

# Effectivity of Teacher Motivation on Dental and Oral Hygiene of Elementary School Students

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## Abstract

**Background:** Dental and oral diseases can be prevented by keeping them clean through toothbrushing in a proper way. The behavior of the brushing of the students can be influenced by an external motivation by their teacher. The purpose of this study is to identify the influence of teacher motivation on the improvement of dental and oral hygiene of Elementary School students in Bangli regency, Indonesia.

**Method:** This research is an experimental study with a pre-test and post-test control group design. The sample was 248 students, from ten elementary schools randomly chosen in each district, then grouped into an intervention group and control group. The data which was collected are dental and oral hygiene in before and after the intervention. The data was analyzed using Wilcoxon Signed Rank Test and Mann Whitney Test.

**Results:** The result of OHI-S on intervention group obtain p-value in 0.000 which is less than 0.05. Meaning that there is a significant difference of dental and oral hygiene of the respondent before and after the intervention. Meanwhile on the control group, the p-value is 0.284, more than 0.05. Meaning that there is no significant difference in dental and oral hygiene before and after the intervention. Mann Whitney Test OHI-S intervention group and control group has sig=0.000, less than 0.05 which means there is a significant difference in the dental and oral hygiene of the intervention group and control group before and after the intervention.

**Conclusion:** In conclusion, the teacher motivation on dental and oral hygiene for the student is effective to increase the dental and oral hygiene of the 3<sup>rd</sup> grade elementary school students.

**Keywords:** Motivation, OHI-S, student, teacher.

## Introduction

Children are vulnerable to dental and oral disease because of their teeth changes from deciduous to permanent. Therefore, there are some oral health problems can be found such as persistence in which deciduous teeth have not yet fell off, while the permanent

teeth have already arisen. Dental decay is the infectious disease which is resulted by the problem of disruption of normal oral bacteria and overgrowth cariogenic organism <sup>(1)(2)(3)</sup>. In addition, gingivitis can also attack as it is also common disease among population in which may result as tooth loss <sup>(4)</sup>. All the problems of dental including to dental caries mostly caused by the health behavior <sup>(5)</sup>. The ability to keep the dental and oral health are influenced by some factors such as knowledge and willingness. The willingness of someone to do something is strongly influenced by a motivation, internally or influenced by others<sup>(6)</sup>. Especially for elementary student, the motivation may come from their teacher to do some act such as how to keep their dental and oral health properly. Teacher

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being an important and role model for their students. Through motivation which is given by the teacher every morning when student start the learning process maybe can give some impact on altering their student behavior especially on keeping the dental and oral health. Toothbrushing must be adopted from a young age<sup>(7)(8)(9)(10)</sup>.

Bangli district is located in Bali province, Indonesia with 141 public elementary schools spread in 4 sub-districts. There are 48 in Kintamani, 30 in Susut, 29 in Tembuku and 33 in Bangli. There is no recent study conducted on dental and oral hygiene by involving teachers as the motivator to their student. That fact encourages the study about teacher motivation effectivity on the improvement of dental and oral hygiene to be conducted. The purpose of this study is to identify the effectivity of teacher motivation on the improvement of dental and oral hygiene in 3<sup>rd</sup> grade elementary school in Bangli Regency in 2018. We analyze the improvement of dental and oral hygiene before and after the motivation is given.

**Methodology**

This research is an experimental community study with pre-test and post-test control group design as mentioned in <sup>(11)</sup>. The population is all of the 3<sup>rd</sup>-grade of Elementary School in Bangli Regency. The minimum sample taken was 124 in each group and the total was 248 students taken from 10 elementary schools and determined by proportional sampling. Elementary school was chosen randomly in each sub district. There were three school in Kintamani, three school in Bangli, three schools in Susut and one school in Tembuku. The type of data collected are primary and secondary data. Primary data of dental and oral hygiene was collected by measuring Oral Hygiene Index Simplified (OHI-S) in both intervention and control group. Health promotion and toothbrushing altogether were carried out to the intervention and control group. A calibration with the principal and teachers was conducted, five 3<sup>rd</sup>-grade teachers were told about the subject that would be delivered to their students and five principals were told about how to observe the process of motivation given by the teachers. At least three weeks in a row, teachers remind and motivate the intervention group to keep their

dental and oral hygiene. At the 21<sup>st</sup> day, the evaluation was done by remeasuring the dental and oral health by using OHIS-S index, then health promotion about dental and oral health and brushing teeth together were done both in intervention and control group. The collected data was analyzed by screening, editing, coding, tabulating, quantitatively by univariate while the effectivity of the teacher motivation on dental and oral hygiene of the students was analyzed by the difference of OHI-S score before and after the treatment in control and intervention group. The test used Wilcoxon and Mann Whitney test<sup>(12)</sup>.

**Results**

**A. Characteristics of Study Subject:**

- **Distribution and frequency of teacher motivation:** Table 1 shows all teachers carried out motivational activities for maintaining dental and oral hygiene to the respondents resulted in good criteria with five students (100%).

**Table 1: Distribution and frequency of teacher motivation**

Motivation Criteria	Teacher	
	f	%
Good	5	100
Moderate	0	0
Poor	0	0
Fail	0	0
<b>Total</b>	5	100

- **Distribution and frequency of OHI-S criteria of student (intervention group) before and after treatment:** Table 2 shows the dental and oral hygiene of respondents (intervention group) prior to the treatment mostly resulted in moderate criteria, namely as many as 90 students (72.6%) and the least is in poor criteria, namely as many as one person (0.8%). After the treatment on dental and mouth hygiene of the respondents namely the intervention group was mostly in good criteria, which is 76 people (60.8%), and none of the respondents has dental and oral hygiene with poor criteria.

**Table 2: Distribution and frequency of OHI-S Criteria of The Students (Intervention Group) Before and After Intervention**

OHI-S Criteria	Intervention Group			
	Before		After	
	f	%	f	%
Good (0.0-1,2)	33	26.6	76	60.8
Moderate (1,3-3,0)	90	72.6	48	39.2
Poor (3,1-6,0)	1	0.8	0	0
Total	124	100	124	100

- **Distribution and frequency of the students (control group) at the beginning of examination and evaluation result:** Table 3 shows the dental and oral hygiene of respondents (control group) the results of the examination before the intervention were mostly in moderate criteria, namely 96 people (77.4%) and the least is in poor criteria, which were 10 people (8.1%). Dental and oral hygiene after the treatment is mostly in moderate criteria, as many as 98 people (79%).

**Table 3: Distribution and Frequency of The Students (Control Group) at The Beginning of Examination and Evaluation Result**

OHI-S Criteria	Intervention Group			
	Before		After	
	f	%	f	%
Good (0.0-1,2)	18	14.5	17	13.7
Moderate (1,3-3,0)	96	77.4	98	79.0
Poor (3,1-6,0)	10	8.1	9	7.3
Total	124	100	124	100

- **Distribution frequency criteria of dental and oral hygiene of the students (intervention group and control group) before intervention:** Table 4 shows the criteria for dental and oral hygiene of the treatment group prior to the intervention being mostly in moderate criteria, namely as many as 90 people (72.6%) and the least is in poor criteria as much as one person (0.8%). While the OHI-S criteria of control group is mostly in moderate criteria as many as 96 people (77.4%) and the least is in poor criteria as many as 10 people (8.1%).

**Table 4: Distribution Frequency Criteria of Dental and Oral Hygiene of The Student (Intervention and Control Group) Before Intervention.**

No.	OHI-S Criteria	OHI-S					
		Intervention Group		Control Group		Total	
		f	%	f	%	f	%
1.	Good	33	26.6	18	14.5	51	21
2.	Moderate	90	72.6	96	77.4	186	75
3.	Poor	1	0.8	10	8.1	11	4
Total		124	100	124	100	248	100

- **Distribution and frequency of the students' dental and oral hygiene (intervention and control group) after intervention:** Table 5 shows that the level of dental and oral hygiene of the intervention group after the intervention is in good criteria, as many as 76 people (60.8%), and no one got dental

and oral hygiene with poor criteria. The level of dental and oral hygiene in the control group is mostly in moderate criteria, namely 98 people (79%), and the least is in poor criteria, which is as many as nine persons (7.3%).

**Table 5: Distribution and Frequency of Dental and Oral Hygiene of The Student (Intervention Group and Control Group) After Intervention**

No.	OHI-S Criteria	OHI-S					
		Intervention Group		Control Group		Total	
		f	%	f	%	f	%
1.	Good	76	60.8	17	13.7	93	37.5
2.	Moderate	48	39.2	98	79.0	146	58.87
3.	Bad	0	0	9	7.3	9	3.63
Total		124	100	124	100	248	100

**Analysis Result:**

1. **Normality Test:** Table 6 shows the results of the normality test of both intervention and control group before and after the treatment. The value of sig = 0.000 which is less than 0.05. These results

indicate that all data are distributed abnormally. So, the different test analysis used is the Wilcoxon Signed Rank Test to test the sample related data and the Ancova Test for the two unrelated sample data <sup>(12)</sup>.

**Table 6: Normality Test**

No.	Variable	N	Mean	Std. Dev	Sig.	Conclusion
1.	OHI-S Intervention-Pre	124	1.8845	0.73235	0,000	Not Normal
2.	OHI-S Intervention-Post	124	1.2669	0.49041	0,000	Not Normal
3.	OHI-S Control-Pre	124	2.0455	0.73088	0,000	Not Normal
4.	OHI-S Control-Post	124	2.0755	0.71730	0,000	Not Normal

2. **OHI-S Analysis of the Intervention Group Before and After Treatment:** The OHI-S was analyzed using Wilcoxon Signed Rank test statistic. The Wilcoxon Signed Rank Test statistic results before and after the treatment obtain p-value (Asymp.sig 2 tailed) of 0.000, less than 0.05 which means there is a significant difference in the dental and oral hygiene of respondents before and after the intervention.

significant difference of the dental and oral hygiene between the intervention group and control group after the treatment.

**Discussion**

3. **Ohi-S Analysis of the Control Group Before and After Treatment:** OHI-S analysis of the control group before and after intervention was done by statistic Wilcoxon Signed Rank test. The results obtain the Wilcoxon Signed Rank test with *p value (Asymp.sig 2 tailed) = 0.284* more than 0.05 which means there is no significant difference of the dental and oral health of the student before and after treatment.

The control group has a moderate score on the average of dental and oral hygiene before and after treatment. There is no significant difference of dental and oral hygiene before and after the treatment, proven by the result of statistical test Wilcoxon Signed Rank test which resulted p-value (Asymp.sig 2 tailed) 0.284, greater than the critical value of the study 0.05. Meanwhile in the intervention group, there is a significant difference, there is an improvement from moderate criteria to good criteria. Statistically, there is a significant difference on dental and oral hygiene before and after intervention, shown by the result of statistics Wilcoxon Signed Rank Test which resulted p-value (Asymp.sig 2 tailed) 0.000 lesser than 0.05. The result of Mann Whitney test sig is 1.75 which means more than 0.05 showing that there is no significant difference between dental and oral hygiene of control group and intervention group before the treatment was given. Meanwhile the Mann Whitney test after treatment has value sig = 0.000, lesser than 0.05 which means there is a significant difference of dental and oral hygiene after the treatment was given. This is caused by before the motivation was given by the teacher, the students brush their teeth irregularly and improperly. This is supported by <sup>(13)</sup>, which says that if we don't brushed our teeth soon after eating regularly and properly, there will be the cumulation of food or called as debris. The motivation that given by the teacher in the beginning of class will encourage the habit of the student to brush their teeth in the morning

4. **OHI-S Analysis of Intervention Group and Control Group Before Treatment:** The OHI-S analysis result of intervention group and control group before the treatment was analyzed by Ancova. The Mann-Whitney results show the sig value of 1.75 greater than 0.05 which means there is no significant difference of dental and oral hygiene (OHI-S score) between the intervention group and control group before the treatment.

5. **OHI-S Analysis of Intervention Group and Control Group After Treatment:** The analysis of dental and oral hygiene (OHI-S score) of the student in intervention group and control group after the treatment was analyzed using Mann-Whitney test. The results of Mann-Whitney test show that the sig value is 0.000, less than 0.05 which means there is a

after breakfast and at night before sleep routinely. Power and strength in human itself is caused by the motivation which given by others to encourage to achieve a goal<sup>(14)</sup>. The changes on behavior after the student has given a health promotion and given the movie about the impact of careless to the dental and oral health, it can encourage the students from toothbrushing lazily to diligently and can reach the oral and dental health better than it was<sup>(15)</sup>. Thus, the success of effectivity also influenced by the teachers as the school dental service to play a key role in the dental and oral health of the students<sup>(16) (17) (18)</sup>.

### Conclusion

Based on our findings in this research, the following conclusions can be drawn. There is a significant difference of dental and oral hygiene level either before and after treatment at the intervention group and there is no any significant difference at the control group before given the treatment. Significant difference is found at the intervention group and control group after the treatment was given. So, it can be concluded that the motivation given by the teacher about how to keep the dental and oral hygiene is effective to improve the dental and oral hygiene.

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**Ethical Clearance:** Before conduct of the study written permission was obtained from Poltekkes Kemenkes Bali, Indonesia. The consent and willingness were established from all the subjects who meet the criteria for this research.

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