Original Research

Effectiveness of Back Massage Acupressure for Treating Dysmenorrhea

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ABSTRACT

Background: Back massage acupressure is a natural complementary technique that minimizes side effects and can be administered to teenage girls experiencing dysmenorrhea. This technique was performed during the menstrual cycle, specifically from the 1st to the 3rd day, administered once a day for approximately 30 minutes. The novelty of the study lies in the complementary combination of a back massage and acupressure to reduce menstrual pain. This study aimed to analyze the effectiveness of back massage acupressure in reducing the intensity of pain and the duration of dysmenorrhea. **Methods:** A quasi-experimental study with a pretest-posttest control group design was conducted on 60 teenage girls in the Magetan district. Systematic random sampling was used to select 30 respondents for both the intervention and control groups. Data were obtained from observations and interviews with respondents regarding the intensity of pain and duration of dysmenorrhea. **Results:** Back mass acupressure effectively reduces the intensity of dysmenorrhea pain from the 1st to 3rd day (p-value= 0.000) and shortens the duration of dysmenorrhea (p-value <0.05), thereby improving adolescent reproductive health. **Conclusions:** Back massage acupressure is a simple, cost-effective, and minimally invasive solution for managing dysmenorrhea. This innovative technique has been proven highly effective in reducing both the intensity of pain and the duration of dysmenorrhea. It is recommended for use among teenage girls to promote better reproductive health.

Keywords: Back massage; acupressure; dysmenorrhea; teenage girl

1. INTRODUCTION

Adolescence is a transition between childhood and adulthood. For a few years, teenagers experience many physical and psychological changes. Puberty events occur in teenage girls between the ages of 10 and 14. This physical change continued until the end of adolescence, between the ages of 19 and 21. The change was intended to prepare young people physically and psychologically for adulthood. One sign of puberty in a teenage girl is menstruation. Menarche lasted from the age of 8 to 11, until he reached the age of 16.[1] Puberty is the starting point of reproductive processes which indicates the importance of preparing individuals to deal with the changes in their reproductive organs long before they reach a fertile age.

Although women in the early stages of puberty are more likely to experience problems in their reproductive organs, 75% of women in the late stages of puberty suffer from premenstrual syndrome, endometriosis, and irregular menstrual. The most common diseases this teenager suffers from are delayed menstruation, irregular menstrual cycle,

dysmenorrhea, and great bleeding that leads to anemia in adolescents. Premenstrual syndrome occurs in 30-40% of women of reproductive age. The most common signs are mood changes, nervousness, anger, being easily offended, headache, blowing, and appetite increases. Primary dysmenorrhea prevalence in adolescent girls varies between 16 to 93%, whereas the severe pain condition suffered by teenage girls ranges from 2 to 29%.[2] Dysmenorrhea in adolescents becomes the main cause of students' inability to follow learning activities in school. Approximately 68.05 % of teens experience dysmenorrhea, and this condition was the leading cause of low school attendance among teenagers and low attendance of women at work. Dysmenorrhea also causes increased break time (54 %) and lower learning ability (50 %). Health disorders often manifest in the form of dizziness, limp, puke even loss of consciousness.[3]

Premenstrual syndrome and teen dysmenorrhea are caused by several causes of hormone disorders, psychic factors (stress), diet and excessive activity, tiredness, and heavy exercise. Several psychological changes occur in adolescents including relatively unstable emotions, it was hard to understand self-changing, and stress as a result of environmental changes. Emotional changes caused by stressors are associated with hormone fluctuations during the menstrual cycle.[4] In Japan, about 53% of women of fertile age suffer from premenstrual syndrome, and 1.2 % also suffer from a more severe disorder called premenstrual dysphoric disorder (PMDD). The number of dysmenorrhea events in Indonesia is 54.89 % which is primary dysmenorrhea. Women with premenstrual syndrome tend to have a much lower quality of life, a rise in the absence of work, a decrease in productivity, and a social relations disorder.[5]

The approach to therapy that can be done on premenstrual syndrome and dysmenorrhea involves 3 methods; conservative or non-pharmacotherapy approach (no nutrition settings, nutrient supplementation, sports, massage, acupressure, acupuncture, yoga, hypnotherapy), pharmacotherapy approach (non-steroid anti-inflammatory/NSAID, diuretic, antidepressants), and the operative approach was done in case of premenstrual syndrome and heavy dysmenorrhea weight.[2] Acupressure is one of China's known treatments thousands of years ago. This method was a development of acupuncture techniques, but the media used was quite simple, It's the pressure on the

meridian points in the body by using the fingers or by using blunt objects. The emphasis on the meridian point of this body was intended to restore the body's positive energy balance.

An emphasis on certain body meridians can increase the useful hormone level of endorphins as the body's produced pain reliever in the blood and opioid peptide endogenous in the central nerve array. The neural tissue given stimuli on the endocrine system releases endorphins hormones according to the body's needs and can reduce pain in dysmenorrhea and premenstrual syndrome. Research proved an acupressure could cope with the pain of dysmenorrhea (p-value 0,000). SP6 acupressure delivered by trained personnel significantly decreased pain intensity immediately after the intervention, pain relief remained up to 3 hours after the intervention.[6] Another meridian point that proved to be able to lower the intensity of dysmenorrhea pain was the point of Guanyuan (CV04) and the point of Qihai (CV06). A drop in the intensity of dysmenorrhea pain was obtained after 3 hours of acute execution at both points.[7]

To stimulate the release of endorphin hormones not only through acupressure techniques alone. The massage technique was one of the oldest therapies in the entire world. This type of massage technique is diverse, one that has been widely known is back massage. This massage method was inspired by Swedish massage which combines several massage techniques which as movement effleurage, friction, patrissage, tapotage, and so on. This back massage was also effective in reducing pain. In addition to serving as a blood vessel in the back, it stimulates the endorphin hormone and gives a calming effect. Pain intensity was significantly reduced in the massage and exercises (p-value 0.001). It seems that massage therapy and isometric exercises were effective in reducing some symptoms of dysmenorrhea.[8] The same research results also revealed that progressive relaxation exercises have an impact on decreasing dysmenorrhea pain when they are practiced on a regular basis (p-value 0.001).[9]

Menstruation should be a pleasant event because it is one of the indicators of reproductive health for adolescents. Disorders during the menstrual cycle in adolescents should be able to be dealt with minimal handling of side effects. Back massage acupressure can be a solution to overcoming dysmenorrhea and premenstrual syndrome because this method is simple, easy to use, cheap, and has minimal side effects. The

purpose of this study was to analyze the effectiveness of the complementary technique of back massage acupressure against the intensity of pain and duration of dysmenorrhea.

2. METHODS

2.1 Study Design

This study employed a quasi-experimental pretest-posttest design with a control group. The intervention group received back massage acupressure, while the control group followed the standard nonpharmacological management of dysmenorrhea and premenstrual syndrome. The back massage acupressure was performed during menstruation from the 1st to the 3rd day, once daily for 10-15 minutes. The intervention followed these four steps: 1. Assessment of dysmenorrhea on days 1, 2, and 3 using the Comparative Pain Scale (CPS) and a watch to measure duration; 2. Execution of back massage acupressure, including: positioning the patient in a prone position, and stretching and massaging the neck, shoulders, back, buttocks, and thighs using effleurage, friction, petrissage, and tapotement techniques; 3. Applying acupressure along the spine and foot meridians using pressure and circular movements; and 4. It was measuring pain intensity and duration 1-2 hours post-intervention. This study was conducted in the Magetan Regency, specifically in three sub-districts: Magetan, Selotinatah, and Jabung at an Independent Midwifery Practice.

2.2 Population

The study population included 60 adolescent females in the Magetan district, with 30 participants in each group selected through systematic random sampling. Participants were required to meet the following criteria: experiencing primary dysmenorrhea and premenstrual syndrome for at least two consecutive months, being in good overall health, and not having conditions such as anemia, depression, anxiety, chronic fatigue syndrome, irritable bowel syndrome, thyroid disease, or secondary dysmenorrhea. Additionally, participants did not smoke, consume alcohol, or use analgesics regularly during menstruation.

2.3 Instrument

In this study, addressing adolescents' pain complaints related to dysmenorrhea requires careful attention from medical personnel. An observation sheet is employed as an instrument to assess pain, integrating two types of evaluation methods: the Numeric Rating Scale (NRS) and the Verbal Rating Scale (VRS). This combination is termed the Comparative Pain Scale (CPS). The CPS is a measurement tool that requires patients to rate their pain intensity on a numerical scale ranging from 0 to 10, with 0 indicating "no pain" and 10 representing "severe pain." In addition to numerical ratings, descriptive terms clarify varying levels of pain intensity, from "no pain" to "extreme pain." To assess pain duration, a questionnaire is employed to measure the time required for pain reduction associated with primary dysmenorrhea. This type of pain is periodic and occurs as intermittent episodes. The duration of dysmenorrhea pain typically ranges between 24 and 72 hours.

2.4 Data Analysis

In this study, a descriptive analysis of numerical data was conducted by calculating statistical measures such as the mean, standard deviation, median, range of pain reduction, and the duration of dysmenorrhea. For both groups, the homogeneity test showed that the respondents were equivalent. Meanwhile, the normality test indicated that both datasets were normally distributed. A paired sample t-test was performed to assess the reduction in the intensity and duration of dysmenorrhea pain before and after the intervention. An independent t-test was used to examine the effectiveness of the intervention between the intervention and control groups. Conducted using data analysis software version 22 IMB-SPSS.

2.5 Ethical Approval

This research has passed the ethical feasibility test from the health research ethics committee of the Health Polytechnic of the Ministry of Health, Surabaya with reference number EA/1726/KEPK-Poltekkes_Sby/V/2023.

3. RESULTS

3.1 Characteristics of Teenage Girls in the Magetan District

The number of teenage girls in the Magetan district region (2021) based on the age group 10-14 years was 21,380 people, 21,358 people aged 15-19 years, and 21,948 people aged 20-24 years. The percentage of

teenagers aged 10 years and over who are not/haven't been to school was 0.18%, while those who are still in school were 14.57%, and the remainder who are no longer in school were 85.25%. Progress in the field of education in the Magetan district region was shown by degree possession; 9.91% of teenagers aged 15 years and over do not have graduated from an elementary school, 26.11% have graduated from elementary school or equivalent, 23.41% have graduated from junior high school, and 40.45% have graduated from high school or above.

Youth health services focused on health promotion efforts that include the extension of reproductive health, HIV/AIDS, and family planning. Efforts to promote health in adolescents are included in the program of the Healthy Living community movement especially in adolescent reproductive health. The problem of reproductive health of adolescents in Magetan district especially still there was early pregnancy of teenage age, sexual relations before marriage, abortion, sexually transmitted diseases, low use of contraceptive devices in young mothers, dropping out of school because of pregnancy, HIV/AIDS infection, and other problems related to the reproductive organs.

Table 1. Characteristics of teenage girls by age, education, menarche age, and nutrition status

No.	Characteristics of teenage girls	Intervention group		Control group		Homogeneity test
		f	%	f	%	
1	Age (years)					0.074
	Early teens (12-15 years)	2	6.7	2	6.7	
	Middle teens (16-17 years)	8	26.7	2	6.7	
	Late teens (18-21 years)	20	66.7	26	86.7	
2	Education					0.146
	Elementary school (SD/MI)	0	0.0	0	0.0	
	Junior high school (SMP/MTS)	2	6.7	2	6.7	
	Senior high school (SMA/MA/SMK)	10	33.3	17	56.7	
	College (D3/S1)	18	60.0	11	36.7	
3	Menarche age					0.163
	Early menarche (<10 years)	0	0.0	1	3.3	
	Menarche (10-14 years)	29	96.7	29	96.7	
	Late menarche (>14 years)	1	3.3	0	0.0	
4	Nutritional status					0.126
	Very thin	1	3.3	1	3.3	
	Thin	9	30.0	5	16.7	
	Normal	17	56.7	16	53.3	
	Overweight	2	6.7	6	20.0	
	Obesity	1	3.3	2	6.7	

The characteristics of the respondents to the intervention group: the teenage age range between 18 and 21 years was the late teenage stage, The majority of associate degree/bachelor degree, most menarche aged at the age of 10-14, and the majority of nutrition status at normal levels. While the control group: had the most teenage age was 18-21 years, the majority of education was senior high school, at the age of 10-14, at the age of the most menarche, and the majority of teen nutrition status at normal levels. The homogeneity test at 60 responders based on age, education, menarche age, and nutrient status declared homogenous (p-value > 0.05).

Both responders had special characters related to the dysmenorrhea case that he experienced. The character is shown in the following Table 2.

The intervention group and the control group experienced the same number of primary dysmenorrhea, namely in the moderate dysmenorrhea classification. The equality test on 60 respondents based on the classification of primary dysmenorrhea was declared homogeneous (p-value > 0.05).

The characteristics of respondents based on factors influencing dysmenorrhea and premenstrual syndrome are shown in the following Table 3.

Table 2. Characteristics of teenage girls' classification based on primary dysmenorrhea

Characteristics of teenage girls	Intervention group		Control group		Homogeneity test
	f	%	f	%	
Classification of primary dysmenorrhea					0.513
Mild	8	26.7	10	33.3	
Moderate	12	40.0	12	40.0	
Severe	10	33.3	8	26.7	

Table 3. Factors affecting dysmenorrhea in teenage girls

No.	Characteristics of teenage girls	Intervention group		Control group		Homogeneity test
		f	%	f	%	
1	Family history of dysmenorrhea					0.824
	Mother	7	23.3	8	26.7	
	Siblings (sister)	7	23.3	5	16.7	
	Aunt	3	10.0	3	10.0	
	Cousin	1	3.3	0	0.0	
	There isn't any	12	40.0	14	46.7	
2	Consume junk food/fast food					0.876
	Instant noodles/instant food	11	36.7	10	33.3	
	Burgers, pizza, fried chicken, french fries	5	16.7	7	23.3	
	Processed meat: sausages, nuggets	3	10.0	3	10.0	
	Light snack with MSG and salt	0	0.0	2	6.7	
	Chili/tomato sauce	1	3.3	1	3.3	
	Soft drinks: Coca-Cola, Sprint	1	3.3	0	0.0	
	Do not consume	9	30.0	7	23.3	
3	Smoking habit					0.197
	Active	0	0.0	0	0.0	
	Passive	10	33.3	15	50.0	
	Do not smoke	20	66.7	15	50.0	

In the intervention group and control group, the highest family history of dysmenorrhea was no family history. For the habit of consuming junk food/fast food in teenagers who experience dysmenorrhea, the majority was the habit of consuming noodles/instant food. Active and passive smoking was the most common result shown in both groups. The equality test on 60 respondents based on factors influencing dysmenorrhea was declared homogeneous (p-value > 0.05).

3.2 Reducing Pain Intensity and Duration of Dysmenorrhea Using the Back Massage Acupressure Technique

Back massage acupressure technique on teenage girls during menstruation showed a significant effect on reducing the intensity of dysmenorrhea pain and the duration of dysmenorrhea itself, as shown in Table 4 below:

From Table 4. above, it was found that there was a decrease in the intensity of dysmenorrhea pain on days 1-3 of the intervention group before and after the back massage acupressure with a p-value of 0.000. The control group also experienced a decrease in menstrual pain on days 1-3 with a p-value of 0.000. The duration of dysmenorrhea pain in both the intervention group and control group also decreased with a p-value <0.05. The treatment of back mass acupressure in teenage girls shows a significant difference between the intervention group and the control group as shown in the following Table 5.

From Table 5 back massage acupressure has been shown to be effective in reducing the intensity and duration of dysmenorrhea pain across all tested

Table 4. Pretest-posttest analysis of back massage acupressure techniques in both the intervention group and control group

Variable	Intervention group						p-value	Control group						p-value
	Pretest			Posttest				Pretest			Posttest			
	f	%	Mean±SD	f	%	Mean±SD		f	%	Mean±SD	f	%	Mean±SD	
Dysmenorrhea pain intensity														
Day 1 of menstruation			5.30±2.120			2.97±1.299	0.000			5.67±1.953			5.17±1.931	0.026
No pain (pain level 0)	0	0.0		0	0.0			0	0.0		0	0.0		
Light (pain level 1-3)	8	26.7		22	73.3			6	20.0		8	26.7		
Currently (pain level 4-6)	12	40.0		8	26.7			14	46.7		14	46.7		
Heavy (pain level 7-10)	10	33.3		0	0.0			10	33.3		8	26.7		
Day 2 of menstruation			4.77±1.736			2.83±1.117	0.000			4.90±1.626			4.33±1.626	0.000
No pain (pain level 0)	0	0.0		0	0.0			0	0.0		0	0.0		
Light (pain level 1-3)	9	30.0		24	80.0			5	16.7		9	30.0		
Currently (pain level 4-6)	15	50.0		6	20.0			20	66.7		18	60.0		
Heavy (pain level 7-10)	6	20.0		0	0.0			5	16.7		3	10.0		
Day 3 of menstruation			3.83±1.147			0.93± 0.828	0.000			3.30±1.442			2.80±1.270	0.001
No pain (pain level 0)	0	0.0		11	36.7			0	0.0		1	3.3		
Light (pain level 1-3)	13	43.3		19	63.3			16	53.3		22	73.3		
Currently (pain level 4-6)	17	56.7		0	0.0			13	43.3		7	23.3		
Heavy (pain level 7-10)	0	0.0		0	0.0			1	3.3		0	0.0		
Duration of dysmenorrhea pain														
Day 1 of menstruation			8.33±7.770			4.37±3.557	0.000			7.90±6.748			7.07±6.275	0.021
Not experienced	0	0.0		0	0.0			0	0.0		0	0.0		
1-8 hours	20	66.7		25	83.3			21	70.0		22	73.3		
9-16 hours	5	16.7		5	16.7			5	16.7		5	16.7		
17-24 hours	5	16.7		0	0.0			4	13.3		3	10.0		
Day 2 of menstruation			5.63±6.026			2.57±2.144	0.000			5.40±4.994			4.33±3.754	0.024
Not experienced	0	0.0		2	6.7			0	0.0		0	0.0		
1-8 hours	24	80.0		27	90.0			26	86.7		27	90.0		
9-16 hours	4	13.3		1	3.3			2	6.7		2	6.7		
17-24 hours	2	6.7		0	0.0			2	6.7		1	3.3		
Day 3 of menstruation			2.20±1.424			0.93±1.172	0.000			3.03±3.222			2.13±2.403	0.032
Not experienced	0	0.0		13	43.3			2	6.7		5	16.7		

(continued on next page)

Table 4. (*continued*)

Variable	Intervention group						p-value	Control group						p-value
	Pretest			Posttest				Pretest			Posttest			
	f	%	Mean±SD	f	%	Mean±SD		f	%	Mean±SD	f	%	Mean±SD	
1-8 hours	30	100		17	56.7			26	86.7		24	80.0		
9-16 hours	0	0.0		0	0.0			2	6.7		1	3.3		
17-24 hours	0	0.0		0	0.0			0	0.0		0	0.0		

Table 5. The effectiveness of massage back acupressure intensity and duration dysmenorrhea

Variable	Intervention group	Control group	p-value
Intensity of dysmenorrhea pain			
Day of menstruation 1	21.73	39.27	0.000
Day of menstruation 2	21.73	39.27	0.000
Day of menstruation 3	15.92	45.08	0.000
Duration of dysmenorrhea pain			
Day of menstruation 1	20.4	40.6	0.000
Day of menstruation 2	23.95	37.05	0.003
Day of menstruation 3	25.58	35.42	0.017

menstrual days (Day 1, Day 2, and Day 3). This finding is supported by significant p-values (all < 0.05). The most pronounced effect of back massage acupressure was observed on the first day of menstruation, with the intervention group exhibiting a significantly lower mean rank compared to the control group for both pain intensity and duration. The effect of back massage acupressure remained consistent on the second and third days, although the significance level slightly decreased for pain duration on the third day. These results support the conclusion that the intervention positively alleviated dysmenorrhea pain in terms of both intensity and duration.

4. DISCUSSION

The term dysmenorrhea originates from Ancient Greek, derived from "dys," meaning difficult, painful, or abnormal; "meno," meaning month; and "rrhea," meaning flow or discharge Dysmenorrhea is a colicky pain in the suprapubic area, radiating to the lumbar region and thighs, occurring before or during menstruation without any pelvic disease. Its initial manifestation usually appears six months after menarche because it only occurs during ovulatory cycles. The pain typically lasts 8-72 hours and is most severe on the first and second days of menstruation due to an increase in prostaglandin release during this period. Symptoms can recur from one menstrual cycle to the next.[2] Dysmenorrhea is associated with a rapid increase in the hormone progesterone following ovulation. The elevated production of this hormone by the corpus luteum continues the function of the ovaries. When progesterone levels are high, dysmenorrhea symptoms arise. Progesterone damages the lysosomal membrane, releasing lytic enzymes and phospholipids that activate the cyclooxygenase pathway, metabolizing arachidonic acid into prostaglandin F2α (PGF2α), prostaglandin E2 (PGE2), leukotrienes, and thromboxanes during menstruation. High levels of PGF2α and PGE2 lead to increased frequency of uterine contractions—4 to 10 times every 10 minutes—and the duration of myometrial contractions. Uterine pressure can reach 100-400 mmHg at peak contraction. If this pressure exceeds uterine arterial pressure, it can cause ischemia in the myometrium.[10,11]

Factors influencing dysmenorrhea include an earlier age at menarche, which is one of the key factors affecting this condition. Women with early menarche experience longer exposure to prostaglandins and have higher serum estradiol hormone concentrations, along with lower levels of testosterone and dehydroepiandrosterone. This condition predisposes these women to primary dysmenorrhea compared to those with later menarche. Additionally, women with long menstrual cycles and extended menstruation experience more severe dysmenorrhea. Excessive prostaglandin production leads to heightened uterine muscle contractions during menstruation.[2,10,12]

Exercise is highly beneficial for women, especially during menstruation, as it can alleviate and even prevent dysmenorrhea. Moderate to moderately intense exercise is particularly recommended to reduce contractions during menstruation. However, in cases of intense exercise, fatigue can often worsen dysmenorrhea. Women with poor nutritional status and those who are overweight have a higher risk of experiencing dysmenorrhea compared to women with normal nutritional status. Thin women tend to have a reduced tolerance to pain, while women who are overweight tend to have more fat reserves that can trigger hormones that disrupt the reproductive system during menstruation and promote the onset of dysmenorrhea.[13]

Women with a family history of dysmenorrhea have a greater risk of experiencing the condition. Some researchers estimate that daughters of mothers with menstrual issues may also have unpleasant menstrual experiences. A family history as a risk factor for dysmenorrhea may be linked to conditions like endometriosis.[14] Women who frequently consume fast food (junk food) also have an increased risk of dysmenorrhea. Fast food is nutritionally imbalanced, being high in calories, fat, sugar, and low in fiber. The fatty acids in fast foods can interfere with progesterone metabolism during the luteal phase of the menstrual cycle. This results in an increase in prostaglandin levels, which can cause menstrual pain.[12,13,15]

Smoking behavior in women further increases the risk of dysmenorrhea. Studies show a relationship between dysmenorrhea and women exposed to passive smoking. The likelihood of dysmenorrhea in passive smokers is due to nicotine's vasoconstrictive properties, which reduce blood flow to the endometrium. Additionally, cigarette smoke has anti-estrogenic effects. Adolescent girls, who are often emotionally unstable and have limited knowledge about menstruation, are more susceptible to dysmenorrhea.

Emotional stress and tension from problems at school or work can exacerbate menstrual pain.[12,16] Smoking may have a direct impact on the endocrine control of menstruation, as it is regularly related to some menstrual disorders, for example, prolonged periods, antiestrogenic extraovarian, and ovarian atrophy, which have been related to dysmenorrhea.[16]

This study found that the complementary technique of the Back Massage combined with Acupressure method effectively reduces dysmenorrhea pain intensity. In acupressure theory, menstrual pain is caused by two main factors: Qi stagnation and blood deficiency. Adolescents experiencing moderate to severe Qi stagnation and blood deficiency from menstrual bleeding suffer from these issues. Due to Qi stagnation, relaxation and reflexes during menstruation are hindered by tension in the supporting muscles around the chest, shoulders, back, abdomen, genital organs, and thigh bones.[7,8,17] The back massage combined with acupressure focuses on strong pressure on nerves at specific meridian points in the chest, especially around the back, buttocks, and genital organs, helping to relieve nerve tension and instantly increase endorphin production. This combined method serves as a solution to relieve blockages and pain from uterine muscle contractions during menstruation. This action helps maximize pain receptors and minimizes the side effects of delayed endorphin production.[11,18]

Massaging the clavicular area opens acupressure points, followed by meridian point pressure, which stimulates the immediate production of endorphins during menstruation. Acupressure, derived from "accus" and "pressure" (meaning needle and pressing), is a term used to provide stimulation to acupuncture points through pressure or mechanical techniques instead of needle insertion.[11] The aim is to facilitate the flow of vital energy (Qi) throughout the body (Indonesian Ministry of Health, 2015). Prenatal breast acupressure techniques can help optimize endorphin receptors and minimize menstrual pain side effects. Pressure on the meridian points in the back and buttocks, especially the sacral area, can reduce discomfort. The effect of acupressure increases endorphin levels in the blood and systemically, blocking pain signals to the brain and provides a calming effect.[19–22]

Some acupoints are located near the target organs they regulate, such as points along the back that can reduce lower back pain, while others are positioned farther from the target organs.[23] Most acupoints are located bilaterally, or on both sides of the body, so acupressure is applied to both sides unless the acupoint is in the body's center. Pressure is applied with a clenched fist, starting gently, then gradually increasing until a mild sensation is felt, but without pain. Dysmenorrhea pain can be managed by providing stimuli, one of which is acupressure. Acupressure stimulates local endorphin production and closes pain gates by focusing on massage/pressure points to control dysmenorrhea pain, with this acupressure technique is also applied in back massage.[11,22–25] In adolescents experiencing dysmenorrhea, the lumbosacral area is often massaged, stimulating mechanoreceptors to reduce pain. Pressure on the acupoint located between lumbar vertebrae 4 and 5 (Bladder Meridian) for 3 to 5 minutes can provide comfort and reduce the duration of dysmenorrhea.[18,21,23]

The limitations of this study include the restricted scope, covering only three Independent Midwifery Practices (PMB) in Magetan Regency, and therefore, the findings may not represent the broader population of adolescent girls. Additionally, the relatively small sample size (a total of 60 participants) may limit the generalizability of the results. The measurement of the intensity and duration of dysmenorrhea pain through interviews and observations also relies on respondents' subjectivity, which introduces the potential for subjective bias. Another limitation is the study's relatively short duration of five months, which may not adequately capture seasonal variations or broader environmental conditions. Lastly, although back massage combined with acupressure therapy is reported to have minimal side effects, this study does not comprehensively evaluate its long-term effects or potential complications.

5. CONCLUSION

The conclusion of this study shows that the combination of back massage and acupressure is significantly effective in reducing the intensity and duration of dysmenorrhea pain on the first to third days of menstruation in the intervention group. This reduction was also significantly recorded compared to the control group. Thus, the proposed hypothesis is proven, that the combination of back massage and acupressure can reduce the intensity and duration of dysmenorrhea pain in adolescent girls. As a

recommendation for future research, it is suggested to expand the sample coverage by involving more regions and diverse age groups, as well as exploring the long-term effects of this therapy on adolescent reproductive health.

Ethics Approval

This research has passed the ethical feasibility test from the health research ethics committee of the Health Polytechnic of the Ministry of Health, Surabaya with reference number EA/1726/KEPK-Poltekkes_Sby/V/2023.

Underlying Data

Derived data supporting the findings of this study are available from the corresponding author on request.

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