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# Consuming Jicama Fruit on Debris Index Status in Elementary School Students

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**ABSTRACT**

Debris index is food residue that sticks to the surface of the teeth. Eating fibrous fruits can reduce the debris index. As we know, fruits can also clean the oral cavity. The results of the examination of dental and oral hygiene on the initial data from all 10 students, the debris index was categorized as bad in 7 students and 3 students were categorized as moderate, this is in accordance with WHO's expectations, namely ≤2. The purpose of the study was to determine the effect of consuming yam bean fruit on the status of debris index in students of SDN Kandang, Sakti District, Pidie Regency. This study used a quasi-experimental study, using a one-group pretest-posttest design. The sampling technique used a random sampling technique totaling 48 students. The study was conducted on February 24, 2014. The results showed the effect of consuming yam bean fruit on the status of debris index with a pretest value of 2.54 to 1.35 in the posttest. With the results of p = 0.000 (p <0.05). It can be concluded that there is an effect of consuming jicama fruit on the debris index status of students at SDN Kandang, Sakti District, Pidie Regency. It is recommended that students maintain dental and oral health by brushing their teeth at least 2 times a day and consuming fibrous foods so that their teeth become healthy.

## INTRODUCTION

Oral health is a key indicator of overall health, well-being, and quality of life (Haryani et al., 2022). Oral health is an important thing that must be prioritized. Poor oral hygiene can cause various oral problems. Worldwide, tooth decay is still one of the most widespread chronic diseases, and oral disease is the fourth most expensive disease to treat (Alsumait et al., 2015). Oral health is a condition of a healthy oral cavity free from disease and pain, where the condition of the teeth functions optimally. Teeth are also one of the factors that support the healthy paradigm and behavioral factors of an individual. Overall body health is greatly influenced by the health of the teeth and mouth itself (Nabila et al., 2024).

One indicator of oral health is the level of oral hygiene. This can be seen clinically from the presence or absence of organic deposits, such as plaque, debris, calculus, and dental plaque (Purnama, 2023). Teeth are a vital organ in our body, one of the functions of teeth is as a tool for chewing food, speaking, helping to crush food in the mouth, and also helping the digestive organs so that food can be absorbed by the body properly. Bacteria will attack your teeth and become cavities if you don't maintain your health (Lin, 2018).

One way to maintain dental and oral health is to brush your teeth properly and at the right time. Brushing your teeth is the easiest and cheapest preventive measure. Brushing your teeth regularly helps reduce plaque buildup. Being able to brush your teeth properly is an important factor in maintaining oral health (Purnama & Sofian, 2023). One of the factors that affects dental and oral hygiene is knowledge of brushing your teeth, including the frequency of brushing your teeth, the method/technique of brushing your teeth, and the shape of the toothbrush used (Gounder, 2019).

Debris Index is a measure of food debris that sticks to the surface of the teeth. Eating fibrous fruits can reduce the amount of debris. As we know, fruits can also clean the oral cavity. Physiologically, fibrous fruits will stimulate the human oral cavity to grind and destroy them before entering the digestive tract, thereby stimulating saliva secretion (Nurjannah et al., 2012),

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Foods rich in fiber can increase the amount of saliva (A'yun & Subekti, 2018). Saliva contains chemical substances that act as buffers that can stabilize the pH above 7 in the mouth. Scientific evidence shows that chewing fibrous fruit after eating can remove food debris trapped in the teeth and neutralize acid in the teeth (Hidayati et al., 2024). The debris index number can be influenced by the type of food a person eats. Foods that are affected by the decrease in debris such as fibrous, watery or sweet, soft and sticky foods (Pereira & Van der Bilt, 2016). In addition to fibrous foods being good for body health, they are also good for dental and oral health. Solid foods that are fibrous physiologically will increase the intensity of chewing in the mouth. The chewing process will stimulate and increase saliva which will help rinse the teeth from food particles that stick to the teeth and also dissolve the sugar components of food residues trapped in the pits and fissures of the (Phillips, 2018).

Jicama (pachyrhizus erosus) is one of the fruits that has many properties and benefits for human health. In general, jicama is known to have high properties in the field of beauty. Jicama has a high vitamin C content and functions as an antioxidant so that it can prevent the emergence of various systemic diseases such as bone health, stroke, cancer and heart disease (Santoso et al., 2021). Jicama contains quite a lot of fiber and water. In 100 grams of jicama fruit contains 4.9 grams of dietary fiber. Jicama fruit requires thorough chewing so that it can stimulate and increase saliva. So that jicama fruit can clean teeth from food residue naturally (Haida & Cholil, 2014; Widyatmoko et al., 2016). The results of (Damayanthy et al., 2023) showed that chewing jicama fruit can reduce the debris index, before chewing jicama fruit the debris index was 1.41 and after chewing jicama fruit the debris index was 0.66. Meanwhile, based on research conducted by (Devi, 2019), it was found that after chewing jicama debris index was 1.4 and after chewing jicama debris index was 0.7. Based on the 2018 Basic Health Research, the prevalence of Indonesian people who have dental and oral health problems was 57.6% and those who received services from dental medical personnel were 10.2%. Aceh Province has dental and oral health problems of 55.34% and those who received services from dental medical personnel were 13.89%. The proportion of the population with dental and oral problems according to the characteristics of the 10-14year age group was 52.9%. The percentage of children aged 10-14 years who brush their teeth every day was 96.99% and children who brush their teeth at the right time were 2.07% (Kementerian Kesehatan RI, 2018).

The results of the dental and oral hygiene examination of 10 students of SDN Kandang conducted by researchers from the initial study, 7 students had poor debris index (DI) values (70%), and 3 students had moderate debris index values (30%). Of the total 10 students, the results of the debris were in the Bad category. This is in accordance with what WHO expects, namely ≤2. From the results of the interview with the principal of SDN Kandang, Sakti District, Pidie Regency, it was said that the elementary school had never carried out dental and oral health education activities.

## METHOD

This study uses a quasi-experimental research method or experiment that aims to determine a symptom or effect that arises due to the treatment (Notoatmodjo, 2018). The design of this study used is pre-test-posttest, where this study aims to determine the debris index before being treated and after being treated on students of SDN Kandang, Sakti District, Pidie Regency. The research instrument used instruments in the form of yam bean material, cotton pellets, disclosing solutions and diagnostic tools, patient status cards. Data analysis using paired sample t-test

## RESULT

**Table 1.** Frequency distribution of respondent characteristics by age and gender

| Characteristics | Frequency | Percent (%) |
|---|---|---|
| **Age** | | |
| 9 | 9 | 18.9 |
| 10 | 16 | 33.3 |
| 11 | 12 | 25.0 |
| 12 | 11 | 22.9 |
| **Total** | 48 | 100 |
| **Gender** | | |
| Male | 26 | 54.2 |
| Female | 22 | 45.8 |
| **Total** | 48 | 100 |

Table 1 shows that the age of respondents in this study was between 9-12 years. Respondents aged 9 years were 9 students with a percentage of 18.8%, respondents aged 10 years were 16 students with a percentage of 33.3%, respondents aged 11 years were 12 students with a percentage of 25.0% and respondents aged 12 years were 11 students with a percentage of 22.9%. Respondents who were male numbered 26 students with a percentage of 54.2% and respondents who were female numbered 22 students with a percentage of 45.8%.

**Table 2.** Frequency distribution of debris index before and after consuming jicama fruit

| Debris index | Before | | After | |
|---|---|---|---|---|
| | F | % | F | % |
| Good | 5 | 10 | 31 | 63 |
| Moderate | 13 | 27 | 17 | 35 |
| Poor | 30 | 63 | 0 | 2.15 |
| **Total** | **48** | **100** | **48** | **100%** |

Table 2 shows that the debris index of respondents before chewing jicama fruit with poor criteria was 30 students (63%), moderate criteria were 13 students (27%), and good criteria were 5 students (10%), while the debris index after chewing jicama fruit with poor criteria was none, moderate criteria were 17 students (35%), and good criteria were 31 students (63%).

**Table 3.** Effectiveness test of debris index before and after consuming jicama fruit

| Knowledge | *Mean* | Difference | *p-value* |
|---|---|---|---|
| Pre-test | 2.54 | 1.19 | 0.000 |
| Post-test | 1.35 | | |

Table 3 shows that the results of the test of the effect of consuming jicama fruit before and after showed that the p-value was 0.000 (p <0.50) thus the research results obtained showed that there was an effect of consuming jicama fruit on reducing the debris index.

## DISCUSSION

Based on the results of statistical tests on the effect of chewing jicama fruit on the status of debris index in students of SDN Kandang, Sakti District, Pidie Regency, it can be seen that there is an effect before and after chewing jicama fruit on the debris index score. Based on data obtained from respondents, the debris score before chewing jicama fruit with a bad category of 30 children (63%), a moderate category of 13 children (13%) and a good category of 5 children (10%) decreased to a good category of 31 children (65%) and a moderate category of 17 children (35%). The average debris index of all criteria in the sample before consuming jicama fruit was 2.54 and the average debris index after consuming jicama fruit was 1.35 with a difference in the decrease in debris index before and after consuming jicama fruit of 1.19.

Researchers assume that there is an effect after consuming jicama fruit on reducing the debris index due to the high water and fiber content in jicama fruit so that it can reduce the debris index value. There is water contained in jicama that helps to stimulate saliva in the mouth to appear and can work to maintain dental hygiene. Judging from the way of chewing and the number of chews, it can be influenced by the decrease in the debris index, because chewing will increase the amount of saliva and chewing is influenced by the hardness of the type of food. Therefore, there is a decrease in the average value of the debris index before and after chewing jicama fruit.

The benefits of jicama fruit for dental health include phosphorus which is relied on to overcome problems related to teeth. In jicama fruit there is water, the water in jicama can help the mouth release fluids naturally so that it can help the process of cleaning the mouth and teeth from dirt. The presence of Calcium has benefits for dental health which can help teeth become stronger and more durable, and teeth become clean and white again. And there is Vitamin C Jicama which helps repair tooth damage (Adrianton et al., 2019; Nurasiki & Amiruddin, 2017). The results of this study are in line with those conducted by (Sondang, 2014) on the effectiveness of chewing jicama fruit on reducing the debris index in class III A students of SD Negeri 060930 Titi Kuning, with an average value before consuming jicama fruit of 1.93 and

after consuming jicama fruit of 0.69 with a difference in the debris index value before and after consuming jicama fruit of 1.24. Based on the results of this study, it can be seen that there is a decrease in the debris index between before and after chewing jicama fruit, this can occur because the water and fiber content in jicama fruit is very high, namely a fiber content of 5 grams and a water content of 85.10 grams

## CONCLUSION

Based on the results of the study, it can be concluded that there is an effect of consuming jicama fruit on the status of debris index in students of SDN Kandang, Sakti District, Pidie Regency with a debris score before chewing jicama fruit, namely the bad category totaling 30 children (63%) and after chewing jicama fruit the debris score decreased to the good category 31 children (65%). The difference in the decrease in debris index before and after consuming jicama fruit was 1.19.

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