


## EDUCATION WITH A REINFORCEMENT METHOD FOR IMPROVING TOOTH BRUSHING SKILLS WITH A DENTAL AND ORAL HYGIENE INDEX

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Info Article	Abstract
<b>Article History:</b>  Received: 10 March 2025 Revised: 11 Apr 2025 Accepted: 18 Apr 2025 Available Online: 25 Apr 2025	Primary school students are susceptible to dental caries. Poor dental hygiene maintenance will further influence the dental hygiene index. An attempt to maintain dental hygiene is through removing plaque by tooth brushing. However, few understand how to do it correctly. A method of dental education is necessary to send a message about dental and oral hygiene. This research aims to see the dental and oral hygiene index before and after performing tooth brushing education by reinforcement, consisting of a lecture and a demonstration of a jaw model. The type of study used was quasi-experimental with a pretest and posttest research design. The sampling was applied with 50 students in grades IV and V at SDN 19 Muaro, Sijunjung District, with 25 students for each control and intervention group. Both groups were given a lecture on tooth brushing at pre-test, and only the intervention group was given a demonstration of a jaw model in the post-test. The data analysis employed the Independent T-test. The results show differences in dental and oral hygiene between the pre-test and post-test. In the control group, there is an average increase of 44% good criteria, and in the intervention group, it is greater at 52%. Even so, the dental and oral hygiene between the control and intervention group is not significantly different, with a p-value of $0.731 > 0.05$ . This study concludes that education with the reinforcement method, including a lecture and demonstration of a jaw model, is more effective than only using the lecture method.
<b>Keywords:</b> Demonstration, Hygiene Index, Lecture, Reinforcement, Primary Student	
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### Introduction

Dental health is a major parameter in determining a person's health. Problems and disorders of dental and oral health affect an individual's ability to bite, chew, smile, or talk (Prabawati et al., 2022; Yap, 2017). The matter of dental and oral health problems is generally caused by dental plaque. Dental plaque induces biofilm, with no mineral and sticks to the surface of teeth. Poor dental and oral hygiene is known as an etiological factor leading to caries, gum disease, and tooth loss, influencing a person's daily activities (Desai & Nair, 2023).

The evidence shows that controlling plaque through tooth brushing is effective in maintaining healthy teeth and gums (Pindobilowo et al., 2023). Tooth brushing can decrease the score of plaque index, representing the condition of dental and oral

hygiene. However, the prevalence of dental and oral disease in Indonesia, based on the Indonesia Health Survey 2023, is 56.9%. Though 95.6% people brush their teeth every day, only 6.2% brush their teeth in a correct time i.e. in the morning after breakfast time and at night before going to sleep (Kemenkes BKPK, 2023).

The prevention of dental problems and disorders needs to be commenced from an early age, such as primary school students. Primary school students are very vulnerable to dental and oral hygiene problems such as dental caries. This is impacted by the lack of knowledge and attention to the importance of maintaining dental and oral hygiene. At this stage of age, the period of changing deciduous to permanent teeth needs more attention to ensure the growth and development of the teeth (Alizar (Jain) et al., 2024).

Dental and oral hygiene education is a pivotal solution to be planned and disseminated attractively and understandably for the students, concerning the expectation to change the behavior (López-Núñez et al., 2019; Saccomanno et al., 2023). Some research regarding dental and oral hygiene education have been conducted. Research by Pinasti et al., 2024) uses leaflet media to teach primary students at 5<sup>th</sup> and 6<sup>th</sup> grade about dental and oral health to evaluate the change of knowledge. It shows the existence of knowledge changes of dental and oral health to the Good criteria with a p-value of 0.000. Another research by (Reca et al., 2020) conducted dental health education on tooth brushing teaching towards primary students resulted in changes of knowledge to Good category 100%. These researches show that dental health education is influential towards the knowledge of the students. However, the analysis of dental hygiene is still lacking. Diagnostic score is important and has the potential to solve the issue that happens towards the subject. Besides, it can also improve the feedback received during the education by the clinicians or dental hygienists (Clarke et al., 2021). An education method of lecture portrays that it can lead to the change of behavior. It is research by (Wali et al., 2024) that analyzed the effect of dental health education. This research analyzes the dental education of the mother and analyzes the oral hygiene status of the children. It shows that after the intervention was performed, the behavior of the mothers increased ( $p=0.000$ ). The method gives a significant value for the children's oral hygiene with a p-value of 0.000. It finds that the change in better behavior can lead to a better score of dental hygiene. However, the lecture was not directly taught to the students. Therefore, research regarding the method to teach directly to primary school students about dental health maintenance is important to prevent them from dental problems and disorder starting from themselves.

## **Method**

### ***Research Design***

The research includes a quasi-experimental research method. Researchers experimented to determine the effect that arises due to the treatment. The design of this study was pretest and posttest. The pretest and posttest designs involved observation and treatment

patterns. The dependent variable is dental and oral hygiene, and the independent variables are before and after the tooth brushing act.

### ***Time and Place of Research***

Research was conducted for two days on March 5 – 6<sup>th</sup>, 2024, in elementary school SDN 19 Muaro, Sinjunjung Sub-district, Sijunjung Regency, West Sumatra.

### ***Sampling Technique and Sample***

The sampling technique was total population with grade IV and V primary school SDN 19 Muaro, Sijunjung, i.e. 50 students and those who were consented to be respondent.

### ***Stages of Data Collection***

The data collection was focused on the dental and oral hygiene represented by the Hygiene Index (HI). Dental and oral hygiene informs whether there is plaque on the tooth surface, measured from the results of HI examination by dividing the number of plaque-free tooth surfaces by the number of tooth surfaces examined. The examination of HI was performed by examining all the teeth, including mesial, distal, facial, and lingual. The parameter of HI was divided into Good criteria with a score more than 85% and Bad with a score of less than 85% (Gultom, 2018). Meanwhile, tooth brushing was performed by observation.

Each class was divided into 2 groups, i.e., class IV into two groups and class V into two groups. One two-groups (group 1) acted as a control group and the other two-groups (group 2) acted as an intervention group. So, there were 25 students in each group. On the first day, the students practiced the tooth brushing steps and were examined for their HI without any lecture. On the same day after tooth brushing and HI examination, a lecture method was given to the control and intervention groups about tooth brushing theory, including the definition, the purpose, the time, and the requirements for proper and correct tooth brushing techniques. On the second day, both groups practiced tooth brushing, and only the intervention group was monitored by giving the demonstration of the jaw model, and the control group brushed their teeth without the monitoring of the demonstration of the jaw model. The HI score was subsequently analyzed.

## Measuring Instrument

The instrument used during the research was HI examination format, sonde, nierbekken, hand Scoon, mask, disclosing, mouthwash, mouthwash glass, Vaseline, alcohol 70%, and mouth mirror.

## Data Analysis

The data analysis for the study used univariate and bivariate analysis. Univariate analysis was presented in the form of a frequency distribution table using HI criteria. Bivariate analysis is an analysis used to see the relationship between two variables. A t-test was performed to understand the difference in dental and oral hygiene before and after the education.

## Result

### Univariate Analysis

This study conducted a reinforcement method using a lecture and demonstration. The lecture and demonstration about tooth brushing were given to both the control and intervention groups. Meanwhile, the practice of tooth brushing with demonstration using a jaw model was only given to the intervention group. The result of the HI of the students is indicated by Table 1.

**Table 1.** Frequency Distribution of HI Criteria of Control and Intervention Groups

HI Criteria	Before		After	
	F	%	f	%
<b>Control Group</b>				
Good	0	0	11	44
Bad	25	100	14	56
Total	25	100	25	100
<b>Intervention Group</b>				
Good	0	0	13	52
Bad	25	100	12	48
Total	25	100	25	100

Table 1 shows the hygiene index before the lecture on tooth brushing in the control group, which resulted in bad criteria of 100% (25 people). Next, after the lecture was given, even without demonstration of the jaw model in the tooth brushing practice in the control group, it changed to the good criteria of 44% (11 students) and the bad criteria of 56% (14 students). Meanwhile, in the intervention group, the HI before the lecture on tooth brushing resulted in bad criteria for 100% (25 people). After an intervention, with the lecture given and with the

demonstration of the jaw model in the tooth brushing practice, the criteria changed to good for 52% (13 students) and bad for 48% (12 students). This result is higher in number than that of the control group.

### Bivariate Analysis

The result of bivariate analysis on the control and intervention groups using Independent T-test is presented in Table 2.

**Table 2.** Independent T-test Result on Hygiene Index

Variable		N	Average	P
Hygiene Index (HI)	Control	25	77.72	0.731
	Intervention	25	79.49	

Table 2 informs the statistical analysis that there is no significant difference in the increase in dental and oral hygiene scores between the two groups. The p-value score of  $0.731 > 0.05$  means there is no significant difference between the control and the intervention groups.

### Discussion

The study results show that dental and oral hygiene before the lecture was given to the students, the control group was 100% in the bad criteria, while after the lecture, the percentage changed to 44% in the good criteria and 56% in the bad criteria. This means that dental and oral hygiene has increased by 44%.

The dental and oral hygiene index of some students is already in the good criteria from the first place, and some children are still bad. The reasons for this are in the point of view of the students that while the dental hygienists were giving the lecture, some of the students didn't listen carefully to the material, so that they didn't understand the whole toothbrushing technique. It may also be because the students' understanding is slow to catch on to the correct tooth brushing technique. Another reason could be that the dental hygienists delivered the lecture too quickly, resulting in the lack of material comprehension by the students. Even for the excellent students, they found difficulty to understand it. Consequently, some plaque remained in the lingual area.

Skills are the ability to operate work that tends to lead to psychomotor activities, by using reason, thoughts, ideas, and creativity in doing it, making something more meaningful to produce a value from the results of the work (Rahman et al.,

2022). The success of tooth brushing is determined by the method of skill in brushing teeth, the shape of the toothbrush, the optimum frequency, and the correct, punctual time in tooth brushing practice. Dental plaque consists mostly of water and various microorganisms that reproduce in an intercellular matrix consisting of extracellular polysaccharides and salivary proteins. Correct direction and time of tooth brushing practice determine how much the plaque is reduced (Umniyati et al., 2020; van der Sluijs et al., 2021).

Through the lecture given towards the intervention group, different results are gained. Before the lecture was performed and the demonstration of the jaw model, the score of HI was 100% bad. Meanwhile, after the intervention, the score of HI increased by 52% with a good criterion and 48% with a bad criterion.

The dental and oral hygiene criteria of the intervention group are not quite different from the control group, as the HI of the students in the intervention group is not fully increased. The reason for this result is due to the situation of the lecture was not conducive. The students were playing around and didn't listen carefully to the guide of tooth brushing. Besides, there was a missing situation of paying attention to the students' details of tooth brushing steps while performing the demonstration of tooth brushing using a jaw model. So, the students followed the steps of tooth brushing that they are used to at home. Besides, the tooth brushing lecture was only given at once, so the students didn't get the material understanding.

Jaw model media is a tool designed to help improve student learning outcomes. Students can understand in more detail how to brush their teeth properly and correctly. Using a jaw model is more effective than other media because the target can see, touch, and understand the shape and structure of a real object. Jaw model study media can increase students' knowledge related to the material that has been taught, thus influencing the decrease in plaque index scores (Anwar et al., 2023; Jatmika & Maulana, 2018).

All the results in the control group are compared to the intervention group. It shows that there is a difference of HI in the control group, and there is no difference in the intervention group. This result is proven by statistical tests using the Independent T-test where the p value is  $0.731 > 0.05$ ,

showing no significant difference between the two groups.

Plaque control must consider the individual's health status. Plaque control is very necessary to maintain dental and oral health (Valkenburg et al., 2019; Vyas et al., 2021). Choosing a good and appropriate plaque control technique can maintain the normal microflora biota of the oral cavity. Some ways are recommended to control plaque, namely mechanical plaque control. Mechanical plaque control can be done in 3 ways, namely toothbrushes, interdental aids, and oral irrigation devices. Tooth brushing has been the accessible way to remove plaque. However, few people understand how to perform it correctly. A dental education presents as the attempt to promote health towards society. In health promotion, there is a need for media to help explain the contents of the material so that someone can understand it clearly. Model studies are useful for one of them, namely the need for presentations or learning to the target (Kusmana et al., 2024; Sofian et al., 2024). Model study media that are similar to the original object to make the target better understand, such as a jaw model for tooth brushing. It is expected that the dental education using this method can help people gain knowledge, and later can influence better behavior (Pay et al., 2023).

## Conclusions and Suggestions

The reinforcement method by lecture and demonstration about tooth brushing using a jaw model has been practiced to understand the dental and oral Hygiene Index of primary school students. As many as 50 students were examined, divided into a control and an intervention group. The results show that both the control and intervention groups at the beginning have bad criteria 100%. Meanwhile, the post-test resulted in the control group gaining 44% in good criteria and the intervention group gaining 52% of students in good criteria. The Dental and Oral Hygiene Index of both groups increased, even though some are still in the bad criteria. The statistical result shows a p-value score of  $0.731 > 0.05$ , which means there is no significant difference in the Hygiene Index between the control and the intervention groups. For future work, a study about the method or media for study model is necessary to explore how it influences the behavior as well as the analysis of excellence and drawbacks of the method or the media.



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