

Effects of Ginger Brown Sugar Decoction on Reducing Primary Dysmenorrhea Pain with Yang Deficiency Syndrome

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ABSTRACT

Menstrual pain (dysmenorrhea) affects approximately 45–95% of women of reproductive age in Indonesia and may interfere with daily activities. Dysmenorrhea is a gynecological disorder caused by an imbalance of progesterone in the blood, leading to pain. In Traditional Chinese Medicine (TCM), dysmenorrhea is referred to as tongjing and is often associated with yang deficiency syndrome. Ginger and palm sugar decoction has natural warming, anti-inflammatory, and analgesic effects, making it suitable for treating cold-type menstrual pain based on TCM principles. Objective: To determine the effect of ginger and palm sugar decoction on reducing primary dysmenorrhea in adolescents with yang deficiency syndrome. Methods: A quantitative study using a single-group pretest-posttest design without a control group. A total of 20 adolescent girls aged 10–18 were given the decoction three times a day for two days. The study was conducted at Mitshaqul Ummah Islamic Boarding School, Cianjur Regency. Results: The average pain score decreased from 4.10 to 1.75 after intervention. The Paired Sample T-Test showed a t-value of 14.104 ($df = 19$) with a significance level of $p < 0.001$, indicating a statistically significant reduction in pain. A 50% decrease was also found in seven key indicators of yang deficiency symptoms, based on a TCM physical constitution questionnaire. Conclusion: Ginger and palm sugar decoction significantly reduces the severity of primary dysmenorrhea and alleviates symptoms of yang deficiency. These findings are consistent with TCM principles, which emphasize warming the body and strengthening yang energy to relieve pain.

KEYWORDS

Dysmenorrhea, ginger decoction, palm sugar, yang deficiency syndrome.



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INTRODUCTION

Reproductive health is essential knowledge for adolescents. One of the earliest changes in adolescent reproductive health is menstruation, which can lead to dysmenorrhea (Gaferi et al., 2018; Wong, 2018). Dysmenorrhea is a gynecological complaint caused by an imbalance in progesterone levels in the blood, resulting in pain (Putra, 2024). Dysmenorrhea affects daily activities but is often inadequately treated or even ignored, as many adolescents prefer to suffer in silence and avoid seeking medical treatment. Many teenagers consider dysmenorrhea embarrassing and taboo, treating the pain as something that must be tolerated during menstruation (Itani et al., 2022).

The World Health Organization (WHO) reports the prevalence of dysmenorrhea globally, with 124,259 non-pregnant women, both with and without endometriosis, showing prevalence rates ranging from 8.8% in women hospitalized (ages 19–41) to 94% in girls aged 10–20 years (Francavilla et al., 2023). In Indonesia, the prevalence of dysmenorrhea is 64.2%,

with 54.9% experiencing primary dysmenorrhea and 9.4% experiencing secondary dysmenorrhea (Kusyanti & Drusila Jakoba Fay, 2023).

In Traditional Chinese Medicine (TCM), dysmenorrhea is known as *tongjing*. It is caused by a deficiency syndrome, often linked to a lack of warm energy (*yang*) in the body, poor blood circulation, and weakness in certain organs such as the kidneys, spleen, and uterus. This syndrome is typically marked by symptoms such as a cold sensation, fatigue, and menstrual pain, which worsen in cold weather. Improper eating and drinking habits can exacerbate this deficiency syndrome by impairing the spleen's function to transform and transport energy (*qi*), leading to dysmenorrhea (Arianti, 2020).

The management of dysmenorrhea varies depending on its classification. Primary dysmenorrhea is menstrual pain not caused by underlying medical conditions but by increased prostaglandin levels, which cause excessive uterine contractions (Saka et al., 2018). Treatment for primary dysmenorrhea can be managed with nonsteroidal anti-inflammatory drugs (NSAIDs). Secondary dysmenorrhea, on the other hand, is characterized by menstrual pain due to underlying pathological conditions, such as uterine infections, cysts, or tumors in the reproductive tract. Treatment focuses on addressing the underlying condition causing the menstrual pain (Fajria, 2024). Secondary dysmenorrhea is rare in adolescents, making health education crucial for addressing this condition in teenagers.

In the treatment of dysmenorrhea pain, an alternative traditional approach widely used is the application of herbal remedies. Ginger (*Zingiber officinale*) contains gingerol and shogaol, which inhibit prostaglandin synthesis (Rahnama et al., 2022). Ginger has long been known for its anti-inflammatory and analgesic properties that help alleviate menstrual pain, particularly in dysmenorrhea associated with deficiency syndrome (Japaries, 2022). Clinical studies have shown that a dose of 750–2000 mg/day of ginger can reduce dysmenorrhea pain by lowering the NRS score by 2–3 points (Daily et al., 2020).

Similarly, brown sugar (*Arenga pinnata*) in TCM is considered warm (*yang*) and helps restore *qi* energy, making it suitable for deficiency syndromes (Zhao et al., 2020). The use of herbal plants to address health issues traditionally has shown its role in public health efforts (Anwar et al., 2024). Although herbal remedies such as ginger and brown sugar are popular for treating dysmenorrhea, scientific evidence regarding their effect on alleviating dysmenorrhea pain—particularly in adolescents with deficiency syndrome—remains limited.

Despite the widespread use of herbal remedies such as ginger and brown sugar for treating dysmenorrhea, scientific evidence regarding their effect on alleviating dysmenorrhea pain remains limited, particularly in adolescents with *yang* deficiency syndrome. Current research predominantly focuses on pharmaceutical interventions, leaving a significant gap in evidence-based traditional treatments. This gap is particularly concerning given that many adolescents in Indonesia, especially those in *pesantren* (Islamic boarding schools), prefer traditional remedies due to cultural beliefs and accessibility issues.

Previous studies have primarily examined individual components of traditional remedies or focused on general dysmenorrhea populations without considering TCM constitutional patterns. For instance, while some studies have investigated ginger's anti-inflammatory properties, few have explored the synergistic effects of ginger combined with brown sugar specifically for *yang* deficiency-type dysmenorrhea in adolescents. This study fills this critical gap by integrating TCM diagnostic principles with modern research methodology.

This study aims to further explore the effect of ginger and brown sugar decoction on reducing primary dysmenorrhea pain, making it an effective, safe, and locally-based non-pharmacological therapy. The title of the study is "**The Effect of Ginger and Brown Sugar Decoction on Reducing Primary Dysmenorrhea Pain with a Deficiency Syndrome.**"

The basic hypothesis or assumption is a temporary answer to a problem that is still presumptive because it has yet to be proven true. This provisional answer will be tested for accuracy using data collected through research (Syafnidawat, 2020). The hypotheses established in this study are as follows:

1. **Null hypothesis (H_0):** There is no significant effect of ginger and brown sugar decoction on reducing dysmenorrhea pain levels in adolescent girls with deficiency syndrome.
2. **Alternative hypothesis (H_1):** There is a significant effect of ginger and brown sugar decoction on reducing dysmenorrhea pain levels in adolescent girls with deficiency syndrome.

METHOD

This study uses a quantitative method with a quasi-experimental design, specifically the pretest–posttest one-group design. This design is used to measure the effectiveness of an intervention involving ginger and brown sugar decoction in reducing dysmenorrhea pain levels. In this design, the research subjects are given an initial measurement (pretest) to determine their pain levels before the intervention. Afterward, they are treated with the ginger and brown sugar decoction during menstruation, followed by a posttest to assess any changes in pain levels after the intervention (Sugiyono, 2017).

According to Asrulla et al. (2023), the population refers to the entire group or elements that have certain characteristics to be studied. The population in this study consists of adolescent girls from *Ponpes* Mitshaqul Ummah Yayasan Gunung Gede in Cianjur, West Java. Sampling is a part of the population or a representative subset that is researched and can represent the entire population. This study uses purposive sampling with specific criteria. The inclusion criteria for the sample are:

- a. The subjects must have dysmenorrhea with a deficiency syndrome and a pain scale above 4.
- b. The subjects must be female adolescents aged 10–18 years (according to the Ministry of Health RI).
- c. The subjects must not be undergoing any other treatment.
- d. The subjects must be willing to participate in the study and consume the ginger and brown sugar decoction three times a day for two days.

The exclusion criteria include:

- a. Withdrawal from the study.
- b. Failure to follow the therapy schedule consistently.

Variables

Independent Variable (IV): The independent variable in this study is the intervention of ginger and brown sugar decoction, which is given three times a day for two days.

Dependent Variable (DV): The dependent variable is the change in pain levels.

Time and Location of the Study

Preliminary research will be conducted in January 2025 to assess the conditions of potential respondents through brief interviews regarding menstrual pain. The main research will take place from May to July 2025 at *Ponpes* Mitshaqul Ummah Yayasan Gunung Gede in Cianjur, West Java.

Data Collection Procedure

The data collection procedure in this study will involve three stages: pre-interaction, interaction, and termination.

- In the pre-interaction stage, the researcher verifies the subjects' data to ensure they meet the criteria. The researcher prepares the herbal ingredients, including dried ginger, brown sugar, and water, along with the necessary equipment to boil the ingredients. Safety and health protocols (*K3*) are followed throughout the intervention process.
- In the interaction stage, the researcher greets the subjects, introduces themselves, and conducts an anamnesis to obtain initial information about the subjects' conditions. The researcher ensures the subjects are comfortable and follow hygiene protocols by washing hands before conducting a physical examination. If the subject experiences dysmenorrhea accompanied by fever, their body temperature is measured. The researcher also performs palpation of the pulse and lower abdomen to detect tenderness, muscle tension, or uterine enlargement. A photo of the subject's tongue is also taken as supporting data. After the examination, the subject is given the ginger and brown sugar decoction, ensuring that it is consumed for two consecutive days according to the prescribed dosage.
- In the termination stage, the researcher evaluates the subjects' responses to the treatment. A follow-up session will be scheduled if necessary. The researcher then summarizes the results of the intervention process.

Data Types and Sources

Primary Data: The main information gathered directly by the researcher. Primary data aims to address the issues under investigation. In this study, primary data are collected through direct interaction with the subjects, including interviews, direct observation, and the use of questionnaires (Ahmad et al., 2024). The primary data source is directly obtained from the respondents—specifically, the dysmenorrhea pain levels measured before and after the administration of ginger and brown sugar decoction using the Numeric Rating Scale.

Secondary Data: Secondary data are also used in this study to support the analysis and provide contextual background.

The research instruments include:

1. Informed Consent Form
2. Respondent consent form
3. Observation sheet containing the subject's identity and pain level measurements before and after the intervention
4. The tools and ingredients for preparing the ginger and brown sugar decoction, along with the Numeric Rating Scale

The data processing steps in this study include editing, coding, data entry, and tabulation.

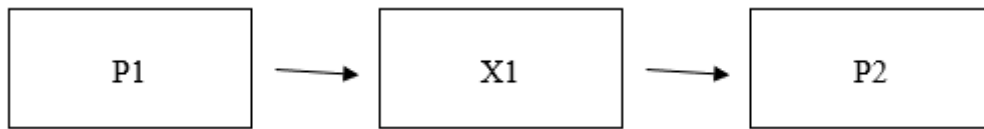


Figure 4. 1 Research design
Source: Primary Data, 2025

P1 : *Pre-test* is done before being given treatment.

X1 : Treatment is given to the research subject.

P2: The final test (*Post-test*) is carried out after being given treatment.

RESULT AND DISCUSSION

Overview of Research Locations

This research was conducted at Pondok Pesantren Mitshaqul Ummah in Cianjur, West Java, chosen for its peaceful and structured environment ideal for observing adolescents. The pesantren, which operates as a full-boarding Islamic institution, is home to female students aged 10-18, a group susceptible to dysmenorrhea. The management provided full support, ensuring smooth data collection and intervention scheduling without disrupting the students' routines. The research focused on administering ginger and brown sugar decoction to relieve dysmenorrhea. The serene, cool environment positively impacted the respondents, while strict adherence to protocols ensured the validity of the data. The study demonstrated that the pesantren setting is an effective venue for applying local herbal treatments for menstrual pain, making it a potential model for future research.

Data analysis results

Descriptive Analysis of Scoring Deficiency Syndrome (Before and After Intervention)

The number of respondents: 20 people obtained results before the intervention: respondents with high scores (4-5) on several main indicators of deficiency syndrome such as: 1) Hands and feet feel cold; 2) Fear of cold/easy cold; 3) Less resistant to air conditioning/cold weather; 4) Easy diarrhea after cold consumption. Almost all respondents showed a score of "Yes" or "Leaning to Yes" at the conclusion of the deficiency syndrome.

Outcomes after the intervention showed a significant decrease in scores on all physical indicators of the deficiency syndrome. Many respondents who were previously at a score of 3–5, dropped to 1–2. Almost all respondents moved to the conclusion "No" or "Leaning to No" for the deficiency syndrome. Some individuals who originally had 4–5 symptoms now show only 1–2 mild symptoms

From the questionnaire answered by the respondents, it was obtained:

- a. There was a consistent reduction in deficiency syndrome symptoms in all participants after the intervention by consuming ginger decoction and brown sugar.
- b. Almost all respondents who were originally categorized as "Yes" or "Leaning to Yes" shifted to the "No" category, indicating recovery from the symptoms experienced.
- c. The effects of the intervention support the principle of Traditional Chinese Medicine which states that ginger and brown sugar warm the body and increase its energy.

Univariate Analysis Results (Frequency Distribution)

The univariate analysis aimed to describe the main characteristics of the pain level data collected before and after the intervention of brown sugar ginger decoction. This study used the Numeric Rating Scale (NRS) to assess the level of dysmenorrhea pain, with a value range of 0 to 10. The data analyzed came from 20 respondents who had met the inclusion criteria and followed all therapy procedures well. The results of descriptive statistical analysis showed a striking change in the average value of pain between pretest and posttest. This analysis is the initial basis for identifying the effects of interventions before further hypothesis testing.

Based on the results of data processing, the mean value of the pain level before the intervention (pretest) was 4.10 with a standard deviation of 0.79. Meanwhile, after the intervention (posttest), the average value of pain level decreased to 1.75 with a standard deviation of 0.55. The range of pretest scores ranged from 3 to 5, which indicated that most respondents experienced moderate pain. Meanwhile, the posttest score range is between 1 to 3, indicating a shift in pain conditions to mild. This decrease in pain score provides a strong indication of the effectiveness of giving ginger and brown sugar decoction as nonpharmacological therapy.

In addition to the decrease in the average score, the calculation of the difference between the pretest and posttest scores showed that all respondents experienced a decrease in pain levels, with an average difference of 2.35 points. This reflects that the interventions carried out are consistent across the entire sample. The largest difference in decline reaches 4 points, while the smallest is 1 point. None of the respondents experienced increased pain or no changes, indicating that the intervention had a noticeable and comprehensive effect. This success reinforces the initial finding that ginger and brown sugar decoction therapy can be widely applied in adolescents with primary dysmenorrhea.

The distribution of data also showed that the majority of respondents experienced a decrease of two to three levels of pain scale, which indicates the biological effectiveness of the active components in ginger and brown sugar. The gingerol and shogaol content in ginger are known to have analgesic and anti-inflammatory effects that are able to inhibit the synthesis of prostaglandins, which are substances that trigger uterine contractions that cause menstrual pain. Meanwhile, brown sugar serves as an energy booster and body warmer in the perspective of Traditional Chinese Medicine. The combination of these two ingredients is not only effective, but also safe and easy to accept among teenagers. These results provide early evidence that traditional herbal remedies can be a valid alternative to pharmacological treatment.

Overall, the results of the univariate analysis provide a strong descriptive picture of the effect of ginger and brown sugar decoction on the reduction of primary dysmenorrhea pain. Normal data distribution, consistent reduction in pain scores, and absence of extreme or outlier data, reinforce the validity of the analysis. Furthermore, to test the significant relationship between the variables before and after the intervention, a bivariate analysis was carried out using the Paired Sample T-Test statistical test which will be described in the next section. Thus, the results of this univariate analysis form a strong basis for initial conclusions about the influence of the interventions given.

Bivariate Analysis Results

Bivariate analysis in this study was used to test the hypothesis regarding differences in pain levels before and after the intervention of ginger and brown sugar decoction. Because the data came from the same group and in pairs (pretest and posttest), the Paired Sample T-Test was used. Before the t-test was performed, it was first confirmed that the data was normally distributed through the Kolmogorov-Smirnov normality test ($p = 0.062 > 0.05$), so that the parametric requirements were met. This analysis aims to determine whether the decrease in pain is statistically significant or just a coincidence. The results of the t-test showed a significant difference between the two conditions.

Based on the results of the Paired Sample T-Test, the average value of the pain score difference between the pretest and posttest was 2.35 points. The t-value = 14.104 with a degree of freedom (df) of 19, and the significance value (p-value) < 0.001 . Since the p-value is much smaller than the significance limit of 0.05, the null (H_0) hypothesis is rejected. This means that there is a statistically significant difference between pain levels before and after the administration of ginger and brown sugar decoctions. These findings support the alternative hypothesis (H_1) that herbal interventions exert a significant influence on the reduction of dysmenorrhea pain.

Table 1. Paired Sample T-Test Results

Test Pairs	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pretest – Posttest Pain Score	2.35	0.745	0.167	14.104	19	<.001

Source: Data processed, 2025

Interpretation of these data showed that all respondents experienced a decrease in pain after therapy, without exception. A high t-value indicates a strong intervention effect, while a very small p-value indicates that the likelihood of this outcome occurring by chance is very low ($<0.1\%$). The effect of this intervention is not only statistically significant, but also has clinical significance due to the difference in average of more than 2 points on the NRS scale. Thus, a decoction of ginger and brown sugar has been shown to be effective as an alternative therapy to reduce pain in dysmenorrhea disorder in adolescents with the deficiency syndrome.

The results of this analysis answer the formulation of the second problem, namely: "What is the difference in pain intensity before and after the administration of brown sugar ginger decoction in adolescents with primary dysmenorrhea and *deficiency syndrome*?" The answer is that there are significant and consistent differences, with all subjects showing improvement. This effectiveness opens up opportunities for wider application in community settings based on Islamic boarding schools, households, and traditional health services. This simple intervention is not only inexpensive and easy to implement, but also in accordance with the principles of Traditional Chinese Medicine that pay attention to the balance of the body's energy (*Qi* and *Yang*).

Homogeneity Test (*Levene's Test*)

Before hypothesis testing, a homogeneity test was first carried out to find out whether the variance of the two data groups (pretest and posttest) had similarities. This homogeneity test is important to determine the validity of the use of the parametric test, namely *the Paired*

Sample T-Test in the analysis of differences in pain levels. The test was carried out using *Levene's Test for Equality of Variances*, assuming that if the significance value (p-value) > 0.05 then the data variance is considered homogeneous (equal).

Based on the results of the Levene test, the following significance values were obtained:

- Based on mean: $p = 0.692$
- Based on median: $p = 0.602$
- Based on median (adjusted df): $p = 0.602$
- Based on trimmed mean: $p = 0.711$

Table 2. Homogeneity Test Results (Levene's Test)

Based Calculation	Levene Statistic	df1	df2	Sig.
Based on Mean	0.162	1	17	0.692
Based on Median	0.282	1	17	0.602
Based on Median adj. df	0.282	1	16.374	0.602
Based on Trimmed Mean	0.142	1	17	0.711

Source: Data processed, 2025

Interpretation of the *Levene's Test* results shows that the significance value (p-value) of all calculation methods shows a result greater than 0.05 ($p > 0.05$). This shows that there is no significant difference in variance between pretest and posttest scores, or in other words the data has a homogeneous variance. Therefore, the assumption of homogeneity of variance is met and the use of a *paired sample t-test* to test the hypothesis is considered valid and statistically valid.

This finding reinforces the reliability of the results of previous hypothesis tests, as not only are the data normally distributed (based on *the Kolmogorov-Smirnov* normality test), but they also have uniform variance. With the fulfillment of these two main conditions, the statistical analysis used in this study can be said to be appropriate and scientifically accountable.

Hypothesis test (*T-Test*)

T-Test (Paired Sample T-Test)

Hypothesis testing in this study was carried out using a *paired t-test (Paired Sample T-Test)*. This test is used because the data analyzed is the result of two measurements in the same group, namely before (pretest) and after (posttest) the administration of ginger and brown sugar stew. The purpose of this test was to find out if there was a significant difference in the level of primary dysmenorrhea pain after the administration of herbal therapy. Before this test, the data were first tested for normality and homogeneity, and the results showed that the data were normally distributed ($p = 0.062$) and had homogeneous variance ($p = 0.692$). Therefore, the use of a parametric t-test is considered appropriate.

The results of *the Paired Sample T-Test* showed that there was a significant difference between the pretest and posttest values of pain levels. The mean *difference* was 2.35, with a calculated t-value = 14.104, a degree of freedom (df) = 19, and a significance value (p-value) < 0.001. Since the significance value is much smaller than 0.05, the null hypothesis (H_0) stating that there is no difference is rejected, and the alternative hypothesis (H_1) is accepted. Thus, it can be concluded that the administration of ginger and brown sugar decoction has a significant

effect on the reduction of primary dysmenorrhea pain levels in adolescents with the deficiency syndrome. The results of the t-test are presented in the following table:

Table 3. Paired Sample T-Test Results

Test Pairs	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pretest – Posttest Pain Score	2.35	0.745	0.167	14.104	19	<.001

Source: Data processed, 2025

The above data can be interpreted as an average difference value of 2.35 points indicating that ginger and brown sugar decoction provides a clinically significant pain reduction effect. The very high t-value and very low p-value reinforce that this outcome did not occur by chance, but was actually the result of the intervention given. These results also showed consistency of the intervention, as all 20 respondents experienced a decrease in pain levels, with none showing an increase or stagnation. In other words, the effects of the ginger and brown sugar decoction were evenly distributed and effective for the entire sample. Thus, hypothesis testing supports the assertion that there is a significant effect between the administration of ginger decoction and brown sugar on the reduction of primary dysmenorrhea pain with the deficiency syndrome. These findings strengthen the position of herbal therapy as a safe, cheap, and effective non-pharmacological alternative, and are suitable for application in Islamic boarding schools or traditional-based communities.

Normality Test (Kolmogorov-Smirnov Test)

The normality test is performed to ensure that the residual data from the difference in pretest and posttest scores is distributed normally, which is one of the main requirements for the use of parametric tests, such as *the Paired Sample T-Test*. In this study, the normality test was carried out using *the Kolmogorov-Smirnov (K-S)* method with *Lilliefors* correction, and strengthened by *Monte Carlo Simulation* calculations. The data tested were *unstandardized residual values* from the difference in pretest and posttest pain scores. This test is important for the results of statistical analysis to be valid and can be used for further inferences.

The results of *the Kolmogorov-Smirnov* test showed that the test statistical value was 0.188 with a significance value (Asymp. Sig. 2-tailed) = 0.062. In addition, *the results of the Monte Carlo* simulation showed a significance value of 0.061 with a 99% confidence range between 0.055 and 0.067. Since the significance value > 0.05, it can be concluded that the residual data is normally distributed. This means that there is not enough evidence to reject the assumption of normality, so the data is considered eligible for a parametric test.

Table 4. Results of the One-Sample Kolmogorov-Smirnov Test

Statistics Test	Nilai
N	20
Mean Residual	0.000

Std.Deviation	0.713
Test Statistic (Kolmogorov-Smimov)	0.188
Asymp.Sig. (2-tailed)	0.062
Monte Carlo Sig. (2-tailed)	0.061
99% Confidence Interval (MC Test)	0.055-0.067

Source: Data processed, 2025

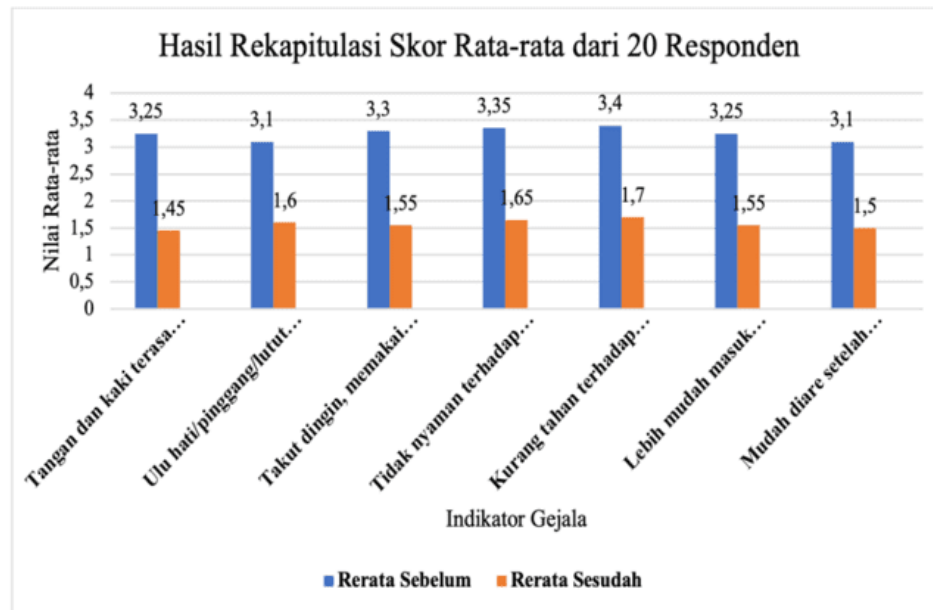
With a p-value of 0.062 (K-S) and 0.061 (*Monte Carlo*), the normality assumption is met. This provides a solid basis for the use of paired ttests because the residual data does not deviate from the normal distribution. This conformity shows that the statistical model used in this study is in accordance with scientific validation standards. In addition, this good normality result also strengthens confidence in the reliability and generalization of the research results. With the fulfillment of the assumptions of normality and homogeneity, as well as significant t-test results, it can be concluded that the administration of ginger and brown sugar decoction in a valid and accountable manner has an effect on the reduction of primary dysmenorrhea pain.

Discussion

This study aims to answer three main questions: 1) What is the level of primary dysmenorrhea pain before and after the administration of ginger and brown sugar decoction in adolescents with the deficiency syndrome? ; 2) Is there a significant difference between the level of pain before and after the intervention? 3) Is ginger and brown sugar decoction effective as an alternative therapy to overcome menstrual pain in adolescent girls in the pesantren environment? Based on the results of the study, the three questions can be scientifically answered through descriptive, inferential, and quantitative analysis based on the deficiency syndrome *questionnaire*. There was a decrease in pain score from an average of 4.10 to 1.75 proving that the intervention had a significant clinical impact on reducing the intensity of dysmenorrhea. Not only that, the results of the questionnaire of physical symptoms of deficiency syndrome *also* showed a very significant decrease in seven main indicators after the administration of ginger and brown sugar decoction. This signifies that the intervention not only reduces pain subjectively, but also improves physical constitutional conditions in the perspective of Traditional Chinese Medicine (PTT).

Changes in the physical symptoms of the deficiency syndrome

To strengthen the answers to the first and third questions, a comparative analysis of the physical symptoms of deficiency syndrome *was* conducted based on questionnaires before and after the intervention. The following are the results of the recapitulation of the average scores of 20 respondents:



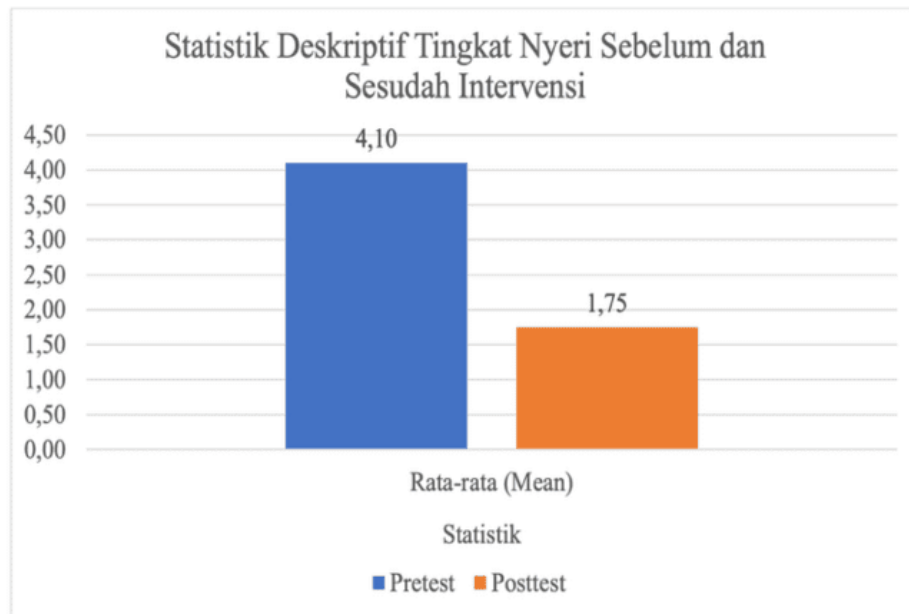
Graph 1. Physical Constitution

Source: Primary Data, 2025

From the data, it can be concluded that all indicators of physical symptoms experienced an average decrease of more than 50%, which shows the success of therapy in restoring *qi*'s balance, improving blood circulation, and strengthening vital organs such as the kidneys and spleen. In the context of PTT, symptoms such as easy coldness, lethargy, and indigestion are classic manifestations of *the deficiency*, which is often the root cause of primary dysmenorrhea in adolescents. A decoction of ginger and brown sugar, which has warm properties and strengthens the body's energy, is shown to significantly reduce all such manifestations. Therefore, the answer to the first question is getting stronger, that before the intervention the condition of deficiency *is* quite dominant, and after the intervention the symptoms decrease drastically.

Confirmation of the Answer to the Second Question: Statistical Significance

To answer the second question, a hypothesis test was carried out using a paired t-test (Paired Sample T-Test). The test results showed a t count = 14.104 with a p-value < 0.001, which means that there was a statistically significant difference between before and after the intervention. This means that the decrease in pain scores and symptoms of the syndrome does not occur due to chance or other external factors, but is the result of the effectiveness of ginger and brown sugar decoction as the main therapy.



Graph 1. Pain Scale

Source: Primary Data, 2025

Therapeutic Effectiveness in Scientific and Holistic Approaches

Answering the third question, the therapeutic effectiveness of ginger and brown sugar decoction is not only demonstrated by statistical data, but also strengthened by theoretical and practical approaches. Ginger contains gingerol and shogaol which are anti-inflammatory, antispasmodic, and analgesic, and work directly in inhibiting the production of prostaglandins that trigger uterine contractions. In the PTT approach, ginger also has a way of working to increase *the qi* to ward off cold so that it can break the stagnation that causes pain. Brown sugar contains minerals and has the properties of warming as well as strengthening *qi*, which synergistically helps to address the main cause of primary dysmenorrhea due to *the deficiency syndrome*.

The Role of the Environment and the Holistic Approach

In addition to physiological factors, psychological and spiritual aspects also play an important role. The pesantren environment, which is calm and religious, creates a stable and supportive atmosphere, which helps speed recovery. From a health psychology perspective, social support and positive mental states can reduce pain perception through the mechanism of stress hormone reduction and endorphin enhancement. This proves that herbal therapy becomes more effective when applied in a holistic approach, which involves physical, mental, social, and spiritual aspects.

Overall, the results of this study were obtained that ginger and brown sugar stew:

- Statistically and clinically significant in reducing primary dysmenorrhea pain ($p < 0.001$),
- Reduced all physical symptoms of deficiency syndrome *by* more than 50%, based on questionnaires,
- Effective as an alternative therapy based on local wisdom that can be applied in the pesantren environment,
- Supported by the theory of Traditional Chinese Medicine and modern scientific evidence,
- Safe, easy to accept, and does not cause side effects,

It is useful in the context of traditional adolescent health services and opens up opportunities for the development of integrative therapies that combine scientific approaches and local cultures.

CONCLUSION

The research findings demonstrate that ginger and brown sugar decoction effectively reduces pain and alleviates symptoms in adolescents with primary dysmenorrhea and *yang* deficiency syndrome. Before the intervention, participants reported moderate pain levels averaging 4.10, which significantly decreased to 1.75 after two days of treatment, indicating a shift from moderate to mild pain. Additionally, *yang* deficiency symptoms such as cold sensitivity and cold-induced diarrhea showed notable improvement, with average scores dropping from 3.25 to 1.55. Statistical analysis confirmed these results, with a Paired Sample T-Test revealing a significant difference ($t = 14.104$, $p < 0.001$) and an average pain reduction of 2.35 points across all respondents. The therapy's effectiveness aligns with Traditional Chinese Medicine principles, as it not only reduced pain but also improved systemic energy balance by warming the body and strengthening *yang* energy. To further validate and expand these findings, future research should focus on controlled clinical trials with larger sample sizes, long-term follow-up studies, and dosage optimization to determine the most effective concentrations of ginger and brown sugar. Comparative studies could assess this decoction against conventional treatments, while mechanistic studies may explore the biochemical pathways behind its therapeutic effects. Furthermore, implementation research is needed to integrate this therapy into formal healthcare systems, and cultural adaptation studies could evaluate its effectiveness across diverse populations. These steps would strengthen the evidence base and support the integration of traditional medicine into modern healthcare, offering accessible and cost-effective treatment options for adolescent dysmenorrhea while respecting cultural health practices.

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