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The effect of green coconut water consumption on reducing the intensity of dysmenorrhea in adolescent girls

Endang Tri Wulandari, Ana Mariza*, Fijri Rachmawati, Nurul Isnaini

Bachelor of Midwifery Program, Faculty of Health Sciences, Malahayati University

Corresponding author: *Email: anamariza@malahayati.ac.id

Abstract

Background: Dysmenorrhea in adolescent girls occurs due to hormonal imbalances, particularly a decrease in progesterone levels in the blood, resulting in pain during menstruation. The prevalence of dysmenorrhea in Indonesia is 64.25%, and the results of a pre-survey of 15 adolescents girls who had menstruated at SMPN 2 Seputih Banyak on February 17, 2025 showed that 7 (46.7%) of them experienced dysmenorrhea. If left untreated, dysmenorrhea can lead to pathological conditions, potentially increasing mortality rates and contributing to infertility. One of the alternative efforts to alleviate dysmenorrhea is through the consumption of green coconut water.

Purpose: to determine the effect of green coconut water consumption on the reduction of dysmenorrhea intensity among adolescent girls.

Method: This research employed a quantitative approach using a quasi-experimental method with a pretest-posttest control group design. The population consisted of all eighth-grade female students at SMPN 2 Seputih Banyak, totaling 57 individuals, with a sample of 30 participants. The sample was divided equally into an experimental group (15 participants) and a control group (15 participants), selected using purposive sampling. Data analysis was conducted using the Mann-Whitney test.

Results: The results showed a decrease in the average dysmenorrhea pain score in the intervention group from 5.04 before the administration of green coconut water to 1.93 afterward. Meanwhile, in the control group, the average pain score decreased from 5.13 during the pretest to 2.93 in the posttest, despite no intervention being given. Statistical analysis indicated a significant effect of green coconut water consumption on reducing the intensity of dysmenorrhea in adolescent girls, with a p-value of 0.000.

Conclusion: Indicated a significant effect of green coconut water consumption on reducing the intensity of dysmenorrhea in adolescent girls.

Suggestion: The adolescent girls expected consider green coconut water as a natural alternative for relieving dysmenorrhea.

Keywords: Adolescent Girls; Dysmenorrhea Pain; Green Coconut Water.

INTRODUCTION

Adolescence is an important transitional period in human life, marked by significant physical, psychological, and biological changes. In adolescent girls, one of the most fundamental biological changes is the onset of the menstrual cycle, which signals the maturation of the reproductive system (Adhistry, 2023). However, in the process, many adolescent girls experience various menstrual

disorders, with dysmenorrhea or menstrual pain being the most common complaint and having a serious impact on the quality of life of adolescents (Saalino, Sampe, & Rante, 2023).

The occurrence of dysmenorrhea in adolescent girls is caused by an imbalance of progesterone hormones in the blood, resulting in pain. Low progesterone levels cause the formation of large

amounts of prostaglandins, which increase the rate of uterine muscle contractions and cause dysmenorrhea. Prostaglandins cause the uterine muscles to contract as an inflammatory reaction to the shedding of the uterine wall. High prostaglandin levels can cause severe abdominal pain and cramps (Triningsih & Mas'udah, 2023).

Primary dysmenorrhea, defined as menstrual pain without any pathological abnormalities in the reproductive organs, has a very high prevalence among adolescent girls (Dharmapuri, 2019). According to 2020 data from the World Health Organization (WHO), the incidence of dysmenorrhea is 1.769.425 (90%) women suffering from dysmenorrhea, with 10%-16% suffering from severe dysmenorrhea. The incidence of dysmenorrhea worldwide is very high. On average, more than 50% of women suffer from it (Sari & Damayanti, 2024). The incidence of dysmenorrhea in Indonesia is 64.25%, which comes from 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea (Rivanica, Bahri, & Handayani, 2025). The incidence rate of dysmenorrhea among adolescents in Lampung Province is estimated to be 1.12% to 1.35% of the total number of sufferers who seek medical attention (Yuviska & Yuliasari, 2024).

Untreated dysmenorrhea can lead to pathological conditions and can cause or trigger an increase in mortality rates and also have an impact on infertility (Horman, Manoppo, & Meo, 2021). In addition, the effects of dysmenorrhea on women include physical weakness, lack of movement, and stress. Because of menstrual pain, many young women go to the doctor for consultation and treatment. Pain felt before and during menstruation is often accompanied by nausea, dizziness, and weakness (Nadhiroh, 2022). This pain is so severe that it forces sufferers to rest, often causing women to leave their jobs and, in the case of teenage girls, to be absent from school and not participate in the learning process. As a result, learning activities can be disrupted, concentration can decrease or even disappear, and the material taught during the learning process cannot be absorbed by teenage girls experiencing dysmenorrhea (Herawati & Muna, 2022).

There are various approaches that can be taken to treat dysmenorrhea, both pharmacological and non-pharmacological. The use of pain medications

classified as Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) is common, but long-term use can cause side effects such as digestive disorders, kidney dysfunction, and dependence (Wati, Tampubolon, & Utami, 2024). This has led to growing interest in safer and more sustainable natural treatment alternatives. Non-pharmacological therapies include warm compresses, cold compresses, yoga or exercise, herbal medicine, massage or acupressure, adequate rest, green coconut water, distraction, and deep breathing relaxation techniques (Diyana, Hanifa, & Karubuy, 2024).

Green coconut water (*Cocos nucifera* L.) has long been known in traditional medicine and has various health benefits supported by scientific evidence. The electrolytes, minerals, and bioactive compounds in green coconut water, such as potassium, magnesium, calcium, and L-arginine, have the potential to provide analgesic and anti-inflammatory effects that can help reduce dysmenorrhea pain. Potassium plays a role in reducing muscle tension, while magnesium helps relax the smooth muscles of the uterus and reduces the production of prostaglandins, which are the main mediators of pain in dysmenorrhea (Nuryanih & Suhatika, 2020).

Previous research conducted with the title "The Effect of Green Young Coconut Water on Dysmenorrhea Pain in Adolescents" showed that there is an effect of green young coconut water on dysmenorrhea pain in adolescents with a significant P value of 0.000. In this study, it is recommended that adolescents who experience menstrual pain consume green young coconut water on the first day of their menstrual cycle (Pattihah, Novelia, & Suciawati, 2021).

RESEARCH METHOD

This study is a quantitative study with a quasi-experimental approach using a pretest and posttest with control group design, conducted at SMP Negeri 2 Seputih Banyak in May 2025. This study aims to determine the effect of green coconut water consumption on reducing dysmenorrhea pain in adolescent girls. The research subjects were 30 eighth-grade female students who experienced dysmenorrhea, selected through purposive sampling according to predetermined inclusion and exclusion criteria. The sample was divided into two groups,

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namely the treatment group (green coconut water) and the control group, each consisting of 15 people. The independent variable in this study was green coconut water, while the dependent variable was the level of dysmenorrhea pain, which was measured using the Numerical Rating Scale (NRS).

The intervention procedure was carried out by administering 250 ml of green coconut water twice a day for three days when the students experienced menstrual pain. Data collection techniques were carried out through direct observation and filling out

pain scales before and after the intervention. The collected data were then processed through editing, coding, processing, and cleaning stages, then analyzed univariately to determine the distribution and mean of the variables, as well as bivariately with the Mann Whitney test because the data were not normally distributed based on the Shapiro-Wilk test. The significance level was set at $\alpha = 0.05$ to test the effect of the intervention on the reduction of dysmenorrhea.

RESEARCH RESULTS

Table Average Dysmenorrhea Pain in the Intervention and Control Groups in Adolescent Girls (N=30)

Dysmenorrhea Pain	Mean - Standard Deviation	Min - Max	Difference in Pain Reduction	P value
Intervention			3.13	0.000
Pretest	5.04-0.704	4-6		
Posttest	1.93-0.799	0-3		
Control			2.20	
Pretest	5.13-0.743	4-6		
Posttest	2.93-0.704	2-4		

Based on the table above, it is known that the average dysmenorrhea pain before being given green coconut water was 5.04 with a standard deviation of 0.704 and a minimum of 4 and a maximum of 6. Meanwhile, after administering green coconut water, the average was 1.93 with a standard deviation of 0.799, a minimum of 0, and a maximum of 3. It is known that the average dysmenorrhea pain during the pretest was 5.13 with a standard deviation of 0.743, a minimum of 4, and a maximum of 6. Meanwhile, the average dysmenorrhea pain during the posttest was 2.93 with a standard deviation of 0.704, a minimum pain of 2 and a maximum of 4, and the average reduction in dysmenorrhea pain in the intervention group was 3.13 and in the control group was 2.20. The Mann-Whitney test results showed that the p-value was $0.000 < 0.05$, indicating that there was an effect of green coconut water consumption on the reduction in dysmenorrhea pain intensity in adolescent girls.

DISCUSSION

The results of this study indicate that the average reduction in dysmenorrhea pain in the intervention group was 3.13 and in the control group was 2.20. The Mann-Whitney test results showed that the p-value was $0.000 < 0.05$, meaning that there was an effect of green coconut water consumption on reducing the intensity of dysmenorrhea pain in adolescent girls.

Green coconut water has been identified as one of the effective natural methods for reducing primary dysmenorrhea pain. Green coconut water is rich in electrolytes such as potassium, magnesium, and calcium, which can help relax the uterine muscles that experience cramps during menstruation. According to a study, consuming green coconut water can reduce the intensity of menstrual pain because its high electrolyte content helps maintain fluid balance and prevent dehydration, which often worsens pain during menstruation. In addition, green coconut water has antioxidant and anti-inflammatory properties that

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contribute to reducing inflammation and pain. The vitamin C and active enzymes in green coconut water can help reduce the production of prostaglandins, chemicals in the body that trigger muscle contractions and pain. The natural antioxidants in green coconut water can relieve inflammation, thereby providing a significant analgesic effect on women experiencing primary dysmenorrhea (Suryani & Gapmelezy, 2025).

The nutrients and minerals contained in green coconut water, namely calcium and magnesium, reduce muscle tension, while vitamin C is a natural anti-inflammatory substance that helps relieve pain caused by menstrual cramps by blocking cyclooxygenase enzymes, which play a role in promoting the formation of prostaglandins. In addition, the vitamin C content can accelerate the healing of tissue damage caused by the shedding of the endometrium during menstruation. During menstruation, prostaglandin hormones increase, resulting in myometrial ischemia and uterine muscle hypercontractility, meaning that the uterine muscles contract more strongly, causing pain or what is commonly known as dysmenorrhea. Coconut water contains calcium and magnesium, which have a relaxing effect on muscles, thereby helping to reduce the pain of dysmenorrhea (Kamalah, Abdullah, & Isir, 2023).

This study is in line with previous studies that show that there is an effect of giving young green coconut water on dysmenorrhea pain in adolescents (Pattihia, Novelia, & Suciawati, 2021). In addition, according to other studies, there is a reduction in pain scale after being given green coconut water. The conclusion of the study is that there are significant results in reducing primary dysmenorrhea, namely drinking green coconut water 1-3 days during menstruation, because the results show a reduction in pain from a scale of 4 to a scale of 2 (Bagaswara, Pebriani, & Susanti, 2025).

Based on the characteristics of menarche age, the reduction in dysmenorrhea pain was seen more quickly in adolescents who experienced menarche at the age of 11 and 12 years compared to those who experienced menarche at the age of 13 years. From the data collected, subjects with a menarche age of 11 generally showed a reduction in pain of up to 1–2 scales on the third day of intervention, with one respondent showing a reduction in pain to a scale of 1 and another respondent reaching a scale of 0. This indicates that adolescents with an earlier age of menarche tend to respond more quickly to the effects

of green coconut water therapy. This factor may be related to hormonal maturity and the body's adaptation to a longer menstrual cycle compared to adolescents who experience menarche at an older age. Thus, the age of menarche can be one of the variables that affect the effectiveness of reducing dysmenorrhea pain through natural therapies such as green coconut water.

This study also shows that most respondents (11 out of 15 people) had a 28-day menstrual cycle, and all of them experienced a decrease in pain from an initial scale of 4–6 to 0–3 on the third day after the intervention. These findings are in line with the theory of menstrual physiology, which states that menstrual pain (dysmenorrhea) is caused by an increase in prostaglandin levels, a chemical compound that triggers intense uterine muscle contractions during menstruation. It is this increase in contractions that causes pain in the lower abdomen, back, and thighs. A regular menstrual cycle indicates a hormonal balance between estrogen and progesterone, which greatly affects the stability of the reproductive system and an individual's pain threshold. Respondents with regular cycles are likely to have prostaglandin regulation that is more easily controlled by systematic intervention.

According to researchers, there is a difference in the average reduction in dysmenorrhea pain scale between the group given green coconut water and the group not given green coconut water. This is because green coconut water contains calcium, magnesium, and vitamin C, which can reduce abdominal muscle tension (including uterine muscles) and help relieve pain caused by menstrual cramps, thus influencing the reduction of dysmenorrhea pain.

CONCLUSION

The average dysmenorrhea pain in the intervention group among adolescent girls before being given green coconut water was 5.04 and after being given green coconut water was 1.93. The average dysmenorrhea pain in the control group among adolescent girls during the pretest was 5.13 and during the posttest was 2.93. There was an effect of green coconut water consumption on the reduction of dysmenorrhea pain intensity in adolescent girls with a p-value of 0.000.

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SUGGESTION

It is recommended that teenage girls consider using green coconut water as a natural alternative to reduce dysmenorrhea pain.

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