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THE INFLUENCE OF GREEN COCONUT WATER (COCOS NUCIFERA LINN VARIETY VIRIDIS) ON THE REDUCTION OF MENSTRUAL PAIN (DYSMENORRHEA) IN FEMALE STUDENTS OF MTSS BABUN NAJAH BANDA ACEH

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Abstract

Menstruation marks the onset of a woman's reproductive phase. Dysmenorrhea is a common issue among young women, often affecting their daily routines. To alleviate dysmenorrhea symptoms, various approaches, both pharmacological and non-pharmacological, have been explored. One such non-pharmacological method involves consuming green coconut water, which is rich in calcium, magnesium, and vitamin C. This research aims to assess the impact of green coconut water (Cocos nucifera Linn variety Viridis) on reducing menstrual pain (dysmenorrhea) among students at Babun Najah Islamic State Junior High School in Banda Aceh. This study employed a quasi-experimental design with a pretest-posttest control group. The research population comprised 65 students, with 15 respondents participating in the study. Data collection took place from May 1st to 20th, 2023. The Wilcoxon test results for the pretest conducted on the first day yielded a mean score of 5.133, while the posttest on the third day resulted in a mean score of 0.733, with a significance value of 0.000, indicating a reduction in menstrual pain. The findings of this research suggest that the consumption of green coconut water (Cocos nucifera Linn variety Viridis) can effectively reduce dysmenorrhea among students at Babun Najah Islamic State Junior High School in Banda Aceh. It is recommended that respondents consider incorporating green coconut water into their routines to alleviate dysmenorrhea pain.

Keywords: *Dysmenorrhea, Green Coconut Water, Menstruation*

1. INTRODUCTION

A woman's body goes through menstruation as a sign that she has entered her reproductive period. One of the most common issues faced by women during menstruation is dysmenorrhea or menstrual pain. Dysmenorrhea is a common gynecological disorder characterized by the emergence of painful symptoms similar to cramps before or during the menstrual cycle. This pain is caused by the accumulation of prostaglandins in the body, which increases the frequency of uterine contractions (Azra et al., 2022). Prostaglandins are natural lipid compounds that play a vital role in various bodily processes, including inflammation, blood flow regulation, and uterine contractions. During menstruation, the uterine muscles contract to help shed the uterine lining. However, when an excess of prostaglandins is produced, these contractions can become more intense and painful. Furthermore, prostaglandins can also constrict blood vessels in the uterus, reducing oxygen supply to the uterine muscles, which can contribute to the discomfort and cramping experienced during dysmenorrhea. Understanding the role of prostaglandins in this process is essential for developing effective strategies to manage and alleviate menstrual pain.

Menstrual pain, medically known as dysmenorrhea, is a prevalent and often debilitating issue that affects a significant portion of the global female population. Extensive research and data collection on menstrual health worldwide consistently reveal that more than half of women worldwide encounter some degree of discomfort and pain during their menstrual cycles. This widespread phenomenon transcends borders, impacting women from diverse cultural, socioeconomic, and geographical backgrounds.

In the Indonesian context, it is estimated that approximately 55% of women grapple with painful menstruation, underlining the considerable prevalence of this condition in the country. While this figure is slightly lower than the estimated 60% reported in the United States and significantly lower than the striking 72% documented in Sweden, it is crucial to recognize that the prevalence of dysmenorrhea is influenced by multifaceted factors (Khairuni Azrah, Cut Oktaviyana, 2022). These factors include genetic predispositions, variances in healthcare accessibility and quality, differences in lifestyle choices, dietary habits, and even cultural attitudes and norms related to menstruation. The varying prevalence rates across these regions illuminate the intricate interplay of these factors in shaping women's experiences with dysmenorrhea.

Dysmenorrhea can be divided into several types, including primary and secondary dysmenorrhea. Primary dysmenorrhea occurs without the involvement of other reproductive organs, while secondary dysmenorrhea can be caused by other medical conditions such as endometriosis or uterine fibroids (Khairuni Azrah, Cut Oktaviyana, 2022). In addition to the high prevalence of dysmenorrhea, its impact can disrupt women's daily activities. That's why many women seek ways to alleviate menstrual pain, both through pharmacological and non-pharmacological methods.

Based on data from the World Health Organization (WHO) in 2020, it is reported that 1,769,425 (90%) women suffer from dysmenorrhea, with 10-16% of them experiencing severe conditions. Dysmenorrhea has a high global prevalence, with approximately 50% of women worldwide suffering from menstrual pain. In Indonesia, the prevalence of dysmenorrhea is notably high, reaching 64.25%, with 9.36% attributed to secondary dysmenorrhea and 54.89% to primary dysmenorrhea (Barus, 2018). A 2016 survey by the Indonesian Ministry of Health revealed that around 55% of women in Indonesia experience menstrual pain, with even higher rates in specific regions such as 63.2% in Bekasi, 56% in Central Java, and 54.9% in West Java. The use of various treatments, including medication (51.2%), relaxation techniques (24.7%), and acupuncture or distraction (24.1%), can lead to a significant increase in the incidence of dysmenorrhea, ranging from 45% to 95%. Additionally, data from the 2018 Rikesdas report highlights that 63.95% of adolescent girls in the province of Aceh have a history of menstrual pain, while in Banda Aceh, the prevalence of dysmenorrhea is notably high at 74.38% (Hasanah et al., 2022).

One non-pharmacological method under consideration is the consumption of green coconut water. Green coconut water is a natural and healthy beverage rich in vitamins, minerals, glucosamine, and hormones. This beverage is considered suitable for the human digestive system due to its isotonic composition. Moreover, green coconut water has a low-calorie content, approximately 17 calories per 100 grams, making it safe for use as a traditional remedy (Dewi & Friska Realita, 2022). Research has been conducted to test whether consuming green coconut water can help alleviate menstrual pain. The results of

the study showed a positive effect of green coconut water in reducing menstrual pain (dysmenorrhea). Therefore, it is recommended for respondents, especially women experiencing dysmenorrhea, to consider consuming green coconut water as a natural way to relieve menstrual pain.

Green coconut water contains electrolytes that can prevent dehydration. Prolonged blood circulation provides the necessary nutrients and oxygen to the cells, making the body better able to withstand the sensation of pain due to menstrual cramps (Luky Febriani, 2022). This enhanced circulation can potentially reduce muscle tension and inflammation, two factors that often contribute to the discomfort experienced during menstrual cramps. Additionally, the replenishment of electrolytes through green coconut water may help in maintaining proper muscle function and hydration levels, further aiding in pain relief. However, it's important to note that while these connections are plausible, more scientific research is needed to establish a direct link between green coconut water consumption and menstrual pain relief.

According to Dewi's research on "The Effect of Green Coconut Water Consumption on the Reduction of Menstrual Pain (Dysmenorrhea)," the study results indicate a significant difference in the reduction of menstrual pain before and after the consumption of green coconut water. The measurements taken on the first day before consuming green coconut water were 6.88 with a standard deviation of 1.054, while the measurement of menstrual pain after consuming green coconut water was 5.56 with a standard deviation of 1.014. On the second day before consuming green coconut water, the measurement was 3.89 with a standard deviation of 1.269, and after consuming green coconut water, it was 2.78 with a standard deviation of 1.093. There is a significant difference before and after the administration of green coconut water with a p-value of 0.006 (p-value < 0.05). Therefore, it can be concluded that there is an effect of giving green coconut water on the reduction of menstrual pain (dysmenorrhea) (Dewi & Friska Realita, 2022).

From the results of interviews conducted by the researcher with 15 students from MTsS Babun Najah, 8 of them mentioned that during menstruation, they experienced cramps in the lower abdomen and breast pain with a pain scale of 1-3 (mild pain). These students consumed warm water and warm milk. On the other hand, 7 students mentioned that during menstruation, they experienced lower abdominal cramps spreading to the lower back and thighs, accompanied by weakness and the inability to engage in activities, with a pain scale of 7-9 (severe pain). These students resorted to taking pain relievers.

Therefore, this research was conducted with the aim of confirming whether green coconut water could be an effective natural alternative to address menstrual pain, especially among female adolescents at MTsS Babun Najah. The primary goal is to demonstrate that green coconut water can help reduce the level of menstrual pain, providing a healthier solution to a common issue experienced by young women during menstruation.

2. LITERATURE REVIEW

2.1. Menstruation Concept

Menstruation, often referred to as "*haid*," "*datang bulan*" or "*tanggal merah*" in various cultures, is a recurring physiological process that takes place in women every month, excluding periods of pregnancy. This natural phenomenon marks the shedding of the uterine lining when fertilization does not occur. The menstrual cycle commences in the uterus, progresses through the cervix, and culminates in the vaginal discharge of blood and tissue. Typically, menstruation begins in girls between the ages of 9 and 12, although some adolescents may experience it later, between the ages of 13 and 15, though this is relatively uncommon (Luky Febriani, 2022).

2.2. Pain Concept

Pain is a complex sensory and emotional experience that often arises from tissue damage, whether it's actual, potential, or perceived as such. This multifaceted phenomenon encompasses not only physical sensations but also emotional and psychological components. Pain can trigger reflexes aimed at avoiding further harm and can lead to changes in autonomic nervous system function (Morier, 2020).

One method commonly employed to assess and describe pain is the Numeric Rating Scale (NRS). This scale quantifies pain intensity on a scale of 1 to 10, allowing individuals to communicate the level of pain they are experiencing. The Numeric Rating Scale is particularly effective in measuring the intensity of pain both before and after medical interventions, making it a valuable tool in clinical practice (Ristiani, 2022).

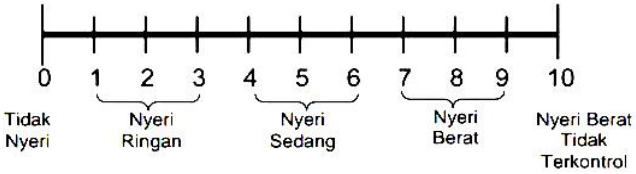

Figure 1. Numeric Rating Scale (NRS)

2.3. Dysmenorrhea Concept

Dysmenorrhea is a common gynecological condition characterized by a sensation of pain in the lower abdomen and accompanying cramps that typically occur in the days leading up to menstruation. This discomfort usually lasts for a duration of 2 to 3 days, commencing approximately one day before the onset of menstruation. Dysmenorrhea can be classified into two main categories: primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is often considered normal menstrual cramping, while secondary dysmenorrhea is associated with an underlying medical condition, such as endometriosis or fibroids (Balitbangkes RI, 2018).

2.4. Green Coconut Water

Green coconut water, known as "*air kelapa hijau*," is a popular and revitalizing beverage consumed in regions with a humid tropical climate. It has long been used in traditional medicine for its potential health benefits. Green coconut water is renowned for its detoxifying properties, making it a popular choice for refreshment. The quantity of water inside a green coconut can vary depending on factors like the coconut's variety and

size. When the coconut is still young and green, it contains a higher proportion of water and relatively less fruit flesh. Medically, green coconut water is considered sterile when handled properly and can be a valuable source of nutrients beneficial to the human body (Islamy & Farida, 2019).

Green coconut water is a rich source of essential nutrients, including calcium, magnesium, and Vitamin C. In every 100 ml of green coconut water, you can find approximately 14.11 mg of calcium, 9.11 mg of magnesium, and 8.59 mg of Vitamin C. Vitamin C, in particular, is recognized for its anti-inflammatory properties, which can help alleviate the pain associated with menstrual cramps. It achieves this by inhibiting the activity of cyclooxygenase enzymes involved in the production of prostaglandins, which play a role in causing menstrual pain. Additionally, the presence of calcium and magnesium in green coconut water contributes to muscle relaxation, aiding in reducing tension and discomfort (Suhatika, 2020). The consumption of green coconut water not only provides hydration but also delivers these valuable nutrients, making it a natural and refreshing option with potential health benefits, including its ability to alleviate menstrual cramping.

3. RESEARCH METHODS

This research employs a quasi-experimental approach with a pretest-posttest control group design to investigate the impact of green coconut water on reducing menstrual pain, also known as dysmenorrhea, among female students of MTsS Babun Najah in Banda Aceh. The experimental design involves a single group of subjects who undergo three main phases: the initial pretest (01) to measure the level of menstrual pain before the intervention, the treatment phase (X) involving the administration of green coconut water, and the subsequent posttest (02) to assess the level of menstrual pain after the treatment.

Data obtained from the pretest and posttest will be comprehensively analyzed using univariate and bivariate analysis methods. Univariate analysis will provide insights into the changes in menstrual pain levels for each individual subject before and after the treatment. Meanwhile, bivariate analysis will allow us to compare the pretest and posttest values within the same group of subjects. With this approach, the research aims to provide a deeper understanding of the potential effects of green coconut water in reducing dysmenorrhea among female students at MTsS Babun Najah in Banda Aceh.

4. RESULTS AND DISCUSSION

4.1. Research Results

An overview of the age of the sample, namely female students of MTsS Babun Najah Banda Aceh.

Table 1. Demographic Data of Respondents

No	Age	Frequency	Percentage
1	13 years old	9	60%
2	14 years old	6	40%
Total		**15**	**100%**

According to the information provided in Table 1, it can be observed that the sample group, comprising female students from MTsS Babun Najah experiencing primary dysmenorrhea, is predominantly composed of individuals who are 13 years old, accounting for 60% of the sample. In contrast, the remaining 40% of the sample consists of individuals who are 14 years old.

Table 2. Wilcoxon Test on the First Day

Day 1	Mean	Sig.	Conclusion
Pre-Test	5.133	0.002	There is a difference
Post Test	3.933		

Based on the outcomes of the difference test mentioned earlier, the research findings reveal a noticeable distinction in menstrual pain (dysmenorrhea) before and after the consumption of green coconut water (*Cocos nucifera Linn varietas viridis*). This is supported by the significance value obtained, which is 0.002, and is smaller than the threshold of 0.05. Notably, the pain experienced after consuming green coconut water is 3.93, which is notably lower than the pain experienced before consumption, recorded at 5.13. Consequently, it can be asserted that green coconut water (*Cocos nucifera Linn varietas viridis*) has a discernible influence in reducing menstrual pain (dysmenorrhea) on the first day.

Table 3. Wilcoxon Test on the Second Day

Day 2	Mean	Sig.	Conclusion
Pre-Test	4.133	0.000	There is a difference
Post Test	3.000		

Based on the results of the difference test conducted, the research outcomes indicate a notable disparity in menstrual pain (dysmenorrhea) both before and after the consumption of green coconut water (*Cocos nucifera Linn varietas viridis*). This conclusion is supported by the significance value obtained, which is 0.000, and is below the threshold of 0.05. Importantly, the discomfort experienced after consuming green coconut water is 3.00, which is considerably lower than the discomfort reported before consuming it, recorded at 4.13. Consequently, it can be affirmed that green coconut water (*Cocos nucifera Linn varietas viridis*) has a significant influence in reducing menstrual pain (dysmenorrhea) on the second day.

Table 4. Wilcoxon Test on the Third Day

Day 3	Mean	Sig.	Conclusion
Pre-Test	2.333	0.000	There is a difference
Post Test	0.733		

Based on the results of the difference test conducted, the research findings strongly indicate a significant contrast in menstrual pain (dysmenorrhea) both prior to and

following the consumption of green coconut water (*Cocos nucifera Linn varietas viridis*). This conclusion is robustly supported by the obtained significance value of 0.000, which is considerably smaller than the standard significance threshold of 0.05. Most notably, the level of discomfort experienced after the consumption of green coconut water is a mere 0.73, representing a substantial reduction from the initial level of discomfort recorded at 2.33. Thus, it can be emphatically asserted that green coconut water (*Cocos nucifera Linn varietas viridis*) exerts a potent influence in alleviating menstrual pain (dysmenorrhea) on the third day.

4.2. Discussion

Menstruation is a recurring phase in women that occurs every month during their fertile years, except during pregnancy. Common terms used to refer to the menstrual cycle include "*haid*," "*datang bulan*," and "*tanggal merah*." This menstrual cycle starts in the uterus and concludes in the vagina (Barus, 2018). Menstrual pain is categorized into two types: primary and secondary dysmenorrhea. Primary dysmenorrhea is pain experienced during menstruation in fertile women and is not linked to reproductive organ abnormalities, while secondary dysmenorrhea occurs when there is an underlying condition or recurring reproductive organ issues, such as uterine infections, cysts, polyps, tumors, and abnormal uterine positioning that affects surrounding organs and tissues (Saraswati, 2019).

Dysmenorrhea can be caused by various factors, including early menstruation, menstrual cycle characteristics, family history of dysmenorrhea, abnormal body mass index, fast-food preferences, menstrual cycle timing, exposure to cigarette smoke, coffee consumption, and alexithymia (Dr. Vladimir, 2020). Therefore, dysmenorrhea can be managed through both pharmacological and non-pharmacological approaches. Pharmacological methods for managing menstrual pain include the use of analgesics, hormonal therapy, and non-steroidal anti-inflammatory drugs. Non-pharmacological approaches involve physical activity, warm compresses, consumption of herbal or natural beverages such as green coconut water (*Cocos Nucifera Linn varietas. Viridis*), rest, relaxation, and aromatherapy (Islamy & Farida, 2019).

Green coconut water is a healthy source of nutrients containing vitamins, minerals, and natural preservative-free components that are easily absorbed by the human body due to its compatibility with the body (Suhatika, 2020). Vitamin C, present in green coconut water, acts as an anti-inflammatory agent that helps reduce pain after menstrual cramps by inhibiting cyclooxygenase enzymes involved in prostaglandin formation. Calcium and magnesium in green coconut water assist in reducing muscle tension. Within 100 ml of green coconut water, you can find 14.11 mg of calcium, 9.11 mg of magnesium, and 8.59 mg of vitamin C (Hasanah et al., 2022). The benefits of green coconut water include rehydration, heart protection, reducing menstrual pain, aiding in alcohol recovery, boosting the immune system, and detoxification (Dewi & Friska Realita, 2022).

According to Nuryanih's research on "The Influence of Green Coconut Water Consumption on Reducing Menstrual Pain (Dysmenorrhea)," the bivariate analysis using the chi-square test showed a statistical significance value of 0.000 (0.000 < 0.05), indicating a relationship between consuming green coconut water and reducing menstrual

pain (Dysmenorrhea) among first-year nursing students at Stikes Yatsi Tangerang in 2019 (Suhatika, 2020).

Based on the researcher's assumption, there is a difference in the pain scale before and after the administration of green coconut water (*Cocos Nucifera Linn varietas. Viridis*) to the respondents. This is because green coconut water contains calcium and magnesium, which can alleviate pain and muscle tension. Primary dysmenorrhea is a concerning issue for women, and the pain that arises before and during menstruation is often caused by an increase in prostaglandin hormone secretion.

5. CONCLUSION

This research indicates that the consumption of green coconut water (*Cocos Nucifera Linn varietas Viridis*) has a significant and positive impact on reducing menstrual pain (dysmenorrhea) over three consecutive days of menstruation. The study reveals a substantial decrease in the intensity of menstrual pain after consuming green coconut water, attributed to the nutritional content such as calcium, magnesium, and vitamin C found in green coconut water. Therefore, it can be inferred that green coconut water serves as an effective natural alternative for addressing the commonly experienced issue of dysmenorrhea among women. For future research, it is recommended to expand the sample size and consider the use of control groups for comparison. Additionally, further research could delve into the mechanisms by which the nutrients in green coconut water alleviate menstrual pain, providing a deeper insight into its effectiveness.

Suggestions for future research include considering long-term studies that involve continuous monitoring of the use of green coconut water in managing menstrual pain. Factors such as the optimal dosage and frequency of consumption should also be investigated. Furthermore, research can expand its analysis to explore the broader psychological impact and overall quality of life associated with the use of green coconut water in addressing dysmenorrhea. Thus, future research endeavors can provide a more comprehensive understanding of the benefits of green coconut water as a natural and sustainable solution for reducing menstrual pain in women.

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