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Effect of a turmeric–tamarind drink on menstrual pain intensity among adolescent girls

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Abstract

Background: Dysmenorrhea is one of the most common gynecological problems experienced by adolescent girls during menstruation. Menstrual pain can disrupt daily activities, concentration, academic performance, and quality of life. Non-pharmacological therapies have been widely used to reduce menstrual pain, one of which is tamarind and turmeric therapy. Tamarind and turmeric contain curcumin and anthocyanins, which have anti-inflammatory, analgesic, and antispasmodic properties, which can help reduce prostaglandin production and uterine contractions.

Purpose: To determine and analyze the effect of tamarind and turmeric therapy on reducing menstrual pain intensity in adolescent girls.

Method: This study used a quantitative pre-experimental design with a one-group pretest-posttest approach. The sample consisted of 40 adolescent girls experiencing dysmenorrhea and were selected using purposive sampling. Pain intensity was measured using a Numeric Rating Scale (NRS). Data were analyzed using descriptive statistics and the Wilcoxon Signed Rank Test.

Results: Before the intervention, most respondents experienced moderate to severe menstrual pain with an average pain score of 6.35. After receiving tamarind and turmeric therapy, the average pain score decreased to 2.95. The Wilcoxon Signed Rank Test showed a significance value of $p = 0.000$ ($p < 0.05$), indicating a statistically significant reduction in menstrual pain intensity after the intervention.

Conclusion: Tamarind and turmeric therapy significantly reduced menstrual pain intensity in adolescent girls.

Keywords: Adolescents; Dysmenorrhea; Non-Pharmacological Therapy; Turmeric–Tamarind Drink Intervention.

INTRODUCTION

Menstrual pain, or dysmenorrhea, is one of the most common reproductive health problems experienced by adolescent girls worldwide. Although menstruation is a normal physiological process, pain during menstruation often disrupts daily activities, educational participation, and overall quality of life. Endometriosis is a complex disease that affects many women worldwide, from their first period (menarche) to menopause, regardless of ethnicity or social status. In women with endometriosis, endometrial-like tissue (normally found only in the lining of the uterus) grows outside the uterus, causing inflammation and scar tissue formation (World Health Organization, 2025). The pain is generally felt as cramps in the lower

abdomen and can radiate to the lower back and thighs.

Dysmenorrhea is lower abdominal pain that sometimes extends to the waist, lower back, and thighs. It is a common problem for adolescent girls approaching menstruation. Menstrual pain, or dysmenorrhea, is often experienced by some women, especially those of reproductive age, and the incidence of dysmenorrhea is very high worldwide. Some women experience unbearable pain during menstruation, which can affect their daily activities (Ministry of Health of the Republic of Indonesia, 2022).

The incidence of dysmenorrhea among adolescents remains high and continues to be a significant public health problem. This condition is primarily caused by increased levels of prostaglandins released from the endometrium during menstruation. Increased prostaglandin production stimulates excessive uterine contractions, resulting in ischemia and pain. The majority of adolescent girls who experience dysmenorrhea fall into the underweight category. The incidence of primary dysmenorrhea is influenced by body mass index, and stress impacts the prevalence of primary dysmenorrhea in adolescents (Nurlaeli, 2024). Consequently, many adolescents experience discomfort severe enough to interfere with their academic and social activities.

Treatment for dysmenorrhea includes both medical and non-medical treatments. In recent years, interest in the use of herbal remedies has increased due to their easy access, affordability, and minimal side effects. Among the traditional herbal therapies widely consumed in Indonesia, tamarind and turmeric have received considerable attention for their potential role in relieving menstrual pain. Turmeric and tamarind is a traditional drink that is very popular in society, especially in Java. This drink was once known as a herbal therapy. Due to advancements in technology and its effects, turmeric and tamarind are no longer recognized as a herbal drink (Gustina, 2022).

Like all other muscles, the uterine muscles contract and relax. During menstruation, these contractions are stronger, caused by increased prostaglandin production. The curcumin in turmeric and the anthocyanins in tamarind inhibit cyclooxygenase (COX), thereby reducing inflammation, thus reducing uterine contractions that cause menstrual pain. Turmeric and tamarind, a combination of *Curcuma longa* (turmeric) and *tamarindus indica*, (tamarind), have long been known in various cultures as an herb with anti-inflammatory and analgesic properties (Amelia, Juwita, & Fajriyah, 2020). The curcumin content in turmeric and the organic acids in tamarind are believed to play a role in reducing inflammation and inhibiting pain mediators (Bahrami, Jafari-Nozad, Karbasi, Ayadilord, & Ferns, 2023).

In addition to regular exercise, warm compresses, and acupressure, non-pharmacological management

is effective, including turmeric and tamarind to reduce menstrual pain. Turmeric and tamarind contain curcumin and anthocyanins, which inhibit cyclooxygenase, thereby reducing inflammation and uterine contractions. Curcumenal, a compound in turmeric, acts as an analgesic agent that can reduce prostaglandin production (Sari & Winarni, 2023).

Menstrual pain has negative effects, both long-term and short-term. In the long term, menstrual pain can trigger infertility. In the short term, menstrual pain can affect daily activities, especially for adolescent girls, including difficulty concentrating, frequent absences from lectures, emotional conflict, tension, anxiety, and disruption to learning. This can lead to feelings of discomfort, decreased learning engagement, some sleeping in class during learning activities, limited physical activity, and absenteeism (Karlinda & Hasanah, 2022).

A recent study conducted previously showed that nearly 10% of women with menstrual pain miss school and work for 1-3 days per month, or their ability to perform daily tasks is affected by severe pain (Linar, C., Wulandari, Susanti, Narizka, Rahmani, & Mahlida, 2024). This finding is supported by other researchers, who reported mild pain in 47.7% and severe pain in 47%. Furthermore, to relieve the pain, adolescents self-medicate without consulting a doctor, take analgesics in 32.5%, apply hot compresses in 34%, and rest in 92% (Linggi, Majid, & Ruwiah, 2022).

The therapeutic effects of tamarind and turmeric are attributed to their active ingredients. Curcumin, the main compound found in turmeric, exhibits anti-inflammatory and analgesic activity by suppressing inflammatory mediators and reducing prostaglandin formation. Furthermore, tamarind contains bioactive compounds such as anthocyanins and flavonoids, which can enhance the anti-inflammatory effect and help relieve uterine muscle spasms.

RESEARCH METHOD

This study used a quantitative approach with a pre-experimental, one-group pretest-posttest design. The study was conducted at State Senior High School 1 Pontianak. The population consisted of adolescent girls experiencing menstrual pain. Purposive sampling was used to select 40 adolescent girls as respondents. Inclusion criteria were adolescent girls experiencing primary dysmenorrhea, willing to

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participate, and menstruating during the study period. The intervention consisted of approximately 200 ml (one glass) of turmeric and tamarind concoction, consumed every two days before menstruation. Pain intensity was assessed using a Numeric Rating Scale (NRS), with a score ranging from 0 to 10.

The assessment categories were: 0 = no pain at all; 1-3 = mild pain, which is beginning to be felt, slightly bothersome, but still bearable; 4-6 = moderate pain, which is beginning to interfere with daily

activities, but the respondent is still able to tolerate it; and 7-10 = severe pain, which is very bothersome, unbearable, and often requires immediate medical attention. Univariate analysis was used to describe respondent characteristics and pain intensity distribution. Bivariate analysis was performed using the Wilcoxon signed-rank test because the data were paired and not normally distributed. The significance level used in this study was $\alpha = 0.05$.

RESEARCH RESULTS

Table Characteristics Respondent (N=40)

Variable	Results	Z	Asymp. Sig.
Age (Mean±SD)(Range) (Years)	(16.15±0.736) (15-17)		
15	8/20.0		
16	18/45.0		
17	14/35.0		
Pre-Test Pain Level (n/%)		-5.521	0.000
Mild	4/10.0		
Moderate	20/50.0		
Severe	16/40.0		
Post-Test Pain Level (n/%)		-5.521	0.000
Mild	30/75.0		
Moderate	10/25.0		
Severe	0/0.0		

The table above shows that the average age of respondents and standard deviation is (16.15±0.736) with an age range (15-17). Based on the pain level during the pretest, the majority of respondents were at a moderate pain level of 20 (50.0%), while after the posttest, the majority of respondents were at a mild pain level of 30 (75.0%). Based on the Wilcoxon signed-rank test, the value of $Z = -5.521$ and Asymptomatic. Sig. (2-tailed) = 0.000.

DISCUSSION

The results showed that the majority of respondents experienced moderate menstrual pain before receiving tamarind and turmeric therapy. This condition is associated with increased prostaglandin production during menstruation, which causes stronger uterine contractions and reduced uterine

blood flow. This finding is consistent with previous research reporting that most adolescent girls experience moderate dysmenorrhea before receiving tamarind and turmeric therapy (Amelia et al., 2020).

After the intervention, menstrual pain intensity decreased significantly, with most respondents reporting mild pain. This decrease may be due to the pharmacological properties of curcumin, found in turmeric. Curcumin inhibits the cyclooxygenase and lipoxygenase pathways, thereby reducing prostaglandin production and the inflammatory response. Tamarind also contains anthocyanins and flavonoids, which contribute to its anti-inflammatory effects. This finding is supported by another study reporting a significant reduction in dysmenorrhea among adolescent girls after consuming a tamarind

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and turmeric drink (Umma, Rahagia, & Pamungkas, 2024).

The Wilcoxon Signed-Rank test yielded a Z value of -5.521 with a significance value (Asymp. Sig. 2-tailed) of 0.000. Since the p-value obtained was lower than the 0.05 significance level, the alternative hypothesis was accepted, indicating a statistically significant effect of turmeric tamarind therapy in reducing the intensity of menstrual pain in adolescent girls. The decrease in pain intensity observed in this study supports previous findings that also reported a significant decrease in dysmenorrhea after administration of turmeric tamarind. These findings indicate that turmeric tamarind therapy can serve as an effective non-pharmacological alternative to treat menstrual pain in adolescents (Ulaa, Murbiah, & Amanda, 2022; Sugiharti Sundari, 2018; Amelia et al., 2020).

The results of previous studies showed that there was no difference in the intensity of menstrual pain between the management of turmeric and tamarind consumption and warm compresses ($p = 0.743$). Both were effective in reducing the intensity of menstrual pain. The conclusion of the study is that turmeric and tamarind consumption and warm compresses can be used to reduce the intensity of menstrual pain in women, with comparable effectiveness (Agussafutri, 2017). The previous researcher concluded by using a paired T-test, namely by comparing menstrual pain experienced by respondents before the intervention and after the intervention, it showed that there was an effect of turmeric and tamarind drink on reducing primary menstrual pain, as indicated by a P value = 0.0001 which means $<1 \pm 0.05$ (Safitri, 2018).

CONCLUSION

The average intensity of menstrual pain before tamarind and turmeric therapy was 6.35 (moderate pain category), the average intensity of menstrual pain after tamarind and turmeric therapy was 2.95 (mild pain category) and the Wilcoxon Signed Rank test showed a p value of 0.000 (<0.05), which indicates a significant effect of tamarind and turmeric therapy in reducing the intensity of menstrual pain in adolescent girls.

SUGGESTION

Adolescent girls experiencing dysmenorrhea (menstrual pain) are advised to use tamarind and

turmeric therapy as a non-pharmacological alternative treatment, schools should provide education on traditional herbal therapies for menstrual pain, healthcare providers should promote evidence-based herbal interventions for adolescent reproductive health and future researchers are encouraged to conduct randomized controlled trials with larger sample sizes to strengthen the evidence on the effectiveness of tamarind and turmeric therapy.

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