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RESEARCH ARTICLES

Giving Carrot Juice (Daucus Carota) Is Effective to Reduce Pain Levels in Primary Dysmenorrhea

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Abstract: Dysmenorrhea is pain that occurs during menstruation and is most common in adolescent women, resulting in many visits to gynecology clinics. Menstrual discomfort can sometimes make women unable to perform activities and is accompanied by emotional instability. In reducing pain, this study explains the effectiveness of carrot juice in reducing primary menstrual pain. This study used a true experimental method with a randomized pre-test-post-test design. The sampling technique used was purposive sampling. Data analysis was based on the severity grade of the Verbal Multidimensional Scoring System. Data normality was tested. A paired t-test was used to determine the normal distribution of data. If the distribution was not normal, a Wilcoxon test was used. The mean score before carrot juice administration was 1.48, categorized as moderate pain, while after carrot juice administration it was 0.43, categorized as mild pain. The mean dysmenorrhea pain before and after carrot juice administration was 1.05 (95% CI: 2.50-3.20) with a mean SD of 1.00. Based on the results of the t-test, $\alpha = 0.05$ indicates a P-value of 0.000, meaning the paired test results are <0.05. Carrot juice is effective in reducing menstrual pain experienced by students of the UMSU Faculty of Medicine.

Keywords: Dysmenorrhea, pain, effectiveness, carrot juice

INTRODUCTION

Dysmenorrhea is pain that occurs during menstruation and is most common in adolescent girls, leading to many visits to gynecology clinics.[1] This type of dysmenorrhea is not life-threatening, but it can be quite disruptive to many teenagers' activities.[2]

Dysmenorrhea is divided into primary and secondary dysmenorrhea. Primary dysmenorrhea is not caused by a pathological condition, while secondary

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dysmenorrhea is caused by a pathological condition.[3] Dysmenorrhea causes many women to feel disadvantaged because it can reduce productivity and increase economic losses for medical care costs. Dysmenorrhea can cause adolescent girls to be unable to concentrate on their studies and have decreased motivation to learn.[3,4]

According to the World Health Organization (WHO), in 2016, 1,769,425 women (90%) worldwide experienced severe dysmenorrhea.[3.] In Indonesia, 107,673 people (64.25%) experienced dysmenorrhea, of which 59,671 (54.89%) experienced primary dysmenorrhea and 9,496 (9.36%) experienced secondary dysmenorrhea.[4] Prevalence in Medan City in 2019, at Madrasah Tsanawiyah Negeri 3 Medan, the results showed that out of 57 people, there were menarche age >12 years as many as 17 people (29.8%), and menarche age 7 years as many as 30 people (52.6%).[5] Having a family history as many as 45 people (78.9%) and those who did not have a family history as many as 12 people (21.1%). Dysmenorrhea as many as 42 people (73.7%) and those who did not experience Dysmenorrhea as many as 15 people (26.3%).[5]

Carrots are a food ingredient that is often called a source of vitamin A because they are high in β-carotene content. β-carotene is the pigment that gives carrots their orange color and is a natural dye commonly used in food processing and can minimize analgesic pain.[6] Carrots contain sugar, carotene, pectin, asparagine, fibre, fat, carbohydrates, calcium, phosphorus, iron, sodium, amino acids, essential oils, and beta-carotene.[6] Carrots contain vitamins A, B, C, D, E, and K. The benefits of vitamin E help block the formation of prostaglandins.[7] The hormones that influence dysmenorrhea are prostaglandins; in this case, prostaglandin E2 (PGE2) and E2a (PDF2 α).[8]

Dysmenorrhea can be treated by taking pain relievers, resting, taking deep breaths, calming yourself, doing light exercise, consuming vegetables and fruits, and applying hot compresses to the painful area.[6] Nutrients that can help relieve dysmenorrhea are calcium, magnesium, and vitamins A, E, B6, and C.[6] Efforts to reduce pain from symptoms. Many adolescent girls consume non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, naproxen, mefenamic acid, and aspirin during dysmenorrhea.[8]

Research has shown that vitamin E can also inhibit prostaglandin biosynthesis by suppressing the activity of the phospholipase A2 enzyme, thereby inhibiting arachidonic acid metabolism.[9 11 12] Vitamin E can relax uterine smooth muscle by increasing the production of prostacyclin, which acts as a vasodilator.[10,11]

Previous research conducted by Mutiara found that the average pain intensity before carrot juice was 5.00.15 and after carrot juice was 2.54. The average reduction in dysmenorrhea pain was 2.46.[12,13] There was an effect of carrot juice on reducing menstrual pain (dysmenorrhea) in

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adolescent girls at SMAN 2 Bangkinang City in 2021.[14,15]

For this reason, researchers want to prove the effectiveness of giving carrot juice (Daucus carota) to reduce the degree of pain in primary dysmenorrhea in female students of the Faculty of Medicine, Muhammadiyah University of North Sumatra, Class of 2020. The study aimed to determine the effectiveness of giving carrot juice before and after giving carrot juice to reduce the degree of primary dysmenorrhea in female students of the Faculty of Medicine, Muhammadiyah University of North Sumatra.

METHOD

The study used a true experimental method with a randomised pretest-posttest design. The subjects selected for this study were female students aged 19-22 years from the Class of 2020 at the Faculty of Medicine. The study design consisted of 250 ml of carrot juice administered twice daily for three days.

This study was conducted at the Faculty of Medicine, Muhammadiyah University of North Sumatra. The population consisted of female students from the Faculty of Medicine, Muhammadiyah University of North Sumatra, and the sample consisted of female students from the Faculty of Medicine, Muhammadiyah University of North Sumatra, in the Class of 2020.

The sampling technique used in this study was purposive sampling. This sample was obtained from the population determined using the Slovin formula.

Data analysis in this study was based on the severity grades of the Verbal Multidimensional Scoring System. Data normality was tested. If the data were normally distributed, a paired t-test was performed. If the data were not normally distributed, a Wilcoxon test was performed. All data analysis was performed using a computer analytics program.

RESULT

This study examines the effectiveness of administering carrot juice (Daucus carota) to reduce the degree of pain in primary dysmenorrhea, where in this study univariate and bivariate data will be discussed as in the table below.

Table 1. Difference in Dysmenorrhea Pain Before and After Giving Carrot Juice to Women

Variable (Dysmenorrhea before administration)	N	%	Variable (Dysmenorrhea After administration)	N	%
Grade 0: Menstruation is not painful	0	0	Grade 0: Menstruation is not painful	14	66,7
Grade 1: Menstruation with mild pain.	13	61,9	Grade 1: Menstruation with mild pain.	5	23,8
Grade 2: Menstruation with moderate pain.	6	28,6	Grade 2: Menstruation with moderate pain.	2	9,5
Grade 3: Menstruation with severe pain.	2	9,5	Grade 3: Menstruation with severe pain.	0	0

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Total	21	100,0	Total	21	100,0

Based on the pain before being given carrot juice, it was found that 13 people (61.9%) had pain intensity number 1, and after being given carrot juice, 14 people (66.7%) had pain intensity number 0.

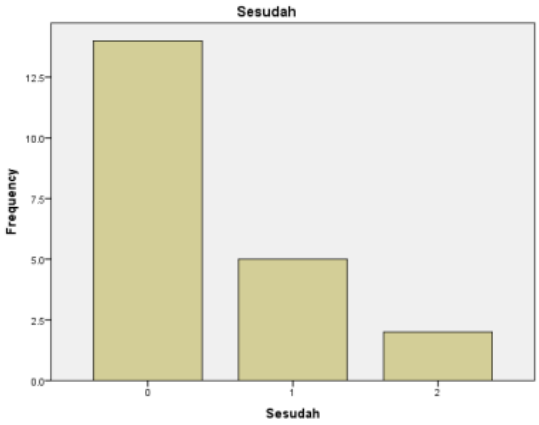

Figure 1. Dysmenorrhea Before Giving Carrot Juice

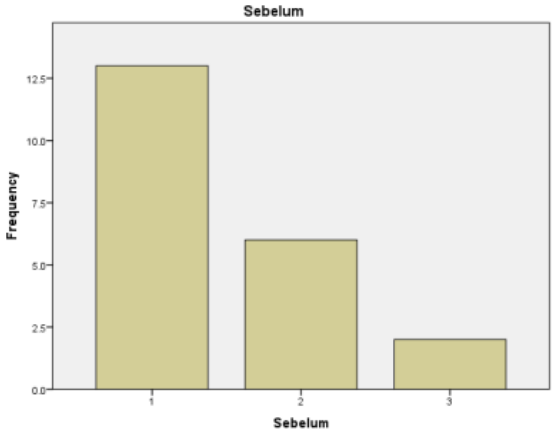

Figure 2. Dysmenorrhea After Giving Carrot Juice

Table 2. Difference in Dysmenorrhea Pain Before and After Giving Carrot Juice to Women

Variable	Mean	SD	Minimum-maximum	n
Dysmenorrhea before giving carrot juice	1.48	0.680	1-2	21
Dysmenorrhea before giving carrot juice	0.43	0.676	0-1	

Table 2 shows that the average score before carrot juice administration was 1.48, categorised as moderate pain, while after carrot juice administration it was 0.43, categorised as mild pain. Nearly all respondents experienced moderate dysmenorrhea before carrot juice administration and mild dysmenorrhea after carrot juice administration.

Table 3. Average Difference in Dysmenorrhea Before and After Carrot Juice Administration

Variable	Group	Mean	SD	SE	95% CI	P Value
Dysmenorrhea intervention carrot juice	Pre	1.48	1.00	0,508	2,50 - 3,20	0,000
	Post	0.43	0.00	0,507		
	Difference	1.05	1.00	0,14		

In Table 3, the difference in the average dysmenorrhea pain before and after being given carrot juice is 1.05 (95% CI: 2.50-3.20) with SD = 1.00. Based on the results of the statistical test t test, α = 0.05 shows that the P value = 0.000, which means the results of the paired test <0.05 then Ho = Rejected meaning that there was a decrease

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in menstrual pain before and after being given carrot juice.

DISCUSSION

Table 1 shows that the mean score before carrot juice administration was 1.48, categorized as moderate pain, while after carrot juice administration it was 0.43, also categorized as mild pain. Almost all respondents experienced moderate dysmenorrhea before receiving carrot juice and experienced mild dysmenorrhea after receiving carrot juice.

This study shows that in the pretest, 10 participants (68.82%) experienced severe pain. Severe pain occurs due to an imbalance of ovarian steroid hormones, in addition to psychological factors that exacerbate dysmenorrhea.[19]

The results of this study align with Dr S. Ziaei's research in Hembing, which found that vitamin E in carrots can reduce menstrual pain. Vitamin E helps block prostaglandin formation and counteracts the effects of increased prostaglandin production. According to Berkley's research, vitamins B1 (Thiamine), B6, and E can reduce menstrual pain. Therefore, foods containing these vitamins should be consumed to reduce menstrual pain. According to Astawan's theory, beta-carotene contains vitamins A, B, C, D, E, and K. [16, 17] In addition to its antioxidant properties, beta-carotene also has analgesic and anti-inflammatory effects when consumed at a dose of 3,071.93 SI/kgBW.[2.] Seeing the problems experienced by adolescent girls, the impact of dysmenorrhea forces them to use various methods to reduce menstrual pain.[18]

Based on the description above, researchers assume that the feeling of pain or discomfort is caused by the pain centre's response to a stimulus, for example, the tension in the abdominal muscles caused by contractions of the uterine wall during dysmenorrhea. The pain will increase if the sufferer focuses on the pain itself without diverting attention to other things. The pain experienced by each person is also different, ranging from mild to moderate to severe. The level of pain experienced by each person depends on age, the type of trauma experienced, and how the pain is diverted or treated.

Table 2 shows the difference in mean dysmenorrhea pain before and after carrot juice administration, which was 1.05 (95% CI: 2.50-3.20) with a mean SD of 1.00. Based on the results of the t-test, $\alpha = 0.05$ indicates a P-value of 0.000, meaning the paired test result is <0.05. Therefore, H0 is rejected, indicating a decrease in menstrual pain before and after carrot juice administration.

Hembing's research suggests that this is because the experimental group was given carrot juice, which contains vitamin E, which is beneficial for reducing dysmenorrhea and helps counteract the effects of increased prostaglandin production. The more carrot juice consumed, the lower the level of dysmenorrhea.

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Rahayu Susilo's research found that 11 women (67.7%) experienced a decrease, 5 women (29.4%) experienced a decrease, and 1 woman (5.9%) did not experience a decrease. The Wilcoxon test was used. The Match Pairs Test showed that with a 5% margin of error, warm water hydrotherapy is a type of natural therapy that aims to improve blood circulation, reduce oedema, increase muscle relaxation, improve heart health, relax muscles, relieve stress, reduce muscle aches, relieve pain, increase capillary permeability, and provide warmth to the body, making it very useful for pain relief therapy.[18]

Albertus's research demonstrated analgesic activity in female mice that consumed carrot juice at doses of 0.5g/kg, 1g/kg, 2g/kg, 4g/kg, and 8g/kg. This suggests that the beta-carotene found in carrots has a pain-inhibiting mechanism due to its antioxidant activity. Changes in dysmenorrhea levels were observed in respondents after administration of carrot juice and carrot hydrotherapy, which contains vitamin E, which is beneficial for reducing dysmenorrhea and helping to overcome the effects of increased prostaglandin production.[19,20]

This demonstrates a decrease in pain after administration of carrot juice. Therefore, if you are given carrot juice, follow the procedure carefully to reduce the pain.[20]

Administering carrot juice correctly will reduce the intensity of pain experienced by clients, and conversely, pain will be reduced if not administered with carrot juice.

CONCLUSION

Based on the results of the t-test, $\alpha = 0.05$ shows that the P value = 0.000, which means the results of the paired test <0.05; then Ho = Rejected, meaning that there was a decrease in menstrual pain before and after being given carrot juice.

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