DIFFERENCES IN CHEWING WATERMELON FRUIT AND CALIFORNIA PAPAYA FRUIT ON THE DEBRIS INDEX IN BLIND CHILDREN (STUDY AT SLB-A YPAB SURABAYA)

Kholifah Nurjannah[1(CA)], Ida Chairanna Mahirawatie[2],Agus Marjianto[3]

[123]Dental Health Department of Politeknik Kemenkes Surabaya
email: jannhkholifah2001@gmail.com

ABSTRACT. Blind people often have poorer oral hygiene status compared to the general public. Poor oral hygiene can also have a negative impact on daily life, such as weakening self-confidence and interfering with one's performance as well as affecting attendance rates at school or work. The debris index score can be influenced by the type of food a person consumes. The debris index score can be lowered by consuming foods that are rich in fiber and water. This study aims to determine the difference of chewing watermelon and california papaya on debris index in blind children. This type of research is Quasi Experiment with pre and post design with a population of 32 students of SLB A YPAB Surabaya. The data collection instrument used was an observation sheet. Data analysis technique using Mann Whitney test. From the Mann Whitney test, the ρ debris index value before and after chewing watermelon fruit was 0.000 with a Mean ± SD value of 1.219 ± 0.603. The debris index ρ value before and after chewing California papaya fruit is 0.004 with a Mean±SD value of 1,438±0.620. This shows that the ρ value < α value (0.05). There is a difference in chewing watermelon fruit and california papaya fruit on the debris index in blind children, watermelon fruit as an alternative to reduce debris.

Keywords: Watermelon Fruit, California Papaya Fruit, Debris Index, Blind Child.

1 BACKGROUND

Visually impaired people often have poorer oral hygiene status compared to the general public. They tend to experience higher caries rates. Limitations are one of the obstacles for blind people to obtain information about oral health that determines attitudes and actions to maintain oral hygiene (Pohilihu, 2020).

The results of an initial survey of blind children at SLB A YPAB Surabaya regarding dental and oral hygiene in blind children with 10 respondents, obtained a debris index of 7 children with poor criteria and a debris index of 3 children with moderate criteria.

The World Health Organization (WHO) notes that there are 285 million blind people worldwide. 39 million are blind and 246 million have low vision. 90% of blindness occurs in developing countries. According to WHO calculations, an estimated 10 percent of Indonesia's population (24 million) are people with disabilities including blindness (Pohilihu, 2020) (Joymak, W et al., 2021).

Poor oral hygiene can also have a negative impact on daily life, such as weakening self-confidence and disrupting one's performance as well as affecting attendance rates at school or work (Kementerian Kesehatan RI, 2019). Poor oral hygiene in blind people is caused by three things, namely cariogenic food, the shape of the tooth position and the lack of education for blind people about oral health (Kutsiyah, C.E et al., 2021) (.

Debris is a soft material on the tooth surface, consisting of a layer of biofilm, alba material, and food debris (Zuraini, N. Z. A. et al., 2021). Debris has a significant impact on the process of caries. Tooth surfaces that are kept clean from debris are stronger against dental caries (Saeed, F et al., 2014). Consuming fruits that contain fiber and water can help maintain the tooth surface from debris so that dental caries can be prevented (Tumembow et al., 2018).

High fiber foods can increase saliva production. Saliva contains buffering chemicals that can stabilize the pH above 7 in the mouth. Scientific evidence shows that chewing high-fiber fruits after meals can remove food debris trapped in the teeth and neutralize acids in the teeth (Dotto, J. M., & Abihudi, S. A., 2021). The debris index score can be influenced by the type of food a person consumes (Jaiswal, A. K, 2020). This type of food can be fibrous, juicy foods or sweet, soft and sticky foods (Bhardwaj, R. L et al., 2014). The debris index number can be lowered by consuming foods that are rich in fiber and water (Wardani, 2020) (Sulistyaningrum, A et al., 2021)

Watermelon fruit is a fibrous and juicy fruit with a lot of water content, so it can directly help prevent plaque formation on the teeth (Sangeeta, Nayik, G. A., & Muzaffar, K, 2020). Watermelon fruit is one of the fibrous and juicy fruits. For chewing this fruit requires sufficient chewing so that it can encourage salivary secretion (Diyatama et al., 2020) (Joy, G. F. F et al., 2022). Watermelon is a fruit that is in great demand because it tastes sweet, is easy to obtain and is a plant source of vitamins, minerals, fiber, and contains enzymes. Watermelon fruit has a fairly high water content of 91.45g and there is a fiber content of 0.4 g (Setiani et al., 2021).

Papaya is a fruit plant found in almost all parts of Indonesia. Papaya fruit is a source of vitamins, minerals, fiber, and contains enzymes that are useful for digestion. Papaya fruit contains a fairly high water and fiber content of 0.7 grams per 100 grams of papaya fruit flesh. This fiber and water content can help increase saliva production and

can provide a self-cleaning effect on the teeth (self cleansing effect) (Tumembow et al., 2018) (Insanu, M et al., 2022).

2 REASEARCH AND METHODS

The research design used is observational analytic with a Quasi Experiment approach design is an experiment that is unable to control the variables under study, in this experiment there is no randomization. The sample used is total sampling which is determining the sample from a random population (Sugiyono, 2018). The inclusion criteria in this study were blind students in grades 1-6, male and female gender, the number of samples in this study were 32 respondents. After obtaining a research permit at SLB A YPAB Surabaya, research on chewing watermelon and california papaya fruit was carried out by giving informed consent to the school and student guardians then observing the students' debris index before and after chewing watermelon and california papaya fruit. Then measure the de-bris index according to the assessment sheet, for maxillary examination, namely, tooth 6 right on the buccal surface, tooth 1 right on the labial surface, tooth 6 left on the buccal surface. For mandibular examination, the lower 6 right teeth on the lingual surface, the lower 1 left tooth on the labial surface, the lower 6 left teeth on the lingual surface. The assessment criteria are good categories if the value is between 0 - 0.6, moderate if the value is between 0.7 - 1.8 and poor if the value is between 1.9 - 3.0 (Putri et al., 2014). The analytical test used in this study was the Mann Whitney test to determine the difference in chewing watermelon and california papaya fruit on the debris index with a value of ρ (p-value) < a (0.05).

3 RESULTS

Table 1. Frequency distribution of respondents based on gender of blind students in SLB A YPAB Surabaya

Gender	Frequency	Percentage (%)
Male	18	56,25
Female	14	43,75
Total	32	100

Based on table 1. It can be seen that the gender characteristics of respondents in the study were mostly male, namely 18 people (56.25%). Meanwhile, there were 14 female respondents (43.75%).

Table 2. Frequency distribution of debris index categories before and after chewing watermelon fruit in visually impaired children at SLB A YPAB Surabaya.

Category Debris Index	Before			After		
	Frequency	n (%)	Average	Frequency	n (%)	Average
Good	0	0		5	31,25	
Medium	9	56,25	1,65	11	68,75	0,78
Bad	7	43,75		0	0	

Based on table 2. It is known that of the 16 respondents before chewing watermelon fruit, 7 respondents (43.75%) had a debris index in the poor category and 9 respondents (56.25%) had a debris index in the moderate category. While the good debris index

category amounted to 0 (0%). The average debris index before chewing watermelon fruit is 1.65. Meanwhile, after chewing watermelon fruit, 11 respondents (68.75%) had a debris index in the moderate category and 5 respondents (31.25%) had a debris index in the good category. While the bad index debris category amounted to 0 (0%). The average debris index after chewing watermelon fruit is 0.78.

Table 3. Frequency distribution of debris index categories before and after chewing california papaya fruit for blind children in SLB A YPAB Surabaya.

Category Debris Index	Before			After		
	Frequency	n (%)	Average	Frequency	n (%)	Average
Good	0	0		4	25	
Medium	6	37,5	1,78	12	75	1,09
Bad	10	62,5		0	0	

Based on table 3. It is known that of the 16 respondents before chewing california papaya fruit, 10 respondents (62.5%) had a debris index in the poor category and 6 respondents (37.5%) had a debris index in the moderate category. While the good debris index category amounted to 0 (0%). The average debris index before chewing california papaya fruit was 1.78. Whereas after chewing california papaya fruit, 12 respondents (75%) had a debris index in the moderate category and 4 respondents (25%) had a debris index in the good category. While the bad index debris category amounted to 0 (0%). The average debris index after chewing california papaya fruit is 1.09.

Table 4. Differences in debris index of chewing watermelon and california papaya fruit in visually impaired children in SLB A YPAB Surabaya.

Group	Mean±SD	*ρ* value
Debris Index Before Chewing Watermelon Fruit	1.219±0.603	**0.000**
Debris Index After Chewing Watermelon Fruit		
Debris Index Before Chewing California Papaya Fruit	1.438±0.620	**0.004**
Debris Index After Chewing California Papaya Fruit		

Based on table 4. it is known that the Mann Whitney test results obtained the ρ value of the debris index before and after chewing watermelon fruit is 0.000. The *ρ* value of the debris index before and after chewing california papaya fruit is 0.004 which indicates that the *ρ* value is smaller than the α value (0.05), it can be concluded that H1 is accepted and H0 is rejected. This indicates that there is a significant difference in debris value between chewing watermelon fruit and chewing california papaya fruit. Chewing watermelon fruit is an effective alter-native to reduce the debris index.

4 DISCUSSION

Based on the results of the study, it was found that before and after chewing watermelon fruit had a difference which showed that after chewing watermelon fruit, the average value of the debris index in the oral cavity decreased. The average initial value of the

debris index is 1.65 and the average value after chewing watermelon fruit is 0.78. According to Putri et al (2014) there are several factors that affect dental and oral hygiene, namely brushing teeth, frequency of brushing teeth, how to brush teeth and the type of food consumed. Dental and oral hygiene also needs support from brushing teeth in a good and correct way and done regularly. However, if the level of dental hygiene in brushing teeth is still not optimal. Therefore, it is necessary to control the formation of debris naturally by consuming fiber and watery foods and avoiding cariogenic foods (

In accordance with previous research by Diyatama et al (2020) which said that there was a significant decrease in the average value of the debris index after chewing watermelon fruit. Watermelon fruit is a fruit that is fibrous and juicy, and has a lot of water content, so it can directly inhibit the formation of plaque on the teeth. The considerable water content in watermelon makes this fruit a natural cleanser for teeth and mouth, so that it can reduce bad breath (Maoto, M. M, 2019)

In line with research from Hartari et al (2021) which states that after chewing watermelon on respondents there is a significant decrease in debris numbers. Before chewing watermelon, many respondents had a debris index value in the bad category, but after chewing watermelon, the respondents debris index value decreased, so the respondents had a good debris index value (Alfarabi, M et al., 2022).

In the frequency distribution table before and after chewing california papaya fruit for blind children in SLB A YPAB Surabaya, it is found that there is a difference that shows that after chewing california papaya fruit, the average value of the debris index in the oral cavity decreases. The average initial value of the debris index is 1.78 and the average value after chewing california papaya fruit is 1.09. In line with research from Jumriani & Liasari (2019), it was stated that the debris index in respondents experienced a significant decrease after respondents chewed papaya fruit. The habit of eating fiber foods does not stimulate the formation of debris but acts as a natural control. The results of research from Tumembow et al (2018) stated that after chewing california papaya fruit, the average value of the debris index in respondents decreased by 1.31.

Based on the research that has been done, it can be concluded that chewing watermelon can reduce the debris index value in blind children rather than chewing california papaya fruit in blind children at SLB A YPAB Surabaya. This happens because watermelon fruit has quite a lot of water and fiber content compared to california papaya fruit. The high content of fiber and water in watermelon is able to increase the rate of saliva production that can clean debris or food debris that sticks to the surface of the teeth. Clean and healthy teeth can avoid dental caries (Skinner, M., & Hunter, D, 2015) (Bautista-Baños, S et al., 2013)

One of the factors that can affect the status of oral hygiene is one-sided chewing. If done continuously in the long term it can trigger problems or abnormalities in the jaw joint caused by an imbalance in the masticatory load. Usually the teeth on the opposite side that have never been used to chew will be in worse condition because the chewing process itself has the ability to clean teeth (Dewi et al., 2022) (Santana, L. F, et al., 2022)

This study is in line with research from Nopiransi & Deynilisa (2019) which shows that statistically the average decrease in debris index in the group that consumes watermelon fruit is greater. Solid and fibrous foods will physiologically increase the intensity of chewing in the mouth. The process of chewing food will stimulate and increase saliva production. Saliva will help rinse the teeth from food particles attached

to the teeth and also dissolve the sugar components of food residues trapped in between the pits and fissures of the tooth surface (Pratiwi & Prasetyowati, 2020).

5 CONCLUSION AND RECOMMENDATION

Based on the research that has been done, it can be concluded that there is a decrease in the debris index before and after chewing fruit, either watermelon or california papaya fruit. Debris index before and after chewing watermelon fruit has a ρ value of 0.000. While the debris index before and after chewing california papaya fruit has a ρ value of 0.004. There is a difference in chewing watermelon fruit and california papaya fruit on the debris index in blind children with a ρ value before and after watermelon fruit is smaller than the ρ value before and after chewing california papaya fruit, so watermelon fruit is an alternative in reducing the debris index.

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