

HALAMAN PENGESAHAN KARYA TULIS ILMIAH

**HUBUNGAN ANTARA PH SALIVA DENGAN PREVALENSI KARIES
PADA ANAK TUNANETRA DI SLB N 1 BANTUL**

*The Correlation between Salivary PH and Prevalence of Caries in Visually
Impaired Child on SLB N 1 Bantul*

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The Correlation between Salivary PH and Prevalence of Caries in Visually Impaired Children on SLB N 1 Bantul

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Abstract: *One of the factors in the occurrence of caries is saliva pH. The pH content of saliva in the visually impaired is different from normal children because of the circadian cycle rhythm in the body which is longer than the normal person, which this thing has an effect on salivary secretion. Visual impaired also has visual abilities that are lacking in recognizing and cleaning the oral cavity.*

This study aims to find out is there any relationship between pH saliva and prevalence of caries in visually impaired children at SLB N 1 Bantul. The method in this study was observational analytic with cross sectional approach, with sample of 15 students of SLB N 1 Bantul aged 9 to 26 years old. The caries index examination used the mount and hume index by knowing caries based on location and depth. The saliva taking was carried out without stimulation, saliva pH was measured by using pH meter. The average pH of visually impaired children is 8-8,9 with an average mount and hume index site 1 size 1 or pit and fissure.

The data analysis used in this study is a spearman test.

The results of this study showed that the score $p > 0,05$ which means there is no correlation between pH and prevalence of caries in visually impaired children at SLB N 1 Bantul.

The research showed that there was no correlation between salivary pH and the prevalence of caries in visually impaired children at SLB N 1 Bantul.

Key words: *Saliva pH, mount and hume, visually impaired*

INTRODUCTION

Visually impaired is a condition that is recognized by a decrease of light perception presence so it causes a limitation in whole or in part of in part or in whole¹. The prevalence of visually impaired people in Indonesia increased from 0.08% in 2010 to 0.17% in 2013².

Visually impaired people receive minimal light stimulation or even not at all so that dark time is longer than normal people, salivary secretion in the dark condition is lower than bright time, so it causes the capacity of buffer is low³. Salivary buffer capacity is associated with flow saliva, the rate of salivary secretion or low flow saliva will cause a low buffer. So it affects the decrease in pH to acid. The acidity of the pH takes effect to the rapid enamel demineralization that can cause teeth cavities⁴.

Dental caries or teeth cavities is a multifactorial disease among saliva, bacteria, substrate, and time. Saliva as one of the factors that play a role in the occurrence of caries, because the acidity or low pH of salivary (4,5 - 5,5) will facilitate the growth of acidogenic bacteria that causes caries⁵. The caries prevalence data in Indonesia based on the Riskerdas in 2018 of 88.8%⁶.

The high caries prevalence in children who experience visually impaired due to the weak of ability and self-development, inability to see and eliminate food remnants in the mouth cavity⁷.

One of indicators to determine the level of dental caries is the mount and hume index. Mount and hume assess caries based on location and the size of tooth damage⁸.

SLB N 1 Bantul is one of the biggest SLB in Yogyakarta which is located in urban areas that enable children to consume lots of sweet foods which cause high caries impact, SLB N 1 Bantul has a mission to realize optimal health for students. Based on that reason, we as researchers help to realize in terms of dental health and mouth⁹.

RESEARCH METHOD

The type of research that was conducted in this study was observational analytic with cross sectional design. The research subjects were 15 students. The study was conducted at SLB Negeri 1 Bantul Yogyakarta in September 2018 - February 2019.

The population of this study was visually impaired students at SLB Negeri 1

Bantul Yogyakarta. The sampling used total sampling technique with inclusion and exclusion criteria. The inclusion criteria are: 1.) children with special needs with visually impaired 2.) cooperative children. While the exclusion criteria include: 1.) children who have systemic disorders associated with salivary secretions such as xerostomia, hypertension, diabetes mellitus, etc., 2.) Children who are using medication ingredients that can affect salivary secretions such as sedatives, anti cholinergic, and anti adrenergic. The subjects that were obtained based on inclusion and exclusion criteria were 15 children.

In the initial stage the subjects were instructed to brush together and then waited for an hour. After that, the subjects were instructed to gargle with water, then checked it with the mount and hume index. The results of the examination were recorded in the form of caries index filling. The next step was taking saliva, the saliva was taken without stimulation, the subjects were instructed to sit upright on the chair and then let the saliva accumulated for 5 minutes then released to a 5ml sample pot. The collected saliva was then placed in the icebox to be taken to UMY pharmaceutical laboratory to be carried out measuring the pH by using pH meter.

RESULT

Table 1. Results of Mount and Hume Index Examination in Visually Impaired Students at SLB N 1 Bantul.

Mount and Hume Index	Frequency	%
<i>Site 1 - size 1</i>	27	57,44
<i>Site 2 - size 2</i>	3	6,38
<i>Site 1 - size 3</i>	3	6,38
<i>Site 2 - size 1</i>	2	4,25
<i>Site 3 - size 1</i>	4	8,51
<i>Site 3 - size 2</i>	3	6,38
<i>Site 3 - size 4</i>	5	10,6

The results of the research data are shown in Table 1. which shows that site 1 - size 1 or occlusal caries (pits, fissures, smooth surfaces, grooves) and minimal lesions (email) can be seen at the most, namely 57.44%.

Table 2. Results of Visually Impaired Saliva PH

Acidity	F	%
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Acid	5,0 - 5,8	0	0
Normal	6,0- 6,6	0	0
Base	6,8- 8,0	15	100

N	15	15
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The table 2 data shows that 100% of subjects had base pH

Table 3. Non Parametric Spearman Test Results between the Mount and Hume Caries Index and Saliva PH

		ph	Mount _and_ hume
Spearman's	PH	Correlation Coefficient	1.000
		Sig.(2-tailed)	.369
		N	15
		Correlation Coefficient	-.250
		Sig.(2-tailed)	.369

The table 3 data shows that the correlation test value is more than 0.05, so there is no correlation between the prevalence of caries and the salivary pH of visually impaired students in SLB N 1 Bantul.

DISCUSSION

The results of the examination of salivary pH and mount and hume index of 15 students had mixed results. Most of salivary pH that were examined showed the base value and percentage of the mount and hume index, the most are carious lesions in the pit and fissure depth of the email. The aim of this study was to fine out the relation between salivary pH and caries prevalence in SLB N 1 Bantul on visually impaired students who were processed by using the spearman test to obtain $p > 0.05$, which means that there was no relation between salivary pH and caries prevalence of visually impaired students in SLB N 1 Bantul.

According to the previous study, Merinda et al. (2013) concerning the Relation of pH and Saliva Buffer Capacity to the Caries Index of SLB-A Bintoro Jember Students that there was no significant relation between pH and salivary

buffer capacity to the caries index of SLB-A students because caries was caused by several factors, including education factor and the children's habit itself and caries involved a complex component, not only of pH and buffer capacity but also other components of saliva include protein, calcium, and antioxidant defense systems which also have a role for the development of caries¹⁰.

It also supported with previous study by Suratri et al. (2017) on the effect of Saliva pH on the occurrence of dental caries in school-age children ummm, that acidity does not affect dental caries because of several other factors that cause changes in salivary pH, namely the average velocity of salivary flow, oral microorganisms, and capacity saliva buffer. There are also factors that influence the formation of acids, namely the type of carbohydrates that are contained in the diet, the type and the amount of bacteria in plaque and physiological conditions in plaque¹¹.

Another study is by Jaya et al. (2014) on Calcium Email Solubility in Saliva of Visually Impaired Patients that salivary pH increases, then a decrease in calcium solubility occurred¹². Calcium email solubility in visually impaired patients was

greater than the control group or artificial saliva. The dissolution process of calcium was very influential with the inorganic composition of email so that it could be an indicator of caries development. Calcium solubility was influenced by the composition of calcium and phosphate in the saliva of visually impaired patients.

The results of salivary measurements in the subjects was obtained base results, this condition enabled the existence of remineralisation, so the caries that were found has average in parts of the pit and fissure. Remineralisation was influenced by the content of calcium and phosphate. Phosphate in saliva is also called salivary buffer capacity because it can reduce H ions so that salivary pH increases. The high calcium and phosphate produced the high deposits of calcium and phosphate on the surface of the email which would close the micropore that was caused by the demineralization process, so that the remineralisation process would occur which decreases caries¹².

There were many factors besides salivary pH that caused caries, it is including the level of education and habits. The education means that both parent education and the child's education such as whether the

child is diligent in cleaning his teeth or not¹⁴. In this study, most of visually impaired students with a background of parents who were educated and concerned about their dental and oral health, it was proven that they were accustomed to toothbrushes and the use of oral glass at the time of examination, in addition the guardian's told that routine dental examinations by dentists UKGS in SLB N 1 Bantul area. The statement is supported by Molagh et al. (2004) that if children are given good training in dental and oral health, the invisible factors or blindness are not the main factors that causing the high caries¹⁵.

Ahmad et al. (2009) also stated that if visually impaired people were given motivation and education to maintain dental and oral health, they would be able to despite the difficulties to visualize the plaque affixed to the teeth¹⁵. Researchers also assumed that even though they eat sweet foods, if they are able to clean properly because they are accustomed to attending the training that was held by the school, it can maintain the balance of the oral cavity so that the visually impaired students in SLB N 1 Bantul, it was found there were 57.44% of pit caries and fissure as well as alkaline salivary pH.

CONCLUSION

The study entitled Relationship The Correlation between Salivary PH and Prevalence of Caries in Visually Impaired Children on SLB N 1 Bantul was found that there was no correlation between salivary pH and caries prevalence in visually impaired children in SLB N 1 Bantul.

SUGGESTION

Suggestions from this study is that it needs to be carried out a further research on the composition of saliva in the visually impaired, the number of subjects in the study should not be too little so that the data that was obtained can be more processed and more representative of the general situation.

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