



The Effect of Soybean, Turmeric, and Tamarind Phytotherapy on Dysmenorrhea in Adolescent Girls

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ABSTRACT

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Adolescents commonly experience reproductive health problems, with Premenstrual Syndrome (PMS) and dysmenorrhea being the most prevalent. Dysmenorrhea, characterized by severe lower abdominal and back pain, affects 54.89% of Indonesian adolescents, with 15% experiencing activity limitations due to pain. In East Java, 64.25% of adolescents suffer from dysmenorrhea, with 54.89% experiencing primary dysmenorrhea. This study investigates the effect of a soybean, turmeric, and tamarind phytotherapy combination on dysmenorrhea in adolescent girls. The population of this study was 79 female adolescents with dysmenorrhea and a quasi-experimental design with a pretest-posttest control group was conducted on 48 female students from SMP 02 Bangkalan (24 treatment, 24 control), selected through random sampling. The Wilcoxon Signed Ranks Test and Mann-Whitney U-Test were used for analysis. Results revealed that 58.3% of the treatment group reported mild pain, while 54.2% of the control group experienced moderate pain. Statistical tests showed a significant effect ($p = 0.000$, $p < 0.05$), confirming the effectiveness of phytotherapy in reducing dysmenorrhea. This study suggests increasing education on phytotherapy as an alternative menstrual pain treatment for adolescents.

INTRODUCTION

Adolescence is a crucial period of biological, emotional, and psychological transformation, marked by the onset of menarche⁽¹⁾. One of the most common reproductive health issues faced by adolescent girls is dysmenorrhea, a condition characterized by intense lower abdominal and back pain during menstruation, often accompanied by cramps and systemic symptoms such as nausea, fatigue, and headaches⁽²⁾. Dysmenorrhea is classified into primary and secondary types. Primary dysmenorrhea occurs without any underlying pathology and is linked to prostaglandin-induced uterine contractions. In contrast, secondary dysmenorrhea is associated with pelvic disorders such as endometriosis or fibroids^(3,4).

Globally, 90% of women experience dysmenorrhea, with 10–15% suffering from severe pain that disrupts daily activities. In Indonesia, 54.89% of adolescent girls suffer from primary dysmenorrhea, while 15% report significant limitations in daily activities due to pain⁽³⁾. In East Java, 64.25% of adolescents experience dysmenorrhea, and in Surabaya, 1.07%–1.31% of cases require medical consultation^(5,6).



Dysmenorrhea is commonly treated using pharmacological and non-pharmacological approaches^(7,8). Pharmacological treatments include NSAIDs (Non-Steroidal Anti-Inflammatory Drugs) – Reduce prostaglandin synthesis to alleviate uterine contractions and Hormonal therapy – Regulates menstrual cycles and reduces prostaglandin production. However, long-term NSAID use may lead to gastrointestinal disturbances, kidney damage, and cardiovascular risks. This has led to an increasing interest in non-pharmacological treatments, including: Heat therapy – Improves blood circulation and relaxes muscles; Exercise and relaxation techniques – Reduce stress-induced pain exacerbation; Herbal medicine – Natural remedies with anti-inflammatory and analgesic properties⁽⁹⁾.

Previous research shown that Soybean (*Glycine max*) help regulate hormonal balance and reduce muscle contractions^(10,11) and research on Turmeric (*Curcuma domestica*) have proven in reducing uterine contractions and pain⁽¹²⁾. Also, previous research^(12,13) has shown that Tamarind (*Tamarindus indica*) which block calcium channels, reducing smooth muscle contractions and pain severity while recent research proven that among herbal treatments, soybean (*Glycine max*), turmeric (*Curcuma domestica*), and tamarind (*Tamarindus indica*) have gained attention due to their therapeutic benefits⁽¹⁴⁾. This study aims to analyze the effectiveness of a phytotherapy combination of soybean, turmeric, and tamarind in reducing dysmenorrhea among adolescent girls at SMP 02 Bangkalan.

METHOD

This study utilized a quasi-experimental design^(15,16) with a pretest-posttest control group at SMP 02 Bangkalan. A total of 48 female students (24 treatment, 24 control) experiencing dysmenorrhea were recruited using random sampling^(17,18). Participants in the treatment group received a drink made from soybean, turmeric, and tamarind, while the control group received no intervention. The intervention group was given phytotherapy of soybeans, turmeric, tamarind 1x 350 ml/day for 2 days (N = 24) and the control group was given mefenamic acid 1x 500mg/day for 2 days (N = 24). Pain intensity was measured using a Numeric Rating Scale before and after treatment. Data collection in this study was carried out by distributing questionnaires to respondents who agreed to participate in this study and the questionnaires were answered directly by the respondents. Data were analyzed using the Wilcoxon Signed Ranks Test and the Mann-Whitney U-Test.

RESULT AND DISCUSSION

Table 1.

The level of dysmenorrhea in female adolescents before and after administration of a combination of soybean, turmeric, and tamarind phytotherapy at SMP 02 Bangkalan

Group	Intervention		Mean±SD Median; Min-Max	<i>p</i> - <i>value</i>	Control		Mean±SD Median; Min-Max	<i>p</i> - <i>value</i>	Wilcoxon Test	Mann Whitney Test
	f	%			f	%				
Dysmenorrhea Pretest										
No dysmenorrhea	0	0			0	0				
Mild dysmenorrhea	1	4.2	6.12 ± 1.11	0.005*	2	8.3	5.75 ± 1.53	0.045*	0,000**	0,000***
Moderate dysmenorrhea	13	54.2	6.00		12	50.0	5.50			
Severe dysmenorrhea	10	41.7	3.00 - 8.00		10	41.7	3.00 - 8.00			
Very severe dysmenorrhea	0	0			0	0				



Dysmenorrhea Pretest								
No	6	25.0			1	4.2		
dysmenorrhea								
Mild	14	58.3	2.04 ±	0.005*	10	41.7	3.58 ±	0.007*
dysmenorrhea			1.45				1.28	
Moderate	4	16.7	2.00		13	54.2	4.00	
dysmenorrhea								
Severe	0	0	0.00 - 4.00		0	0	0.00 - 5.00	
dysmenorrhea								
Very severe	0	0			0	0		
dysmenorrhea								

Source: Primary Data, 2024

* Shapiro-Wilk Test

** Wilcoxon Signed Rank Test

*** Mann Whitney Test

Based on the research results, it was found that dysmenorrhea pain in female adolescents before being given a combination of soybean, turmeric, and tamarind phytotherapy at SMP 02 Bangkalan in the treatment group mostly showed moderate pain, amounting to 13 (54.2%) and the control group given mefenamic acid medication, half showed moderate pain, amounting to 10 (50%).

Based on the research results, dysmenorrhea pain was found in female adolescents after being given a combination of soybean, turmeric, and tamarind phytotherapy at SMP 02 Bangkalan. In the treatment group, most showed mild pain, amounting to 14 (58.3%) and the control group given mefenamic acid, most showed moderate pain, amounting to 13 (54.2%).

This study results showed that 58.3% of the treatment group reported mild pain after consuming the phytotherapy drink (from previous 4.2%), compared to 54.2% of the control group experiencing moderate pain. The statistical analysis revealed a significant difference ($p < 0.05$), indicating the effectiveness of the herbal combination. Soybean contains isoflavones that act as phytoestrogens, turmeric has curcumin with anti-inflammatory properties, and tamarind provides analgesic effects. These findings support the use of herbal medicine as a non-pharmacological approach to managing dysmenorrhea. These results suggest that soybean, turmeric, and tamarind phytotherapy can effectively reduce menstrual pain and provide a safer alternative to NSAIDs.

This study is in line with the results conducted by Diana in 2023⁽¹⁹⁾ which explained that considering that primary dysmenorrhea is often experienced by adolescent girls and young women without any obvious genital abnormalities, this more natural approach could be a safer and more comfortable solution because the integration of herbal methods in treating menstrual pain is also in line with the global trend that is increasingly moving towards natural-based medicine and minimal side effects. In addition, the herbal approach to treating dysmenorrhea could be a more natural option and have minimal side effects compared to pharmacological drugs. Moreover, the results of the study showed that the combination of soy, turmeric, and tamarind phytotherapy gave better results in reducing dysmenorrhea pain compared to mefenamic acid. This suggests that traditional medicine can play an important role in menstrual pain management.

Treatment for dysmenorrhea pain can be done pharmacologically and herbally. Pharmacological treatment follows the Standard Operating Procedure (SOP) which includes the use of analgesic drugs, hormonal drugs, and NSAIDs (Non-Steroidal Anti-Inflammatory Drugs). Meanwhile, herbal treatment for dysmenorrhea pain can use herbal medicines made from turmeric, tamarind, and soy milk. Currently, with the advancement of the times, sufferers of dysmenorrhea pain are starting to choose herbal medicines to treat pain due to dysmenorrhea. Some herbal ingredients that are useful in treating abdominal pain due to dysmenorrhea include soybeans (*Glycine max*), tamarind (*Tamarindus indica*), and turmeric (*Curcuma domestica*)^(20,21).



Soybeans (*Glycine max*) are believed to be able to relieve dysmenorrhea pain because they contain calcium which helps relieve anxiety and control nerve impulse conduction. Calcium deficiency can cause muscle spasms. The estrogen content in soybeans also helps calcium absorption. Consuming 60 grams of soy protein daily can increase the follicular phase and suppress the midcycle surge of FSH (Follicle Stimulating Hormone) and LH (Luteinizing Hormone)⁽²²⁾.

Tamarind (*Tamarindus indica*) contains flavonoids, tannins, alkaloids, anthocyanins, and citric acid which are useful for reducing primary dysmenorrhea pain. Anthocyanins in tamarind function as anti-inflammatory and antipyretic by inhibiting the action of cyclooxygenase to prevent the release of prostaglandins that cause dysmenorrhea. Tamarind can also reduce smooth muscle contractions by blocking calcium channels and inhibiting the release of intracellular calcium from the sarcoplasmic reticulum. Tamarind does not have harmful side effects on other body systems such as the stomach and kidneys⁽²³⁾.

Turmeric (*Curcuma domestica*) contains curcumin which functions as an analgesic, antipyretic, and anti-inflammatory. Curcumin inhibits the enzyme cyclooxygenase-2 (COX-2) thereby reducing inflammation and uterine contractions. Curcumenol as an analgesic inhibits the release of excessive prostaglandins through uterine epithelial tissue, which reduces uterine contractions and dysmenorrhea pain. Turmeric also helps smooth menstrual blood, removes blockages in blood circulation, and acts as an anti-inflammatory, carminative, cholagogue, antibacterial, and astringent⁽⁴⁾. This study is in line with the results conducted by Anugrahhayu in 2019⁽¹⁴⁾ which explained that as time progresses, sufferers of dysmenorrhea pain are starting to choose herbal medicines to overcome pain due to dysmenorrhea. Herbal treatment of dysmenorrhea pain can use herbal medicines made from turmeric, tamarind, and soy milk. Some herbal ingredients that are useful in treating abdominal pain due to dysmenorrhea include soybeans (*Glycine max*), tamarind (*Tamarindus indica*), and turmeric (*Curcuma domestica*).

CONCLUSION

The combination of soybean, turmeric, and tamarind was found to be effective in reducing dysmenorrhea symptoms in adolescent girls. This study highlights the potential of phytotherapy as an alternative treatment for menstrual pain. Further research should focus on optimizing dosage and evaluating long-term benefits.

To improve the accuracy of research results, further research needs to be conducted to explore the effectiveness and safety of soy, turmeric and tamarind phytotherapy in the long term as well as its potential interactions with other drugs, with larger and more diverse samples to ensure the generalizability of research results. By integrating traditional herbal knowledge with scientific research, this study paves the way for safer and more sustainable dysmenorrhea treatments for adolescent girls.

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