

## Effect of Routine Consumption of Turmeric-Tamarind Herb on Dysmenorrhea among Adolescent Girls

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### ABSTRACT

Puberty in adolescents is identified by the sign of monthly menstrual period. Although it occurs naturally, many adolescent girls suffer from dysmenorrhea. Dysmenorrhea affects daily activities and even causes absence from school. Herbal medicine is still an alternative therapy for dysmenorrhea among adolescent girls. Non-pharmacological therapy using turmeric-tamarind herb is easy to obtain and has no side effects. This study aims to determine the effect of routine consumption of turmeric-tamarind herb on dysmenorrhea among adolescent girls in Pondok Meja Village. This was an observational analytical study with cross-sectional design. The population in this study involved all adolescent girls in Pondok Meja Village, with a total sample of 76 adolescent girls, who were selected using a purposive sampling technique based on inclusion and exclusion criteria. Data was collected using online questionnaires from December 2021 to April 2022. Data collected were analyzed using Chi-Square test. Results showed that there was an effect of routine consumption of turmeric-tamarind herb on dysmenorrhea among adolescent girls. Adolescent girls who did not routinely consume turmeric-tamarind herb had a 0.035 times higher probability of experiencing primary dysmenorrhea than those who routinely consume turmeric-tamarind herb. Adolescent girls who routinely consumed turmeric-tamarind herb did not experience dysmenorrhea.

*Pubertas pada remaja putri dikenali dengan tanda menstruasi setiap bulan, meskipun terjadi secara alami banyak yang menderita dismenorea. Dismenorea mempengaruhi aktivitas sehari-hari bahkan ketidakhadiran di sekolah. Jamu masih menjadi terapi alternatif bagi remaja putri dalam mengatasi dismenorea. Terapi non farmakologi jamu kunyit asam mudah didapatkan dan tidak memiliki efek samping. Penelitian ini bertujuan untuk mengetahui pengaruh kebiasaan minum kunyit asam terhadap dismenorea pada remaja putri di Desa Pondok Meja. Penelitian ini merupakan studi observasional analitik dengan rancangan cross-sectional. Populasi dalam penelitian ini adalah seluruh remaja putri di Desa Pondok Meja, dengan jumlah sampel sebanyak 76 remaja putri, menggunakan teknik purposive sampling sesuai kriteria inklusi dan tidak termasuk kriteria eksklusi. Data dikumpulkan memakai kuesioner daring pada bulan Desember 2021 sampai April 2022. Data yang terkumpul dianalisis dengan uji Chi-Square. Hasil menunjukkan terdapat pengaruh kebiasaan minum kunyit asam terhadap dismenorea pada remaja putri. Remaja putri yang tidak memiliki kebiasaan minum kunyit asam mempunyai kemungkinan mengalami dismenorea primer sebesar 0,035 kali lebih besar daripada remaja putri yang memiliki kebiasaan mengkonsumsi kunyit asam. Remaja putri yang memiliki kebiasaan minum kunyit asam tidak mengalami dismenorea.*

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## Introduction

Puberty in adolescent girls is characterized by a monthly menstrual period which lasts 5 to 7 days. Menstrual period is a natural and natural event, although in reality many adolescent girls experience

mild to severe dysmenorrhea since each woman has a different level of pain. Psychologically, dysmenorrhea will greatly interfere with physical activity even causes absence from school (Mustikawati, 2020).

Dysmenorrhea is the most common problem that occurs among adolescent girls and adult women which usually experienced before menstrual period for 48 to 72 hours. The pain is felt radiating to the thigh. Physical symptoms include complaints of cramps, dizziness, diarrhea, fatigue and excessive sweating (Sharghi et al., 2019). In addition, other symptoms of dysmenorrhea may include mood swings, stomach cramps, headaches, backaches, nausea and vomiting (Rahman et al., 2020).

Hormonal imbalance such as prostaglandins imbalance become the cause of an increase in uterine contractions which leads to dysmenorrhea. The arachidonic acid contained in PGs is able to assist the homeostatic function and pathogen mechanisms in responding to inflammation. Prostaglandins cause contraction and relaxation in the uterus to form a thick layer of luteal phase which will be released by the uterus. Pain arises from PG-induced myometrium (especially PGF<sub>2a</sub>) derived from the secretory endometrium. High levels of PG can cause stronger uterine contractions resulting in pain (Rahman et al., 2020).

Prevalence rate of dysmenorrhea worldwide is estimated to be high although it varies greatly, with incidence ranging from 45 to 97% among women of childbearing age and the highest rate was reported to occur among adolescent girls (Petraglia et al., 2017). Prevalence of dysmenorrhea in Indonesia reaches 98.8%, which generally occurs among late adolescents (mean age of 17.7 years) along with intermittent pelvic pain complaint which affects daily activities (Kartilah et al., 2020).

Losses caused by dysmenorrhea in the United States due to cases of absence from school and work reach 600 million hours per year or the equivalent of 2 billion (Sharghi et al., 2019). Dysmenorrhea symptoms generally affect daily activities both physically and emotionally in terms of school attendance, concentration during class hours, academic achievement, socialization or social and family relationships. Productivity of the company will be affected if women are absent from work due to dysmenorrhea. Dysmenorrhea surely have negative impact the life quality of adolescent girls (Kartilah et al., 2020).

Complementary medicine therapy is still widely used by people to relieve dysmenorrhea. Herbs, yoga, relaxation, psychotherapy, massage, hypnosis, acupressure and acupuncture are types of complementary medicine that are often applied. Herbs such as turmeric, ginger, fennel, cinnamon, aloe vera are most often consumed to help relieve dysmenorrhea (Sharghi et al., 2019). Many adolescent girls think that dysmenorrhea can be overcome by lying down or sleeping, taking medicine or herbs, and applying warm compresses (Kartilah et al., 2020). Some respondents (33.3%) experienced a relief in dysmenorrhea by doing activities, drinking warm water, drinking milk, while a small percentage of respondents (6.06%) experienced a relief in dysmenorrhea by drinking water (Rahayu & Nujulah, 2018). Alternative therapies of herbal medicine or herbal drinks, warm compresses with bottles filled with warm water are still used by some adolescent girls to relieve dysmenorrhea. Turmeric-tamarind herb as a non-pharmacological therapy is easy to obtain and has no side effects (Priyadi et al., 2018).

Turmeric and tamarind are the main raw materials that have been used in many researches in Indonesia as a treatment for dysmenorrhea. Antioxidants, anti-inflammatories, and analgesics are the active ingredients in turmeric. Antioxidant, anti-inflammatory, antipyretic and sedative are the active ingredient in tamarind. The benefits of turmeric-tamarind herb have been proven in many studies based on the results of statistical analysis. The results of a previous study showed a relief in dysmenorrheal pain after being given herbal medicinal intervention. There was also a recommendation from the previous study to consume herbs or herbal drinks before and during menstrual period to relieve dysmenorrhea (Rahman et al., 2020).

Habit is defined as a series of actions of a person that are done repeatedly in the same way or something that is commonly done. Besides, it is also interpreted as a pattern that a person does repeatedly in certain situations. When experiencing dysmenorrhea, adolescent girls who routinely consume turmeric-tamarind herbal tend to take repeated actions to consume turmeric-tamarind herb so as to avoid dysmenorrhea. Routine consumption of turmeric-tamarind herb carried out by adolescent girls could reduce the symptoms of primary dysmenorrhea (Sugiharti & Febriana, 2021).

Pondok Meja Village is one of the 15 villages in Mestong District. The people of Pondok Meja Village develop turmeric cultivation under the newly planted rubber tree stands, to utilize and at the same time clear the land in their respective gardens. The turmeric harvest area of Mestong District in 2017-2018 has increased, from 16,000 m<sup>2</sup> to 51,500 m<sup>2</sup> (Statistics Muaro Jambi District, 2021). Tamarind trees also grow as wild plants in the gardens of the Pondok Meja Village residents. In 2015, Pondok Meja Village also welcomed youth from Canada in a youth exchange program. On that occasion, the youth of Pondok Meja Village succeeded in developing processed turmeric plant products, one of which was herbal medicine.

Based on the results of interviews with adolescent girls in Pondok Meja Village on September 26, 2021, of the 10 adolescent girls, 7 of them (70%) said they always experienced dysmenorrhea during menstrual period. Through this interview, it was also revealed that 4 out of 7 adolescent girls who experienced dysmenorrhea treated it by taking drugs purchased at pharmacies, 2 people coped with it by resting or sleeping while rubbing eucalyptus oil and drinking warm water, and 1 person consumed turmeric-tamarind herb made by their parents. In addition, 8 out of 10 adolescent girls said they did not know that turmeric-tamarind herb has properties to treat dysmenorrhea.

The existence of natural development and potential possessed by adolescent girls in Pondok Meja Village becomes a great potential. Adolescent girls are able to take advantage of the existing potential properties, namely turmeric-tamarind as first aid in treating dysmenorrhea. Based on the background above, the authors are interested in conducting a study entitled "Effect of routine consumption of turmeric-tamarind herb on dysmenorrhea among adolescent girls in Pondok Meja Village".

## **Methods**

This study is an analytical observational study with a cross-sectional design. The population in this study was all adolescent girls in Pondok Meja Village, Muaro Jambi District, Jambi Province,

totaling 301 people. The total sample of the study was 76 adolescent girls, who were selected using a purposive sampling technique based on inclusion and exclusion criteria. The inclusion criteria included: 1) adolescent girls who lived in Pondok Meja Village; 2) adolescent girls aged 12-21 years, or less than 12 years who were already had menstrual period; 3) adolescent girls who had or had no routine consumption of turmeric-tamarind herb; 4) adolescent girls who were willing to be respondents; 5) adolescent girls who had smartphones (internet users). Meanwhile, the exclusion criteria included: 1) adolescent girls who experienced a disease or abnormality of the reproductive organs; 2) adolescent girls with mental disorders; 3) adolescent girls who were taking analgesic drugs; 4) adolescent girls who could not read and write. The data collection instrument was an online questionnaire containing questions about routine consumption of turmeric-tamarind herb and dysmenorrhea using Menstrual Symptoms Questionnaire (MSQ) which was distributed through a Google form to be accessed via a smartphone. Data collection was carried out from December 2021 to April 2022. Data were analyzed using Chi-Square test and processed using SPSS version 16.0.

## Results

**Table 1.** Distribution of Respondents' Characteristics by Age, Menarche Age, Menstrual Frequency, Length of Menstrual Period, Routine consumption of Turmeric-Tamarind Herb, Dysmenorrhea

Characteristic	Sum (%)	
	N = 76	%
<b>Age (Years)</b>		
14	9	12
15	20	26
16	40	53
17	7	9
<b>Menarche Age (Years)</b>		
10	13	17
11	43	57
12	17	22
13	3	4
<b>Menstrual Frequency (Times)</b>		
46-50	50	66
51-55	0	0
56-60	16	21
61-65	4	5
66-70	0	0
71-75	6	8
<b>Length of Menstrual Period (Days)</b>		
5	4	5
6	19	25
7	40	53
8	13	17
<b>Routine consumption of Turmeric-Tamarind Herb</b>		
Good	38	50
Bad	38	50
<b>Dysmenorrhea</b>		
Had Primary Dysmenorrhea	46	61
No Primary Dysmenorrhea	30	39

Source: Primary data

Table 1 shows that 53% of respondents aged 16 years, 57% of respondents had their first menarche at the age of 11 years, most of respondents (66%) had menstrual frequency of 46-50 times, 53% of respondents experienced 7 days in a menstrual cycle, 50% of respondents had routine

consumption of turmeric-tamarind herb and 50% of respondents did not have routine consumption of turmeric-tamarind herb. 61% of respondents experienced primary dysmenorrhea and 39% of respondents did not experienced primary dysmenorrhea.

**Table 2.** Effect of Routine Consumption of Turmeric-Tamarind Herb on Dysmenorrhea among Adolescent Girls

<b>Routine Consumption of Turmeric-Tamarind Herb</b>	<b>Primary Dysmenorrhea</b>	<b>No Primary Dysmenorrhea</b>	<b>Sum</b>	<b>p-value</b>	<b>OR 95% CI</b>
Yes	11	27	38	0.001	0.035
No	35	3	38		(0.09-0.138)
<b>Total</b>	43	33	76		

Source: Chi-square test primary data

Table 2 showed that there was an effect routine consumption of turmeric-tamarind herb on dysmenorrhea among adolescent girls. The Chi-Square test obtained a level of significance of  $p=0.001 < \alpha 0.05$ . Adolescent girls who did not routinely consume turmeric-tamarind herb had a 0.035 times higher probability of experiencing primary dysmenorrhea than those who routinely consume turmeric-tamarind herb. Adolescent girls who routinely consumed turmeric-tamarind herb did not experience dysmenorrhea.

## Discussion

Table 1 shows that 53% of adolescent girls in Pondok Meja Village aged 16 years. Primary dysmenorrhea occurs when a woman has her first menstrual period, increases during a woman's age of 15-17 years and will reach its highest level in 20-24 years then stops when the woman becomes pregnant and gives birth (Indahwati et al., 2017). A study conducted by Rahayu et al (2018) showed that the mean age of respondents who experienced dysmenorrhea was 20 years with the mean length of menstrual period of 7 days. In this study, 57% of respondents experienced the first menarche at the age of 11. The first menstrual period experienced by a woman or what is called menarche is usually experienced in the age range of 10-16 years (middle adolescence). A study conducted by Larasati et al (2016) found that women who experienced menarche less than 12 years tended to be 23% more likely to experience dysmenorrhea than women who experienced menarche at the age of 12-14 years. Furthermore, regarding the menstrual frequency, most of respondents (66%) had 46-50 times of menstrual period. Primary dysmenorrhea usually occurs 6 to 12 months after menarche and generally lasts 8 to 72 hours. The more a woman have menstrual period after the first menarche, the dysmenorrhea pain will continue to increase (Larasati, T. A. & Alatas, 2016). In addition, 53% of adolescent girls in Pondok Meja Village experienced 7 days in a menstrual cycle. Women with Menstrual Period of more than 5-7 days had 1.9 times the tendency to experience dysmenorrhea (Larasati, T. A. & Alatas, 2016).

This study revealed that 50% of adolescent girls in Pondok Meja Village routinely consumed or had a habit turmeric-tamarind herb. Habit is defined as a series of actions of a person that are done repeatedly in the same way or something that is commonly done. Besides, it is also interpreted as a pattern that a person does repeatedly in certain situations (Sugiharti & Febriana, 2021). Of all adolescent girls in Pondok Meja Village who routinely consumed turmeric-tamarind, 58% of them consumed it 1 time per day, 16% of them consumed it 2 times a day, and 26% of them consumed it 3 times a day, with an approximately 150 ml in volume each time they consumed. Such herb was taken 2 days (46%), 4

days (20%), 6 days (34%) during the menstrual cycle. In addition, 82% of them consumed it in the 1 day before until the 3<sup>rd</sup> day of menstrual period, and 18% of them consumed it in 2 days before until the 2<sup>nd</sup> day of menstrual period.

A similar study was conducted by Fatmawati et al (2020) among 35 adolescent girls aged 12-18 years who were not married and had experienced menstrual period. The intervention was administration of turmeric-tamarind herb therapy 1 time a day for 4 days as much as 150 ml which was carried out 2 days before until the 2<sup>nd</sup> day of menstrual period. Furthermore, menstrual pain was assessed 1 hour after being given intervention. It was found that some respondents experienced mild pain before the turmeric-tamarind herb therapy. Meanwhile, after turmeric-tamarind herb therapy, most of the respondents had no pain (Fatmawati et al., 2020).

Adolescent girls who routinely consumed turmeric-tamarind herb were those who consumed it repeatedly and regularly, at least ten times in a certain period of time. It was carried out under the awareness of the goal, with no personal analysis and specific consideration when doing so (Sugiharti & Febriana, 2021). In this study, out of 50% of adolescent girls who consumed turmeric-tamarind herb, all consumed it for more or equal to 10 times (100%) to relieve dysmenorrhea. Such finding indicated that the adolescent girls consumed turmeric-tamarind herb at least in 10 periods or 10 menstrual cycles repeatedly and regularly. The turmeric-tamarind herb was consumed by the adolescent girls before the menstrual period which was known based on the calendar.

The turmeric-tamarind herb consumed by 50% of adolescent girls in Pondok Meja Village was obtained from herbal medicine depots (21%), stalls/supermarkets (34%), itinerant herbalists (26%), and homemade (18%). Pondok Meja Village developed turmeric cultivation under newly planted rubber tree stands, to utilize and at the same time clear the land in their respective gardens. In addition, the youth of Pondok Meja Village have succeeded in developing processed turmeric plant products, one of which is herbal medicine. It should be considered that the existing potential can be utilized to make turmeric-tamarind herb as an alternative for relieving dysmenorrhea.

Dysmenorrhea is the medical term for menstrual pain due to uterine contractions caused by an increase in the levels of prostaglandin hormone. The existing theory explains that dysmenorrhea is divided into two, one of which is primary dysmenorrhea, which is generally harmless, does not cause complications and is not due to disease, although the complaints it causes can interfere with daily activities (Kartilah et al., 2020). The current study showed that most of adolescent girls in Pondok Meja Village (61%) experienced primary dysmenorrhea. Primary dysmenorrhea can be caused by several risk factors including age, menarche age, menstrual frequency, and length of menstrual period.

Table 2 revealed that most of adolescents who routinely consumed turmeric-tamarind herb did not experience dysmenorrhea. Chi-Square obtained a p-value of  $0.001 < \alpha = 0.05$ . Such finding indicated that there was an effect of routine consumption of turmeric-tamarind herb on dysmenorrhea among adolescent girls in Pondok Meja Village. Furthermore, based on the OR calculation, it was revealed that adolescent girls who did not routinely consume turmeric-tamarind herb had a 0.035 times higher probability of experiencing primary dysmenorrhea than those who routinely consume turmeric-tamarind

herb. In other words, it can be said that adolescent girls who did not routinely consume turmeric-tamarind herb had a primary dysmenorrhea probability of  $1/0.035 = 27.168$  times = 27 times higher than those who routinely consumed turmeric-tamarind herb.

Turmeric contains curcumin that function as antioxidants, anti-inflammatories, and analgesics. On the other hand, tamarind fruit contains flavonoids as antioxidants, anti-inflammatory, anti-pyretic and sedative. Turmeric rhizome has the highest antioxidant content compared to the other parts. Certain parts used in the manufacture of turmeric-tamarind herb are the tamarind fruit or leaves. Turmeric-tamarind herb with a 5% turmeric extract formula has a fairly high antioxidant content of 0.123%, vitamin C 0.688 mg/100 g (Mulyani et al., 2014). A previous study (Kusteja et al., 2019) was conducted among 88 high school students who were assigned into 2 groups, both received interventions namely ginger drink and turmeric-tamarind herb. It was found that consuming turmeric-tamarind herb was more effective in relieving primary dysmenorrhea compared to ginger drink. Another study (Marsaid et al., 2017) also proved that turmeric-tamarind extract was effective in relieving dysmenorrhea among adolescent girls.

This study found a significant difference in the incidence of primary dysmenorrhea between adolescent girls who routinely consumed turmeric-tamarind herb and those who did not routinely consume turmeric-tamarind herb. The study finding supported the hypothesis that routine consumption of turmeric-tamarind herb could relieve the symptoms of primary dysmenorrhea. This is in accordance with the theory which states that turmeric-tamarind herb with analgesic, anti-inflammatory, antipyretic, and sedative properties is able to respond to sympathetic nerve stimulation from the stressful state of adolescent girls due to its activities. The ability of active ingredients in turmeric rhizomes and tamarind fruits which were then processed into turmeric-tamarind herb was able to inhibit the action of cyclooxygenase enzymes so as to reduce inflammation that occurs due to the release of prostaglandins during menstrual period. It further suppresses autonomic nervous activity and excessive uterine contractions and reduces emotional stress. Thus, adolescent girls who routinely consumed turmeric-tamarind herb did not experience primary dysmenorrhea (MoH, 2015).

## Conclusions

Analysis results revealed that there was an effect of routine consumption of turmeric-tamarind herb on dysmenorrhea among adolescent girls in Pondok Meja Village. Adolescent girls who did not routinely consume turmeric-tamarind herb had a 27 times higher probability of experiencing primary dysmenorrhea than those who routinely consume turmeric-tamarind herb. It is expected that adolescent girls can seek information about dysmenorrhea as well as non-pharmacological therapies to manage the symptoms of dysmenorrhea, as well as get used to consume turmeric-tamarind herb as an alternative for relieving dysmenorrhea that can interfere with daily activities.

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