

# THE EFFECTIVENESS OF TOOTH BRUSHING EDUCATION ON REDUCING PLAQUE INDEX (PATIENT HYGIENE PERFORMANCE INDEX) IN MENTALLY RETARDED CHILDREN

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## ABSTRACT

The main cause of caries and periodontal disease is plaque. Plaque can be removed by brushing your teeth. Children with mental disabilities or mental retardation have limitations in functioning themselves and adjusting to the environment. The prevalence of caries is 30% higher than normal children and poor oral hygiene is a problem faced by mentally retarded children. The purpose of this study was to analyze the effectiveness of tooth brushing education on reducing plaque index (Patient Hygiene Performance Index) in mentally retarded children at SLB N 02 Padang. The research design used was a Pre-Experimental One Group Pre and Posttest design with an initial plaque index examination (pretest) and a plaque index examination after brushing education (posttest), with a population of 86 people, the sampling technique was purposive sampling, obtained a sample of 45 person. The study was conducted at SLB N 02 Padang in 2019. The results showed a higher difference in the PHP index, namely for moderate mental retardation at 1.3 while the difference in numbers for mild mental retardation was 1.28. Data analysis using statistical tests with paired sample t-test showed that there was a significant difference between the PHP index before and after education about brushing teeth in children with mild and moderate mental retardation. It is recommended to respondents to always apply the brushing technique that has been given, and brush their teeth at least twice a day, ie in the morning after breakfast and at night before going to bed and guide the mentally retarded children one by one when brushing their teeth.

**Keyword** : *Tooth brushing education, plaque index, mentally disabled*

## Introduction

Teeth have an important role in children's growth, including as a means of chewing food, helping to crush food in the mouth and functioning in helping the digestive system so that food can be absorbed by the body properly. [1]. A child is said to be healthy if his oral hygiene is maintained. If oral hygiene is not maintained, various dental problems will arise, such as cavities or caries [2]. The prevalence of caries in Indonesia still tends to be high, namely 90.90%, where the main cause of caries is the

accumulation of plaque associated with poor oral hygiene. [1] [3]. Plaque is a soft layer consisting of 80% water and the remaining 20% are components such as proteins, lipids, and mineral components, namely calcium and phosphorus [4].

Efforts to clean plaque can be done by brushing your teeth, the goal is to clean food debris from the surface of the teeth and massage the gums [5]. The habit of brushing teeth should be introduced to children from an early age [6]. Difficulty carrying out proper oral cleaning procedures is found in children under 5 years of age as well as in children with mental disabilities [7]. Children with mental disabilities or known as mental retardation have limitations in functioning themselves, adjusting to the environment [8].

The caries prevalence is 30% higher than normal children and poor oral hygiene is a problem faced by mentally retarded children [9] [10]. Lack of motivation and ability to concentrate makes it difficult for mentally retarded children to carry out activities related to dental hygiene [9]. Mental retardation has an IQ below 68-54 with an IQ range of 50-75%, but mentally retarded children have the ability to be educated [11]. Based on the results of the 2013 Basic Health Research (RISKESDAS) survey, it was stated that there were 0.14% of mentally retarded children, this is the second highest percentage after physical disabilities [12].

Based on previous research on the description of the independence of mentally retarded children in brushing their teeth before brushing their teeth, it was found that 15 children were still not independent in brushing their teeth and the description of the independence of mentally retarded children in brushing their teeth after brushing their teeth was found to be 9 children who were not independent in brushing their teeth. at SLBNegeri Semarang. In conclusion, not many mentally retarded children can brush their teeth independently even though they have received brushing practice [13].

SLB N 02 Padang has 120 students with special needs, consisting of 86 mentally retarded students consisting of 46 mild and 40 moderately impaired students, 3 blind students, 14 deaf students, 8 physically handicapped and 9 autistic people. The initial survey regarding dental and oral hygiene with the PHP index of mild and moderate mentally retarded children, namely from 9 mentally retarded children who had their dental and oral hygiene checked, they consisted of 5 mild and 4 moderately mentally retarded children, two children with a score of 3.5, three children children with a score of 3.7, and two children with a score of 3.9, and two other children with a score of 2.1.

The results of interviews conducted with children with mild and moderate mental retardation found 5 children brushing their teeth twice a day and 4 children only once. The results of interviews conducted on 8 parents of mentally retarded children, data obtained from 6 parents stated that their children liked to consume foods such as bread, sweets, and cold and sweet drinks, and 2 other parents stated that their children did not like to consume cold and sweet drinks, but likes to eat sweets. Based on the observations of researchers, there are 2 canteens at SLB N 02 Padang, both canteens sell sweet foods such as bread, biscuits, chocolate, sweets and cold drinks. This study aims to determine the effectiveness of education about brushing teeth to reduce plaque index (Patient Hygiene Performance Index) in mentally retarded children at SLB N 02 Padang in 2019.

## **Method**

This study uses an experimental design that uses a pre-experimental one group pre and posttest design with an initial plaque index examination (pretest) and after

brushing education is carried out by checking the final plaque index (posttest). The study was conducted in August 2019. The study population was all mentally retarded students at SLB N 02 Padang. The sampling technique in this study was carried out by purposive sampling. The sample was taken with the inclusion criteria, namely the criteria that need to be met by each member of the population that can be taken as a sample. Based on research considerations with inclusion criteria, namely: 1) mild and moderate mentally retarded patients; 2) willing to be a respondent; 3) have index gear. Data was collected by observing and examining the plaque index directly on the research subjects with predetermined conditions.

The initial examination was carried out before brushing education was carried out, the research subjects were instructed to brush their teeth in the usual way, then the PHP plaque index was examined. Then the researchers conducted education on brushingteeth by way of counseling, demonstrations and exercises a combination of vertical techniques, fone's techniques and horizontal techniques every day for 2 weeks. After twoweeks, the researcher came in the morning and gave the same food, before the break the research subjects were instructed to brush their teeth according to the education that had been given for two weeks. After that, a final PHP plaque index check was carried out. The data that has been obtained were analyzed by univariate and bivariate. Bivariate analysis was carried out by using paired sample t-test.

## Result

Based on research conducted on research subjects, the average PHP index index of mild and moderate mentally retarded children before and after brushing education is shown in the following table:

Tabel 1. Average PHP index ("Patient Hygiene Performance") of Mild Mentally Impaired Children Before and After Tooth Brushing Education at SLB N 02 Padang

Type of mental retardation	PHP Index		PHP Index Difference
	Before	After	
Mild mental retardation	3,15	1,87	1,28

Tabel 2. Average PHP index ("Patient Hygiene Performance") Children with moderate mental retardation Before and After Tooth Brushing Education at SLB N 02 Padang

Type of mental retardation	PHP Index		PHP Index Difference
	Before	After	
Mild mental retardation	3,13	1,83	1,3

Tabel 3. Differences in Average Plaque Index (“Patient Hygiene Performance”) Before and After Dental Brushing Education for Mild and Moderate Mentally Impaired Children at SLB N 02 Padang

Type of mental retardation	PHP Index		PHP Index Difference
	Before	After	
Mild mental retardation	3,15	1,87	1,28
moderate mental retardation	3,13	1,83	1,3

Tabel 4. Statistical Test Results Dependent T-Test/ Paired T-Test Effectiveness of Toothbrushing Education on the Decrease of Plaque Index (Patient Hygiene Performance) in Mild and Moderate Mentally Impaired Children at SLB N 02 Padang

Variable	N	Average ± SD	mean difference± SD	IK95%	P
PHP Index before	45	3,14 ± 0,76	1,28 ± 0,87	1,02 – 1,55	0,000
PHP Index after	45	1,85 ± 0,71			

Based on the table of statistical test results T-Test dependent / paired T-Test obtained P value "value" of 0.000 (0.000 < 0.05) then Ha is accepted which means there is a significant difference between the PHP index before and after education about brushing teeth in mild and moderate mentally retarded children.

## Discussion

The average PHP index before education about brushing teeth in mild mentally retarded children was 3.15 moderate criteria and the PHP index after education about brushing teeth was 1.87 moderate criteria with a difference of 1.28. According to researchers, this is because children with mild mental retardation do not brush their teeth with the recommended technique and are not done regularly. Another thing that makes the PHP index number high in mild mentally retarded children is that mentally retarded children do not receive guidance on how to brush their teeth properly.

This is reinforced by the theory which states that the technique of brushing teeth must be understood and must be carried out regularly, therefore brushing teeth if only done sparingly, it will not get optimal results. The best way to brush one's teeth for a person can be determined by dental health professionals such as dentists and dental therapists [14]. Mild mentally retarded children can still be educated and trained because generally mild mentally retarded children do not experience physical disorders, physically look like normal children in general [15]. This study is in line with previous studies regarding the plaque index number after 6 weeks of training can reduce the plaqueindex number with a weekly average of 7 [13].

The average PHP index before education about brushing teeth in children with moderate mental retardation was 3.13 moderate criteria, and after education about brushing teeth was 1.83 moderate criteria with a difference of 1.3. According to researchers, this happens because the brushing technique provided is simple and can be understood by moderately mentally retarded children, basically mentally retarded children can be trained by paying attention to various things, and supported by a strong desire, considering that moderately mentally retarded children are different from normal children in general. Tooth brushing education was carried out for 2 weeks, and the participation of the mentally retarded was very large so they did it seriously.

The theory states that the easy-to-understand and simple brushing technique is the fones and vertical technique, the fones technique is performed by placing the bristles perpendicular to the buccal and labial surfaces with the teeth in occlusion, the brush being moved in large circles so that the jaw teeth the upper and lower jaws were cleaned at once [14]. Health education is different from general education because in theory and practice health education is carried out at almost the same time, the theory obtained is directly put into practice to see the development of students' mastery of the material that has been delivered [16]. This study is in line with other studies where after receiving training in brushing teeth using the bass and horizontal methods, the plaque index of mentally retarded children decreased by 0.80 with good criteria [14].

The average PHP index before and after brushing education for children with mild and moderate mental retardation showed a higher plaque index difference, namely for moderately mentally retarded children of 1.3 while the lowest decline was in mild mental retardation of 1.28. This is reinforced by the results of statistical tests which state that the p "value" is 0.000 ( $0.000 < 0.005$ ), so there is a significant difference between the PHP index before education about brushing teeth and after education about brushing teeth in children with mild and moderate mental retardation.

According to the researcher, this occurs because mentally retarded children are different from normal children in general and have an IQ below the average of normal children in general. Children with mental retardation are less adaptive in carrying out mass tooth brushing activities and the researchers also do not guide one by one the mentally retarded children when brushing their teeth mass. Mild mentally retarded children have a higher IQ than moderate mentally retarded children, but in the educational process about brushing teeth given for 2 weeks, the enthusiasm of mild mentally retarded children is lower than moderate mentally retarded children, moderate mentally retarded children have high desire and enthusiasm, so that can beat the situation where the intellectual disability IQ is lower.

According to the theory, mild mentally retarded children have a higher IQ of 69- 55 while those with moderate mental retardation are 51-36. Children with moderate mental retardation can learn to read, write and count simply, with good guidance and education, and are supported by the high desires of mentally retarded children. Generally, mild mentally retarded children do not experience physical disorders, physically look like normal children in general, therefore it is rather difficult to distinguish them from normal children [16].

Children with mental retardation are very difficult and can't even learn academically such as writing, reading and arithmetic even though children with mental retardation are still able to write socially such as writing their own names. Children with moderate mental retardation can still be taught to take care of themselves such as bathing, dressing, eating and drinking, children with mental retardation are in need of

continuous supervision and simple steps in their training to improve their health status [15]. The results of this study also support previous research on the results of the paired T-Test test before and after brushing education showed a p value of 0.000 and this value was below 0.05 ( $p < 0.05$ ) so that it could be said that there was a significant difference between the index plaque before and after tooth brushing treatment, with the average plaque index before and after treatment was 3.88 and 3.03 [17].

Another researcher said that the results of statistical tests showed that the mean value of plaque index before counseling on how to brush teeth was 1.53 in the medium category and after being given counseling on how to brush teeth the average value was reduced to 0.43 in the good category [18].

## Conclusion

The average PHP index before and after education about brushing teeth in children with mild and moderate mental retardation. It can be seen that the difference in the PHP index is higher for moderate mental retardation of 1.3 while the difference in numbers for mild mental retardation is 1.28. The results of the dependent sample T- Test/paired T-Test test showed that the P "value" was 0.000 ( $0.000 < 0.05$ ), so there was a significant difference between the PHP index before and after education about brushing teeth in children with mild and moderate mental retardation. It is recommended to respondents to always apply the brushing technique that has been given, and brush their teeth at least twice a day, ie in the morning after breakfast and at night before going to bed and guide the mentally retarded children one by one when brushing their teeth.

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