THE EFFECT OF DARK CHOCOLATE ON DYSMENORRHEA IN TEENAGE GIRLS

AT PONDOK PESANTREN ASSUBKIYAH, BANDUNG

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Abstract

Background: Dysmenorrhea is a cyclic pain during menstruation; it typically occurs in the lower abdomen and the waist and radiates to the legs. The incidence of dysmenorrhea in West Java in 2016 was 54.9%, consisting of 24.5% mild symptoms, 21.28% moderate symptoms, and 9.36% severe symptoms. Dysmenorrhea can be handled in a non-pharmacological way, one of which is by consuming dark chocolate.

Objective: This study was aimed to determine the effect of giving dark chocolate on dysmenorrhea in teenage girls at Pondok Pesantren Assubkiyah, Bandung.

Methodology: This is a quasi-experimental study that used a pre and post-test design with two group designs. The sample in this study was 34 respondents divided into two groups, 17 respondents were in the intervention group (given 100 grams of dark chocolate), and 17 respondents were in the control group. The study was conducted in July 2021 which the sampling technique used was purposive sampling. The instrument used was a numeric rating scale sheet. Data were analyzed using Paired T-Test and Independent T-Test.

Results: The average pain scale value before being given dark chocolate is 5 (moderate pain), while after being given dark chocolate is 3 (mild pain); the analysis results obtain a p-value of 0.022.

Conclusion: There is an effect of giving dark chocolate on pain of dysmenorrhea in teenage girls.

Keywords: Dark chocolate, Dysmenorrhea, Teenage Girls

I. INTRODUCTION

According to WHO (2012), it was obtained the incidence of 1,769,425 (90%) women who experience dysmenorrhea, with 10-15% of them having severe dysmenorrhea (Novadela, Rosmadewi, & Wakyuni, 2019). In Taiwan, the prevalence of women with dysmenorrhea is 75.2% (Ismail, Kundre, & Lolong, 2015). In Thailand, it is reported that the incidence of dysmenorrhea is 84.2% in puberty teenage girls (Hapsari & Anasari, 2015), while in Indonesia, it is recorded that the incidence of menstrual pain is 64.25% consisting of 54.89% experiencing primary menstrual pain while 9.36% experiencing secondary menstrual pain (A. Wulandari, Rodiani, & Sari, 2018). It is not much different from the incidence of dysmenorrhea in West Java, which records that 54.9% of women experiencing dysmenorrhea, with 24.5% experiencing mild dysmenorrhea, 21.28% experiencing moderate dysmenorrhea, and 9.36% experiencing severe dysmenorrhea (Savitri, Citrawathi, & Dewi, 2019).

Dysmenorrhea in teenagers can cause absenteeism at lecture attendance in 39.9% (of cases) (Handayani, Gamayanti, & Julia, 2016), emotional conflict, tension, and anxiety. Emotional conflict, stress, and anxiety—will eventually affect their skills and abilities. Skills and abilities meant here are broad, both personal skills which include self-awareness skills and analytic thinking skills, social skills, academic skills, and vocational skills (Calis et al., 2011).

Dysmenorrhea can be overcome by giving pharmacological and non-pharmacological therapy. Pharmacological therapy is the administration of analgesic drugs, namely non-steroidal anti-inflammatory drugs (NSAIDs), which can relieve pain. Non-pharmacological therapy is carried out through distraction, relaxation, guided imagination, and warm or cold compresses (Hamaranani, Permatasari, & Yuliani, 2017).
Back massage (Goddess & Nofia, 2020), acupressure (Jiang et al., 2013), acupuncture, and aromatherapy (Ardela, Yuliwar, & Dewi, 2017), sport (Armor et al., 2019), herbs to nutritional improvement (Lowdermilk, Perry, & Cashion, 2013), dark chocolate (Arfailasufandi & Andiarna, 2018), as well as breathing relaxation techniques (Smeltzer & Bare, 2002). According to (Hill 2002), magnesium functions to relax muscles and prevent muscle spasms and blood vessel walls from reducing pain during menstruation (S. Wulandari & Afriliana, 2017). Magnesium is a well-known muscle relaxant that is used successfully to promote relaxation and reduce pain and tension associated with female hormonal conditions including menstrual cramps (Happy; is helped by Magnesium). Dark chocolate is processed cacao rich in calcium, potassium, sodium, Magnesium, and vitamins A, B1, C, D, and E. (Arfailasufandi & Andiarna, 2018). It can stimulate the brain to release endorphins. Endorphins function to inhibit pain impulses—and become natural analgesics. Therefore chocolate can be used as non-pharmacological therapy to reduce pain intensity, such as menstrual pain. (Kundaryanti, Suciawati, & Nurfaizah).

A preliminary survey conducted at Pondok Pesantren Assubkiyah at the end of April 2021 found 47 teenage girls experiencing dysmenorrhea during menstruation. 38.30% experiencing moderate pain, 6.38% experiencing mild pain, and 0% experiencing severe pain.

The treatment done to ease the pain of dysmenorrhea is a warm compress; thus, when teenage girl students are dealing with dysmenorrhea, they often skip classes – or even school and are unable to participate in other activities. Therefore, researchers are interested in providing 100 grams of dark chocolate to be an alternative for treating dysmenorrhea to increase the quality of activity during menstruation.

II. RESEARCH METHODS

This study is quasi-experimental using a pre and post-test with two group designs. The sample in this study was 34 respondents divided into two groups, 17 respondents were in the intervention group (given 100 grams of dark chocolate), and 17 respondents were in the control group. The study was conducted in July 2021 which the sampling technique used was purposive sampling. The instrument used was a numeric rating scale sheet. Data were analyzed using Paired T-Test and Independent T-Test.

III. RESULTS AND DISCUSSION

The frequency distribution of pretest and post-test pain scales in the intervention and control groups of teenage girls at Pondok Pesantren Assubkiyah, Bandung, is presented in the following table.

<table>
<thead>
<tr>
<th>Pain Scale</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest F</td>
<td>%</td>
</tr>
<tr>
<td>1-3 (Mild)</td>
<td>5</td>
<td>29.4</td>
</tr>
<tr>
<td>4-6 (Moderate)</td>
<td>12</td>
<td>70.6</td>
</tr>
<tr>
<td>7-10 (Severe)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on table 1.1 show the results of the dysmenorrhea pain scale in teenage girls during the pretest (before being given dark chocolate).
Five people experiencing mild pain (29.4%), and 12 people experiencing moderate pain (70.6%); whereas, in the post-test, it shows that 15 people are experiencing mild pain (88.2%) and two people experiencing moderate pain (11.8%). In the control group, the dysmenorrhea pain scale in teenage girls during the pretest showed that seven people experienced mild pain (41.2%), nine people experienced moderate pain (52.9%), and one person experiencing severe pain (5.9%); whereas, in the post-test, it is shown that, eight people experiencing mild pain (47.1%) and nine people experiencing moderate pain (52.9%).

Table 1.2 Description of the Average Pain of Dysmenorrhea Before and After Being Given Dark Chocolate

<table>
<thead>
<tr>
<th>Variable</th>
<th>mean</th>
<th>Mean Difference</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>4.24</td>
<td>1.71</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Post-test</td>
<td>2.53</td>
<td></td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Based on table 1.2, the average value before being given dark chocolate is 4.24, and after being given dark chocolate is 2.53. So it is found that the difference in moderate pain of dysmenorrhea in teenage girls before and after being given dark chocolate is 1.71.

Table 1.3 Differences in Dysmenorrhea Pain Scale in the Pretest and Post-test of the Intervention and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Post-test</th>
<th>Mean Difference</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dark chocolate</td>
<td>4.24</td>
<td>2.53</td>
<td>1.71</td>
<td>0.001</td>
</tr>
<tr>
<td>Control</td>
<td>3.94</td>
<td>3.59</td>
<td>0.35</td>
<td>0.287</td>
</tr>
</tbody>
</table>

The results of the additional testing on the average pain scale, in the post-test of the dark chocolate group, using the paired sample t-test, showed a significant value of 0.001 (<0.05), meaning that there is a difference in the dysmenorrhea pain scale of the intervention group, before and after being given dark chocolate. In the control group, the different testing results using paired sample t-test obtained a significant value of 0.287 (> 0.05), meaning that there is no change in the dysmenorrhea pain scale in teenage girls at Pondok Pesantren Assubkiyah, Bandung, 2021.

Table 1.4 The Effect of Dark Chocolate on Dysmenorrhea in Teenage Girls at Pondok Pesantren Assubkiyah, Bandung

<table>
<thead>
<tr>
<th>Pain scale</th>
<th>Intervention mean</th>
<th>Control mean</th>
<th>Mean difference</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>4.41</td>
<td>4.24</td>
<td>0.17</td>
<td>0.725</td>
</tr>
<tr>
<td>Post-test</td>
<td>2.53</td>
<td>3.59</td>
<td>1.06</td>
<td>0.022</td>
</tr>
</tbody>
</table>

The calculation of the mean pretest of the dysmenorrhea pain scale in the intervention group is 4.41 (moderate) and in the control group is 4.24 (average), with a difference of 0.17. The result of the independent t-test test shows a significance value of 0.725 > 0.05. Meanwhile, the mean post-test of the dysmenorrhea pain scale in the intervention group is 2.53 (mild) and in the control group is 3.59 (moderate), so it can be seen that the difference between the two groups is 1.06 and with a p-value of
0.022 < (0.05). Thus it can be concluded that there is an effect of giving dark chocolate on dysmenorrhea in teenage girls at Pondok Pesantren Assubkiyah, Bandung, in 2021.

IV. DISCUSSION

a. Frequency Distribution of Dysmenorrhea Pain Scale in the Intervention and Control Groups

The study results, in the pretest of the dysmenorrhea pain scale, teenagers are experiencing moderate pain, both in the intervention or control group. The post-test shows a difference in pain scale in the intervention and control groups, while in the intervention group, the pains are mild to medium and moderate in the control group.

According to Devi (2012), dark chocolate has several advantages, including being rich in polyphenols, functioning as antioxidants in warding off free radicals, and be anti-inflammatory. Magnesium can relax muscles and provide a sense of relaxation that can control mood—which, Magnesium can stimulate the brain to synthesize collagen and neurotransmitters to release endorphins (Wahtini, Hidayah, & Wahyuntari, 2021).

Dark chocolate is rich in vitamins A, B1, C, D, and vitamin E, antioxidant phenols and flavonoids, as well as minerals such as calcium, potassium, iron, a little of omega 3 and 6, Magnesium, a little caffeine, and theobromine (S. Wulandari & Afriliana, 2017). According to Devi (2012), the magnesium content in dark chocolate can relax muscles and provide a sense of relaxation that can control a gloomy mood—in which Magnesium can stimulate the brain to synthesize collagen and neurotransmitters to release endorphins (Wahtini et al., 2021).

The results of this study follow Pangesti’s (2017) analysis—that the pain scale before the intervention was given moderately. After the intervention was given, it changed to mild and no pain (Utami, Isworo, & Hanafi, 2017).

According to the researcher's assumptions, the frequency of pain obtained differs in both the control and intervention groups. Depending on a person's pain threshold, the post-test pain scale shows an effect of giving dark chocolate; this happened because the endorphins released by Magnesium affect teenagers' mood. Thus they will feel calmer—this will divert the pain that they think. Besides, Magnesium can also relax smooth muscles in the uterus.

b. The Effect of Dark Chocolate on Dysmenorrhea in Teenage Girls at Pondok Pesantren Assubkiyah, Bandung

The results show that the intensity of the dysmenorrhea pain scale in teenage girls before the intervention is 4.41 (moderate) on average and in the control group is 4.24 (middle) on average. Meanwhile, the dysmenorrhea pain scale after the intervention is 2.53 (mild) in the intervention group and 3.59 (medium) in the control group—in other words, it can be interpreted that the intervention group experiences mild and the control group experiences moderate pain.

According to French (2005), dysmenorrhea pain occurs due to the release of prostaglandins in the menstrual fluid, which causes uterine contractions and pain. Increased levels of prostaglandins during the luteal phase and menstruation cause uterine contractions. A threefold increase in prostaglandins in the endometrium occurs from the follicular phase to the luteal stage, further increasing during menstruation. The increase in prostaglandins is accompanied by a decrease in progesterone at the end of the luteal phase of the increased myometrium and excessive uterine contractions (Pangesti, 2017) (Rahayu, Suryani, & Marlina, 2014). The impact caused by dysmenorrhea is in the form of activity disorders such as high levels of absenteeism from school and work, limitations in social life, and a decrease in academic performance and sports activities. The problem of dysmenorrhea also impacts the decline in the quality of life of teenagers (Oktavianto, Kurniati, Badi’ah, & Bengu, 2018).
The results of this study are in line with Wahtini’s (2021) study that there is an effect of dark chocolate consumption on reducing primary dysmenorrhea pain levels with a p-value = 0.000 (Wahtini et al., 2021).

**ETHICAL CLEARANCE**
No. 118/PE/KE/FFK-UMJ/VII/2021

**V. CONCLUSION**

Giving 100 grams of dark chocolate reduces the pain scale of dysmenorrhea in teenage girls at Pondok Pesantren Assubkiyah, Bandung. Thus, dark chocolate is proven to be able to be used as a pain reliever during dysmenorrhea.

**REFERENCES**

8. Happy, F. M. Category: goals.


