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The Effect of Toothbrushing Habits before Bed to Oral Health Status of Elementary School Student

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ABSTRACT: The habit of toothbrushing before bed is a continuous activity of brushing at night before bed, aiming to remove plaque from the tooth surface to prevent the build-up of plaque and plays a vital role in preventing the growth of bacteria which is more active at night that able to cause tooth decay and oral hygiene. The poor dental and oral hygiene can lead to being a risk factor for the onset of various problems of oral health status such as dental caries disease, diseases of the gum tissue, and the acidity of saliva. Basic Health Research survey in 2013 revealed that in Central Java who doing toothbrushing before bed at night is only 21.2%. This study aims to determine the effect of before bed toothbrushing to the dental and oral health status of students grade IV and V SDN Sendangmulyo 04 Semarang.

This study uses a cross-sectional method using correlative descriptive design. The sample for the survey was 63 respondents drawn at random.

The results showed there is an effect of toothbrushing before bed at night with caries where $\rho = 0.013$, and there is the effect of toothbrushing before bed at night with the dental and oral hygiene index status (OHIS) where $\rho = 0.002$. However, no effect of toothbrushing before bed at night with the health status of the gum tissue (gingival index) where $\rho = 0.182$, and no impact of toothbrushing before bed at night with the saliva acidity status (saliva PH) where $\rho = 0.446$. It is suggested to the researchers who continue the study of toothbrushing habitat night to regard the way and knowledge of toothbrushing.

KEYWORDS: toothbrushing, before bed, dental, oral health status.

I. INTRODUCTION

In Indonesia, the dental and oral health is still an issue. It is illustrated by the high prevalence of people in Indonesia with problematic mouth and teeth through the results of Health Research report (Riskesdas). Based on Riskesdas in 2013, the number of dental and oral problems in Indonesia reached 25.9%. Gum disease is ranked 6th out of 10 outpatient diseases in Indonesia [1].

The results of Health Research in 2013 showed Indonesia has dental and oral problems in 25.9%. Central Java is one of the provinces whose high oral and dental issues at above 25%. Besides, based on the profile of Semarang city health department in 2015, UKGS service efforts in primary schools have implemented the dental health examinations, and as the result, there are 47% of students having oral and dental problems [2].

The habit of Indonesians brushing their teeth is still ignored. Survey Basic Health Research (RISKESDAS) in 2013 revealed that 93.8% of the average Indonesian who do toothbrushing before bed at night is only 27.3% and just 2.3% who brush correctly. For the Central Java province toothbrushing before bed at night only 21.2% and 1.7% who clean the teeth properly which is still below the Indonesia average [3].

Children's dental and oral health is characterized by reduced oral hygiene conditions and buildup of plaque as well as deposits - other deposits on the tooth surface as the knowledge of children about proper brushing time is still

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lacking[4]. Lousy dental and oral hygiene can be a leading risk factor for the various oral and dental problems status such as dental caries disease. Wong, Eaton-Hockenberry, Wilson, Winkelstein, and Schwartz (2008) revealed that 4 to 8 are the most susceptible age of primary dental caries and 12 to 18 for permanent teeth[5]. Thus, dental caries is also one of the severe health problems in school-age children. The dental and oral hygiene can affect the gingival tissues health. The worse the level of oral hygiene, the more susceptible to the gingivitis it is, or inflammation of the gingival tissues. This phenomenon is in line with research results of Hadnyanawati to primary school students which states that students with oral and dental hygiene are poorly exposed gingivitis [6]. The health status of the gingival tissues can be measured using gingival index introduced by Loe and Silness [7].

The dental and oral health status is generally expressed in the dental caries prevalence, and periodontal disease for the disease of dental caries and periodontal disease is experienced by almost all people in the world. To assess the dental and oral health status, in this case, is dental caries, the values DMF-T (Decay Missing Filled Teeth) is used. For the oral is OHIS (Oral Hygiene Index Simplified), Gingiva Index for gingiva condition and to measure the acidity of saliva or saliva is by the pH of saliva[8].

According to the preliminary results of the study were drawn from data field learning practices of students in 2015, discovered the tooth condition phenomenon of SDN Sendangmulyo 04 Semarang in 2015 where 51% of cases are caries, and 85% is the permanent dental caries. Not to mention, the percentage of total oral hygiene was found 2.4% poor criteria, and 60.3% average criteria.

Based on the problem descriptions above, which happened in SDN Sendangmulyo 04 Semarang, the researchers are interested in conducting the study on the effect of toothbrushing habit before bed at night to the status of dental and oral health of students grade IV and V in SDN Sendangmulyo 04 Semarang.

II. RESEARCH METHODOLOGY

This study is a correlation with a *cross-sectional* approach and used correlation study. Correlation design examined the relationship between two or more variables in a group to describe the variables and analyze the relationship between variables. This study examined the relationship between variables of toothbrushing before bed at night to the dental and oral health status. The purpose was to describe the variables of brushing before bed at night to the dental and oral health status of school-age children, as well as examine the relationship between these two variables. In this study, the population was all students of class IV and V in SDN Sendangmulyo 04. The samples with Slovin formula obtained 63 respondents using *random* sampling technique.

The data obtained through two stages, the first is through clinical examination directly to the respondents of students grade IV and V SDN Sendangmulyo 04. In this clinical analysis, the data to be obtained is children's dental and oral health. The second stage for securing data source is filling checklists done by parents or guardians of students who have done the same clinical examination. Data obtained from this list is the data of toothbrushing habit before bed at night. The used instrument includes checklists of toothbrushing before bed at night form, Inspection Sheet, OD Set, Dental Caries Index (DMF-T), and Oral Dental Hygiene Index (OHI-S), Gingival Index, Saliva PH meter.

The analysis used univariate analysis to describe the characteristics of each variable using frequency distribution. Spearman correlation statistical tests are to identify whether or not there is a relationship between influence variable and affected variable.

III. RESULT AND DISCUSSION

It had been reported the effect of toothbrushing before bed at night to the dental and oral health status. Respondents who have filled out *an informed consent*, have a direct examination of dental and oral form of caries, dental and oral hygiene index, gum tissue health index, and saliva acidity scale. The respondents were given checklists of toothbrushing before bed at night habit which is observed directly by a parent or guardian for a week.

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Table 1 Frequency Distribution of Toothbrushing before Bed at Night

Criteria	Number of Students	%
Good	37	59%
Average	19	30%
Poor	7	11%
Total	63	100%

Based on data from Table 1, it can be seen that from a total of 63 respondents who brush at night is the good criteria in 59% (37 respondents) which means the habit of toothbrushing at night is 5-7 times a week.

Table 2 Tooth Caries Frequency Distribution

Criteria caries	Total	student%
Good	21	33%
Average	15	24%
Poor	27	43%
Total	63	100%

Based on data from Table 4.2, it can be seen that from a total of 63 respondents, the highest caries is terrible criteria in 43% (27 respondents), which means the number of carries in the oral cavity is more than 4.

Table 3 Frequency Distribution of OHIS

Criteria OHIS	Total	student%
Good	11	17.5%
Average	36	57%
Poor	16	25.5%
Total	63	100%

Based on data from Table 3 it can be seen that from a total of 63 respondents, the highest OHIS is average in 57% (36 respondents), which means the OHIS score is 1.3 to 3.0.

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Table 4 Frequency Distribution of GI

GI Criteria	Number of	students%
Good	61	97%
Average	2	3%
Poor	0	0%
Total	63	100%

Based on data from Table 4, it can be seen that from a total of 63 respondents, the highest GI is right criteria in 97% (61 respondents), which means that gingival index is 0.1 to 1.0.

Table 5 Frequency Distribution of Saliva ph

Criteria pH of Saliva	Total	student%
Neutral	23	37%
Base	32	51%
Acid	8	13%
Total	63	100%

Based on data from Table 5, it can be seen that from a total of 63 respondents, the highest pH of saliva criteria is 51% (32 respondents), which means to have acidity score 8 - 14.

Table 6 The Effect of Toothbrushing before Bed at Night Habit to The Carries

Caries	Toothbrushing Habit Before Bed at Night								ρ Value
	Good		Average		Poor		Total		
	N	%	N	%	N	%	N	%	
Good	15	24%	5	8%	1	1%	21	33%	0,013
Average	11	17.5%	4	6,5%	0	0%	15	24%	
Bad	11	17.5%	10	16%	6	9.5%	27	43%	
Total	37	58%	19	30.5%	7	10.5%	63	100%	

Based on data from Table 6, it is known that the most respondents commonly found in proper brushing teeth before bed at night in good criteria are as much as 58% (37 respondents) where 24% (15 respondents) have good carries. Further, as much as 17.5% (11 respondents) had average carries, and 17.5% (11 respondents) had bad carries.

While the results of the statistical test with Spearman test showed that the value $\rho = 0.013$ ($\rho < 0.05$) in other words, no significant effect of brushing before bed to carries.

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Table 7 Effect of brushing habit before Bed to OHIS

OHIS	Brushing Habits Sleep Before Evening								ρ Value
	Good		Average		Poor		Total		
	N	%	N	%	N	%	N	%	
Good	10	15.9%	1	1%	0	0%	11	17.5%	0,002
Average	21	33.3%	13	20.6%	2	2%	36	57%	
Bad	6	9.5%	5	8%	5	3.1%	16	25.5%	
Total	37	58.7%	19	30.5%	7	10.5%	63	100%	

Based on data from table 7, it is known that the most found respondents with good criteria are 58.7% (37 respondents) where out of that number, those have good OHIS criteria as much as 15.9% (10 respondents). The average OHIS criteria are 33.3% (21 respondents) and the bad OHIS criteria is as much as 9.5% (6 people).

The results of the Spearman statistical test showed the value $\rho = 0.002$ ($\rho < 0.05$) in other words, no significant effect of toothbrushing before bed at night to OHIS.

Table 8 Effect of Toothbrushing Habit before Bed at Night to the GI

GI	Brushing Habits Sleep Before Evening								ρ Value
	Good		Average		Poor		Total		
	N	%	N	%	N	%	N	%	
Good	37	58.7%	17	27%	7	11.1%	61	96.8%	0.182
Average	0	0%	2	3.2%	0	0%	2	3.2%	
Poor	0	0%	0	0%	0	0%	0	0%	
Total	37	58.7%	19	30.5%	7	11.1%	63	100%	

Based on data from Table 8, it is known that most respondents found with good criteria are in 58.7% (37 respondents), of that amount, the good gingival index criteria is 58.7% (37 respondents) and for average and bad gingival index criteria have amounted to 0% (0 respondent).

While the statistical test within Spearman test showed the value $\rho = 0.182$ ($\rho > 0.05$) in other words, there is no significant effect of toothbrushing before bed at night to gingival index.

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Table 9 Effect of Toothbrushing Habit before Bed at Night to the pH of Saliva

Saliva pH	Toothbrushing Habit before Bed at Night								ρ Value
	Good		Average		Bad		Total		
	N	%	N	%	N	%	N	%	
Good	12	19%	6	9.5%	5	7.9%	23	36.5%	0.446
Average	21	56.8%	10	15.9%	1	1.6%	32	50.8%	
Poor	4	6.3%	3	4.8%	1	1.6%	8	12.7%	
Total	37	58.7%	19	30.5%	7	11.1%	63	100%	

Based on the data table 9, it is known that the most found with good criteria is in 58.7% (37 respondents). It is located that the neutral pH of saliva criteria in 19% (12 respondents), and the base saliva pH criteria are 56.8% (21 respondents) while the acid saliva pH criteria are 6.3% (4 respondents). Further, the results of statistical tests showed the value of $\rho = 0.446$ ($\rho > 0.05$), in other words, there is no significant effect of toothbrushing before bed at night to saliva pH.

The result of Spearman statistic from Table 6 obtained $\rho = 0.013$ ($\rho < 0.05$) which means there is significant effect between toothbrushing before bed at night to carries. It can be seen from data table 4.6 that as many as 11 respondents who have a habit of proper brushing teeth before bed at night yet poor caries criteria averagely have more than four dental caries.

This can be caused by many factors, one of them is diet, nine observation was done by a written interview which turned out from all the students who have bad caries criteria, in fact, have a poor diet such as consuming sticky sweet foods as a snack in a break during big meal almost every day.

As well as from the data of Table 6, some respondents who brush before bed at night with bad habit yet good caries criteria as much as 1%. The carries is not only caused by the practice of toothbrushing before bed at night but also other factors in which one of them is saliva [9]. That respondent is known having base criteria of saliva acidity scale, in which the acidic pH will cause demineralization (carries process), whereas if the pH is base, it will be more resistant to the demineralization. Therefore, respondents whose bad criteria in toothbrushing habit before bed at night yet have good carries, caused by base acidity of saliva (Saliva pH) that will make it more resistant to demineralization [10]. This is in line with research conducted by Rahim [11] which showed there was a significant relationship between children toothbrushing habit to dental carries.

Based on data from Table 7, the statistical test results showed the value of $\rho = 0.002$ ($\rho < 0.05$) in other words, no significant effect of toothbrushing before bed at night to the OHIS. From Table 7, it is known that there are still respondents who have bad OHIS criteria despite having the habit of toothbrushing before bed at night since one of them is the respondent who is technically incorrect doing toothbrushing[12] so that the rest of the food is still attached and not clean. The results of this study are also consistent with the research by Anitasari [13] that there is brushing frequency correlation with the level of oral hygiene.

Table 8 in which Spearman test results showed the value of $\rho = 0.182$ ($\rho > 0.05$) indicating there is no significant effect between toothbrushing habit before bed at night to the Gingival Index. There are seven respondents in Table 8 whose bad criteria of toothbrushing habit before bed at night yet have good Gingival Index. It is because of the toothbrush at night cannot directly affect the status of the gingival tissues as one of the factors that directly affect the gingival tissue is oral hygiene[14]. This finding is consistent with research conducted by Hadnyawati [15] that the more average level of oral health, the more susceptible gingivitis is. Also, observed from the results of the data were taken, it is known that the most criteria of respondents in toothbrushing before bed at night is useful even the dental and oral health status is average.

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Spearman test results in Table 9 showed the value of $\rho = 0.446$ ($p > 0.05$) indicating there is no significant effect of toothbrushing before bed at night to the pH of Saliva. In table 4.9, as much as 21 respondents have an excellent toothbrushing habit before bed at night yet low pH of Saliva and as much as four respondents whose good toothbrushing habit before bed at night having an acidic pH of saliva. This observation is done due to the activity of the oral cavity of the respondent. At the time of inspection, some respondents have done the movement in the oral cavity, and some are not. This activity positively can affect the pH of saliva in the mouth. If the respondent has conducted operations in the oral cavity, pH of saliva will tend to fall according to research conducted by Indriana [16] which says that ten minutes after eating carbohydrates, it will produce acid through glycolysis and pH may decrease to the lowest critical pH.

However, many factors can affect the pH of saliva which cannot be controlled by researchers including the rhythm of day and night, diet and stimulation speed salivary secretion as being in a period of treatment, the concentration of fluoride in toothpaste, and the components of other toothpaste [17]. The day and night rhythm effect showed the acid scale and backing capacity of saliva would be high in the morning wake but then decreased rapidly. By the time 15 minutes after eating the level of acid and backing capacity of saliva will be raised for their mechanical stimulation, but after 30-60 minutes, it goes low.

IV. CONCLUSION

The result of the study on the effect of toothbrushing before bed at night to the dental and oral health status of grade IV and V elementary school (SDN) Sendangmulyo 04 Semarang is concluded that:

1. The most criteria for respondents' habit of toothbrushing before bed at night is right criteria, in 59% (37 respondents).
2. The carries status has quite high wrong criteria in 43% (27 respondents), while the most measures of respondents' dental and oral hygiene status (OHIS) is average in 57% (36 respondents). The most criteria of gum tissue health status (gingival index) are found good in 96.8% (61 respondents) and the state of the acidity scale of saliva (pH of Saliva) the most by respondents with base pH is 50.8% (32 respondents).
3. There is an effect of toothbrushing before bed to the dental caries of students grade IV and V elementary school (SDN) Sendangmulyo 04. There is an effect of toothbrushing before bed to the oral hygiene index status (OHIS) to students grade IV and V SDN 04 Sendangmulyo No effect of toothbrushing before bed at night to the gum tissue health status (Gingival Index) to students grade IV and V elementary school (SDN) Sendangmulyo 04. No effect of toothbrushing before bed at night to the scale of acidity (pH Saliva) to the students grade IV in SDN Sendangmulyo 04.

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