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Effectiveness of chewing water apple and star fruit in reducing plaque scores on Students Dental Health Department of the Jambi Ministry of Health Polytechnic

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Abstract

Background: Plaque is a layer attached to the surface of the teeth consisting of microorganisms that grow on the surface of the teeth if someone ignores dental and oral hygiene. Plaque is the main cause of caries and periodontal disease. Efforts made to prevent or reduce plaque formation with mechanical plaque control by brushing teeth, chemical methods using mouthwash and natural methods by chewing fibrous and juicy fruits. Objective: to determine the difference in the effectiveness of chewing water guava and star fruit in reducing plaque scores in students majoring in dental health in Jambi.

Method: this study is a quasi-experimental study using a pre-test and post-test design. Sampling using purposive sampling, the sample in this study amounted to 30 students divided into 2 groups.

Result: in the group chewing water apple fruit the average value of plaque score reduction was (29.9) and the results of the statistical test p-value 0.000 <0.05 in the group chewing star fruit the average plaque score reduction was (33.7) and the results of the statistical test p-value 0.000 <0.05 In the independent T-Test unpaired difference test obtained a p-Value of 0.017 <0.05 meaning there is a significant difference between chewing using water apple fruit and star fruit.

Conclusion: water apple fruit and star fruit are effective in reducing plaque scores. But star fruit is more effective in reducing plaque scores in students of the Dental Health Department of the Jambi Ministry of Health Polytechnic.

Keywords: water guava fruit; star fruit; plaque score

INTRODUCTION

Ministry of Health Basic Research Results Health (Riskesdas) In 2018, the Indonesian population suffer disease tooth And mouth Still tall ,prevalent caries 88.8% And prevalence periodontal disease 74.1% (1). According to the World Health Organization (WHO) dental health problems in society are tooth decay and periodontal disease, in adults it is found almost 100% and periodontal disease 15-20% (2).

Plaque is a layer that adheres to the surface of the teeth consisting of microorganisms that multiply on the surface of the teeth if someone ignores dental and oral hygiene. Plaque is the main cause of caries and periodontal disease. Efforts made to prevent or reduce plaque formation with plaque control by: mechanically by brushing teeth, chemically by using mouthwash and naturally by chewing fibrous and juicy fruits (3) The results of research from Wiradona that chewing star fruit can reduce plaque scores. Star fruit has a fiber content of 0.9 grams per 100 grams and contains 90% water and the results of research from Sutha, Dw (5) the average plaque score before chewing star fruit is 2,750 and the average plaque score after chewing star fruit is 1,295. The resulting difference is 1,445. Research from Pratama, AT (6) the average plaque before consuming water apple fruit is 1,557 and after consuming water apple fruit is 1,443 (4).

METHOD

The design of this study is a quasi-experimental study using a pre-test and post-test design. The sample in this study were students of the Jambi Dental Health Department, who met the inclusion criteria. The inclusion criteria for this study were students of the Jambi Dental Health Department, a maximum of 3 carious teeth, a calculus index of 0, non-crowded teeth, and not using orthodontics and willing to be respondents, crowded teeth. using orthodontics and not willing to be respondents. The subjects of the study were 30 people who were prepared according to the predetermined criteria and had been given sufficient information in advance and had signed an informed consent.

The research subjects were divided into 2 groups, namely Group A and Group B, each group consisting of 15 people. First, the subjects were instructed not to brush their teeth after 21.00 WIB, not to brush their teeth in the morning before treatment. Respondents were instructed to eat bread/biscuits of the same size. Then measure the initial plaque score with the plaque index with PHPM in both groups. This is done to identify the presence of plaque. The plaque score measurement procedure is carried out with a disclosing solution. Its use is by applying a disclosing solution to the surface of the subject's teeth and then the results are recorded. Group A was instructed to eat water apples with 32 chews and group B was instructed to eat star fruit with 32 chews. Furthermore, the plaque scores of both groups were re-examined and recorded on the form Data analysis using Paired T-Test to test the difference in mean plaque scores before and after chewing water guava and starfruit. Independent T-Test to test the difference in plaque scores before and after treatment.

RESULTS

This study was conducted on 30 students majoring in dental health at the Jambi Ministry of Health Polytechnic, sampling using purposive sampling technique, with the following results table 1. The average plaque score value in students of the Dental Health Department, the plaque score before chewing water apple fruit was (34.87) while after chewing water apple fruit it dropped to (4.27) with an average decrease in plaque score of (29.9) and the results of the statistical test p-value 0.000 <0.05 which means there is a significant difference before and after chewing star fruit.

Table 1. Effectiveness Chewing Water Guava on Decreasing Plaque Scores in Students Jambi Dental Health Department

No	Intervention	N	Average Plaque Score Value	*P-Value*
1.	Before Chewing Water Apple Fruit	15	34.87	0.000
2.	After Chewing Water Apple Fruit	15	4.27	
Plaque Score Reduction			29.9	

Table 2 Effectiveness Chew Star fruit Against Decreasing Plaque Scores in Students Jambi Dental Health Department

No	Intervention	N	Average Plaque Score Value	*P-Value*
1.	Before Chewing Star Fruit	15	35.07	0.000
2.	After Chewing Water Apple Fruit	15	1.80	
Plaque Score Reduction			**33.27**	

The average plaque score value in Dental Health Department students, the plaque score before chewing star fruit was (35.07) while after chewing star fruit it decreased to (1.80) with an average decrease in plaque score of (33.7) and the results of the statistical test p-value 0.000 <0.05 which means there is a significant difference before and after chewing star fruit.

Table 3 Comparison Effectiveness Chewing Water Apple And Starfruit Electric Against Decreasing Plaque Scores in Students Jambi Dental Health Department

No	Fruit Intervention	N	Average Plaque Score Reduction	*P-Value*
1.	Guava fruit	15	29.9	0.017
2.	Star fruit	15	33.27	

The average value of plaque score reduction in students of the Department of Dental Health, Poltekkes Kemenkes Jambi in the guava chewing group was 29.9, while the average decrease in plaque score in the star fruit chewing group was greater, namely 33.27

In the difference test No paired independent T-Test for to find out the difference in effectiveness of chewing water guava and star fruit in reducing plaque scores in students of the Dental Health Department of the Jambi Ministry of Health Polytechnic, a p-value of 0.017 <0.05 was obtained, which means there is a significant difference between chewing using water guava and star fruit.

DISCUSSION

Fruit water guava contains fiber 0.9 grams and water 87 grams. In fruit water guava is also available fibers that can used as brush tooth natural that can increase cleanliness teeth and mouth that can reduce debris index (5)Fruit water guava is called as circles brush tooth experience or as self cleansing. Fruit This help For stimulate gums , increase flow of saliva in the mouth , preventing accumulation plaque , and clean the tooth surface (6). Food fibrous is eat This can clean tooth from reason caries. Food that is like This is type fruits that contain lots of water (7)

Sweet starfruit (Averrhoa carambola L.) is a non-climacteric fruit with thin skin, has a sweet and refreshing taste, and also has high levels of vitamin C. Starfruit has benefits as an antioxidant and antibacterial. Sweet starfruit is one example of a high-fiber food with a fairly high water content. Every 100 grams of sweet starfruit contains 91% water, 42 calories of energy, 3% fiber, 10 grams of carbohydrates, 1 gram of protein, 5 mg of calcium, 207 potassium (potassium), 11 mg of magnesium, 20 mg of phosphorus, 65 RE vitamin A, 27 RE vitamin C, 0.1 vitamin B6, 1 (8). The process of chewing starfruit can indeed reduce the growth of plaque, debris, and can overcome bad breath because chewing will stimulate the formation of saliva (saliva) so that the self-cleansing process occurs. Lots of saliva will make the mouth rich in oxygen so that anaerobic bacteria that cause bad breath can be suppressed (9).

The combination of fiber and water in fruits such as. Starfruit can stimulate saliva production, causing a natural cleaning effect on the teeth (self-cleansing). The self-cleaning process occurs naturally because of the muscular work involved in breaking down food, which in turn triggers saliva production (10). This muscle activity is a result of the chewing process (11). Chewing hard foods, such as watercress and fiber-rich Starfruit, which have high water content and hard texture, requires prolonged chewing and contributes to self-cleaning of the tooth surface. The mechanical properties of chewing can produce a brush-like effect that may effectively remove dirt from the tooth surface. Starfruit is more effective in reducing plaque scores because Plaque control can be done by removing and preventing the formation of plaque accumulation. Plaque can be controlled mechanically, namely by brushing teeth and chemically, namely by rinsing. Prevention of plaque formation can use fruits that contain epicatechin. Epicatechin as an anti-caris because it is bactericidal, one of the fruits containing epicatechin is sweet starfruit (Averrhoa carambola L) (12). Self-cleaning mechanism refers to the natural process of cleaning food debris from inside the mouth. The most effective methods for maintaining dental and oral hygiene include regular brushing and consumption of fruits high in fiber, water, and hard texture. Hard textured fruits need to be chewed for a long time, and

with two sides so that they help the process of mechanically cleaning teeth in the oral cavity (4)

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