

The Effectiveness of Chewing Pineapple (*Ananas Comosus L. Merr*) on Reducing Debris Index Among Fifth Grade Students at SDN Barengkrajan 1 Sidoarjo 2024

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ABSTRACT Pineapple is a fruit that is popular with many people because its taste is generally sweet and slightly sour, the aroma is very fragrant and it is easy to find everywhere. Pineapples contain quite a lot of fiber and water and contain active substances such as the enzyme bromelain and flavonoids which function as antibacterials so they can stop the growth of plaque bacteria and reduce the growth of *Streptococcus mutans* bacteria. Then pineapple contains citric acid which can increase saliva secretion and pineapple contains iodine and phenol which functions as an antiseptic. The aim of this research was to determine the effectiveness of chewing pineapple on the debris index in class V students at SDN Barengkrajan 1 Sidoarjo. The method in this research was carried out by collecting index debris data for class V students at SDN Barengkrajan 1 Sidoarjo, totaling 30 students, using an index debris examination sheet by carrying out direct observations of respondents and providing intervention in the form of chewing pineapple. Data analysis using the Wilcoxon test. The results showed that there was a decrease in the debris index in class V students at SDN Barengkrajan 1 Sidoarjo between before and after being given the intervention, namely from bad to moderate. There is the effectiveness of chewing pineapple on the debris index in class V students at SDN Barengkrajan 1 Sidoarjo.

KEYWORDS Chewing pineapple, index debris, fifth grade elementary school students

I. INTRODUCTION

Maintaining good oral health is an important aspect of overall health. The reason is, a person's general health is influenced by his teeth and oral health. Simply put, the oral cavity is very important for human health. When a person's teeth and gums are in good condition, it can be said that he is healthy. If a person does not pay attention to the health of his teeth and mouth, the oral cavity becomes a place for bacteria to develop which causes tooth decay [1]. Based on the results of the 2018 Riskesdas, the prevalence of caries was found to be 73.4% in children aged 10 to 14 years [2]. Children's inability to independently practice good oral hygiene is the root cause of this problem [3]. Too much plaque or food particles left on the teeth can cause caries [4].

Parents' efforts to keep their children's teeth and gums clean affect the debris index. When children have support from their parents, they tend to take more pride in the cleanliness of their teeth and mouth. Parental neglect of their children's oral health was associated with lower poop index scores [5]. Teachers can help spread awareness about the need for good oral hygiene in the classroom. Educators should know better than to ignore their students' need for good oral hygiene [6]. Educators should know better than to ignore their students' need for good oral hygiene [6]. The results of the initial survey carried out by researchers at SDN Barengkrajan 1 Sidoarjo on 21 October 2023 on 10 class V students showed that the students' debris index level was in the bad category of.

A person's food consumption also affects the stool index. Food textures can range from chewy and sticky to mushy and sweet. Food is not the only thing that influences the poop index; Habits such as flossing after meals and before bed also play a role. Eating more fibrous and watery foods can lower the dirt index, such as fruit and vegetables which contain 75-95% water so they can clean teeth naturally (self cleansing) because they need to be chewed to scrub the surface of the teeth from adhering debris [7].

Maintaining healthy teeth and gums is a top priority when chewing. The chewing process can increase saliva production which helps clean teeth and neutralize acid compounds found in oral waste. Pineapples, apples and star fruit are examples of high fiber foods that act like a toothbrush and don't get stuck in your teeth [8].

Chewing fibrous fruit helps reduce the debris index from poor to moderate. The average yield was 2.11 before eating fibrous fruit and 1.44 after. Pineapple is a popular fruit that is liked by many people because of its easy availability, fragrant aroma, slightly sour taste, and slightly sweet taste. The various nutrients contained in pineapple include water, vitamins, chemical compounds, macro and micro minerals, and many more. From 100 grams of pineapple flesh, 1.4 grams of fiber and 86.37 grams of water are released. Pineapple has several active ingredients, including the antibacterial enzyme bromelain and flavonoids, which can inhibit the formation of *Streptococcus mutans* bacteria and

plaque. Pineapple contains citric acid which can increase saliva secretion and is antibacterial. Apart from that, pineapple also contains iodine and phenol which function as an antiseptic so that it can suppress the growth of *Streptococcus mutans* bacteria [7].

SDN Barengkrajan 1 Sidoarjo is supported by the Barengkrajan Health Center Sidoarjo. Puskesmas officials carry out visits once a year to class I only. This visit includes counseling, dental and oral examinations and limited treatment procedures such as extractions and fillings. This is done because class 1 is the beginning of the growth of permanent teeth so prevention is needed as early as possible before experiencing dental and oral disease.

Elementary school age children are children aged 6-12 years who have better physical growth and motor development and are starting to develop social and environmental interactions outside the family to learn morals and culture and need daily activities for 4 to 5 hours a day [8]. Elementary school age children are easily influenced by the environment outside their family. Often elementary school age children will begin to try to be independent and set boundaries and rules in their lives. This is because school-age children are at the stage of searching for identity, resulting in changes in activities, behavioral development and dietary intake [8].

Fifth grade elementary school children are able to retain their memory so it is easier to remember things and explain what they remember. Fifth grade elementary school children can understand concrete things so they can start solving a problem. Apart from that, the thinking of fifth grade elementary school children is more logical and their language skills are better so they are easier to direct when doing something [9].

Elementary school age children are still in the low category when it comes to maintaining dental hygiene. This is due to a lack of knowledge about maintaining dental hygiene [10]. Parents' lack of knowledge about maintaining oral hygiene means that their children have bad habits in maintaining dental hygiene at home [11]. When it comes to children's oral and dental health, parents must always be there to help, accompany and encourage them. If parents do nothing to keep their children's mouths and teeth healthy, the stool index will decrease [12].

Teachers at school play a role in educating about dental and oral hygiene. It is hoped that teachers will have sufficient knowledge about maintaining the oral hygiene of their students. Teachers also act as counselors and motivators in maintaining school children's dental hygiene [13]. Apart from that, there is a need for health workers to provide routine education in schools regarding dental and oral hygiene [14].

To keep teeth clean and healthy, teeth need to be free from debris that sticks to the surface of the teeth. One way to prevent the formation of debris is to eat fruit and vegetables that are high in fiber because they can be self-cleaning for the teeth [15]. One fruit that can clean teeth is pineapple. Pineapple contains the enzyme bromelain, rich

in vitamins and fiber so it is beneficial for body health, namely maintaining eye health, increasing body immunity, forming body energy, facilitating digestion, improving blood flow, relieving nausea, strengthens bones and hydrates skin [16].

Pineapples are very beneficial for dental and oral health. Pineapples are rich in fiber and water which can clean teeth and mouth naturally by increasing saliva production in the oral cavity. In pineapple there are bromelain and flavonoid enzymes as antibacterials which can kill the growth of plaque bacteria and reduce the growth of *Streptococcus mutans* bacteria. Pineapple contains citric acid which can increase saliva secretion and is antibacterial. Apart from that, pineapple also contains iodine and phenol which act as antiseptics so they can suppress the growth of *Streptococcus mutans* bacteria [17].

So, this research aims to determine the effectiveness of chewing pineapple (*Ananas Comosus L. Merr*) on index debris for class V students at SDN Barengkrajan 1 Sidoarjo in 2024.

II. METHOD

This research was conducted at SDN Barengkrajan 1 Sidoarjo which was held from October to January 2024. This research is analytical research with Quasy Experiments. The population in this study were 30 fifth grade students at SDN Barengkrajan 1 Sidoarjo. The data collection process involves direct examination of respondents and carrying out a debris index assessment. The data collection procedure was carried out by researchers by measuring the debris index value using an observation sheet where respondents previously filled out an informed consent form to be willing to be respondents in this research. The study instruments used were 30 mouth mirrors and disposable sondes, cotton buds, disclosing gel, small plastic bags and an index debris examination sheet as an observation sheet.

The research process was carried out twice in meetings with the procedure calling students one by one to carry out an initial index debris assessment by smearing the index teeth using a disposable mouth mirror, disclosing gel and cotton bud. Then instruct class V students to rinse their mouths with not too strong water once and throw the mouth water in the sink in front of class V. After that, look at the debris index score with a mouth mirror and disposable sonde. Then record the results of the index debris examination. Instruct students to consume honey pineapple fruit that has been peeled and cut into small, heavy pieces ± 100 grams by chewing pineapple with both sides of the jaw alternately 32 times. Researchers counted each chewing movement up to 32 chewing times for 1 student. Then assess the index debris by applying disclosing gel to the index teeth using a disposable mouth mirror and cotton bud. After that, he was instructed to rinse his mouth with not too strong water once, then look at the index debris score again with a mouth mirror and disposable sonde, then record the results of the index debris examination after chewing honey pineapple.

The analysis technique used in this research is the Paired Sample T-test with the alternative Wilcoxon test if the data used is not normally distributed.

III. RESULTS

A. RESPONDENT CHARACTERISTICS

Based on the data presented in TABLE 1, shows that the debris index of class V students at SDN Barengkrajan 1 Sidoarjo in 2024 before chewing pineapple mostly had a debris index score of 2.5 (36.7%). TABLE 2 showed that the debris index of class V students at SDN Barengkrajan 1 Sidoarjo in 2024 after chewing pineapple mostly had a debris index score of 0.8 (36.7%). TABLE 3 shows that the results of the normality test using the Shapiro Wilk test, it is known that the significance value (Sig) of the variable is $\text{sig} < 0.005$, so it is concluded that the data obtained is not normally distributed

TABLE 1
Frequency Distribution of Debris Index Measurement for Class V Students of SDN Barengkrajan 1 Sidoarjo Before Chewing Pineapple in 2024

Debris Index Score	Frequency	Percentage (%)
1.3	1	3.3
1.5	1	3.3
1.8	2	6.7
2	5	16.7
2.1	4	13.3
2.2	1	3.3
2.3	5	16.75
2.5	11	36.7
Total	30	100

TABLE 2
Frequency Distribution of Debris Index Measurements for Class V Students of SDN Barengkrajan 1 Sidoarjo After Chewing Pineapples in 2024

Debris Index Score	Frequency	Percentage (%)
0.8	11	36.7
1	6	20
1.3	8	26.7
1.5	5	16.7
Total	30	100

TABLE 3
Normality Test Results Before and After Chewing Pineapple Fruit Against Debris Index for Class V Students of SDN Barengkrajan 1 Sidoarjo with Shapiro Wilk Test Year 2024

Variable	N	Sig
Debris index before chewing pineapple	30	0.001
Debris index after chewing pineapple	30	0,000

TABLE 4
Wilcoxon Test Results of Chewing Pineapple Fruit Against
Debris Index for Class V Students at SDN Barengkrajan 1
Sidoarjo in 2024

Variable	median	minimum	maximum	P Value
before chewing pineapple	2,3	1.3	2.5	0,000
after chewing pineapple	1	0.8	1.5	

Based on TABLE 4 There are analysis results obtained using the Wilcoxon test that show the effectiveness of chewing pineapple on the debris index in class V students at SDN Barengkrajan 1 Sidoarjo. This result is based on the median value before chewing pineapple which is higher, namely 2.3 and decreases to 1 after chewing pineapple. This can also be seen in the minimum and maximum values which have different values. Apart from that, at a sig value (p value) = $0.000 < 0.05$, H_0 is rejected and H_1 is accepted, which means that there is effectiveness of chewing pineapple on index debris in class V students at SDN Barengkrajan 1 Sidoarjo.

IV. DISCUSSION

Elementary school age children are still in the low category when it comes to maintaining dental hygiene. This is due to a lack of knowledge about maintaining dental hygiene [10]. Parents' lack of knowledge about maintaining oral hygiene means that their children have bad habits in maintaining dental hygiene at home [11]. When it comes to children's oral and dental health, parents must always be there to help, accompany and encourage them. If parents do nothing to keep their children's mouths and teeth healthy, the stool index will decrease [12]. Teachers at school play a role in educating about dental and oral hygiene. It is hoped that teachers will have sufficient knowledge about maintaining the oral hygiene of their students. Teachers also act as counselors and motivators in maintaining school children's dental hygiene [13]. Apart from that, there is a need for health workers to provide routine education in schools regarding dental and oral hygiene [14].

Based on the results of data analysis, it can be seen that the debris index numbers for class V students at SDN Barengkrajan 1 Sidoarjo before chewing pineapple were mostly in the bad category. Meanwhile, the debris index numbers for class V students at SDN Barengkrajan 1 Sidoarjo after chewing pineapple were mostly in the medium category. This shows a decrease in the debris index between before and after chewing pineapple, namely from the bad to moderate category.

The decrease in debris index occurs because pineapple contains a lot of water so it can increase saliva production which cleans debris on the surface of the teeth. Pineapples

also contain the enzyme bromelain which can kill plaque bacteria and Streptococcus mutans. Apart from that, pineapple is rich in fiber so that the chewing process occurs when consuming pineapple resulting in mechanical self-cleaning which can clean food residue or debris from the surface of the teeth.

The results of this study are supported by research which states that after chewing pineapple there is a decrease in the debris index number from bad to moderate. The decrease in debris index is due to the mechanical movement of chewing fruit rich in fiber and water which can have a brushing effect and then stimulate the formation of saliva in the oral cavity which dissolves food residue attached to the surface of the teeth [18]. Consuming pineapple which contains a lot of fiber and water results in increased saliva production which causes mechanical self-cleaning of the tooth surface [17].

Apart from that, pineapple contains active substances such as the enzyme bromelain and flavonoids as antibacterials which kill plaque bacteria and Streptococcus mutans. Pineapple has citric acid to produce lots of saliva and is antibacterial. Apart from that, pineapple also contains iodine and phenol which function as an antiseptic so that it can suppress the growth of Streptococcus mutans bacteria [17].

Saliva will help rinse away debris stuck to the surface of the teeth and dissolve the sugar between the teeth [1]. Pineapple fruit can reduce Streptococcus mutans bacteria because it contains active enzymes bromelain and flavonoids which break down saliva proteins and glycoproteins which are the attachment sites for bacteria on the surface of teeth [19].

Pineapples contain phenol, chlorine and iodine which act as an antiseptic and suppress the growth of Streptococcus mutans bacteria [17]. The way phenol works as an antibacterial is by breaking down cell proteins and damaging the cell membrane of the Streptococcus mutans bacteria. Chlorine as a bacterioside kills Streptococcus mutans bacteria by damaging its cell walls. The way iodine works is by coagulating the protein of the Streptococcus mutans bacteria so that it can kill the bacteria [17].

Apart from that, pineapple has a rough and fibrous texture so it takes a little time to chew. This is to clean the surface of the teeth from adhering debris because it has a brush-like effect [20]. The vitamin C in pineapple is high, it can stimulate saliva formation of more than 0.5 ml/minute. This can help clean debris on the tooth surface resulting in a decrease in the debris index number [21].

V. CONCLUSION

Based on the results of a study that has been carried out regarding the effectiveness of chewing pineapple (*Ananas Comosus L. Merr*) on index debris for class V students at SDN Barengkrajan 1 Sidoarjo in 2024. Debris index for class V students at SDN Barengkrajan 1 Sidoarjo occurs before chewing pineapple and after chewing pineapple. decrease from poor to moderate. There is effectiveness of chewing pineapple on debris index in class V students of SDN Barengkrajan 1 Sidoarjo in 2024.

Increase the interest of fifth grade students at SDN Barengkrajan 1 Sidoarjo in consuming foods rich in fiber and water such as pineapple, because they can maintain clean teeth and mouth. Recommendations for research development are to develop research with other variables that influence the debris index of elementary school students as well as educating about dental and oral health in order to increase the knowledge of sixth elementary school children.

VI. REFERENCE

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