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Effectiveness of Tamarind-Turmeric Drink in Reducing Dysmenorrhea Pain Intensity among Psychology Students at Universitas Aisyiah Yogyakarta

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ABSTRACT

Introduction: Dysmenorrhea is a common menstrual problem among adolescent girls and young women that may interfere with daily activities, academic performance, and quality of life. Tamarind-turmeric drink is widely used as a non-pharmacological therapy because it contains active compounds with potential analgesic and anti-inflammatory effects. This study aimed to determine the effectiveness of tamarind-turmeric drink in reducing dysmenorrhea pain intensity among Psychology students at Universitas 'Aisyiyah Yogyakarta. **Methods:** This study used a quantitative pre-experimental design with a one-group pre-test and post-test approach. A total of 32 second-semester female students from the Psychology Study Program were selected using simple random sampling through a lottery system by application. Dysmenorrhea pain intensity was measured using the Numerical Rating Scale before and one hour after the administration of tamarind-turmeric drink. The intervention was given twice daily for two consecutive days during menstruation. Data were analyzed using the Wilcoxon Signed-Rank Test. **Results:** The results showed a decrease in dysmenorrhea pain intensity after the intervention. On the first day, the Wilcoxon Signed-Rank Test showed a Z value of -3.710 with a p-value of 0.000. On the second day, the Z value was -4.105 with a p-value of 0.000. These results indicated a statistically significant difference in pain intensity before and after the administration of tamarind-turmeric drink. **Conclusion:** Tamarind-turmeric drink was effective in reducing dysmenorrhea pain intensity among second-semester Psychology students at Universitas 'Aisyiyah Yogyakarta. This herbal drink may be considered as an alternative non-pharmacological approach for menstrual pain management among adolescents and young women.

Keyword: Dysmenorrhea; tamarind-turmeric drink; adolescents; menstrual pain; non-pharmacological therapy.

Introduction

Menstruation is a natural process indicating that the female reproductive system and hormones are functioning properly and in balance [1]. During menstruation, many adolescents experience menstrual disorders, one of the most common being menstrual pain. Some adolescents perceive menstrual pain as very painful, to the extent that it disrupts daily activities. This condition is commonly referred to as dysmenorrhea [2]. Dysmenorrhea is a major reason why students who menstruate miss school or experience limitations in their daily activities. Previous studies have also shown that inadequate knowledge of menstrual health may affect the ability of adolescents and young women to manage menstrual pain independently [3].

Dysmenorrhea is characterized by pain and cramping in the lower abdomen, sometimes accompanied by other symptoms such as nausea, vomiting, diarrhea, trembling, and sweating. Dysmenorrhea is divided

into two types: primary dysmenorrhea and secondary dysmenorrhea. One of the most prevalent gynecological disorders in young women is primary dysmenorrhea, which significantly impairs productivity and health-related quality of life. Despite its high incidence, little is known about management-seeking behaviors and how helpful they are thought to be by female primary dysmenorrhea patients [4].

Primary dysmenorrhea is menstrual pain that occurs without any underlying disease or abnormality in the reproductive organs, while secondary dysmenorrhea is menstrual pain caused by disorders or abnormalities in the female reproductive organs [5]. Primary dysmenorrhea is one of the most prevalent gynecological problems among young women and may significantly affect productivity, academic performance, and health-related quality of life. If not properly managed, dysmenorrhea can interfere with daily activities, including attendance and concentration in learning activities. Dysmenorrhea is also one of the common reasons for women to miss school or work, making it an important adolescent reproductive health concern [4], [6].

Secondary dysmenorrhea may be associated with reproductive disorders such as pelvic inflammation, abnormal pelvic structure, pelvic adhesions, endometriosis, tumors, polyps, or ovarian cysts. These conditions may require further clinical assessment and management [7]. A study by Sima *et al.* [8] reported that many female students experience decreased energy and increased discomfort during menstruation. The severity and intensity of symptoms may vary, and many students use both pharmacological and non-pharmacological methods to reduce menstrual pain.

According to the World Health Organization (WHO), in 2016 there were 1,769,425 cases of dysmenorrhea, with 90% of women worldwide experiencing severe dysmenorrhea [9]. In Indonesia, the prevalence of dysmenorrhea was recorded at 107,673 cases (64.25%), consisting of 59,671 cases (54.89%) of primary dysmenorrhea and 9,496 cases (9.36%) of secondary dysmenorrhea [9]. Among women of productive age, the incidence rate of dysmenorrhea ranges from 45% to 95%, with 60% to 75% of adolescents reporting symptoms of primary dysmenorrhea. It has been reported that 30% to 60% of adolescent girls with dysmenorrhea miss school, and 7% to 15% are unable to attend school due to the pain [10]. In Yogyakarta Province, the incidence of dysmenorrhea among women of reproductive age has also been reported to be relatively high (52%). These data indicate the importance of safe, accessible, and acceptable interventions to help adolescents manage menstrual pain.

Efforts to manage dysmenorrhea can be carried out through pharmacological and non-pharmacological treatments. Pharmacological treatment usually involves the use of analgesic drugs. However, the use of medication may cause side effects, such as nausea, vomiting, drowsiness, restlessness, and other discomforts, especially if used without appropriate guidance. Therefore, non-pharmacological therapy is often recommended as an alternative or complementary approach. Non-pharmacological therapies include warm compresses, relaxation techniques, exercise, and the use of herbal or phytopharmacological drinks [11], [12], [13].

One well-known herbal remedy among the public is turmeric and tamarind. Turmeric contains curcumenol, which functions as an analgesic capable of inhibiting excessive prostaglandin release through soft epithelial tissue, thereby reducing uterine contractions and pain intensity during dysmenorrhea [14], [15]. Tamarind contains active compounds such as anthocyanins, tannins, saponins, sesquiterpenes, alkaloids, and phlobotannins, which may contribute to anti-inflammatory and antipyretic effects and help reduce nervous system activity [16]. Based on these mechanisms, tamarind-turmeric drink may have potential benefits in reducing dysmenorrhea pain intensity.

This study aimed to determine the effectiveness of tamarind-turmeric drink in reducing dysmenorrhea pain intensity among second-semester undergraduate Psychology students at Universitas 'Aisyiyah Yogyakarta.

Methods

This study was conducted at Universitas 'Aisyiyah Yogyakarta, located at Jl. Siliwangi, West Ring Road No. 63, Mlangi, Nogotirto, Gamping, Sleman, Yogyakarta. This study used a quantitative approach with a pre-experimental method and a one-group pre-test and post-test design. In this design, pain intensity was measured before and after the intervention in the same group of respondents. Ethical approval was obtained from the Research Ethics Committee of Universitas 'Aisyiyah Yogyakarta with approval number 2734/KEP-UNISA/IV/2023.

The population consisted of all female students from the 2022 Psychology Study Program, totaling 97 students. A total of 32 respondents were selected based on the inclusion and exclusion criteria. The inclusion criteria were female students who experienced dysmenorrhea, had menarche at the age of more than 9 years, and were willing to participate in the study. The exclusion criteria included students who used pharmacological therapy for menstrual pain and students with a history of gynecological disorders.

The sampling technique used in this study was simple random sampling. Simple random sampling was conducted using a lottery system through an application to ensure that each eligible respondent had the same opportunity to be selected as a participant. The names of eligible respondents were entered into the application, and the required number of respondents was randomly selected until 32 participants were obtained.

Pain intensity was assessed using the Numerical Rating Scale (NRS). The pre-test measurement was conducted when respondents experienced dysmenorrhea before consuming the tamarind-turmeric drink. After the pre-test assessment, respondents consumed the tamarind-turmeric drink. The post-test measurement was conducted one hour after the intervention. The same procedure was carried out on the first and second days of menstruation to observe changes in pain intensity after the intervention.

The intervention used in this study was a commercially available packaged tamarind-turmeric herbal drink consisting of 5 grams of turmeric extract and 2.5 grams of tamarind extract, equivalent to 35 grams of fresh turmeric and 10 grams of tamarind, dissolved in 150 cc of boiled water. Respondents consumed the drink twice daily for two consecutive days during menstruation. On each day of measurement, pain intensity was assessed before consumption and one hour after the first administration of the drink.

Data were analyzed using the Wilcoxon Signed-Rank Test because the study compared paired pre-test and post-test pain intensity scores in the same respondents. A p-value of less than 0.05 was considered statistically significant.

Result

Table 1.
Frequency Distribution of Respondents' Characteristics among Second-Semester Undergraduate Psychology Students at Universitas 'Aisyiyah Yogyakarta

No	Characteristics	F	%
1.	Age (Years)		
	18	15	46,9
	19	10	31,3
	20	5	15,6
	21	2	6,3
2.	Age at Menarche (Years)		
	11	16	50,0
	12	12	37,5
	13	4	12,5
3.	Menstrual Duration (Days)		
	>7	2	6,3
	≤ 7	30	93,8
	Total	32	100

Source: Primary data, 2023

The characteristics of respondents showed that most respondents were 18 years old, totaling 15 respondents (46.9%). Based on age at menarche, most respondents experienced menarche at the age of 11 years, totaling 16 respondents (50.0%). Regarding menstrual duration, most respondents had a menstrual duration of ≤ 7 days, totaling 30 respondents (93.8%).

Table 2.

Frequency Distribution of Dysmenorrhea Pain Intensity on the First Day Among Undergraduate Psychology Students at 'Aisiyiah University Yogyakarta

Dysmenorrhea Pain Intensity	Pre-test		Post-test	
	F	%	F	%
No Pain	0	0	0	0
Mild Pain	13	40,6	15	46,9
Moderate Pain	11	34,4	12	37,5
Severe Pain (Controlled)	8	25,0	5	15,6
Severe Pain (Uncontrolled)	0	0	0	0
Total	32	100	32	100

Source: Primary data, 2023

On the first day, before the intervention, the most commonly reported dysmenorrhea pain intensity was mild pain, experienced by 13 respondents (40.6%). Moderate pain was experienced by 11 respondents (34.4%), and controlled severe pain was experienced by 8 respondents (25.0%). After the intervention, 15 respondents (46.9%) experienced mild pain, 12 respondents (37.5%) experienced moderate pain, and 5 respondents (15.6%) experienced controlled severe pain.

Table 3.

Frequency Distribution of Dysmenorrhea Pain Intensity on the Second Day Among Undergraduate Psychology Students at 'Aisiyiah University Yogyakarta

Dysmenorrhea Pain Intensity	Pre-test		Post-test	
	F	%	F	%
No Pain	0	0	5	15,6
Mild Pain	13	40,6	14	43,8
Moderate Pain	15	46,9	9	28,1
Severe Pain (Controlled)	4	12,5	4	12,5
Severe Pain (Uncontrolled)	0	0	0	0
Total	32	100	32	100

Source: Primary data, 2023

On the second day, before the intervention, the most commonly reported dysmenorrhea pain intensity was moderate pain, experienced by 15 respondents (46.9%), followed by mild pain in 13 respondents (40.6%) and controlled severe pain in 4 respondents (12.5%). After the intervention, 5 respondents (15.6%) reported no pain, 14 respondents (43.8%) experienced mild pain, 9 respondents (28.1%) experienced moderate pain, and 4 respondents (12.5%) still experienced controlled severe pain.

Table 4.

Wilcoxon Analysis Test

Pain Intensity	Z	p-value
Pain Intensity – Day 1	-3.710	0,000
Pain Intensity – Day 2	-4.105	0,000

Source: Primary data, 2023

Based on the Wilcoxon Signed-Rank Test, dysmenorrhea pain intensity on the first day showed a Z value of -3.710 with a p-value of 0.000. On the second day, the Z value was -4.105 with a p-value of 0.000. These findings indicate a statistically significant difference in dysmenorrhea pain intensity before and after the administration of tamarind-turmeric drink on both days.

Table 5.
Wilcoxon Test Analysis (Pre-test on the First Day and Post-test on the Second Day)

	Mean	SD (Min-max)	Z	p-value
Pre-test Day 1	4,59	1,94 (1-8)	-4.459	0,001
Post-test Day 2	3	2,34 (0-8)		

Source: Primary data, 2023

The mean score of dysmenorrhea pain intensity on the first-day pre-test was 4.59 with a standard deviation of 1.94 and a range of 1–8. Meanwhile, the mean score on the second-day post-test was 3.00 with a standard deviation of 2.34 and a range of 0–8. The Wilcoxon Signed-Rank Test showed a Z value of -4.459 with a p-value of 0.000, indicating a statistically significant decrease in dysmenorrhea pain intensity after the intervention.

Discussion

The findings of this study indicate that tamarind-turmeric drink contributed to a reduction in dysmenorrhea pain intensity among second-semester Psychology students at Universitas ‘Aisyiyah Yogyakarta. The decrease in pain intensity after the intervention suggests that tamarind-turmeric drink may be beneficial as a non-pharmacological approach for managing menstrual pain. Although several respondents still experienced dysmenorrhea after the intervention, the overall findings showed a reduction in pain intensity after the administration of tamarind-turmeric drink.

The effectiveness of tamarind-turmeric drink in reducing dysmenorrhea pain may be explained by the active compounds contained in turmeric and tamarind. Turmeric contains curcumin and curcumenol, which have analgesic and anti-inflammatory properties. These compounds may inhibit excessive prostaglandin production, thereby reducing uterine contractions and menstrual pain. Dysmenorrhea is closely related to increased prostaglandin levels, which stimulate uterine muscle contractions and cause ischemia and pain. Therefore, interventions that reduce inflammatory responses and prostaglandin activity may help relieve dysmenorrhea symptoms.

Tamarind also contains active compounds such as anthocyanins, tannins, saponins, alkaloids, and other phytochemical substances that may contribute to anti-inflammatory and antipyretic effects. The combination of turmeric and tamarind may provide a complementary effect in reducing menstrual pain through anti-inflammatory, analgesic, and relaxation mechanisms. This supports the use of tamarind-turmeric drink as a traditional herbal therapy that is commonly accepted in Indonesian communities and may be integrated into adolescent reproductive health education.

The results of this study are consistent with previous research by Safitri and Gustina [17], which reported that routine consumption of turmeric-tamarind herbal drink reduced dysmenorrhea among adolescent girls. This finding is also supported by Makiyah and Anggraini [18], who stated that turmeric-tamarind contains curcumin, essential oils, anthocyanins, and tannins that may block the production of prostaglandin F2 α , thereby reducing prostaglandin levels and relieving menstrual pain.

According to a study by Osuga *et al.* [5], adolescents who experience health issues such as dysmenorrhea may suffer negative impacts, including disruption to daily activities and tasks. Menstrual discomfort can also lead to decreased academic performance in female students due to reduced concentration. Dysmenorrhea may further affect psychological well-being, causing fatigue, irritability, emotional conflict, tension, and anxiety, all of which contribute to discomfort and interfere with daily routines. Dysmenorrhea occurs due to the release of prostaglandin hormones, which cause contractions in the uterine muscles. Interventions to reduce dysmenorrhea can be carried out in two ways: pharmacologically using analgesics, hormonal therapy, and medication; however, the use of drugs may

lead to dependence on pain relief and produce undesirable side effects, which can be dangerous if not used according to a doctor's instructions [19].

The present study is also in line with the findings of Marlefi and Oktavianti [20], who reported that tamarind-turmeric drink reduced dysmenorrhea pain scores among adolescent girls. Similarly, Fauzia [21] found a significant reduction in dysmenorrhea after the administration of tamarind-turmeric drink. Amalia et al. [22] also reported that tamarind-turmeric drink significantly reduced dysmenorrhea among women of reproductive age. In addition, Azrah et al. [23] found that tamarind-turmeric drink had a significant effect on reducing primary dysmenorrhea among nursing students. These findings strengthen the evidence that herbal drinks containing turmeric and tamarind may serve as a supportive non-pharmacological therapy for menstrual pain management.

This study also supports the broader concept of non-pharmacological dysmenorrhea management. Non-pharmacological approaches are important because they are relatively simple, accessible, and can be applied independently by adolescents. For students, menstrual pain may interfere with concentration, learning activities, and daily productivity. Therefore, reproductive health education should not only focus on menstrual physiology but also include safe and culturally acceptable strategies for managing menstrual discomfort.

The findings of this study have practical implications for midwifery and adolescent reproductive health services. Midwives and other healthcare providers can provide education to adolescent girls and young women about non-pharmacological options for managing dysmenorrhea. Tamarind-turmeric drink may be introduced as one of the alternative approaches, while still emphasizing that persistent, severe, or unusual menstrual pain should be assessed further to rule out secondary dysmenorrhea or other gynecological problems.

Individual differences may influence the response to tamarind-turmeric drink. Pain perception, menstrual characteristics, stress levels, physical activity, dietary habits, and previous pain management practices may affect the intensity of dysmenorrhea and the response to non-pharmacological interventions. Therefore, although this study found a significant reduction in pain intensity, the findings should be interpreted within the context of the study design and population.

This study has several limitations. First, the study used a one-group pre-test and post-test design without a control group, which may limit the ability to determine causal relationships. Second, the sample size was relatively small and involved respondents from a single study program at one university, which may limit the generalizability of the findings. Third, pain intensity was measured using a self-reported scale, which may be influenced by individual pain tolerance and subjective perception. Fourth, this study only observed short-term pain reduction during the first and second days of menstruation and did not assess long-term effects across several menstrual cycles.

Future studies are recommended to use randomized controlled trial designs with larger and more diverse populations. Further research may also compare tamarind-turmeric drink with other non-pharmacological interventions or standard care. In addition, future studies should evaluate different doses, frequency of administration, duration of consumption, and repeated use across several menstrual cycles to obtain stronger evidence regarding the effectiveness and safety of tamarind-turmeric drink for dysmenorrhea management.

Conclusion

Tamarind-turmeric drink was effective in reducing dysmenorrhea pain intensity among second-semester Psychology students at Universitas 'Aisyiyah Yogyakarta. The findings indicate a significant difference in pain intensity before and after the intervention on both the first and second days of menstruation. Therefore, tamarind-turmeric drink may be considered as an alternative non-pharmacological approach to help manage dysmenorrhea among adolescents and young women.

Midwives and other healthcare providers may use these findings as a basis for providing reproductive health education, particularly regarding safe, accessible, and culturally acceptable menstrual pain management. However, further studies with a control group, larger sample size, and longer observation period are needed to strengthen the evidence.

Declaration of Conflicting Interest

The authors declare that there were no financial, commercial, or personal conflicts of interest related to this study. The authors also declare that they have no competing interests with any institution or party involved in this research.

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