The Effect of Giving Dark Chocolate on Primary Dismenorrhorea in Junior High School Students in Long Ikis District, Pader Regency Year 2022

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Abstract:- Puberty is a stage of development for children who enter adolescence which is always characterized by the maturity of the sexual organs and has reached the ability to reproduce. In young women, the symptoms of hormonal changes can be seen clearly in the physical appearance in question. In addition, puberty in adolescent girls is also marked by menarche (dysmenorrhea), commonly referred to as menstruation or menstruation. -3 days, starting the day before the start of the first day of menstruation. This phenomenon occurs in most women, so it can be said as a disorder. Patterns to overcome these disorders are carried out both pharmacologically and non-pharmacologically. This study aims to determine the effectiveness of dark chocolate given to sufferers of menstrual pain during a certain observation period in overcoming symptoms of dysmenorrhea. This study uses a quantitative approach with the Quasi Experiment method on a population of junior high school students. By involving 36 respondents who were divided into two sample groups according to Fereder's formula, each of which was determined as many as 18 respondents. One group received treatment consuming dark chocolate, and the other group was a control group without treatment. The experimental process was carried out for a span of 30 days for each respondent which was adjusted to the period of dysmenorrhea. All respondents (100%) felt "moderate" pain before consuming dark chocolate, and after consuming dark chocolate 27.8% experienced mild pain and 72.2% did not feel pain anymore. The study concluded that the experimental group showed a reduction in pain of 72%, no longer felt pain, and 28% still felt a little pain. Meanwhile, the control/intervention group did not show any change in the pain scale. This means that consuming dark chocolate can reduce the pain of dysmenorrhea. At the end of the observation, the results of the statistical test showed that in the experimental group the p-value (0.000) <0.05, which means the hypothesis (Ha) is accepted. Meanwhile, in the control group, the p value (1.000) > 0.05, which means that the hypothesis (Ha) is rejected. There is an effect of dark chocolate consumption on reducing dysmenorrhea pain, and there is a difference in pain between groups that consume and those who do not consume dark chocolate.

Keywords:- *Dark Chocolate, Dysmenorrhea Pain, Junior High School Student.*

I. INTRODUCTION

Puberty is a stage of development marked by the maturity of the sexual organs and the attainment of the ability to reproduce. Changes that appear during puberty often occur in girls who turn into young women. A young woman who is experiencing puberty According to Proverawati & Misaroh (2009) , dysmenorrhea is a natural biological symptom in the form of periodic and cyclic bleeding from the uterus which is accompanied by release (descumulation) of the endometrium .

Common symptoms that occur during the menstrual process where women feel complaints in the form of abdominal pain or cramps before menstruation which can last up to 2-3 days, starting the day before the first day of menstruation. Pain will greatly interfere with daily activities, even forced to be absent from school/work. Dysmenorrhea is pain in the pelvic area due to menstruation and the production of prostaglandin substances (Andriyani, 2013) .

Dysmenorrhea is a gynecological problem the main complaint that women often complain about (Perry et al., 2013) . According to Beddu et al. (2015); Wulandari et al. (2018) , dysmenorrhea can have a negative impact on young women because it causes disturbances in concentration in teaching and learning activities which in turn will affect the academic and non-academic achievements of the individuals concerned.

Complaints of pain is quite large. It is recorded in the data that on average more than 50% of women in each country experience this pain. According to (Proverawati & Misaroh, 2009) in America it reaches 60%, in Sweden around 72%, while in Indonesia it reaches 55%. Specifically, in Indonesia the rate of dysmenorrhea primary type is about 54.89%, while the rest are sufferers with dysmenorrhea

secondary. D ismenorrhea occurs in adolescents with a prevalence between 43% to 93%, in which 74-80% of adolescents experience dysmenorrhea light. The incidence of *endometriosis* in adolescents with pelvic pain is estimated at 25-38%, whereas in adolescents who do not respond positively to treatment for menstrual pain, *endometriosis is* found in 67% cases at *laparoscopy* (Hestiantoro et al., 2012) .

Answering these complaints, experts recommend treatment in two ways, namely (1) pharmacological methods such as administering analgesic drugs, hormonal therapy, non-steroidal anti-prostaglandin drugs, guidance or advice (Prawirohardjo, 2010) and (2) non- pharmacological methods, such as aerobic exercise, rest, orgasm, relaxation (Proverawati & Misaroh, 2009) , warm compresses, aromatherapy, music (Solehati & Kosasih, 2015) , warm drinks, waiting positions (Fajaryati, 2019) , take a warm bath, drink turmeric and drink tea with mint aroma (Sukarni & Margareth, 2013) .

I. LITERATURE RIVIEW

Potter & Perry, 2005 Among the two, pharmacological methods tend not to be recommended because they have side effects, therapeutic effects and toxic effects. As many as 30-70% of women treat menstrual pain with over-the-counter pain medications, they prefer pharmacological techniques over non-pharmacological techniques, this is very risky because the side effects of these drugs vary if used freely without doctor supervision (Nurwana et al., 2017) . Reducing dysmenorrhea pain in non- pharmacological ways , one of which is to improve nutrition or adolescent nutrition using dark chocolate (*dark chocolate*). Dark chocolate which is rich in calcium, potassium, sodium, omega 3, omega 6, magnesium, vitamins A, B1, B2, D, E, a little caffeine and *theobromine* can also have a relaxing effect on the uterine or uterine muscles (Hansen et al., 2018) , with its magnesium content . According to Cakrawati & NH (2014) it will be able to relax muscles and provide a sense of relaxation which can control a gloomy mood, where magnesium stimulates the brain to synthesize collagen and neurotransmitters to release endorphins. Dark chocolate also has several other ingredients such as caffeine, *theobromine* , *methyl-xanthine* and *phenylethyl alanine* which can affect mood and reduce fatigue due to depression. Dark chocolate also has another advantage, namely the *polyphenol* content which functions as an antioxidant in counteracting free radicals and as an anti-inflammatory (Juliastuti et al., 2021) .

Dark chocolate is usually consumed in urban communities, but not in suburban communities, let alone rural areas. The village community prefers to consume food or drink that has become a tradition handed down by the local

community which is believed to be better. Puskesmas, which are service operators and health facilitators for the community, certainly have limitations in the availability of medicines. Moreover, if the Puskesmas is not in an urban area or close to an urban area, it is important to have drugs that can be an alternative to existing treatments.

Based on the description and previous research, the researcher compiled the research hypothesis (Ha) that consuming dark chocolate has an effect on reducing dysmenorrhea pain that occurs in junior high school students , then conducted experimental tests on research samples and data analysis.

II. METHODOLOGY

This type of research uses a quantitative approach with the method used, namely the Quasi *Experiment Method* . According to Sugiyono (2015) that quasi-experimental research is **a research method used to find the effect on a group of subjects who are treated against others under conditions that can be controlled .** This quasi-experimental study used all subjects in a group of equal school levels to be given treatment , not using subjects taken at random.

Respondents to this study were junior high school students (junior high school) whose average age was between 13-16 years who were in grades 7, 8 and 9 , with a total student population of 74 students. The sample was determined by inclusive criteria such as having experienced feelings of pain and exclusive criteria such as not having had a menstrual period when the study was conducted. The researcher determined the sample using Fereder's equation, so the number of samples was determined as many as 18 respondents for the experimental group and 18 respondents for the control/intervention group.

Field data collection was carried out for one month and 10 days by making observations at the beginning of the menstrual period (*pre-test*), then given treatment by giving dark chocolate to be consumed and observed again as the final observation (*post-test*). Data analysis was done by testing the normality of the data and the Wilcoxon test and the Mann-Whitney U test as a procedure for statistical tests of non-parametric data.

III. RESULTS AND DISCUSSION

A. Observation Result
As a result of observation and data analysis, the respondents of this study have the criteria as shown in Table 1 below.

Table 1. Criteria for Research Respondents

Category	Characteristics	Frequency (Person)	Percentage
Age	13 years old	3	8.30%
	13-15 years	23	64.00 %
	15 years	10	27.70%
Class	VII	9	25.00%
	VIII	16	44.44%

	IX	11	30.56%
Menstruation	First time	0	0
	Not First Time	36	100%
Pain	Never used dark chocolate	0	0
	Never used anything other than dark chocolate	3	8.30%
	Never been treated with any method	33	91.67%

Source: Primary Data (2022)

Most of the respondents were female students who were in puberty/early adolescence who often experienced pain and had never received any treatment at all. This will increase the objectivity of the respondent's assessment of the pain scale and the effect of the dark chocolate that will be given.

Meanwhile, based on the results of observations/observations, the researcher managed to collect observational data at the beginning (*pre-test*) and at the end (*post-test*) which are broken down in Table 2 below .

Table 2. Observation Results per Group

Value Scale	Experiment Group			Control Group		
	Beginning	**End**	**Ket**	**Beginning**	**End**	**Ket**
10	--	--	--	--	--	--
9	--	--	--	--	--	--
8	--	--	--	--	--	--
7	--	--	--	--	--	--
6	--	--	Down	17%	17%	Permanent
5	44%	--	Down	39%	39%	Permanent
4	33%	--	Down	33%	33%	Permanent
3	--	--	Down	11%	11%	Permanent
2	--	28%	Ride	--	--	--
1	--	0%	--	--	--	--
0	--	72%	Ride	--	--	--
Amount	100%	100%		100%	100%	

Source: Primary Data (2022)
Information:
A = Experimental Group
B = Control Group

Table 2 above shows that in group A, the pain felt was on a medium scale from the 18 public junior high school students who were respondents to this study respectively on a scale of 6 there were 22% of people, on a scale of 5 there were 44% of people and 33% people. Whereas in group B, successively on a scale of 6 there were 17% of people, on a scale of 5 there were 39% of people, on a scale of 4 there were 33% of people and on a scale of 3 there were 11% of people. Meanwhile for the upper scale (numbers 7-10) and the lower scale (numbers 1-3) there is none/nil. Meanwhile, in the final observation (*post-* test) in both groups, the results of the assessment in group A obtained that the pain suffered after consuming dark chocolate was on the lower scale, where successive data were on a scale of 2, there were 28% of people, and a scale of 0 there are 72% people. Whereas in group B, people with dysmenorrhea were still relatively dominant on the medium scale, where successive data on scale 6 had 17%, scale 5 had 39%, scale 4 had 33% and scale 3 had 11%.

The data above shows that most of the respondents are female students who relatively rarely make efforts to reduce pain, both medically and non-medically. This shows that knowledge factors (Sari et al., 2021; Yulastini & Fajriani,

2021) and age/experience (Alsaleem, 2018; Bernardi et al., 2017) are the things that dominate the respondents in this study. According to research by Melati *et al.* , (2014) that 55.6% of junior high school youth aged 12-15 years have a negative attitude towards the experience of menstruation. The cause of the emergence of this attitude is due to the lack of sufficient information and explanations and the lack of response to help to deal with the pain experienced.

The results of the experiment in the two groups, both in the initial assessment (*pre-test*) were all at the middle/moderate level (Scale 4-6) and only 11% in the control group which was on Scale 3. This shows that in the age group young women around 13-15 years mostly experience pain on a moderate/medium scale. As for the final assessment (*post-test*), the experimental group that consumed dark chocolate experienced a change in pain to a lower level, such as 28% on Scale/1 and 72% on Scale 0. Meanwhile, in the control/intervention group there was no change (decreased) pain. All patients assess the pain at the beginning is still the same as the pain at the end. This shows that there is a change/decrease in effect due to consumption of dark chocolate.

In this regard, it can be said that the symptoms of dysmenorrhea accompanied by pain are almost always experienced by women on a regular basis every month. Pain is generally a process of the brain working in response to the stimulant received (Sperry, 1964; Sperry & Trevarthern, 1990) , so that everything related to the work process of the brain will in turn affect other behaviors (Zelekhah & Utami, 2020) . Likewise with pain caused by dysmenorrhea which is the body's hormonal process due to certain organs being disrupted. Pain during dysmenorrhea is felt in women aged 15-25 years, this is classified as primary dysmenorrhea. Respondents in this study were on average aged between 15-16 years who had relatively early experience (*menarche*) of feeling pain. Complaints of pain in adolescents like this will interfere with learning activities which are their main task as students. Ignorance of children at that age in dealing with pain results in disruption of individual and social activities , due to emotional instability, pain in certain organs/parts and so on. Apart from that, there is also anxiety that is always experienced by adolescent children who need parental guidance when they first experience menstruation (Fajriannor, 2018) .

The results of this study indicate that by increasing negative numbers / *negative ranks* proving by consuming dark chocolate, patients experience a decrease in pain by comparing the results of measurements at the beginning with measurements at the end. This is again reinforced by the results of the analysis of calculating the *Asymp Sig value* . (2 tailed) is below the value of α (0.05) so that the research hypothesis is accepted. Thus giving dark chocolate to treat pain is an alternative to overcome pain in dysmenorrhea sufferers.

Research by Sari *et al.,* (2021) where using tamarind turmeric media to reduce pain during dysmenorrhea. With respondents who are higher in age, it gives research results where the Sig value is 0.046. This figure is still higher than the results of this study, so it can be interpreted that the significance of the effect of dark chocolate is better/higher than that of sour turmeric.

Reflecting on the results of research conducted by Puspita (2018) in which carrot juice was used as a medium to reduce dysmenorrhea pain in 16 young women who were female students who experienced dysmenorrhea. Puspita's research results show that the Sig value is below/less than 0.05, which means it has a significant effect and the hypothesis is accepted. What Puspita did in her research gave results that were almost not much different from this study. However, the number of respondents is still larger in this study, so it can be interpreted that this research tends to be more tested and more accurate.

Based on the description above, according to the researchers, it was possible that the differences in backgrounds and conditions of each respondent had an influence on the initial and final assessments in determining the range/scale of values for pain suffered due to menstruation. In addition, the different time intervals between *the pre-test* and *post-test* also result in an assessment that is not always the same for each respondent.

B. Hypothesis test

The process of testing the hypothesis is carried out by analyzing the observed data in the experimental group as described in Table 3 below.

Table 3. Observations on Chocolate Consumption in the Experimental Group

Dysmenorrhea Pain Category	Before Consumption		After consumption	
	f	%	f	%
Heavy	0	0	0	0
Currently	18	100	0	0
Light	0	0	5	27.80
Gone pain	0	0	13	72,20
Amount	18	100	18	100

Source: Primary Data (2022)

Table 3 above explains that at the beginning of the observation before consuming dark chocolate, respondents felt pain at the "Moderate" level of 18 respondents (100%). However, after consuming dark chocolate, 18 respondents felt pain in the "Mild" category, 5 respondents (27.8%), even 13 respondents (72.2%) stated that the pain was gone. This data can be said to be an overview of the overall condition of the sample, especially at the start (not yet/not consuming dark chocolate).

➢ *Data Normality Test*

The step of carrying out this data normality test is to determine the next data analysis process, whether to do it with parametric or non-parametric statistical tests. From the results of the normality test it was found that if the p-value (*p-value*) < 0.05, the data is normally distributed.

From the results of the analysis using the IBM-SPSS ver.25 application, the p-value obtained from both the Kolmogorov-Smirnov and Shapiro-Wilk significance calculations for all groups in all observations was less than 0.05. This means that the data is classified as abnormal. Thus, further statistical testing uses non -parametric statistical tests. Table 4 below is a description of the results of the data normality test in the two groups.

Table 4. Data Normality Test

Observation	Kolmogorov-Smirnov Sig values	Sig Shapiro-Wilk score	Description (Decision Making)
Group A (early)	0.017	0.002	Abnormal
Group A (end)	0.000	0.000	Abnormal
Group B (early)	0.021	0.040	Abnormal
Group B (end)	0.021	0.040	Abnormal

Source: Primary Data (2022)

➢ *Wilcoxon test*

In the analysis of the Wilcoxon test data, it also tests the research hypothesis. From the data analyzed, IBM-SPSS ver.25 issued the results as shown in Table 5 below i.

Table 5. Processing Results of Wilcoxon Analysis and Hypothesis Testing

		Respondents	Average Increase Amount	Number of Upgrades	Statistics		Decision
					Z value	Sig p value	
Ex. Experiment (Beginning-End)	Negative Number Increase	18	9,5	171	-3,794	0.000	Ha accepted _
	Negative Number Increase	*Nothing*	*Nothing*	*Nothing*			
	Remains unchanged	*Nothing*	*Nothing*	*Nothing*			
Ex. Control (Begin-End)	Negative Number Increase	*Nothing*	*Nothing*	*Nothing*	0.000	1,000	Ha rejected _
	Negative Number Increase	*Nothing*	*Nothing*	*Nothing*			
	Remains unchanged	18	*Nothing*	*Nothing*			

Source: Primary Data Analysis Outcomes (2022)

From the table above it appears that in the experimental group a negative increase value (*Negative Ranks*) of 18 has an average number of increases (*Means Ranks*) of 9.5 and a total of increase (*Sum of Ranks*) of 171. Meanwhile in the increase column positive (*Positive Ranks*) or the increase rate is not seen at all, and likewise the *Ties value* which is the similarity number at the initial and final assessment is also nil.

Whereas in the control/intervention group, the data obtained negative increases (*Negative Ranks*) and positive increases (*Positive Ranks*) were both zero, but the *Ties* value showed a value of 18. This means that there is no change in value and the same value occurs between the initial assessment and finally on all respondents.

Taking into account the results of the Wilcoxon test above, it can be interpreted that ; *First* , the number of negative differences (*negative ranks*) between the final assessment and the initial assessment of the group given dark chocolate showed that there were 18 students whose pain scale was reduced in dysmenorrhea. *Second* , while the *positive ranks* indicate an increase in dysmenorrhea pain experienced after administration of dark chocolate, and *third* , the trend in the number of respondents who do not experiencing changes in pain at the beginning and at the end (*ties*).

The results of the Wilcoxon test in the experimental group obtained a P-value of 0.000, this value is less than 0.05, so it can be interpreted that there is a significant difference in pain in female students with dysmenorrhea for the initial and final assessment (hypothesis **H1 is accepted**) . In contrast, in the control/intervention group from the same table it is known

that the *Asymp Sig* (2 tailed)/ *P-value* is 1.000 which has a value exceeding 0.05. That means, the hypothesis is rejected because there is no significant difference in the initial assessment and the final assessment. So from these two conditions, it can be concluded that there is a significant effect of consuming dark chocolate on female students of SMP Negeri suffering from dysmenorrhea.

➢ *Mann-Whitney U test*

The results of the Mann-Whitney U test on non-normally distributed data using the IBM-SPSS ver.25 application obtained the results as shown in Table 6 below .

Table 6. Results of the Mann-Whitney U Statistical Test for the Hypothesis

	Final Assessment	Information
Mann-Whitney U test	0.000	Haha accepted
Z value	-5,292	Reception area
Sig Value (*P-value*)	0.000	Haha accepted

Source: Primary Data Analysis Outcomes (2022)

From Table 6 above, the *P-value* (Sig) and the Mann-Whitney U test result are 0.000, which is less than 0.05, meaning that **the hypothesis (Ha) is accepted** . This is reinforced by a Z value of -5.292 which is included in the acceptance curve area. Thus it can be concluded that there is a difference in pain from consuming dark chocolate in female junior high school students who suffer from dysmenorrhea, Meanwhile, to determine whether the overall hypothesis can be accepted or not, you can use Table 7 below which is the result of a statistical test.

Table 7. Mann-Whitney U test for the hypothesis

Group	Number of Respondents	Average Increase	Number of Upgrades	Information
Experiment	18	9.50	171	H $_a$ Accepted
Control	18	27.50	495	H $_a$ Accepted
Total	36			

Source: Statistical Data Processing Results

From the table above in the Experiment Group there is an average increase of 9.5 with an increase of 171. This shows that the distribution of data is more inclined towards the acceptance curve. Likewise the Control Group which had an average increase of 27.50 and an increase of 495 which gave a tendency to the acceptance curve.

IV. CONCLUSION

This study concluded that (1) there is a significant effect of consuming dark chocolate on reducing dysmenorrhea pain; and (2) there was a difference between the group that consumed dark chocolate and the pain of dysmenorrhea compared to the group that did not consume dark chocolate.

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