The effect of coconut water on alleviating menstrual pain (dysmenorrhea) in teenage women

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The effect of coconut water on alleviating menstrual pain (dysmenorrhea) in teenage women

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Abstract

Background: *World Health Organization* (WHO) in 2018 stated that the number of dysmenorrhea in the world is very large, on average more than 50% of women in each country experience *dysmenorrhea*. In the United States, it is estimated that almost 90% of women experience dysmenorrhea and 10-15% of them experience *dysmenorrhea* severe, which causes them to be unable to carry out any activities.
Method: This research was conducted using the method *Quasi Experiment* with a plan *one grup pretest posttest design*. Random sampling technique *total sampling* as many as 28 young women experienced it *dysmenorrhea* currently. Data analysis consists of univariate, bivariate and multivariate analysis. The sample tests used were Wilcoxon, Mann Whitney and Binary Logistic Regression tests.
Results: The results of this study showed that the average pain *dysmenorrhea* before and after had given coconut water was 5.18 and the average pain after had given coconut water was 2.64. The statistical test results obtained p-value= 0.000, with a mean difference of 2.54 which shows that there is an influence on giving coconut water to young women at Junior High School 02 Bengkulu City in 2021.
Conclusion: It is hoped that the school at Junior High School 02 Bengkulu City can optimize School's Health Clinic program services such as increasing the role of officers to implement canteens or school cooperatives to be able to provide coconut water which has the effect of reducing pain *dysmenorrhea* in teenage girls.

Keywords: *Dysmenorrhea; Green Coconut Water; Teenage girl*

INTRODUCTION

The number of dysmenorrhea in the world is very large, on average more than 50% of women in each country experience it *dysmenorrhea*. Each country percentage *dysmenorrhea t*his varies, such as in Sweden around 75% in the United States it is estimated that almost 90% of women experience dysmenorrhea and 10-15% of them experience *dysmenorrhea* severe, which causes them to be unable to carry out any activities (World Health Organization, 2018).

Percentage *dysmenorrhea* in Singapore around 10-15%, Malaysia 35-40% and Thailand 65% (*Association of Southeast Asian Nations*, 2018). In Indonesia alone, the incidence of menstrual pain in women aged 13-19 years is 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhoea, menstrual pain (*dysmenorrhea)*causing 14% of adolescent patients to often not be able to participate in learning activities either at school or in college (Nuraeni, & Nurholipah, 2021).

Risk factors for dysmenorrhea include early menarche, family history of dysmenorrhea complaints, abnormal Body Mass Index, habit of eating fast food, duration of bleeding during menstruation, exposure to cigarette smoke, coffee consumption, and alexithymia (Larasati & Alatas, 2016). Other risk factors that influence *dysmenorrhea* is the menstrual cycle and the length of menstruation (Pratiwi, 2017).

Management of menstrual pain*(dysmenorrhea)*can be done with pharmacological or non-pharmacological therapy. The first pharmacological effort that can be taken is to administer analgesic drugs which function as pain relievers. Non-pharmacological therapy can be done as an effort to treat it without using chemical drugs. One of the non-pharmacological treatments for pain is green coconut water (Rismaya, Rosmiyati, & Mariza,2020).

Coconut water, compared to other types of coconut, contains the highest amount of tannin or antidote (anti-toxin) (Nurqalbi, & Lolo, 2019). Coconut water can reduce the level of menstrual pain in teenagers who are experiencing menstrual pain. The chemical content in coconut water is an anti-inflammatory substance that helps relieve pain due to menstrual cramps (Pattiiha, Novelia, & Suciawati, 2021).

Dysmenorrhea has an adverse impact on teenagers' lives, *dysmenorrhea* can result in disrupted activities, lower academic achievement, disrupt performance and sleep quality, have a negative impact on *mood,* and cause anxiety and depression. Apart from that, young women experience it *dysmenorrhoea* will feel limited in carrying out activities, especially learning activities at school (Bernardi, Lazzeri, Perelli, Reis, & Petraglia, 2017). Based on preliminary data obtained from the Bengkulu City National Education Service, it was found that 350

female students at Junior High School 02 Bengkulu City in grades VIII and IX experienced dysmenorrhea as many as 26 cases (12%). From the data, there were 26 people who came to the School's Health Clinic and were only given anti-pain medication and given eucalyptus oil to the lower abdomen to relieve pain. Female students who experience dysmenorrhea are students who lack knowledge in dealing with dysmenorrhea.

RESEARCH METHODS

The research design used is a quasi-experimental research design *one group pretest and posttest*. Is design *like an experiment* by doing *pretest* before giving treatment and doing *posttest* after giving treatment. This research design has one experimental group without comparison and non-random sampling. Sampling using techniques *purposive sampling*. The research instrument uses a pain scale *numeric rating scale (NRS),* with a scale of 0-10 (Pattiiha, Novelia, and Suciawati, 2021). The research was carried out from November to December 2021. The place of this research was Junior High School 02 Bengkulu City.

The population in this study were female students from class VII to IX at Junior High School 02 Bengkulu City, totaling 497 female students, there were female students from class VII and class VIII totaling 350 female students, there were 28 female students who experienced menstrual pain *(dysmenorrhea)*. The method used in taking this sample is by using *total sampling*. Variable *dependent* is coconut water, while variable i*ndependent* is age *menarche* and old *menstruation*.

250ml of green coconut water is given, taken twice a day, 1 glass and consumed in the morning and evening, for 3 consecutive days starting on the first day of menstruation. And to see the effect of giving green coconut water on menstrual pain*(dysmenorrhea)* by asking participant to; contact during menstruation, fill out the NRS checklist, measure the pain scale on participant and after the third day of drinking green coconut water, participant are asked to fill out the NRS again.

Univariate analysis uses frequency distribution, bivariate uses *wilcoxon,* and *Mann Whitney test* which is used to see the relationship between age variables *menarche* and old *menstruation* with variables *dysmenorrhea*. This research has been declared ethically appropriate by the Bengkulu Ministry of Health Polytechnic with number KEPK.M/205/11/2021.

RESEARCH RESULTS

Table 1. Frequency Distribution of Participant (N=28)

Variables	Results
Age Menarche (n/%)	
<12 years	13/46.4
12-14 years old	15/53.6
Length of Menstruation (n/%)	
<3 days or >7 days	12/42.9
3-7 days	16/57.1

Based on table 1, it can be seen that of the 28 young women, it was found that almost half of the young women were aging *menarche* 12-14 years, namely 15 (53.6%) and for a long time *menarche* mostly 3-7 days as many as 16 (57.1%).

Table 2. Average of menstrual pain score (N=28)

Variable Changes in Menstrual Pain	Pain Scale		Mean	Different Mean	Standard Deviation	Z	p-value
	Min	Max					

Before Intervention	4	6	5,18		0.8631		
				2,54		-4.701	0,000
After Intervention	2	6	2,64		1.283		

* *Wilcoxon test*

Based on table 2, it is known that the average value of pain intensity before had given coconut water to reduce menstrual pain *(dysmenorrhea)* 5.18 and the average value of pain intensity after had given coconut water was 2.64, where there was a decrease in pain as evidenced by 2.54. It was found that there was an effect of coconut water on menstrual pain *(dysmenorrhea)* among young women at Junior High School 02 Bengkulu City in 2021, proven by statistical test results *p-value* (2-tailed) value 0,000 < 0,05.

Table 3. Normality Test (N=28)

Change Variables Pain Changes	Shapiro-Wilk		
	Statistic	df	Say.
Pain score before intervention	0,759	28	0,000
Pain score After intervention	0,931	28	0,066

Based on table 3 above using the normality test `*Shapiro-Wilk* that sig. < 0.05 which means the data is not normally distributed so this bivariate analysis uses the *Wilcoxon* test. This bivariate analysis was also carried out to determine the influence of variables outside of age *menarche* and old *menstruation* with the incident *dysmenorrhea* among young women at Junior High School 02 Bengkulu City in 2021. The analysis method uses test analysis *"Mann whitney"*. The results of the analysis can be seen from the table below:

Table 4. The Influence of Age of Menarche and Length of Menstruation on Menstrual Pain (Dysmenorrhea)

External Variables	Mean Rank	Asymp. Sig. (2-tailed)
Age *Menarche*		
<12 years	17,88	0,035
12-14 years old	11,57	
Length of Menstruation		
<3 or >7 days	18,46	0.022
3-7 days	11,53	

*Mann Whitney

Based on table 4 above, it is found that there is an influence between the age variables *menarche* with *dysmenorrhea* proven by the results of p-*value* 0.035 < 0.05. Likewise with the old variables *menstruation* there is an influence on *dysmenorrhea* proven by the results p-*value* 0,022 < 0,05.

Table 5. Linear Regression Analysis

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Variable	Coefficient	95% Confidence Interval B		p-value
		Lower Bound	Upper Bound	
Coconut Water	2,536	3,051	2,020	0,000
Menarche Age	0,807	1,329	284	0,003
Length of Menstruation	0,807	1,326	289	0,003

Based on table 5 above, the statistical results of the variables coconut water, age are known *menarche* and old *menstruation* everything is related, but the variable that is most related is coconut water as proven by the results *p-value* 0,000 < 0,05.

DISCUSSION
Average of menstrual pain score

Pain is an unpleasant sensory and emotional experience related to actual and potential tissue damage localized to a part of the body, often described in terms of destructive processes, tissue like prickling, burning heat, twisting like emotions, feelings of fear, nausea and dread. (Judha, & Sudarti 2014). Pain is a condition in the form of an unpleasant feeling, is very subjective and the feeling of pain in each person varies in terms or levels (Jayanti, Puspitasari, & Arisanti, 2017).

Based on table 2, it shows that the average value of pain intensity before had given coconut water was 5.18 which was classified as moderate pain, characterized by the young women hissing, grinning, still had able to show the location of the pain and still had able to describe the pain and still had able to follow commands well. A total of 28 young women were in the moderate pain category, including 8 people on scale 4 (28.5%), 7 people on scale 5 (17.8%) and 13 people on scale 6 (46.4%).

Based on table 2, after had given coconut water, the average pain intensity for young women was 2.64, which was classified as mild pain, indicating that the participant were still able to communicate well. A total of 27young women (96.4%) of 28 young women experienced decrease in the intensity of the pain scale among which 21 people (75.0%) experienced a decrease from the moderate category to the mild category and the other 7 people (25.0%) remained in the moderate pain category but still experienced a decrease in the value of the scale to be lower than the previous pretest results while 1 person (3.5%) out of 28 teenage girls did not experience a decrease in the pain scale or remained in the same category and scale when the pretest was performed.

This difference in pain is influenced by several factors such as age *menarche* and old *menarche*. Age *menarche* can be said to be normal when at the age of 12-14 years. Age *menarche* who are too young (<12 years), there is a relationship between age *menarche* to the incident *dysmenorrhea* primary due to time *menarche* occurs earlier than normal, so the reproductive organs are not ready to undergo changes and there is still narrowing of the cervix, so there will be pain during menstruation (Susanti, Rusminah, & Sari, 2016).

Old *menstruation* can be influenced by many things, such as the food consumed and physical activity, hormones and enzymes in the body, vascular problems and genetic factors (Basith, Agustina, & Diani, 2017). The classification of menstrual duration is divided into normal and abnormal. Normal if the duration of menstruation is 3-7 days and it is said to be abnormal if it is beyond that the longer *menstruation* occurs, the more frequently the uterus contracts, the more prostaglandins are released as a result. As a result of excessive prostaglandins, pain can occur *menstruation* (Gustina, Wijayanti, & Raharjo, 2016).

The condition of a person's body will not be the same as another, which is caused by differences in endorphin levels. Endorphins function to regulate various physiological functions such as pain transmission, emotions, appetite control and hormone secretion. The difference between high endorphin levels will cause little pain and low endorphin levels will cause excessive pain. Apart from that, prostaglandins also stimulate pain nerves in the uterus, thereby increasing the intensity of pain.

The results of this study are in accordance with research that has been conducted previously regarding "the effect of green coconut water on reducing pain *dysmenorrhea* in teenagers" in Ampere hamlet, Teluti District, Central Maluku District, Maluku Province. This was explained by looking at the behavioral responses of 30 teenagers who were given coconut water therapy and the posttest results showed that 16 participant (53.3%) had no pain. The results of this research are proven by *p-value* 0.000 < 0.05, which means there is a difference between giving coconut water for the pretest and posttest, so it can be concluded that there is an effect of had

coconut water against dysmenorrhea pain (Pattiha, Novelia, & Suciawati, 2021).

This research is in line with research conducted at the Raudhatul Mutta'alimin Tasikmalaya Islamic Boarding School regarding "the effect of consuming coconut water on reducing menstrual pain" where from the results of statistical tests there was a significant difference in menstrual pain before and after had given coconut water therapy with proven *p-thanks* 0.000 < 0.05. Which means there is an effect of giving coconut water on reducing menstrual pain in young women (*Realita, Dewi, & Susilowati,* 2021).

From the description above, researchers are of the opinion that the scale or level, the feeling of pain felt by each person is different. Only that person can indicate the scale or level of pain they are experiencing.

The effectiveness of coconut water in alleviating menstrual pain (dysmenorrhea)

To determine the effect of coconut water on changes in menstrual pain scale (*dysmenorrhea*)**,** researchers use statistical *Wilcoxon* tests provided that the data is not normally distributed. After analyzing, based on the research results, it can be seen that the average scale of pain during menstruation *(dysmenorrhea)* before doing yoga was 5.18, the average scale *dysmenorrhea* after had given coconut water was 2.64, the average difference before and after the intervention was 2.54 and the *p-value* obtained is 0.000 with a significance level of α = 0.05. Because of *p-value* 0.000 < 0.05 then "Hypothesis is accepted".

This states that there is a significant difference between had given coconut water and changes in the pain scale *dysmenorrhea*. Based on the category, a pain scale is obtained *dysmenorrhea* before had given coconut water, 28 young women experienced moderate pain. Then after a meaningful change occurs. The number of young women experiencing moderate pain changed to 21 young women experiencing mild pain and 7 young women experiencing moderate pain.

The results of research conducted on level I and II midwifery students at Malahayati University showed that there was a significant difference in reducing the level of dysmenorrhea pain before and after giving coconut water, because coconut water is very effective in reducing dysmenorrhea. Participant who had undergone treatment found a decrease in menstrual pain after had given coconut water, this is because during menstruation the body releases fluid and blood. The folic acid contained in it is also useful for replacing lost blood. With sufficient blood production, blood circulation will improve. Smooth blood circulation will fulfill cells' needs for oxygen and nutrients. With this condition, the body will be more resistant to the painful sensations caused during menstruation (Rismaya, Rosmiyati, & Mariza, 2020).

This happens because pain is subjective and only someone who experiences this condition can describe the amount of pain they feel. So it will have an effect on reducing the pain intensity score for each respondent (Jayanti, Puspitasari, & Arisanti, 2017).

In line with research conducted in Tanggerang, it is stated that giving coconut water can reduce the level of menstrual pain in women who are experiencing menstrual pain. This is because coconut water has high nutritional content and various health benefits (Nuryanih, & Suhatika, 2020).

The results of this study are in line with research in Srinanti Village, Gunung Gajah District, Regency everyone, Regarding "efforts to reduce dysmenorrhea in young women by consuming young coconut water in Srinanti village, Gunung Gajah sub-district, Lahat district," a negative rank was obtained, namely 30, which means that all participant experienced a decrease in the pain scale after consuming coconut water for 3 days. From the statistical test results obtained *p-value* 0.000 < 0.05, which means that there is a significant influence on the consumption of young coconut water (Widowati, Eltamira, & Choirunissa, 2021). Likewise, research conducted at Rusunawa Putri Muhammadiyah University Semarang stated that menstrual pain among young women at Rusunawa Putri Muhammadiyah Semarang before and after had given young coconut water with *p-value* = 0.000 (<0.005) (Amiritha, Pawestri, & Samiasih, 2017).

Other research that supports this research is research entitled giving coconut water can alleviating dysmenorrhea in teenagers at Malahayati University as many as 30 people, divided into 2 groups, the average pain felt by participant before had given treatment was 8.40 and the turn was 2, 73 after had given coconut water treatment, while for the control group the average pain was 8.67 to 4.00. The results of data analysis use tests *dependent T-Test* The value obtained was (0.006) < 0.05, Ha was accepted and Ho was rejected, which means that there was an influence between giving coconut water on alleviating dysmenorrhea pain in female midwifery students at Malahayati University (Rismaya, Rosmiyati, & Mariza, 2020).

Based on the description above, researchers assume that giving coconut water is a technique that can be used to reduce *dysmenorrhea*.

In this study most of the scales *dysmenorrhea* participant after had given coconut water experienced changes, namely in the form of a decrease. From the results of research conducted by researchers with theoretical concepts and the results of existing related research, it can be defined that there is a significant influence

between giving coconut water on changes in the scale *dysmenorrhea*. So coconut water can be applied as an alternative that can be used to treat *dysmenorrhea*.

The most influential variable of Coconut Water

Based on table 4 above, it is found that there are variables that influence the requirements for carrying out further tests in multivariate analysis, due to all the *p-value* smaller than 0.25. This means statistically age *menarche* with *p-value* (0.035) means *p-value* <0,05.

Age m*enarche* those who are too young (≤12 years) where the reproductive organs have not developed optimally and there is still narrowing of the cervix, will experience pain during menstruation, because the female reproductive organs are not yet functioning optimally (Rosenthal, 2013). Age m*enarche* varies by individual and region of residence, but age *menarche* can be said to be normal when at the age of 12-14 years. There is a relationship between age *menarche* to the incident *dysmenorrhea* primary due to time *menarche* occurs earlier than normal, so the reproductive organs are not ready to undergo changes and there is still narrowing of the cervix, so there will be pain during menstruation (Susanti, Rusminah, & Sari, 2016).

Men*arche* earlier, the reproductive organs are not functioning optimally and are not ready to face the changes that arise *dysmenorrhea* (Kristianingsih, 2016). Age *menarche* going too fast for some young women can cause anxiety because they are not mentally ready. Teenage girls who *menarche* at an easier age are at risk of experiencing *dysmenorrhea* higher than that of teenagers *menarche* at normal age (Nurwana, Sabilu, & Fachlevy, 2017).

Age *menarche* early onset increases the risk of occurrence *dysmenorrhoea*. Women who have ages *menarche* those at risk need to pay more attention to their health problems, especially incidents *dysmenorrhea*. The results of this research are in line with research entitled "Incidence of Dysmenorrhea Based on Age of Menarche and Mother's History of Dysmenorrhea in Class X Adolescent Girls. It is known that of the 26 participant who experienced *menarche* experienced early *dysmenorrhea* as many as 24 (92.3%) participant while the rest experienced *dysmenorrhea* with time *menarche* normal. From the results of the chi square statistical test, the p value = 0.009 < α = (0.05) (Riyanti & Widia, 2019).

In line with research by female students at Junior High School 02 Sawan, where the highest incidence of dysmenorrhea occurred at age *menarche* early namely as many as 21 people while age *menarche* normally 18 people. Correlation analysis results p*roduct moment,* shows a value of p=0.005, then there is a relationship between age *menarche* with dysmenorrhea (Savitri, Citrawathi, & Dewi, 2019).

Based on table 4 above, it is found that there are variables that influence the requirements for carrying out further tests in multivariate analysis, due to all the values*p-value* smaller than 0.25. It means long time *menstruation* with *p-value* (0.022), which means that means *p-value* < 0,05.

Old *menstruation*can be influenced by many things, such as the food consumed and physical activity, hormones and enzymes in the body, vascular problems and genetic factors (Basith, Agustina, & Diani, 2017). The classification of menstrual length is divided into normal and abnormal. It is normal if the length of menstruation is 3-7 days and is said to be abnormal if it is beyond that. Long *menstruation* more than normal will cause more frequent uterine contractions and more prostaglandins are released (Sirait & Besi, 2015). Excessive production of prostaglandins is what causes pain while continuous uterine contractions cause the blood supply to the uterus to stop and there is *dysmenorrhea* (Proverawati & Misaroh, 2019).

The results of research conducted on young women at Senior Vocational School 10 in Medan showed that the participant who experienced the most dysmenorrhea were those who experienced a menstrual period of > 7 days (87.2%) with a value of *p-value* amounted to 0.046, so it was concluded that there was a relationship between the length of menstruation and the incidence of dysmenorrhea. In this study, it was also stated that menstruation duration > 7 days was 1.2 times more likely to experience dysmenorrhea compared to young women whose menstruation period was ≤ 7 days (Ancient, & Sarumpaet, 2013).

Based on table 5, it is known that there are variables for coconut water, age *menarche,* and old *menstruation* everything has an influence on *dysmenorrhea,* where for the variable coconut water the value is proven *p-value* (0.000), age *menarche p-value* (0.033). and old *menstruation* with *p-value* (0.033), which all variables have an effect on *dysmenorrhea* where the coconut water variable is the most influential among other variables as proven by the results*p-value*0,000 < 0,05.

This is proven by previous research which shows that giving young coconut water can reduce the level of menstrual pain in teenagers who are experiencing menstrual pain. This is because young coconut water has a lot of high nutritional content for various health (Pattiiha, Novelia, & Suciawati, 2021). In line with other research, it is stated that reducing menstrual pain can be done by administering coconut water (Sumino, Nursanti, & Trisnawati, 2012).

This is the same as research conducted at Rusunawa Putri, Muhammadiyah University, Semarang, reducing pain *dysmenorrhea* for female students in the nursing science study program with *p-value* 0.000 (0.005) and also research on D IV Midwife Educator Study Program students at Aisyiyah University, Yogyakarta, stated a decrease in pain *dysmenorrhea* with a significant value of 0.001 (0.001 < 0.05, statistical test results show that Ho is rejected and Ha is accepted (Amiritha, Pawestri, & Samiasih, 2017; Khodijah, Herfanda, & Putri, 2017).

From the discussion above, it can be concluded that all variables have an influence on *dysmenorrhea* age *menarche,* old *menstruation* and coconut water, but taking into account the younger age of the participant, it turns out that this doesn't have much of an effect because the reproductive system has not been fully used so there is still narrowing which results in *dysmenorrhea,* as well as the old one *menstruation* that age is more. It is also easy to influence because the reproductive organs are not yet working perfectly, however, of the three variables, coconut water is the variable that has the most influence on *dysmenorrhea* which is proven by the results *p-value* 0,000 < 0,05.

CONCLUSION

There is an effect of coconut water on menstrual pain *(dysmenorrhea)* among young women at Junior High School 02 Bengkulu City. Obtained statistical test results *p-value* (2-tailed) has a value of 0.000 < 0.05. There is an influence between the age variable *menarche* and old *menstruation* with *dysmenorrhea* proven by the results of *p-value* 0.035 < 0.05. Likewise with the old variables *menstruation* there is an influence on *dysmenorrhea* proven by the results p-*value* 0,022 < 0,05.

Statistically, the variables are coconut water, age *menarche* and old *menstruation,* The most related variable is coconut water as evidenced by the results *p-value* 0,000 < 0,05.

SUGGESTION

It is hoped that the school at Junior High School 02 Bengkulu City can optimize School's Health Clinic program services such as increasing the role of officers to implement the canteen or school cooperatives to be able to provide coconut water which can be used as an alternative to reduce pain *dysmenorrhea* in teenage girls.

For future researchers, conducting similar research can extend the research time so that menstrual pain intensity can be measured *(dysmenorrhea)* at least 3 menstrual cycles, to get better results.

It is hoped that students from the Bengkulu Ministry of Health Polytechnic, Department of Midwifery, can use the results of this research as reference material in treating menstrual pain. *(dysmenorrhea)* for yourself and others.

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