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The Effectiveness of Tamarind Turmeric Water on the Dysmenorrhea Pain Scale in Teenage Girl

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ABSTRACT

Dysmenorrhea, or menstrual pain, is one of the most common gynaecological complaints among teenage girls. Menstrual pain is a symptom and not a disease. One herbal remedy that can be consumed by teenage girls to alleviate dysmenorrhea is tamarind turmeric drink. The purpose of this study was to assess the effectiveness of tamarind turmeric water in reducing menstrual pain in teenage girls. This research is quantitative in nature, utilizing a pre-experimental research design with the One Group Pre-Test Post Test approach. Sample calculation results indicate a total of 29 respondents using accidental sampling. Results: Based on statistical tests, a p-value of 0.000 was obtained, which is less than 0.05, indicating the effectiveness of tamarind and turmeric water in reducing dysmenorrhea pain in teenage girls at Integrated Vocational School Waway Karya, East Lampung, in 2023. It is expected that respondents will establish a more regular routine of consuming tamarind turmeric water to reduce pain and maintain healthy eating habits, such as avoiding spicy, oily foods, alcoholic beverages, and maintaining good hygiene practices.

Keyword: Dysmenorrhea, Hygiene, Menstrual pain, Tamarind

1. Introduction

Menstruation is the process of expelling blood from the uterus, accompanied by shedding of the lining of the uterine wall in adult women, occurring periodically. During and before menstruation, women often experience discomfort in the lower abdomen (Kojo et al., 2021). However, if the discomfort becomes so disruptive that it necessitates leaving activities and forces them to rest or seek treatment, this condition is known as menstrual pain or dysmenorrhea. Dysmenorrhea is divided into two types: primary dysmenorrhea, which is not related to gynaecological disorders, and secondary dysmenorrhea, caused by gynaecological disorders (Hayati & Agustin, 2020).

Dysmenorrhea, or menstrual pain, is one of the most common gynaecological complaints among teenage girls. Menstrual pain is a symptom and not a disease (Mouliza, 2020). Almost all women experience discomfort during menstruation, such as lower abdominal discomfort, usually accompanied by nausea, dizziness, and even fainting. Dysmenorrhea occurs when menstrual pain is so severe that it forces the sufferer to rest and leave work or routine daily activities for several hours or days (Sujiah & Yuliana, 2023).

According to the World Health Organization (WHO) in 2021, the incidence of dysmenorrhea is widespread across various parts of the world. On average, it is estimated that 90% of adolescent women experience dysmenorrhea, with 10 to 15% of them facing severe symptoms. In the United States, dysmenorrhea is recognized as the leading cause of school absence among girls. Additionally, a survey of 113 women in the

United States revealed that the prevalence of dysmenorrhea ranged from 29% to 44%, with the majority falling between the ages of 18 and 45.

Indonesia stands out as one of the countries with the highest incidence of dysmenorrhea, reaching 90%. The classification of dysmenorrhea prevalence includes primary dysmenorrhea at 72.89% and secondary dysmenorrhea at 21.11%. Data from the Lampung Provincial Health Office indicates a yearly increase in the incidence of dysmenorrhea in teenage girls. In 2019, the number of teenage girls affected reached 19,430, with an average of 34% experiencing dysmenorrhea pain among those aged 17-20 years. By 2020, the number increased to 20,120, with 36% of teenage girls aged 17-20 years reporting dysmenorrhea pain (Dinkes Provinsi Lampung, 2020).

There are several ways to manage dysmenorrhea, including pharmacological and non-pharmacological methods. Pharmacologically, pain can be treated with effective analgesic drugs such as mefenamic acid, ibuprofen, paracetamol, and others. In addition to pharmaceutical options, there are non-pharmacological herbal products for teenage girls that can reduce pain without side effects. One popular choice in Indonesia is the consumption of traditional drinks, such as turmeric tamarind (Sugiharti & Febriana, 2021).

The benefits of tamarind turmeric in alleviating dysmenorrhea lie in the fact that turmeric contains curcumin and essential oils with effects similar to analgesic drugs, inhibiting the formation of prostaglandins. Tamarind, on the other hand, contains anthocyanins and tannins, which have distinct effects from non-steroidal anti-prostaglandin drugs, reducing pain by alleviating muscle tension in the myometrium during menstruation (Fatmawati et al., 2020). The therapy involves preparing a decoction of tamarind turmeric, which exhibits antioxidant activity due to its high phenolic compound content, functioning as analgesics, anti-inflammatories, and blood purifiers, along with acids containing analgesic flavonoids (Baiti et al., 2021).

Dysmenorrhea can have health implications if not properly treated, leading to physical weakness, limited activity, and psychological impact (Salamah, 2019). Many teenage girls may miss school, affecting learning activities and concentration. The purpose of this study is to evaluate the effectiveness of administering tamarind turmeric water in reducing menstrual pain among teenage girls.

2. Methods

This study used a quantitative research design, specifically the Pre-Experimental Design with the One Group Pretest-Posttest approach. This design, without a comparison group (control), involves the first observation (pretest) to allow for changes after the experiment or program. The research was conducted from June 7 to 25, 2023, at SMK Waway Karya, East Lampung. The study population consists of all female students at SMK Waway Karya, East Lampung, totalling 54 respondents. The sample size for this study is 29 respondents.

The instrument used in this study is the Numerical Rating Scale (NRS) pain scale sheet to assess adolescent pain levels. After obtaining the respondents and their data, the researcher seeks approval through the informed consent process. Once the respondents agree and meet the criteria, they become part of the sample.

Data collection involves initial interviews using the Numerical Rating Scale on a scale of 0-10. Following the NRS interview, the respondent's pain level is recorded on the observation sheet. Subsequently, the researcher administers tamarind turmeric water as an intervention for 5 to 15 minutes. This administration occurs over three days to evaluate the effectiveness of tamarind turmeric water in treating dysmenorrhea. The researcher then assesses the pain scale and records the observations on the provided sheet.

The reduction in pain is influenced by the acid content of turmeric, which consists of derivatives of curcumin, namely demethoxy, bisdemethoxy, and curcumenol obtained through steam distillation of the rhizome. The natural ingredients in sour turmeric, such as curcumin and anthocyanins, play a role in inhibiting the cyclooxygenase (COX-2) reaction, thereby reducing inflammation and inhibiting uterine contractions associated with primary dysmenorrhea. The mechanism of inhibition involves curcumin reducing the influx of calcium ions into epithelial cells of the uterus. Additionally, the presence of tannins, saponins, sesquiterpenes, alkaloids, and phlobotam affects the autonomic nervous system, influencing the brain to reduce uterine contractions. Furthermore, curcumenol acts as an analgesic agent by inhibiting excessive prostaglandin release.

This study conducted univariate analysis to determine the average (mean) level of dysmenorrhea before and after the administration of turmeric tamarind water. The normality test using Shapiro-Wilk showed that the average significant value of dysmenorrhea pain before and after was normally distributed, with values of 0.261 and 0.204 (p-value > 0.05), respectively. Therefore, the bivariate analysis used in this study was a paired t-test, comparing differences within the same subjects subjected to two different measurements (Sugiyono, 2020). Ethical approval for this research has been granted by the Ethics Commission for Research at Mitra Indonesia University, with letter number S.25/193/FKES10/2023.

3. Results

3.1. Age

Table 1 Frequency characteristics distribution of age

Age	Frequency	Percentage (%)
16 years	4	13.8
17 years	13	44.8
18 years	10	34.5
19 years	2	6.9
Total	29	100.0

According to the findings presented in Table 1, it is evident that most respondents at SMK Waway Karya, East Lampung in 2023 are 17 years old, comprising a total of 13 individuals (44.8%).

3.2. Dysmenorrhea pain before intervention

Table 2 Mean of dysmenorrhea pain before intervention

Scale of Pain	N	Mean	Min-Max	Standard Deviation
Before	29	7.03	6-8	0.626

Table 2 reveals that the average (mean) dysmenorrhea pain experienced by teenage girls before receiving turmeric tamarind water was 7.03, with a minimum pain score of 6 and a maximum of 8.

3.3. Dysmenorrhea pain after intervention

Table 3 Mean of dysmenorrhea pain after intervention

Scale of Pain	N	Mean	Min-Max	Standard Deviation
After	29	1.69	1-3	0.541

Upon reviewing Table 3, it becomes apparent that the average (mean) dysmenorrhea pain in teenage girls significantly decreased to 1.69 after the administration of turmeric tamarind water, with a minimum pain score of 1 and a maximum of 3.

3.4. Normality test

Table 4 Normality test

Scale of Pain	Shapiro-Wilk		
	Statistics	df	Sig.
Before	0.832	29	0.261
After	0.746	29	0.204

Table 4 demonstrates the results of the normality test, indicating significant values of 0.261 and 0.204 (p-value > 0.05) for dysmenorrhea pain before and after administration. This leads to the conclusion that the data in this study follows a normal distribution.

3.5. The Effectiveness of turmeric tamarind water on reducing dysmenorrhea pain

Table 5 The effectiveness of turmeric tamarind water on reducing dysmenorrhea pain

Variable	N	Mean	Mean Rank	SD	*P-Value*
Before	29	7.03	5.345	0.897	0.000
After		1.69			

In Table 5, the mean dysmenorrhea pain in teenage girls at SMK Waway Karya, East Lampung, before receiving turmeric tamarind water, is 7.03, while after administration, it decreases to 1.69. The mean rank is calculated as 5.345.

Statistical tests yield a p-value of 0.000, or a p-value < 0.05, signifying the effectiveness of turmeric tamarind water in reducing dysmenorrhea pain among teenage girls at SMK Waway Karya, East Lampung in 2023.

4. Discussion

4.1 Dysmenorrhea pain before intervention

The study findings reveal that the average (mean) dysmenorrhea pain in teenage girls prior to receiving turmeric tamarind water is 7.03, with a minimum pain level of 6 and a maximum of 8.

Dysmenorrhea, or menstrual pain, is a prevalent gynaecological concern among teenage girls. It's essential to recognize that menstrual pain is a symptom, not a disease. Distinguishing dysmenorrhea from menstrual pain or PMS (Pre-Menstrual Syndrome) involves considering factors such as a syndrome or a cluster of symptoms occurring before menstruation, specifically around 7-10 days prior. PMS symptoms result from a combination of hormonal changes involving estrogen, progesterone, and serotonin. This condition affects every woman and generally doesn't necessitate special medical treatment. In contrast, dysmenorrhea manifests with fewer symptoms, primarily encompassing physical symptoms. From a medical standpoint, dysmenorrhea is characterized as menstrual pain, with symptoms and severity varying among individual women (Hayati & Agustin, 2020).

Information regarding the onset, location, duration, and characteristics of pain, along with any factors that worsen or alleviate it, should be obtained from the patient. Primary dysmenorrhea typically begins six to 12 months after menarche, coinciding with the onset of ovulatory cycles. Lower abdominal or pelvic pain often persists for eight to 72 hours and is typically linked to the initiation of menstrual flow. Additional symptoms may include back and thigh pain, headache, diarrhea, nausea, and vomiting. Nearly all women encounter discomfort during menstruation, involving sensations in the lower abdomen, often accompanied by nausea, dizziness, and, in severe cases, fainting. Dysmenorrhea manifests when menstrual pain becomes so intense that it compels the individual to rest and abstain from work or regular daily activities for several hours or even days (Astuti et al., 2020).

Secondary dysmenorrhea can manifest at any point post-menarche, potentially emerging as a new symptom during a woman's 30s or 40s, following the onset of an underlying causative condition. Women may report alterations in the timing or intensity of pain. Depending on the underlying condition, additional gynaecological symptoms such as dyspareunia, menorrhagia, intermenstrual bleeding, and postcoital bleeding may also be present. The presence of certain conditions may suggest secondary dysmenorrhea, including dysmenorrhea within the first one or two cycles after menarche, initial occurrence of dysmenorrhea after the age of 25, late-onset dysmenorrhea in the absence of a history of menstrual pain, pelvic abnormalities upon physical examination, infertility (considering endometriosis, pelvic inflammatory disease, or other causes of scarring), heavy menstrual flow or irregular cycles (considering adenomyosis, fibroids, polyps), dyspareunia, and minimal or no response to treatment with non-steroidal anti-inflammatory drugs (NSAIDs), oral contraceptives, or both. Additionally, insights from the patient's family history, such as a history of endometriosis among first-degree relatives, may aid in distinguishing secondary dysmenorrhea from primary dysmenorrhea (Hayati & Agustin, 2020).

Dysmenorrhea can significantly impact health when not properly treated, leading to physical weakness, limited activities, and psychological challenges. Many teenage girls, if not receiving appropriate treatment, may avoid attending school and participating in the learning process, resulting in disrupted learning activities, decreased concentration, and difficulty understanding the material presented (Afrioza & Srimulyati, 2022).

According to the findings of the aforementioned study, the researchers observed that most teenage girls experience pain during dysmenorrhea, a common gynaecological complaint in adolescents. However, what sets this study apart is that the respondents reported an average pain level of 7.03. This heightened pain perception may be attributed to the respondents' lack of knowledge regarding how to manage dysmenorrhea pain, coupled with suboptimal eating behaviours such as consuming snacks, high-cholesterol foods, and a preference for soft drinks. These dietary habits may exacerbate dysmenorrhea pain.

4.2 Dysmenorrhea pain after intervention

Based on the study results, it is revealed that the average (mean) pain of dysmenorrhea in teenage girls after receiving turmeric tamarind water is 1.69, ranging from a minimum pain score of 1 to a maximum of 3.

There are various approaches to managing dysmenorrhea, encompassing both pharmacological and non-pharmacological methods. Pharmacologically, pain relief can be achieved through the administration of effective analgesic drugs such as mefenamic acid, ibuprofen, paracetamol, and others (Mouliza, 2020). Additionally, non-pharmacological herbal remedies for teenage girls are available, offering pain reduction without adverse effects. One such remedy is the tamarind turmeric drink. Notably, a significant number of Indonesian teenage girls prefer non-pharmacological treatments, opting for traditional beverages like tamarind turmeric (Sari & Hayati, 2020).

The benefits of tamarind turmeric in alleviating dysmenorrhea lie in the fact that turmeric contains

curcumin, and the impact of essential oils is comparable to that of analgesic drugs, effectively reducing dysmenorrhea pain by inhibiting the formation of prostaglandins. Additionally, tamarind contains anthocyanins and tannins, offering a distinct effect from non-steroidal anti-prostaglandin drugs, by reducing pain through the relaxation of muscle tension in the myometrium during menstruation (Iryani et al., 2022). The therapy involving the administration of tamarind turmeric can be executed by processing it into a decoction, exhibiting antioxidant activity attributed to the high phenolic compound content, serving as analgesics, anti-inflammatories, and blood purifiers. These compounds, along with the acids carrying analgesic content in the form of flavonoids (Pangestu et al., 2020), contribute to the effectiveness of the treatment (Pangestu et al., 2020).

In the study results, it was observed that some respondents experienced a reduction in average pain after receiving turmeric tamarind water. This reduction can be attributed to turmeric's curcumin content and the essential oils' analgesic effect, inhibiting prostaglandin formation. Simultaneously, tamarind's anthocyanins and tannins, with distinct effects from non-steroidal anti-prostaglandin drugs, contributed to pain reduction by easing muscle tension in the myometrium during menstruation.

4.3 The Effectiveness of turmeric tamarind water on reducing dysmenorrhea pain

Based on the study results, it is revealed that at SMK Waway Karya, East Lampung, the average (mean) dysmenorrhea pain in teenage girls before receiving tamarind turmeric water was 7.03. After the administration of tamarind turmeric water, the average pain reduced to 1.69, resulting in a mean difference of 5.345. Statistical tests yielded a p-value of 0.000, indicating a significance level below 0.05. This suggests the effectiveness of providing tamarind turmeric water in reducing dysmenorrhea pain in teenage girls at SMK Waway Karya, East Lampung, in 2023.

Menstruation is a natural process involving the expulsion of blood from the uterus, accompanied by fragments of the uterine wall lining in adult women. This occurs periodically. Women commonly experience discomfort in the lower abdomen during and before menstruation (Baiti et al., 2021). However, if the discomfort becomes severe, necessitating leaving work and requiring rest or treatment, it is termed menstrual pain or dysmenorrhea. There are two types of dysmenorrhea: primary and secondary. Primary dysmenorrhea is typically experienced during puberty (Arianti & Milindasari, 2022).

To alleviate menstrual pain (dysmenorrhea), both pharmacological and non-pharmacological therapies can be used. Pharmacological approaches include the administration of analgesic drugs, hormonal therapy, non-steroidal prostaglandin drugs, and cervical canal dilation (Husna, 2021). Non-pharmacological therapies encompass methods such as warm compresses, exercise, Mozart therapy, relaxation techniques, and the consumption of herbal drinks. Herbal products are gaining popularity as an alternative, particularly among teenage girls seeking pain relief without experiencing side effects. One commonly used herbal product for alleviating menstrual pain is turmeric drink. In this context, Indonesian people believe in the efficacy of turmeric consumption to alleviate menstrual discomfort, yet many are unaware of turmeric's specific contents (Murbiah & Amanda, 2022).

Turmeric drink, composed mainly of turmeric, is believed to naturally contain active ingredients with analgesic, antipyretic, and anti-inflammatory properties. Furthermore, it has been noted that turmeric drink, as a pain reliever in primary dysmenorrhea, has minimal side effects. The primary active compound or chemical in turmeric is curcumin (Saputri et al., 2020). Curcumin functions by inhibiting the cyclooxygenase (COX-2) reaction, thereby suppressing, or reducing inflammation and subsequently diminishing or inhibiting uterine contractions. Additionally, curcumenol, acting as an analgesic, inhibits the excessive release of prostaglandins through uterine epithelial tissue, contributing to the reduction of dysmenorrhea occurrences (Gustina, 2022).

Based on the results of the research above, as per the researchers, pain can be attributed to elevated levels of prostaglandins and psychological factors such as stress. Each individual exhibits different perceptions and responses to pain, and the intensity of pain is discerned based on personal experiences. Following the administration of tamarind turmeric drink, it is evident that there is an effect on reducing dysmenorrhea pain in teenage girls. This is supported by the study's findings, indicating that the mean dysmenorrhea pain in teenage girls decreased from 7.03 before receiving tamarind turmeric water to 1.69 after administration, with a mean difference of 5.345. This reduction is attributed to the traditional composition of tamarind turmeric drink, containing curcumin and anthocyanin compounds, which serve as menstrual pain relievers. Both turmeric and tamarind possess anti-inflammatory properties capable of inhibiting or reducing inflammation, thereby mitigating or even preventing uterine contractions. In addition to its anti-inflammatory effects, tamarind turmeric also functions as an analgesic and antipyretic.

5. Conclusion

Based on the results of the research and discussion, the conclusions drawn in this study are the average (mean) dysmenorrhea pain in teenage girls before receiving turmeric tamarind water is 7.03, with a minimum pain of 6 and a maximum pain of 8. The average (mean) dysmenorrhea pain in teenage girls after receiving turmeric tamarind water is 1.69, with a minimum pain of 1 and a maximum pain of 3. There is an observed effect of administering tamarind turmeric water in reducing dysmenorrhea pain in teenage girls at SMK Waway Karya, East Lampung, in 2023. It is recommended that respondents adhere to a regular consumption of tamarind turmeric water to alleviate pain and maintain healthy eating habits, nurses can serve as a valuable reference or supplementary material for nursing students engaged in research related to dysmenorrhea pain, vocational high schools provide health education on managing dysmenorrhea pain in young women and distribute informative leaflets or display brochures outlining the stages of dysmenorrhea in young women. Future researchers consider conducting qualitative research to delve into in-depth interviews to identify the causes of dysmenorrhea in young women.

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