25,00	2	12,50
	Irregular	12	75,00	14	87,50
	Total	16	100	16	100

According to Table 1, it is described that the majority of female adolescents who received the Abdominal Stretching intervention were 17 years old, while the majority of those in the Effleurage Massage intervention group were 16 years old. Almost all of the female adolescents who received the Abdominal Stretching intervention experienced menarche or

Pain Scale	Level of Dysmenorrhea Before Effleurage Massage Intervention		Level of Dysmenorrhea After Effleurage Massage Intervention	
	F	%	F	%
No Pain	0	0,00	0	0,00
Mild Pain	10	66,67	15	93,75
Moderate Pain	5	33,33	1	6,25
Severe Pain	0	0,00	0	0,00
Very Severe Pain	1	6,67	0	0,00
Total	16	100	16	100

the onset of menstruation at an age older than 12, while most

of those in the Effleurage Massage intervention group also experienced menarche at an age older than 12. The majority of female adolescents in the Abdominal Stretching intervention group had no family history of pain, and similarly, the majority in the Effleurage Massage group also had no family history of pain. Most of the female adolescents who received the Abdominal Stretching intervention experienced irregular menstrual cycles, while nearly all of those in the Effleurage Massage group had regular menstrual cycles. The majority of female adolescents in the Abdominal Stretching group did not regularly exercise, and similarly, almost all of the female adolescents in the Effleurage Massage group did not exercise regularly.

B. Specific Data

1. Identification of Dysmenorrhea Pain Scale Before and After Abdominal Stretching Intervention Among Female Adolescents at SMA Muhammadiyah 10 Surabaya

Table 2 Average Level of Dysmenorrhea Before and After Abdominal Stretching Among Female Adolescents at SMA Muhammadiyah 10 Surabaya

Pain Scale	Level of Dysmenorrhea Before Abdominal Stretching Intervention		Level of Dysmenorrhea After Abdominal Stretching Intervention	
	F	%	F	%
No Pain	0	0,00	0	0,00
Mild Pain	6	40,00	12	75,00
Moderate Pain	6	40,00	2	12,50
Severe Pain	3	20,00	2	12,50
Very Severe Pain	1	6,67	0	0,00
Total	16	100	16	100

According to Table 2, the level of dysmenorrhea before and after the intervention showed a difference. Before undergoing Abdominal Stretching, nearly half of the participants experienced mild pain, and nearly half experienced moderate pain. A small number reported severe pain, and one respondent experienced very severe pain. After the Abdominal Stretching intervention, there was a decrease in dysmenorrhea levels, with the majority experiencing mild pain, and a small number reporting moderate and severe pain. None of the participants reported very severe pain or no pain at all.

2. Identification of Dysmenorrhea Pain Scale Before and After Effleurage Massage Intervention Among Female Adolescents at SMA Muhammadiyah 10 Surabaya

Table 3 Average Level of Dysmenorrhea Before and After Effleurage Massage Among Female Adolescents at SMA Muhammadiyah 10 Surabaya

According to Table 3, the level of dysmenorrhea before and after the intervention showed a difference. Before undergoing Effleurage Massage, the majority of participants experienced mild pain, nearly half experienced moderate pain, and a small number experienced severe pain. After the Effleurage Massage intervention, there was a decrease in dysmenorrhea levels, with almost all participants experiencing mild pain and a small number reporting moderate pain. None of the participants reported severe pain, very severe pain, or no pain at all.

3. Difference in Dysmenorrhea Pain Scale Before and After Abdominal Stretching Among Female Adolescents at SMA Muhammadiyah 10 Surabaya.

Table 4: The Difference in Dysmenorrhea Pain Scale Before and After Abdominal Stretching Among Female Adolescents at SMA Muhammadiyah 10 Surabaya.

Variable	n	Mean rank	Z-score	P value
Pain Scale Before and After Abdominal Stretching Intervention				
Negative ranks	16	8.50		
Positive ranks	0	.00	-3.666	0.000
Ties	0			
Total	16			

According to Table 4, the data reveal a statistically significant difference in the dysmenorrhea pain scale pre- and post-Abdominal Stretching, with a p-value of 0.000, which is less than the significance level of $\alpha = 0.05$, as determined by the Wilcoxon Signed-Rank Test. This finding indicates a notable reduction in pain levels following the intervention of Abdominal Stretching.

4. The Difference in Dysmenorrhea Pain Scale Before and After Effleurage Massage Among Female Adolescents at SMA Muhammadiyah 10 Surabaya.

Table 5: The difference in dysmenorrhea pain scale before and after Effleurage Massage among female adolescents at SMA Muhammadiyah 10 Surabaya.

According to Table 5, the Wilcoxon Signed-Rank Test reveals a statistically significant difference in the dysmenorrhea pain scale pre- and post-intervention of Effleurage Massage, evidenced by a p-value of 0.001, which is less than the alpha level of 0.05. This indicates that the intensity of pain experienced prior to and following the Effleurage Massage intervention markedly differed.

5. The Effectiveness of Abdominal Stretching and Effleurage Massage Among Female Adolescents at SMA Muhammadiyah 10 Surabaya

Table 6 The Effectiveness of Abdominal Stretching and Effleurage Massage in Female Adolescents at SMA Muhammadiyah 10 Surabaya

Group	Mann Whitney		Sig.
	N	Mean Rank	
Abdominal Stretching	16	14.66	0.250
Effleurage Massage	16	18.34	

According to Table 5.6, the results of the Mann-Whitney test show that there is a difference in the level of dysmenorrhea reduction between the group that received Abdominal Stretching and the group that received Effleurage Massage, with a p-value or Asymp. Sig. (2-tailed) of 0.250 (>0.05). The Effleurage Massage group had a higher mean rank (18.34) compared to the Abdominal Stretching group (14.66). Therefore, it can be concluded that Effleurage Massage is more effective in reducing dysmenorrhea.

IV. DISCUSSION

According to the research results, the mean rank of the Effleurage Massage group was higher (18.34) compared to the Abdominal Stretching group (14.66). Among the female adolescents who received the Abdominal Stretching and Effleurage Massage interventions, there was no significant difference in the level of dysmenorrhea reduction, as demonstrated by the Mann-Whitney test with a p-value of 0.250 (>0.05).

Abdominal stretching exercises constitute a significant relaxation technique that may alleviate menstrual pain, also known as dysmenorrhea. Engaging in abdominal stretching during episodes of menstrual discomfort can facilitate improvements in muscle strength, endurance, and flexibility. These enhancements, in turn, are likely to optimize physical fitness, augment cognitive function, elevate mental well-being, and promote overall physical health. [21] It also increases body awareness, reduces muscle tension (cramps), alleviates muscle pain, and reduces discomfort during menstruation. Engaging in exercise or training stimulates the production of endorphin hormones, which can provide a sense of calm and increase tolerance to pain, especially menstrual pain.[22]

Effleurage massage therapy is beneficial for improving

Variable	n	Mean rank	Z-score	P value
Pain Scale Before and After Effleurage Massage Intervention				
Negative ranks	12	6.50		
Positive ranks	0	.00	-3.357	0.001
Ties	4			
Total	16			

blood circulation throughout the body, maintaining overall health, helping to reduce pain and fatigue, stimulating the production of endorphin hormones that promote body relaxation, reducing the burden caused by stress, eliminating toxins, and promoting the health and balance of the body's organs.[22]

According to a study conducted by Nandini [22] Title "*The Effectiveness of Abdominal Stretching Exercise and Effleurage Massage on Reducing Dysmenorrhea Pain in Adolescents at Pondok Putri Hafshawaty, Zainul Hasan Islamic Boarding School*," the research involved two groups: Group 1 received Abdominal Stretching and Group 2 received Effleurage Massage. This study utilized the Numeric Rating Scale (NRS) to measure pain levels.[23]

The observations conducted by the researcher on respondents experiencing dysmenorrhea revealed that the respondents consistently reported feeling pain during menstruation. The pain was described as intermittent and severe enough to disrupt daily activities at the boarding school. This condition is caused by continuous uterine muscle contractions as the uterine lining sheds and blood is expelled. In such situations, therapeutic interventions are necessary to address the respondents' complaints. One such intervention is Abdominal Stretching Exercise, which can help alleviate dysmenorrhea pain while also serving as an alternative form of physical activity during breaks in the students' daily routines at the boarding school.[21]

Another recommended intervention in these circumstances is Effleurage Massage, which can assist in reducing dysmenorrhea pain among adolescent girls in the boarding school environment. The results of this study show a significant difference in pain reduction between adolescents who received Abdominal Stretching Exercise and those who received Effleurage Massage. The data indicated that the mean rank of the Effleurage Massage group was higher (24.33) compared to the Abdominal Stretching Exercise group (12.67).[24]

Dysmenorrhea pain in each individual woman cannot be completely avoided, but it can be prevented and reduced. In this study, both therapies—Abdominal Stretching and Effleurage Massage—were found to be effective in reducing dysmenorrhea pain. However, the mean rank value was higher for Effleurage Massage than for Abdominal Stretching, [25]indicating that Effleurage Massage is more effective in alleviating menstrual pain. Effleurage Massage can be performed on the first day of menstruation when pain is felt. Therefore, it is important to further develop the implementation of both Effleurage Massage and Abdominal Stretching in the hope of reducing dysmenorrhea more optimally.[26]

Effleurage Massage is more effective than Abdominal Stretching in reducing dysmenorrhea pain due to several physiological factors and its working mechanism. Effleurage Massage is a massage technique involving gentle, slow, and repetitive strokes that calm the nervous system more quickly than Abdominal Stretching, resulting in a faster relaxation effect.[27]

Effleurage Massage triggers endorphin secretion more quickly because it provides direct stimulation to the skin and abdominal muscle tissues. This technique enhances vasodilation (the widening of blood vessels), which helps

reduce uterine ischemia and improves blood flow to the pelvic area. While Abdominal Stretching also improves blood circulation, its effects are not as immediate as Effleurage Massage, as it focuses more on muscle flexibility rather than direct stimulation of blood vessels.[28]

Effleurage Massage helps relieve tension in the abdominal and pelvic muscles directly through light, rhythmic pressure, which allows the muscles to relax more quickly. In contrast, Abdominal Stretching takes longer to produce effects, as it relies on muscle activation and stretching, which may initially cause slight tension before achieving relaxation. The gentle touch of Effleurage Massage provides a soothing and calming sensation that helps reduce anxiety and stress—factors that often worsen dysmenorrhea pain. While Abdominal Stretching can reduce pain, it often lacks the immediate psychological relief that Effleurage Massage can offer.[22]

V. CONCLUSION

Before the Abdominal Stretching intervention, nearly half of the female adolescents experienced mild to moderate menstrual pain. However, after the intervention, almost all participants reported only mild pain, indicating a reduction in the intensity of dysmenorrhea. Similarly, prior to the Effleurage Massage intervention, most of the participants reported mild pain. Following the intervention, nearly all respondents continued to experience only mild pain, showing a consistent improvement.

According to the comparative results, Effleurage Massage proved to be more effective than Abdominal Stretching in reducing dysmenorrhea among female students at SMA Muhammadiyah 10 Surabaya. This suggests that Effleurage Massage may serve as a more impactful alternative for managing menstrual pain in adolescents.

Given the effectiveness of abdominal stretching and effleurage massage, healthcare professionals and schools should consider incorporating these non-pharmacological treatments into adolescent health education programs.

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