***PROCEEDING***
**The 8th International Conference on Health Science**

# Effect of Consuming Papaya Fruit (*Carica papaya)* on pH Saliva in Students Class X and XI Madrasah Aliyah (MA) Puteri Al-Amin Martapura, Indonesia

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**ABSTRACT**

Saliva becomes one of the components that affect the process of caries because saliva always wets the teeth so that it affects the environment in the oral cavity. The role of saliva in the caries process is related to demineralization and remineralization of hard tissue teeth or emails. Eating fibrous foods has many benefits, because the process of chewing fibrous foods will stimulate saliva production and have a *self-cleansing* effect on the mouth. Papaya has a high-water content and fiber so by consuming papaya is expected to change the pH saliva. This study aims to find out the influence of consuming papaya fruit on pH saliva in students of grade X and XI Madrasah Aliyah (MA) Puteri Al-Amin Martapura. This type of research is pseudo-experimental research with the design *of one group pretest post-test.* Sampling with *Total Sampling* technique of 41 people. Analyze data with *Paired T-Test.* The result of the analysis with *Paired T-Test* test is ρ = 0.003 with a value of 0.05 (ρ < ɔ) which means there is an influence of consuming papaya fruit on pH saliva. In this study, it can be concluded that there is an influence of consuming papaya fruit on pH saliva in students of grade X and XI Madrasah Aliyah (MA) Puteri Al-Amin Martapura. It is recommended to consume fibrous and juicy fruits especially papaya because papaya can neutralize the pH of saliva.

**Keywords : Papaya Fruit, pH Saliva**

## 1. INTRODUCTION

Based on WHO data in 2012, worldwide 60-90% of schoolchildren and nearly 100% of adults have dental caries. Dental caries also often cause pain and can affect quality of life (Dengah, R., 2015). Dental and oral health conditions in Indonesia are still very concerning, 90% of Indonesians still suffer from dental and oral diseases (Magfirah, A., 2013).

Saliva becomes one of the components that affect the process of caries because saliva always wets the teeth so that it affects the environment in the oral cavity. Saliva also has different compositions and concentrations that can affect the condition of saliva secretion so that the oral cavity environment of each individual is different. Factors that affect the composition and concentration of saliva include saliva flow rate, volume, pH, and saliva *buffer* capacity. Saliva secretion can be affected by stimuli received by the salivary glands. Such stimuli can occur through mechanical stimuli such as chewing gum or hard food and chemical stimuli such as sour, sweet, salty, bitter and also spicy (Pradanta, E.Y., 2016).

Dental caries status for permanent teeth can be measured using *DMF-T* index*(Decay, Missing, Filling teeth).* This index is used to see the state of teeth of a person who has experienced damage or untreated caries*(Decay),*has been removed or does not exist because of caries (*Missing*), teeth that are folded or patched because of caries (*Filling*) in fixed teeth (*Teeth*) (Magdarina, D., Indirawati., and Tjahja, N., 2013). According to *the World Health Organization* (WHO) in 2000 the analysis of caries prevalence data based on *dmf-T* index in several countries such as the United States (2.05 %), Africa (1.54 %), Southeast Asia (1.53 %), Europe (1.46 %), and the Western Pacific (1.23 %). The percentage of Indonesians who have problems with dental and oral health has increased based on Basic Health Research in 2007 and 2013 from (23.2 %) (25.9 %). This increase occurred in the 12-year age group, an increase of (28.9 %) (42.6 %), while the 15-year age group increased from (36.1 %) (44.3 %). *Indonesia's DMF-T* index is 4.6 with the value of each component of D-T 1.6, component M-T 2.9, and component F-T 0.08 which means tooth decay of the Population of Indonesia 460 teeth per 100 people (Riskesdas., 2013). The *DMF-T* index of South Kalimantan Province at 6.83 includes D-T 1.31 components, M-T 5.52 components, and F-T 0.12 components. This means the average amount of tooth decay per person (tooth severity per person) is 6.83 teeth, including 1.31 cavities, 5.52 removed teeth, and 0.12 teeth that are crushed.

## 2. MATERIALS AND METHODS

This type of research is a pseudo experiment*(quasi experimental),*with *a cross sectional*approach. The design is*"One Group Pretest Post-test"*where there is no comparison group (control). The samples in the study were students of grade X and XI Madrasah Aliyah (MA) Puteri Al-Amin Martapura which amounted to 41 people. Variabel *independent* research is Consuming Papaya Fruit. while *dependent* variable pH saliva. Tools and materials used are diagnostic sets, nier bekken, litmus paper, cups of saliva, papaya fruit (*Carica papaya)*, masks, gloves, tissue, soap, alcohol, aqua. The research site was conducted Madrasah Aliyah (MA) Puteri Al-Amin Martapura Banjar District South Kalimantan Province.Data analysis: conducted *Paired T-Test* (Test Two Sample Pairs).

## 3. RESULTS AND DISCUSSION

Based on table 1 shows the pH saliva before consuming papaya fruit obtained the result of pH 6 (tend to acid) there are 20 people or about 50%, pH 5 (more acidic) there are 2 people or about 5%, pH 7 (neutral) there are 12 people or about 30% and pH 8 (base) there are 6 people or about 15%. pH saliva obtained varies, because respondents have consumed other foods first. This is in accordance with research conducted by Irene (2010) where the pH saliva before chewing the fruit pepaya obtained also varies because respondents have consumed biscuits first.

Based on table 2 shows the pH of saliva after consuming papaya fruit with a pH of 6 there are 2 people (5%) and pH 7 there are 38 people (95%). This indicates that there was a change in saliva pH in respondents with pH 6 (acid) there were 2 people and pH 7 (neutral) increased to 38 people. pH saliva changes due to the influence of water content and enzymes contained in papaya fruit that can affect the pH of saliva. This is in accordance with research conducted by Furaihan, A., (2017) where there is a change in the pH of saliva before and after chewing papaya fruit that is with an average pH before of 6.50 and an average pH of saliva after 7.46.

**Table 1. Results of Saliva pH Measurement Before Treatment in Grade X and XI Madrasah Aliyah (MA) Puteri Al-Amin.**

| pH Saliva | sum | Percent (%) |
|---|---|---|
| 5 | 2 | 5 |
| 6 | 20 | 50 |
| 7 | 12 | 30 |
| 8 | 6 | 15 |
| Total | 40 | 100 |

**Table 2.Results of Saliva pH Measurement After Treatment in Grade X and XI Madrasah Aliyah (MA) Students Puteri Al-Amin Martapura.**

| pH Saliva | sum | Percent (%) |
|---|---|---|
| 6 | 2 | 5 |
| 7 | 38 | 95 |
| Total | 40 | 100 |

**Table 3. Statistical Analysis Results with *Paired T-Test***

| variable | *Mean* | Std. Deviation | Std. Error | N | T | Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| pH before-pH after | -.400 | .810 | .128 | 40 | -.3.122 | .003 |

The average pH of saliva before consuming papaya fruit is 6.55, which means that the pH of saliva is acidic, but after being treated with papaya fruit for 1 minute the average pH of saliva becomes 6.95, which indicates the pH of saliva in a near-normal state, this means that by consuming papaya fruit has a function to neutralize the pH state of saliva that is acidic. In this study the difference in the average pH saliva before and after consuming fruit pepaya (*Carica Papaya*) is 0.4 means a significant change. Changes in the pH of saliva obtained by the amount of less than 0.5 because respondents had already consumed other foods.

Irene conducted the study by asking the subject to consume 100 gr of chewed papaya fruit 32 times or for 2 minutes. In the paired T-Test test the results of research in the *treatment* group showed no significant difference in the pH of saliva before and after consuming papaya fruit. The change in pH saliva *treatment* is 0.22. In the control group that did not consume papaya fruit showed no meaningful difference in pH saliva at the same time span as *the treatment* group that consumed papaya. The change in pH saliva control is 0.28. Thus, the pairless T-Test also showed that there was no meaningful difference between the decrease in pH saliva *treatment* group that consumed papaya fruit and the control group that did not consume papaya fruit (Irene, 2010).

Furaihan, A., (2017) also conducted research on students of the Faculty of Dentistry Unimus on the influence of chewing papaya fruit and sweet star fruit on pH saliva. The average test result of the difference in pH saliva of papaya fruit*(Carica Papaya)*is 0.96 and in sweet star fruit is 2.97. Paired T test showed that the pH of saliva in the group of papaya fruit chewers (*Carica Papaya*) *Sig value.* 0.00 less than 0.05 so that there are changes before and after chewing papaya fruit (*Carica Papaya*) (Furaihan, A., 2017).

Based on the research conducted on students of grade X and XI Madrasah Aliyah (MA) Puteri Al-Amin Martapura can be seen in table 4.5 that by consuming papaya fruit has an influence in the change in acidity pH saliva degree is quite significant. It means that there is an influence of consuming papaya fruit ( *Carica Papaya)*on pH saliva in students of grade X and XI Madrasah Aliyah (MA) Puteri Al-Amin Martapura. This is in accordance with research conducted by Furaihan, A., (2017) where the results of the study also prove that there is an influence of chewing papaya fruit on pH saliva. The taste content will stimulate the saliva production center to secrete more saliva so that it can neutralize acidic substances in the mouth and is an effort to prevent demineralization or tooth decay.

## 4. CONCLUSION

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## REFERENCES

Dengah, R., 2017. Gambaran Tingkat Karies Berdasarkan Status Kebersihan Gigi dan Mulut Pada Anak Usia 12-13 Tahun Di SMP Katolik Santo Yohanis Penginjil Desa Laikit Minahasa Utara, Universitas Sam Ratulangi Manado.

Fawell J, Bailey K, Chilton J, Dahi E, Fewtrell L, Magara Y, Fluoride in drinking water. London: Iwa Publishing; 2006

Furaihan, A., 2017. Beda pH Saliva Pasca Pengunyahan Buah Pepaya (Carica Papaya) dengan Buah Belimbing Manis (Averrhoa Carmbola L.), Univeraitas Muhammadiyah Semarang, Semarang.

.Irene, 2010. Perbedaan Debris Index dan pH Saliva Sebelum dan Sesudah Mengkonsumsi Pepaya (Carica Papaya) Pada Siswa Kelas IV SDN Gayamsari 05 Kota Semarang, Universitas Negeri Semarang.

Kemenkes RI, 2013. Riset Kesehatan Dasar (Riskesdas),2013. PP:110-119.

Magfirah, A., 2013. Efektifitas Menyikat Gigi Disertai Dental Floss Terhadap Penurunan Indeks Plak, Universitas Lambung Mangkurat, Banjarmasin.

Pradanta, E.Y., 2016. Hubungan Kadar pH dan Volume Saliva Terhadap Indeks Karies Masyarakat Menginang Kecamatan Lokpaikat Kabupaten Tapin, Fakultas Kedokteran Unioversitas Lambung Mangkurat, Banjarmasin.

Profil Madrasah Aliyah Puteri Al-Amin (2018)

Sunubi,E.,2014, Hubungan kadar fluor air minum terhadap karies gigi pada anak sekolah dasar di kecamatan landono kabupaten konawe selatan provinsi sulawesi tenggara. Jurnal Masyarakat Epidomologi Indonesia. Vol 2. No. 2 Januari-Juni; 87-91