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Chewing water apple (*syzygium aqueum)* as an effort to reduce plaque index

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ABSTRACT

Background: Teeth are important organs that need to be kept clean. Maintaining oral hygiene will reduce a person's risk of developing diseases related to the mouth. Dental plaque is a collection of microorganisms on the surface of the teeth in the form of biofilms that can affect the oral cavity system. How to remove plaque naturally with fresh and fibrous fruits can be a self-cleaning or natural cleaner for the layer that sticks to the surface of the teeth, because it can indirectly rub the surface of the teeth. Guava is one of the fruits that contains water and fiber. Objective: This study aims to analyze the plaque index before and after chewing water apple. Method: The research design used in this study was a quasi-experimental design with a pretest and posttest with one group design. The data collection technique was purposive sampling, as many as 35 respondents. The instrument used in this study was a plaque index with the Patient Hygiene Performance Index and data analysis using a paired sample test. Results: The results of this study showed that before chewing water apple, 25 respondents (71.43%) were in the poor category and after chewing water guava, 34 respondents (97.14%) were obtained. The difference in plaque index score before chewing water apple was 2.1 while after chewing water apple was 1.1, with p=0.02. Conclusion: There was a decrease in plaque index before and after chewing water apple as evidenced by p<0.05.

INTRODUCTION

Dental and oral are important organs that need to be kept clean. People still consider the oral cavity to be only a small part of the body so that awareness to maintain dental and oral health is still low (Fadjeri et al., 2023). This can have an impact on the occurrence of dental and oral diseases that will interfere with the function and activities of the oral cavity such as digestion, aesthetics and communication (Kasihani et al., 2021). Maintaining oral hygiene will reduce the risk of oral diseases, such as canker sores, bleeding gums, tooth decay, and others. In addition, it will also help someone not to experience bad breath and lack of confidence in their appearance (Anil & Anand, 2017).

Dental disease is experienced by 90% of Indonesian people (Ramdiani et al., 2020). The results of the 2018 Basic Health Research showed that 92.2% of mothers aged 35-44 experienced caries. From the 2018 basic health research data, dental and oral health problems in Indonesia were found to be 57.6% and in DKI Jakarta 59.1% (Kementerian Kesehatan RI, 2018).

Dental plaque is a collection of microorganisms found on the surface of the teeth in the form of biofilms that can affect the oral cavity system. Colonies of bacteria found in biofilms are found throughout the body and can cause infection. The development and maturity of dental plaque are caused by a warm and moist oral cavity environment (Jakubovics et al., 2021; Peterson et al., 2013).

One of the efforts to maintain dental and oral hygiene is to routinely remove to prevent plaque buildup. This prevention effort is called plaque control and can be done mechanically, chemically, and biologically. An example of mechanical plaque control is brushing teeth with a toothbrush, plaque control can also be done by combining mechanical and chemical methods, including chewing fresh and fibrous fruits. The fruit is good for dental health and can be used to brush teeth naturally (Haida & Cholil, 2014).

Foods that are good for dental health are foods that contain fiber such as fruits and vegetables, while foods that can affect dental health are sweet and sticky foods (Nurilawaty et al., 2022). Fibrous foods

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such as fruits and vegetables can be self-cleaning or clean the surface layer of the teeth naturally, because they can indirectly rub against the surface of the teeth. Several studies have shown that chewing foods with hard, rough, and fibrous textures such as fruits and vegetables can stimulate saliva flow, this can increase food cleaning and reduce food residue in the oral cavity (Zafar et al., 2020).

Water apple (Syzygium aqueum) is a plant that can grow in tropical and warm climates, grows well in humid areas with high rainfall each year. Water apple is a plant that is easy to grow. In addition, this plant is also easy to adapt and can survive well in all types of soil (Mutia, 2018; Pello, 2022). Research (Rifqi, 2017) proves that consuming water apple (Syzygium aqueum) is effective in reducing dental plaque index. Other research (Pratama et al., 2020) proved that chewing green Camplong water guava fruit and red Kusuma water guava fruit are equally effective against debris index

Based on initial interviews conducted by researchers with 7 dasawisma mothers on Friday, February 2, 2024 in the yard, the results showed that during the examination in February 2024, dasawisma mothers experienced a level of dental health of almost 50% which was not good with a PHP (Patient Hygiene Performance) examination. It can be interpreted that many dasawisma mothers do not know how to maintain dental and oral health. Based on the problems described above, researchers are interested in conducting further research entitled "Chewing Water Apples to Reduce Plaque Index in Dasawisma Mothers".

METHOD

The research design used in this study was a quasi-experimental design with a pretest and posttest with one group design. This study aims to analyze the plaque index before and after chewing water apple in mothers of Dasawisma RW 11 Kebon Pala, East Jakarta in 2024. The data collection technique was purposive sampling, as many as 35 respondents, with sample criteria: Registered as a mother of Dasawisma RW 11; have at least 2 index teeth; willing to be a respondent. This study was conducted in May 2024 on mothers of Dasawisma Rw 11 Kebon Pala, East Jakarta. The instrument used in this study was a plaque index with the Patient Hygiene Performance Index. Data analysis used SPSS with paired sample test.

RESULT

Table 1. Frequency distribution of plaque index before and after consuming chewing water apple

Plaque Index	Before		After	
	F	%	F	%
Very good	0	0	0	10.5
Good	10	28.57	34	97.14
Poor	25	71.43	1	2.86
Bad	0	0	0	0
Total	**35**	**100**	**35**	**100**

Table 1 shows that of the before chewing water apple, 25 people had a poor plaque index (71.43%), there were no respondents with a poor plaque index (0.00%), had a good plaque index of 10 people (28.57%), and there were no respondents with very good criteria. While after chewing water apple, it was found that respondents had a good plaque index of 34 people (97.14%), had a poor plaque index of 1 person (2.86%), and there were no respondent mothers with very good and bad criteria.

Table 2. Effectiveness plaque index before and after consuming chewing water apple

Knowledge	*Mean*	Difference	*p-value*
Pre-test	2.1	1.0	0.02
Post-test	1.1		

Table 2 shows that the plaque index before chewing water apple was 2.1 and the plaque index after chewing water apple was 1.1. There was a decrease in the plaque index by 1.0, with statistical tests obtained p = 0.02 (p <0.05).

DISCUSSION

Dental plaque is a biofilm, usually pale yellow in color, that develops naturally on teeth. Plaque is like a biofilm formed by colonial bacteria that try to attach to the smooth surface of the teeth. Dental plaque is mostly composed of water and various microorganisms that grow in an intracellular matrix consisting of extracellular polysaccharides and salivary proteins. In addition to microorganisms, there are loose epithelial cells, leukocytes, food particles, and inorganic salts that are mostly composed of calcium, phosphate and fluoride (Jakubovics et al., 2021).

The results of the study obtained the plaque index criteria before chewing water apple obtained the most results with moderate criteria of 25 respondents (71.43%). While after chewing water apple obtained good plaque index criteria of 34 respondents (97.14%). The results of this study also showed that the average difference before chewing water apple was 2.1 and after chewing water apple there was an increase in the average decrease in plaque index to 1.1 including good criteria. This can be seen from the results of a significant increase, namely the average results before chewing water apple and after chewing water apple, so that there was a difference in the results of an increase in the average to 1.0. The results of the paired sample test obtained p = 0.02 (p <0.05)

The decrease in plaque index is due to the fact that water guava fruit has a fairly high water content of 91.45 g and a fiber content of 0.4 g. Water guava fruit is a fruit that is high in fiber and contains water, so it has a direct inhibitory effect on the formation of debris and plaque on teeth. This fruit can be a natural cleanser for teeth and mouth, can reduce bad breath. The high water content in water guava fruit can remove debris and plaque that has formed (Pratama et al., 2020). This is in line with research (Rifqi, 2017) proves that consuming water apple (Syzygium aqueum) is effective in reducing dental plaque index. Other research (Pratama et al., 2020) proved that chewing green Camplong water guava fruit and red Kusuma water guava fruit are equally effective against debris index

The effect of plaque control influenced by water and fiber. When chewing fruit, saliva will be released which is a mechanical effect that can inhibit the invasion of dental bacteria, inhibit plaque growth, prevent demineralization, and dissolve plaque that forms causing a decrease in plaque scores (Jamidah et al., 2020).

CONCLUSION

Based on the results of the research that has been done, it can be concluded that the chewing water apple is effective in reducing the plaque index.

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