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THE EFFECT OF TRADITIONAL KALIMANTAN DANCE EXERCISES ON MENSTRUAL PAIN (DYSMENORRHEA) INTENSITY AMONG FEMALE ADOLESCENTS

Pengaruh Latihan Tari Tradisional Kalimantan terhadap Intensitas Nyeri Haid (Dismenorea) pada Remaja Putri

Muhammad Aulia Gifari[1*], Dian Tjahyadi[2], Alia Salma Nour Fathia[3]
[1]Rumah Sakit TNI AD Tk. IV Guntung Payung Banjarbaru, Kalimantan Selatan, Indonesia
[2]Departemen Obstetri dan Ginekologi, Fakultas Kedokteran, Universitas Padjajaran, Bandung, Indonesia
[3]Rumah Sakit TNI AD Tk. III DR. R. Soeharsono, Banjarmasin, Kalimantan Selatan, Indonesia
*Email: muhammad_agif@rocketmail.com

ABSTRAK

Dismenorea merupakan gangguan ginekologi yang disebabkan oleh ketidakseimbangan hormon, khususnya progesteron, yang memicu rasa nyeri dengan tingkat keparahan bervariasi. Kondisi ini umum terjadi pada remaja putri dan berdampak pada kualitas hidup serta kemampuan belajar mereka. Produksi prostaglandin yang berlebihan menjadi penyebab utama kontraksi uterus, berkurangnya aliran darah, dan meningkatkan sensitivitas terhadap nyeri. Salah satu alternatif non-farmakologis untuk mengurangi nyeri haid adalah aktivitas fisik seperti menari. Penelitian ini bertujuan mengevaluasi pengaruh latihan tari terhadap tingkat nyeri haid pada remaja putri. Desain penelitian yang digunakan ialah komparatif analitik dengan pendekatan potong lintang (cross-sectional), Total 50 partisipan dibagi ke dalam dua kelompok yakni remaja putri yang mengikuti latihan tari dan tidak mengikuti latihan tari, masing-masing 25 orang, diperoleh melalui purposive sampling dengan mempertimbangkan kriteria inklusi dan eksklusi. Pengukuran intensitas nyeri dilakukan dengan menggunakan Numeric Rating Scale (NRS). Hasil analisis menunjukkan bahwa kelompok mengikuti latihan tari memiliki rata-rata nyeri sebesar 2,24 (SD = 1,480), sementara kelompok yang tidak mengikuti latihan tari sebesar 4,48 (SD = 2,267). Uji Mann-Whitney menunjukkan nilai p 0,000 (p <0,001). Hasil ini mengindikasikan bahwa latihan tari berkontribusi signifikan dalam menurunkan intensitas nyeri haid. Aktivitas fisik ritmis seperti latihan menari yang dilakukan rutin dua kali seminggu dengan durasi 60 menit, dapat menjadi solusi yang efektif, ekonomis dan menyenangkan dalam manajemen nyeri haid bagi remaja putri.

***Kata kunci**: aktivitas fisik, dismenorea, latihan tari, nyeri haid*

ABSTRACT

Dysmenorrhea is a common gynecological disorder resulting from hormonal imbalances, particularly involving progesterone, that causes varying degrees of pain. It frequently affects adolescent girls and may interfere with their quality of life and academic performance. Elevated prostaglandin levels trigger uterine contractions, reduced blood flow, and increased pain sensitivity. Non-pharmacological approaches, such as physical activities like dance, have been studied for their potential in alleviating menstrual pain. This study aimed to assess the effectiveness of dance exercise in reducing menstrual pain intensity among adolescent girls. The research employed a comparative analytic design with a cross-sectional approach. A total of 50 participants were divided into two groups: 25 female adolescents who participated in dance training and 25 who did not. Participants were selected through purposive sampling based on predefined inclusion and exclusion criteria. Pain levels were measured using the Numeric Rating Scale (NRS). The results revealed that the mean pain score in the dance group was 2.24 (SD

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= 1.480), while the non-dance group reported a higher mean score of 4.48 (SD = 2.267). The Mann-Whitney test showed a p-value of 0.000 (p < 0.001). These findings suggest that dance activity significantly reduces menstrual pain intensity. Rhythmic physical activities like dance offer a practical, low-cost, and enjoyable option for managing menstrual pain in adolescent girls.

Keywords: dance exercise, dysmenorrhea, menstrual pain, physical activity

INTRODUCTION

Dysmenorrhea or menstrual pain is a common complaint in gynecology caused by an imbalance of the hormone progesterone in the body, which triggers an increase in the production of prostaglandins, causing uterine contractions and pain[1]. This condition can occur before or during the menstrual period and usually lasts for 8 to 72 hours from the start of the cycle[2]. There are two types of dysmenorrhea: primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea occurs without any anatomical abnormalities of the reproductive organs, while secondary dysmenorrhea is usually associated with pathological conditions such as endometriosis, pelvic inflammatory disease, uterine fibroids, or cervical stenosis.

Based on data from the World Health Organization (WHO), the prevalence of dysmenorrhea from 106 studies involving 125,249 women from the world population ranges from 1.7 – 97%.[3]In Indonesia, the prevalence of dysmenorrhea is reported to reach 64.25%, with 54.98% of cases being primary and 9.36% being secondary. Pain levels vary from mild to severe, with accompanying symptoms such as back pain, cramps, nausea, vomiting, diarrhea, headaches, and even fainting[1]. Various factors have been identified as triggers for dysmenorrhea, including early age at menarche, an unhealthy body mass index, fast food consumption, smoking, caffeine consumption, and long menstrual periods[1]. Lifestyle factors and conditionspsychologicalsuch as stress, mental status, low physical activity, and poor dietary habits, contribute to worsening the symptoms of dysmenorrhea and premenstrual syndrome[2],[4].

Medical treatment for dysmenorrhea includes pain relievers, hormone therapy, non-steroidal anti-inflammatory drugs, and procedures such as cervical dilation. However, non-pharmacological approaches such as lifestyle modification and increased physical activity are potential additional strategies to improve the quality of life for women of childbearing age.[5]. Physical activity has been proven to provide many benefits, such as relieving pain and improving physical and mental conditions.[6]The WHO itself recommends that children and adolescents engage in at least 60 minutes of aerobic physical activity per day. Unfortunately, approximately 80% of adolescents and young adults globally do not meet this recommendation, particularly among girls.[7]Dancing is a fun and accessible form of physical activity. Dance training is considered to provide physiological benefits comparable to other aerobic activities, as well as supporting mental health.[5]Physical activities such as dancing have also been shown in several studies to reduce menstrual pain and have a positive effect on the cardiovascular system, as well as reducing anxiety and depression[5]. Physical exercise like dancing regularly can increase blood flow to the reproductive organs, stimulate the production of endorphins as the body's natural analgesic, and help reduce stress and anxiety, which can worsen the perception of pain[8].

Traditional dancesNot only is it an artistic expression and cultural preservation, but it is also a moderate-intensity, rhythmic physical activity that involves breathing, muscle stretching, and body movement coordination. This physical activity can be compared to the aerobic and stretching exercises currently used in dysmenorrhea therapy approaches[5]. However, there has not been much research that has examined this specifically, especially in South Kalimantan.

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This study aims to evaluate the influence of traditional Kalimantan dance trainingincluding the Baksa Kambang Dance, the Radap Rahayu Dance, and the Kanjar Dance, on pain intensity in adolescent girls, as a form of non-pharmacological intervention that is easy to implement, affordable, and has long-term effects on menstrual pain management.

METHODS

This study used a comparative analytical design with a cross-sectional approach to assess differences in levels of menstrual pain (dysmenorrhea) between adolescent girls who regularly participate in traditional Kalimantan dance training and those who do not. The study was conducted in May 2025 at two locations: Kayu Ulin Dance Studio and SMP Negeri 3 Banjarbaru, South Kalimantan.

The population in this study was adolescent girls aged 10-18 years who lived in Banjarbaru City. The sampling technique used was purposive sampling with consideration of inclusion criteria: having experienced menarche, generally healthy, willing to participate in the study; and exclusion criteria: having a history of gynecological disease (endometriosis, PCOS), and regular consumption of analgesics. The sample size used the minimum sample formula in two independent groups (test of differences in the means of two groups).

$$N = \frac{2(Z\alpha/2+Z\beta)2\cdot\sigma 2}{\Delta 2} = 24.5 \approx 25 \text{ per group}$$

A total of 50 respondents met the requirements to participate in the study, which were divided into a group that participated in dance training (25 respondents) and a group that did not participate in dance training (25 respondents). The determination of the criteria for the non-dancing group was based on the inclusion criteria, namely female adolescents aged 10-18 years who do not do dance training, do not have a history of gynecological disease (endometriosis, PCOS), and do not regularly consume analgesics. Respondents were drawn from SMP Negeri 3 Banjarbaru, South Kalimantan. Respondents in the dance training group were female adolescents who had been practicing traditional Kalimantan dances at the Kayu Ulin Dance Studio, with an average of practicing regularly for >3 months, twice a week, for 60 minutes per session. The dances practiced included the Baksa Kambang Dance, the Radap Rahayu Dance, and the Kanjar Dance. Data were collected on days 1 and 2 of menstruation using a Numeric Rating Scale (NRS) questionnaire was used via Google Forms. Respondents were asked to subjectively rate their menstrual pain levels on a scale of 0-10. Both groups were previously provided with education and an explanation of menstrual pain to ensure a shared understanding.

Data analysis was performed using SPSS software version 26.0. Normality tests were performed using the Shapiro-Wilk, and data analysis to assess differences in pain levels between the dance training group and the control group used the Mann-Whitney U Test because the data were not normally distributed. An Ethics Test was conducted before the research was conducted no. 15/KEPK/EC/V/2025.

RESULT

Univariate Analysis

The general characteristics of respondents in this study were divided into two groups: those who participated in dance training (25 respondents) and those who did not participate in dance training (25 respondents). The average age of respondents in the dancer group was 14.4 $\pm$ 1.25 years, and the non-dancer group was 14.7$\pm$1.21 years. The age of menarche in both groups was around 11.6 years. The majority of respondents had regular menstrual cycles, and menstrual periods lasted approximately 5 days. The

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respondents in the study experienced dysmenorrhea with a higher incidence in the non-dancer group (92%) compared to the dancer group (84%).

Table 1. Respondent Characteristics, Age of Menarche, and History of Dysmenorrhea

Variables	Group of dancers (n=25)	Non-dancer group (n=25)
Age (years), mean + SD	14.4 ± 1.25	14.7 ± 1.21
Body weight (kg), mean + SD	46.3 ± 6.21	45.8 ±5.95
Height (cm), mean + SD	154.7±5.80	153.5 ±5.66
Age at menarche, mean + SD	11.6 ±0.91	11.7 ±0.87
Regular menstrual cycle, n (%)	20 (80%)	19 (76%)
Menstrual duration (days), mean + SD	5.1 ±1.2	5.0±1.3
Menstrual frequency/month	1.0	1.0
History of dysmenorrhea, n (%)	21 (84%)	23 (92%)

Mean menstrual pain levels were measured in each group using the Numeric Rating Scale (NRS). The results showed a different distribution of pain scores between the two groups, as presented in Table 2.

Table 2. Characteristics of Menstrual Pain Scale in Dancer and Non-Dancer Groups

Pain Scale	Dance Practice		Total
	Dance	No Dancing	
0	2	1	3
1	6	0	6
2	8	0	8
3	6	8	14
4	0	4	4
5	2	2	4
6	1	5	6
7	0	2	2
8	0	1	1
9	0	1	1
10	0	1	1

Data Normality Test

Before conducting inferential testing to determine the difference in average levels of menstrual pain (dysmenorrhea) between dancers and non-dancers, a normality test was performed. The Shapiro-Wilk test was used to test the normality of the data distribution in this study. The following data are presented in Table 3.

Table 3. Results of the Data Normality Test Calculation

Group	Statistics	p	Information
Dancing	0.899	0.019	Abnormal
No Dancing	0.935	0.112	Normal

Based on the results of the normality test of the data on the degree of menstrual pain (dysmenorrhea) in the dancer and non-dancer groups using the Shapiro Wilk test, the significance value of the test (p) for the data on the degree of menstrual pain (dysmenorrhea) in the dancer group was 0.019, which indicates that the data did not meet the normality assumption ($p < 0.05$), while for the data on the degree of menstrual pain (dysmenorrhea) in the non-dancer group, it was 0.112, indicating that the data was normally distributed ($p > 0.05$) as listed in Table 3. Thus, the data were analyzed using a non-parametric test.

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Comparison of Average Degree of Menstrual Pain (Dysmenorrhea) in Dancers and Non-Dancers

The average intensity of menstrual pain in the group that participated in dance training was lower than in the group that did not. The mean pain score in the intervention group was 2.24 (SD=2.267). This finding indicates a significant difference in pain levels between the two groups, as shown in Table 4.

Table 4. Average Degree of Menstrual Pain (Dysmenorrhea) in the Dancer Group and the Non-Dancer Group

Group	N	Average	Median	Standard Deviation	Minimum	Maximum
Dancing	25	2.24	2	1,480	0	6
No Dancing	25	4.84	5.5	2,267	0	10

Test of Differences in Average Degree of Menstrual Pain (Dysmenorrhea) in Dancers and Non-Dancers

To determine the significance of the difference between the two groups, a Mann-Whitney U test was performed. The analysis showed a P value of 0.000 (<0.001), indicating a statistically significant difference between the intensity of menstrual pain in the dance training group and the non-dance group. The detailed results of this test are shown in Table 5.

Table 5. Mann-Whitney U Test Results

	Pain Scale
Mann-Whitney University	90,500
Wilcoxon W	425,500
Z	-4,375
Asymp Sig (2-tailed)	0,000

DISCUSSION

The mean age at menarche in both groups was nearly identical, at approximately 11.6 years and 11.7 years, respectively, which is considered normal. Research conducted by J. Witkos et al. showed that age at menarche was inversely related to the risk of menstrual pain in adulthood. It can be speculated that women who experience menarche earlier have more ovulatory cycles and are therefore more exposed to hormonal fluctuations at a given age, thus increasing their risk of menstrual pain[2]. There was no significant difference in the average age of menarche, so there is little possibility of bias in this study.

The average weight and height in both groups were similar, indicating that nutritional status or body mass index were not significantly different and were unlikely to bias the results of menstrual pain. Most respondents in both groups also had regular menstrual cycles (80% vs. 76%), with an average menstrual cycle lasting 5 days, a normal menstrual duration. According to research by TA Aprilia et al., low or excessive nutritional status can be a risk factor for menstrual pain. Poor nutritional status reduces the body's resistance to pain and requires more nutrients during the luteal phase. Women with a higher than normal BMI have higher prostaglandin levels, which can contribute to primary dysmenorrhea. Excess fat tissue also triggers prostaglandin formation, increasing menstrual pain[5].

The history of dysmenorrhea was found to be quite high in both groups, namely 84% in dancers and 92% in non-dancers. This finding indicates that dysmenorrhea is a common complaint in adolescent girls. However, the difference in numbers (although not too striking) is still relevant because the dancer group showed slightly lower numbers, which could be an early indication that structured physical activity such as dancing has

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the potential to provide a protective effect against the onset of dysmenorrhea. This study aimed to evaluate the effect of traditional Kalimantan dance training on the intensity of menstrual pain (dysmenorrhea) in adolescent girls. The findings showed a significant difference between the group that did dance training and the group that did not, with a p value <0.001. The average pain score of the dancer group was 2.24 (SD = 1.480), lower than the non-dancer group, which was 4.84 (SD = 2.267). This indicates that dance training significantly contributed to reducing the intensity of menstrual pain in respondents. Dysmenorrhea is a painful condition that occurs before and during menstruation, caused by increased levels of prostaglandins that stimulate myometrial contractions, reduce blood flow to the uterus, and increase the perception of pain[8]. In general, dysmenorrhea is treated with pharmacological therapies such as analgesics or hormonal contraception. However, these therapies are not without side effects such as breast discomfort, inter-cycle bleeding, dizziness, nausea, and even visual disturbances[9].

Alternatively, physical exercise is a recommended non-pharmacological intervention because it can increase endorphin levels, modulate macrophage activity, and change the production of pro-inflammatory cytokines (such as IL-1β) to anti-inflammatory cytokines (IL-10), which play a role in pain reduction[10]Exercise also contributes to stabilizing the autonomic nervous system, inhibiting sympathetic dominance, and improving the body's pain threshold [7]. Physical activity also helps improve blood circulation in the pelvic area, relaxes abdominal muscles, and encourages vasodilation of blood vessels, thereby reducing pain[11]. Psychological aspects such as distraction effects, increased self-confidence, and a sense of self-control during dance practice also contribute to reducing pain perception[12]. These effects vary depending on the duration, type, and frequency of exercise [8].

Enjoyable and safe physical exercise is highly recommended in the context of adolescents [5]. Dance training can be a rhythmic activity option that combines aerobic movement with self-expression. This activity is also effective in reducing prostaglandin levels, improving mood, and improving overall quality of life [10]. Dance training (as a form of physical exercise) is widely enjoyed as a physical activity and a therapy option. Regular dance training has movement components that can improve physical condition (weight loss, better cardiovascular function) and reduce anxiety and depression[13]. A number of studies show that physical exercise, such as dancing, is not only beneficial in physical aspects, but also in social and academic aspects [5].

Dance training has a positive effect on menstrual pain intensity, which may be linked to increased pain tolerance and improved hormonal balance. Previous research has shown that aerobic activities such as brisk walking, Pilates, dancing, and yoga effectively improve menstrual pain (dysmenorrhea). These activities also offer numerous benefits, including requiring no special skills, being easy to regulate, and offering numerous health benefits, such as improved blood circulation in the pelvic cavity, increasing pain threshold, and reducing the inflammatory response, all of which can improve pain[14]. In addition, teenagers who do dance training and performances show better social and academic abilities compared to teenagers who do not take dance training [5].

Lack of physical activity reduces oxygen and blood flow to the uterus, resulting in ischemia and increased pain. Furthermore, low endorphin levels exacerbate the body's stress response, which can worsen dysmenorrhea. Regular physical activity is believed to prevent endometrial hyperplasia and suppress excessive prostaglandin production[15].

It's important to understand that menstrual pain can disrupt daily physical activity, primarily due to uterine contractions triggered by prostaglandins. Prostaglandins are produced in the endometrium, blood vessels, and myometrium. Prostaglandin production is stimulated by estrogen and inhibited by progesterone. These uterine contractions can

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result in vascular compression and ischemia, which are the primary causes of pain [11]. Consequently, many women choose to abstain from activity during menstruation.

According to the World Health Organization (WHO), dance training is a form of recreational physical activity with moderate to vigorous intensity, characterized by an increased heart rate, deeper breathing, increased blood circulation, and the release of endorphins. Dance training involving repetitive, full-body movements falls into the moderate-intensity physical activity category, while faster, more rhythmic dances fall into the vigorous activity category.[16]The dances performed in dance training include traditional Kalimantan dances such as the Baksa Kambang Dance, the Radap Rahayu Dance, and the Kanjar Dance. Although no specific research has identified the physical activity intensity categories for these dances, research on other traditional and recreational dances indicates moderate intensity physical activity[17].

In this study, respondents performed regular dance exercises for >3 months, twice a week, for 60 minutes per session. Research conducted by Cai J et al[12], comparing several components of aerobic-equivalent exercise such as intensity, duration, frequency, and activity period, showed that optimal effects were obtained with low-intensity activity, 46-60 minutes, performed regularly for two menstrual cycles, and <2 times a week. Excessive physical activity can worsen menstrual pain. In a study conducted by Armour M et al. in 2019[18], found that in 854 women who did physical activity regularly for a full month, providedsignificant reduction in menstrual pain intensity compared to those who were not given any therapy. There is no strong evidence that high-intensity activity is better than low-intensity activity with low intensity, but both can certainly reduce the intensity of menstrual pain compared to not doing any exercise[19].

This study highlights the potential of traditional Kalimantan dance as a culturally relevant, non-pharmacological intervention for managing menstrual pain in adolescent girls. The use of objective pain scales, a comparative design, and clear intervention parameters adds to the study's validity. However, limitations include the exclusion of other risk factors, a cross-sectional design that cannot establish causality, a small sample size (50 respondents), and purposive sampling, which limits generalizability. Despite this, the findings suggest that Kalimantan dance may offer an effective, safe, and enjoyable alternative, warranting further research with multivariate analysis and a broader population.

CONCLUSION

The results of this study indicate that traditional Kalimantan dance training has a significant influence on reducing the intensity of menstrual pain in adolescent girls. The significant difference between the dance training group and the non-dance training group supports the finding that rhythmic physical activity, such as dancing, can be an effective non-pharmacological strategy in the management of dysmenorrhea. Therefore, dance training can be recommended as a simple, economical, and enjoyable alternative form of physical activity, especially for adolescent girls experiencing menstrual pain. Further research with a longitudinal design, a larger population, a multivariate approach, and more stringent variable controls is highly recommended.

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