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Relationship Raisin Between 60% Extract Solution And Saliva Ph

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ABSTRACT

Caries is a dental and oral disease with the highest percentage. One group that is susceptible to caries is children. Caries is a dental and oral disease that has several causative factors, including the acid-base state of the oral cavity and also the status of oral hygiene. Prevention of caries can be done by controlling the salivary pH by gargling with a solution of raisins which contains flavonoids, tannins and triterpenoids which can control the salivary pH. The purpose of this study was to determine the relationship between gargling with 60% raisin solution and salivary pH in children aged 13-16 years. This type of research is analytic research, namely true experimental research. The sample consisted of 32 children, consisting of the intervention group (gargle with 60% raisin solution) and the control group (gargle with distilled water). Data analysis was performed using a dummy independent variable linear regression test. Statistical test results showed that there was a relationship between gargling with 60% raisin solution and salivary pH with a unidirectional relationship and sufficient strength of the relationship with the R coefficient value of salivary pH = 0.384. Further research is needed regarding the effect or relationship of raisin varieties or other types on salivary pH with different target characteristics, as well as the preparation of raisin-based mouthwash preparations.

Keywords : Raisin Extract; saliva pH; Children's Dental Health.

Introduction

Health is one of the elements of welfare that must be realized in a nation. Dental health is one of the most important to achieve general health. Dental and oral health can be interpreted as a healthy condition of the hard and soft tissue of the teeth so that it supports individuals to perform the functions of eating, speaking, interacting socially without dysfunction and without aesthetic disturbances. Individuals who are free from dental and oral health problems have indications of being able to live productive lives socially and economically [1]. The conditions and status of the productive, social and economic levels of the Indonesian nation are

influenced by the dental and oral health conditions of its citizens.

The condition of oral health in Indonesia according to the 2018 Basic Health Research (Riskesdas) data has a proportion of 57.6% which has increased from the 2013 Basic Health Research (Riskesdas) data which amounted to 25.9% [2]. Reporting from the Ministry of Health article (2019) according to The Global Burden of Disease 2016, Dental and oral health is still a major concern with its main problem, namely caries [3]. The provision of Central Java itself has a percentage of dental and oral health problems, especially caries of 43.45% with a caries proportion of 37.38% at the age of 10-14 years and 34.57% at the age of 15-24 years [4].

Cavities or caries is a disorder of the oral cavity that affects the hard tissues of the teeth, namely enamel, dentine and cementum due to the metabolic processes of microorganisms in plaque, as well as interactions between microorganisms, saliva, and parts of food and enamel which cause demineralization. 5].

The presence of saliva in the oral cavity affects the condition of the oral cavity. Saliva is a liquid in the oral cavity composed of organic and inorganic substances, which can clean teeth and control bacteria in plaque [6]. In addition to affecting the growth of plaque, saliva also affects the level of acidity. Salivary pH is a liquid produced from the process of exocrine secretion, which has an acid category below 6.7 which can trigger caries if the salivary pH is at 5.5 for a certain period of time [7].

One way to control salivary pH is by gargling. Gargling is an activity of washing the mouth by moving water and so on in the mouth (KBBI V). One preparation that can be used for gargling is raisin extract. Raisin extract is a preparation made for gargling or washing the mouth. Gargling preparations or mouthwashes from natural ingredients can be made by infusion, decoction or tincture method which is diluted [8]. Raisins are dried fruit produced from dried grapes and have a naturally sweet taste, consisting of fructose and glucose sugars. Even though the fruit is dry and sticky, raisins contain flavonoids, tannins and triterpenoids which are potent as antibacterial against *S. mutans* and anti-inflammatory [9][10].

There are several types of raisins, sultana raisins are raisins with the highest antioxidant and phenolic content. According to research by Machmud, et al (2015) 60% concentration of raisin extract containing oleanolic acid is considered effective in reducing the dental plaque index in high school students. Raisin extract concentration of 60% is a 100% raisin extract preparation which is treated with dilution using distilled water to have a concentration of 60% [11].

Research Methods

The type of research used is analytic research with Tru Experiment Research. The design of this study was a randomized posttest only control group design to determine the relationship between salivary pH after rinsing with raisin solution and the control group rinsing with distilled water. The sample was divided into the intervention group, namely raisin solution with a concentration of 60% and the control group, namely distilled water. The sample is children aged 13-16 years at the Nurul Chusna Islamic Boarding School. The sampling technique used an experimental research sample formula with inclusion and exclusion criteria for obtaining a large sample of 32 children. Data analysis was carried out by univariate and bivariate analysis, using a linear regression test of dummy independent variables to determine the relationship between the independent variable and the dependent variable.

Results and Discussion

Table 1.

Distribution of salivary pH in respondents with raisin solution and distilled water

Saliva Category of	Raisin Solution Frequency		Aquades	
	n	%	n	%
Acid	0	0 %	3	9,4 %
Normal	7	43,8 %	10	31,3 %
Base	9	56,3 %	3	9,4 %
Total	16	100 %	16	100%

Table 2.

Average, maximum, minimum values and Dummy Linear Regression test Saliva pH in raisins and distilled water

Parameter	Mean	Maximum	Value Minimum Value	R
Raisin Solution	6.8	8.0	6.0	0.322
Aquades	6.4	7.4	5, 8	

The study was conducted by 32 respondents who were divided into two groups. The group

consisted of the intervention group, namely the group of respondents who rinsed their mouths with

raisin extract with a total of 16 children and the control group, namely the group of respondents who rinsed their mouths with distilled water as many as 16 children. After measuring the salivary pH, the results of the salivary pH distribution of the respondents are shown in the table. The results of the analysis of gargling using raisin solution resulted in a salivary pH that was not alkaline than gargling using distilled water. There were nine respondents who had alkaline salivary pH and seven respondents who had normal salivary pH. While the pH after gargling with distilled water tends to be normal, it can be seen from the number of pH respondents in the normal category, as many as ten people and three respondents have the normal category, and the other three have the pH category of alkaline saliva.

Based on the table above the pH of saliva after rinsing using raisin solution tends to be normal to alkaline with an average salivary pH value of 6.8 and the lowest value is 6.0 (normal) and the highest value is 8.0 (alkaline). Whereas in the control group the pH of saliva after rinsing with distilled water tends to be normal with an average pH of saliva after rinsing with distilled water, namely 6.4 and the highest value is 7.4 (alkaline) and the lowest value is 5.8 (acid).

The results of the research conducted Linear Regression test Dummy pH Saliva Independent Variable, obtained an R coefficient value of 0.384 which can be interpreted that there is a relationship between gargling raisin solution with salivary pH after rinsing. This means that by gargling with concentrated raisin extract it can increase the salivary pH towards normal to alkaline in respondents, who are prone to caries with acidic salivary pH. Based on the magnitude of the R value, it can be analyzed that the strength of the relationship between the two variables is sufficient. The value of the coefficient R is positive so that it can be interpreted that there is a unidirectional relationship.

Saliva pH is used as a measure of the degree of acidity or alkalinity of saliva. A decrease in salivary pH has the potential to cause caries risk because the salivary pH is acidic, whereas when the salivary pH increases, the saliva is alkaline which has the potential for tartar formation [12]. According to research conducted by Kusmana, 2021 that there is a relationship between salivary pH and dental caries. Carbohydrates left in the oral cavity will be fermented by pathogenic bacteria to produce acids which lower the salivary pH [13].

Gargling with raisin solution causes an increase in the salivary pH value in the treatment group with a normal pH value towards alkaline. Raisin solution has the ability to increase the pH of saliva with sufficient strength. This happens due to the influence of the bitter taste of raisin extract and the content of antibacterial substances in the form of flavonoids, tannins, and triterpenoids which can inhibit bacteria from secreting acid and increase the pH of saliva in the oral cavity compared to neutral distilled water [14].

The raisin solution is the result of the extraction of raisins, namely the purification of the active substance contained in sultana raisins using a suitable solvent and producing a thick raisin solution with a concentration of 100% which is then diluted using distilled water to obtain a concentration of 60%. Sultana raisins (gold raisins) contain antibacterial chemical compounds in the form of flavonoids, tannins, and tripenoids. Sultana raisins are a type of raisin that contains high levels of hydroxycinnamic acids, lightness values, antioxidants and phenolic acids compared to types of fruits in Indonesia and other types of raisins [15]. Flavonoids, tannins, and tripenoids are compounds that can inhibit plaque accumulation and increase salivary pH. The antibacterial compound in raisins is a compound that effectively inhibits the growth of the *Streptococcus mutans* bacteria. These bacteria are bacteria that manifest in the oral cavity and are contained in plaque and salivary pH and can cause caries under certain conditions and atmosphere [14]. Research conducted by Fajarani et al, 2017, showed that raisins have an effective antibacterial in inhibiting the growth of *Streptococcus mutans* [16].

Conclusion

It can be concluded that the results of the average value have a relationship between gargling with raisin solution and the pH of saliva, which means that rinsing with raisin solution can increase the pH of saliva towards alkaline. The average value of salivary pH is 6.8 in the alkaline category.

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