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Effectiveness of Counseling Using Puzzle Games and Lectures on Index Debris and Index Plaque in Class IV and V Students at Muhammadiyah Meruyung Primary School, Depok

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ABSTRACT

Health education aims to raise awareness and encourage people to adopt healthy practices, especially in dental health for elementary school children. Dental health is crucial as it affects overall health and requires early intervention. Elementary school children are particularly at risk for dental issues. A screening at SD Muhammadiyah Meruyung Depok showed an average debris index of 2.7, indicating poor dental hygiene among students in grades IV and V. The aim of this research was to determine the effectiveness of index debris and index plaque values before and after being given counseling using puzzle games with lectures. This type of research is analytical, the method used is Quasy Experimental pre and post test design with control group with a sample size of 66 respondents. The sampling technique used purposive sampling technique and statistical tests using the Wilcoxon and Mann Whitney tests were used to determine the effectiveness of the research results. The results of this study show that puzzle games are more effective than lectures. The average change value of puzzle games was higher than lectures for both index debris and index plaque. The statistical test results obtained a significant value <0.05 . The conclusion from the research results is that puzzle games are more effective in reducing index debris and index plaque in class IV and V students at SD Muhammadiyah Meruyung Depok

Keyword: counseling, puzzle method, lecture method, index debris and index plaque

Introduction

Dental and oral health, especially in elementary school age children, needs special attention because it is an important part of their overall health. Children need immediate treatment before it is too late because it can have an impact on their general health. Dental and oral health education must be promoted to all families and communities [1]. Indonesian people are still not fully aware of their dental and oral health. Even when they are sick, they tend to ignore teeth that have cavities, so that tooth decay becomes the main complaint of the public and children [2]. The prevalence of sufferers of dental and oral problems in Indonesia is 25.9%. Meanwhile, the rate of dental and oral problems in other places is 25.4%. People

need to be aware of the importance of maintaining healthy teeth and mouth, including brushing their teeth. Elementary school children are more susceptible to dental and oral health problems so they need to be careful. As many as 89% of Indonesian children under the age of 12 suffer from tooth decay, including cavities. If children have a habit of eating sweets and rarely brushing their teeth, this can trigger dental and oral health problems. Therefore, dental health education through counseling needs to be provided [3].

Health education is an educational activity carried out through the dissemination of messages, namely by fostering a sense of self-confidence in the community so that they know, comprehend, understand, want and carry out recommendations related to dental and oral health. Dental health

education is a health education activity that can be carried out using lecture and play techniques. Choosing the right method when delivering material is very helpful in achieving target behavior change efforts. For example, through lecture methods and playing puzzles [4].

Counseling through the lecture method is a way to explain or communicate verbally and includes questions and answers to training respondents or listeners using props. Teaching can be called a lecture technique, which is a way of teaching, conveying information or information orally. description of a topic or problem. Thus, it can be understood that the lecture method is a way of presenting lessons carried out by teachers directly to students through narration or oral explanation [5].

Dental health education can be done through games, for elementary school children. This is because children of this age, especially children in grades 4 and 5, still like to play, therefore learning through the process of playing will be easier for students to accept and understand [6]. The world of games is something that is very close to children. For children, learning is playing, playing is learning. Children like free time without pressure, they socialize with friends by playing. Educational games also explore emotions and in games there are winners and losers for them, which is normal and accepted. Apart from that, games are also to test and improve students' skills and achievements [7].

Playing has become every child's hobby, in fact most children spend their lives playing. Playing is an activity that is done repeatedly to make children happy and satisfied without a goal. Experts argue that it is not easy to define precisely the meaning of play, in their daily lives, they must free themselves from the bonds and rules of parents or those caused by the environment. Play is a term used so loosely that its main meaning is lost. The most appropriate meaning is any activity carried out for pleasure and satisfaction, whatever the results obtained [8]. Games are a means for children's cognitive development. Games are able to train and shape children's skills in a relaxed way but please them [9].

Elementary school children are children aged 6 to 12 years. This period is the final period of childhood, lasting from the age of 6 years until the child reaches puberty. Puberty is 13 years old for girls and 14 years old for boys. Elementary school students are divided into 2 parts, namely, children aged 6-9 years in the lower class and children aged 10-12 years in the upper class [10].

Based on data from the 2021 inspection, it was found that the dental hygiene conditions at SD Muhammadiyah Meruyung Depok in 2021 had an average Debris Index and plaque index score of 2.7 for students in grades IV and V of Muhammadiyah Meruyung Depok, including the poor criteria. This is still far from the OHI-S target, while the optimal dental and oral health indicator in 2018 is OHI-S ≤ 1.2 (Ministry of Health of the Republic of Indonesia, 2025). This is because they have inappropriate habits regarding the technique and timing of brushing their teeth and there are still many students who consume sweet and sticky foods.

Based on this, researchers are interested in conducting research on the effectiveness of counseling using puzzle games with lectures on index debris and index plaques for students in grades IV and V at SD Muhammadiyah Meruyung Depok.

Methods

This type of research is analytical research using the Quasy Experiment research method. The design used was pre test and post test with control group, namely an approach carried out by measuring the debris index before and after counseling using the puzzle playing method with the lecture method. The population taken from classes IV and V of SD Muhammadiyah Meruyung Depok was 66 students. The sample size in the study was taken using a purposive sampling technique, namely 66 students as samples. Data analysis was carried out using statistical tests using the Wilcoxon and Mann Whitney tests which were used to determine the effectiveness of the research results.

Results and Discussion

Lecture method

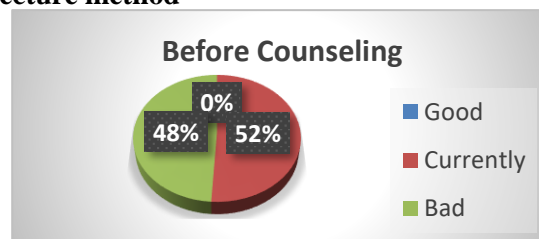


Figure 1 Distribution of Debris Scores for Class IV Lecture Method

Before the counseling was carried out using the lecture method, the results obtained for the medium criteria were 52% (17 respondents), greater

than the bad criteria of 48% (16 respondents), while there were no respondents for the good criteria.

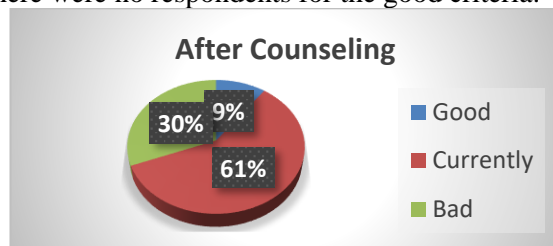


Figure 2 Distribution of Debris Scores for Class IV Lecture Method

After conducting counseling using the lecture method, the good criteria were found to be 9% (3 respondents), smaller than the medium criteria of 61% (20 respondents) while the bad criteria were 30% (10 respondents).

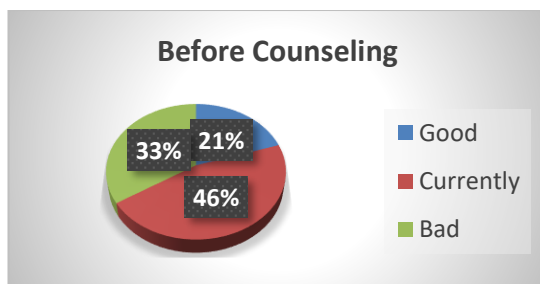


Figure 3 Distribution of Plaque Index Class IV Lecture Method

Before the counseling was carried out using the lecture method, the results obtained for the medium criteria were 46% (15 respondents), greater than the bad criteria of 33% (11 respondents), while for the good criteria there were 21% (7 respondents).

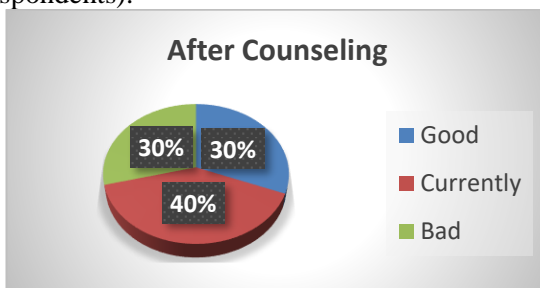


Figure 4 Distribution of Plaque Index Class IV Lecture Method

After conducting counseling using the lecture method, the good criteria were found to be 30% (10 respondents), smaller than the medium criteria of 40% (13 respondents) while the bad criteria were 30% (10 respondents).

Puzzle Method

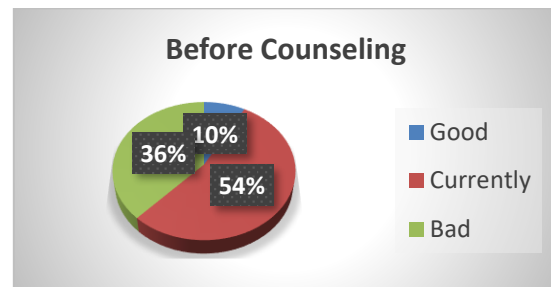


Figure 5 Distribution of Class V Puzzle Methods

The results obtained before the counseling was carried out using the puzzle method with good criteria were 10% (3 respondents) smaller when compared with the medium criteria by 54% (18 respondents), medium to bad criteria was 36% (12 respondents).

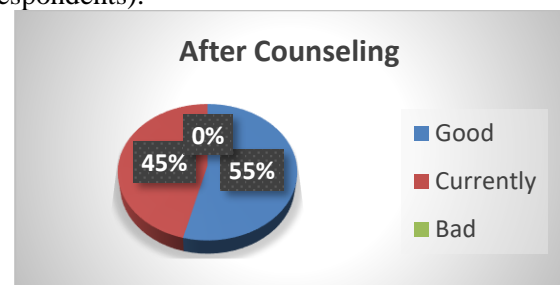


Figure 6 Distribution of Class V Puzzle Methods

The results obtained from the puzzle method for the good criteria were 55% (18 respondents), greater than the average criteria of 45% (15 respondents), while there were no respondents for the bad criteria.

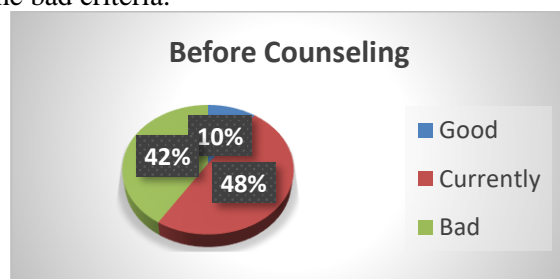


Figure 7 Distribution of Plaque Index Class V Puzzle Method

The results obtained before the counseling was carried out using the puzzle method with good criteria were 10% (3 respondents) smaller when compared with the medium criteria by 48% (16 respondents), medium to bad criteria was 42% (14 respondents).

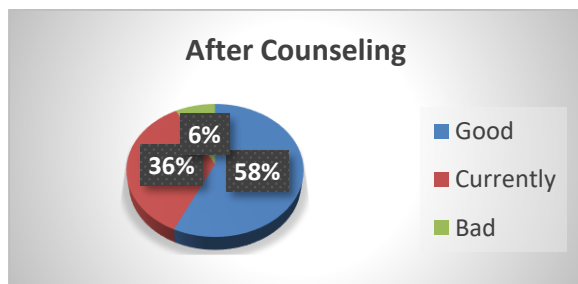


Figure 8 Distribution of Plaque Index for Class V Puzzle Method

The results obtained from the puzzle method for good criteria were 58% (19 respondents), greater than those for medium criteria of 36% (12 respondents), while for bad criteria there were 6% (2 respondents).

Table 1. Condition of Difference in Debris Index Before and After Toothbrushing Education Method of Playing Puzzles and Lectures

Type of counseling	before	after	Difference
playing puzzles lecture	1.7	0.9	0.8
	2	1.6	0.4

Table 2. Condition of difference in plaque index before and after education on tooth brushing using puzzle playing and lecture methods.

Type of counseling	before	after	Difference
playing puzzles lecture	41.35	20.37	20.98
	60.91	55.75	5.16

Table 3. Frequency Distribution of Debris Index Before and After Education on Toothbrushing with Lecture Method and Playing Puzzles

DI Criteria	Lecture				Puzzles			
	Before		After		Before		After	
	N	F	N	F	N	F	N	F
Good	0	0%	3	9%	3	10%	18	55%
Currently	17	52%	20	61%	18	55%	15	45%
Bad	16	48%	10	30%	12	36%	0	0%
Amount	33	100%	33	100%	33	100%	33	100%

Table 4. Frequency Distribution of Plaque Index Before and After Education on Teeth Brushing with Lecture Method and Playing Puzzles

Plaque Criteria	Lecture				Puzzles			
	Before		After		Before		After	
	N	F	N	F	N	F	N	F
Good	7	21%	10	30%	3	10%	19	58%
Currently	15	46%	13	40%	16	48%	12	36%
Bad	11	33%	10	30%	14	42%	2	6%
Amount	33	100%	33	100%	33	100%	33	100%

Table 5. Differences in debris index values before and after education on tooth brushing using the lecture method and playing puzzles using the Wilcoxon test.

Method	N	pValue
Puzzles	39	0.002
Lecture	39	0.013

Table 6. Test Results For Different Groups Using Puzzle Playing And Lecture Methods Using The Mann Whitney Test.

Method	<i>pValue</i>	Interpretation
<i>Puzzles</i>	0.004	Ho accepted
Lecture		

Table 7. Differences in plaque index values before and after education on tooth brushing using the lecture method and playing puzzles using the Wilcoxon test.

Method	N	<i>pValue</i>
<i>Puzzles</i>	39	0.001
Lecture	39	0.002

Table 8. Test Results For Different Groups Using Puzzle Playing And Lecture Methods Using The Mann Whitney Test.

Method	<i>pValue</i>	Interpretation
<i>Puzzles</i>	0.001	Ho accepted
Lecture		

In the table 1, it can be seen that the effectiveness of the debris index before and after counseling using puzzle games has an average of 0.8, while the debris index before and after using lectures has an average of 0.4. Judging from the average of puzzle games and lectures, it can be seen that the average value of the puzzle playing method is higher compared to the lecture method. So puzzle games are more effective than lectures.

Based on the table 2, it can be seen that there is a difference in the plaque index before and after counseling using the puzzle playing method with an average of 20.98, while the plaque index before and after using the lecture method with an average of 5.16. Judging from the average of the puzzle playing method and the lecture method, it can be seen that the average value of the puzzle game is higher when compared to the lecture. So puzzle games are more effective than lectures.

From table 3, it shows that the debris index value before the education on brushing teeth with lectures was carried out, students who were included in the moderate category were 52% (17 respondents), this was more than the bad category, which was 48% (16 respondents), and was not found in the criteria. Good. The debris index value after counseling on tooth brushing using the lecture method decreased, students in the good category were 9% (3 respondents), smaller than those in the medium category at 61% (20 respondents), and the bad category at 30% (10 respondents). The debris index value before the education on brushing teeth using the puzzle playing method was carried out, students who were in the good category were 10% (3 respondents), smaller than those in the medium category of 55% (18 respondents), while those in

the bad category were 36% (12 respondents). The debris index value after counseling on tooth brushing using the puzzle playing method, 55% of students were included in the good category (18 respondents), more than those in the medium category of 45% (15 respondents), and there were no bad criteria.

From table 4, it shows that the plaque index value before the tooth brushing education was carried out using the lecture method, 46% of students were included in the moderate category (15 respondents), compared to the poor category of 33% (11 respondents), and there were no 21 % (7 respondents) in good criteria. The plaque index value after counseling on tooth brushing using the lecture method increased, students who were in the good category were 30% (10 respondents), smaller than those in the medium category at 40% (13 respondents), and in the bad category at 30% (10 respondents). The plaque index value before the education on brushing teeth using the puzzle playing method was given to students who were in the good category at 10% (3 respondents), smaller than those in the medium category at 48% (16 respondents), while those in the bad category were 42% (14 respondents). The debris index value after counseling on brushing teeth using the puzzle playing method, students who were included in the good category were 58% (19 respondents), more than those in the medium category of 36% (12 respondents), and there were 6% (2 respondents). on bad criteria.

Based on table 5, the statistical results using the puzzle playing method show that the p value is 0.002 ($p < 0.05$), meaning that there is a significant difference between the debris index value before

and after being given counseling on the puzzle playing method. Meanwhile, using the lecture method, the p value was 0.013 ($p > 0.05$), meaning that there was no difference in the debris index value before and after being given counseling on playing puzzles using the lecture method for students at Muhammadiyah Meruyung Elementary School, Depok.

Based on table 6, the p value is 0.004, so it can be concluded that H_0 is accepted, which means there is a difference between counseling using the puzzle playing method and the lecture method on the debris index value for students at SD Muhammadiyah Meruyung Depok.

Based on table 7, the statistical results using the puzzle playing method show that the p value is 0.001 ($p < 0.05$), meaning that there is a significant difference between the index plaque value before and after being given counseling on the puzzle playing method. Meanwhile, using the lecture method, the p value was 0.002 ($p < 0.05$), meaning that there was a difference in the plaque index value before and after being given counseling on playing puzzles using the lecture method for students at Muhammadiyah Meruyung Elementary School, Depok.

Based on table 8, the p value is 0.001, so it can be concluded that H_0 is accepted, which means there is a difference between counseling using the puzzle playing method and the lecture method on the plaque index value for students at SD Muhammadiyah Meruyung Depok.

From the results of research table 8 conducted at SD Muhammadiyah Meruyung Depok, it shows that after the education on brushing teeth using the puzzle playing method experienced a significant decrease, namely p Value = 0.002 ($p < 0.05$), meaning there was a difference between the education before and after brushing teeth. Meanwhile, the education on brushing teeth using the lecture method was p Value = 0.013 ($p > 0.05$), meaning there was no significant difference between education before and after brushing teeth.

In table 3, the results show that the debris index number decreased the most before the counseling using the puzzle playing method was 36% with bad criteria, and after the counseling there were no results with bad criteria. Meanwhile, before using the lecture method, the results were 48% with bad criteria, and after counseling there were 30% with bad criteria.

Based on the average value before counseling using the puzzle playing method, it was 1.7 and after

counseling it was 0.9, the difference between the average value before and after counseling on playing puzzles was 0.8. Meanwhile, the average value before the counseling was carried out using the lecture method was 2 and after the counseling was carried out the average value was 1.6, the difference between the average value before and after counseling using the lecture method was 0.4. So it can be concluded that the more effective method is the puzzle method when compared to the lecture method.

In the index plaque results, there was a difference in index plaques before and after counseling using the puzzle playing method with an average of 20.98, while index plaques before and after using the lecture method with an average of 5.16. From the statistical results using the puzzle playing method, it was found that the p value was 0.001 ($p < 0.05$), meaning that there was a significant difference between the plaque index value before and after being given counseling on the puzzle playing method. Meanwhile, using the lecture method, a p value was obtained of 0.002 ($p < 0.05$), meaning that there was a difference in the plaque index value before and after being given counseling on playing puzzles using a lecture method to students at SD Muhammadiyah Meruyung Depok. The p value was obtained at 0.001, so it can be concluded that H_0 is accepted, which means there is a difference between counseling using the puzzle playing method and the lecture method on the plaque index value for students at Muhammadiyah Elementary School in Meruyung, Depok. So it can be concluded that the more effective method is the puzzle method when compared to the lecture method.

This is because the results of observations made when conducting lecture method counseling, some children did not pay attention. Therefore, some students still have poor criteria for dental hygiene, maintaining healthy teeth and mouth is something that must be done by every individual. This is in line with research regarding dental and oral care during childhood greatly determines the health of their teeth and mouth at an advanced age. Preventive measures that can be taken are cleaning the mouth by brushing, flossing and regular dental check-ups at the dentist.

Another simple thing is to brush your teeth. Brushing your teeth needs to be done at least twice a day, namely after breakfast and before going to bed at night. According to research, brushing your teeth thoroughly can remove plaque which can produce acids that can damage teeth [11]. Several

things to pay attention to when brushing your teeth include brushing your teeth slowly and not in a hurry, so that all parts of your teeth can be reached by the bristles of the toothbrush. Make sure all surfaces of your teeth can be brushed, and brush your teeth regularly every day after breakfast and before going to bed at night [12].

When brushing your teeth, you must pay attention to 5 things to be more effective in cleaning plaque and debris, namely: choosing the right toothbrush, the right way to brush your teeth, the right time to brush your teeth, the right amount of time for brushing your teeth and being thorough so that all parts of your teeth are clean of debris [13]. The effectiveness of brushing your teeth not only depends on the shape and method of brushing your teeth, but also depends on the frequency and duration of brushing your teeth [14].

Apart from that, the media used must be appropriate. One of the requirements for good learning media is that learning media must increase student motivation and be able to stimulate students to remember what they have learned [15].

Using the right method also needs to be considered because the right method can also help the target understand better what is being conveyed and can also influence a decrease in dental hygiene rates and change the target's behavior [16]. The media used must also be interesting because media is a tool that functions to convey messages. Learning media is a tool that functions to convey learning messages. Learning is a communication process between students, educators and teaching materials. Communication will not work without the help of a means of delivering messages or media [17].

The method used is the lecture method which is the oldest learning method or one that is often used in the field of education starting from the elementary level. This is often done so there must be counseling using an interesting method so that children do not feel bored with the material provided [18].

Counseling using the play method is a good method to use with children because it can provide a memorable experience for children, because playing can make children more enthusiastic, especially by playing puzzles. Puzzles are games that arrange images or objects that have been broken into several pieces. part. By playing puzzles, children will feel challenged to complete puzzle pieces that are not yet perfectly arranged and children will understand the material presented more quickly. They also understand more quickly

what is given, apart from training students to think, this game also trains students to work together more in a group [19].

From the discussion above, it can be seen that both methods have a good increase in debris and plaque index before and after being given counseling. However, from both methods it can be seen that with the puzzle playing method students become more enthusiastic and they feel challenged to complete the puzzle pieces they are playing with. Children also have more freedom to express their opinions when their friends make mistakes when connecting words. This game also trains teamwork in each group to further improve the social skills of each child [20].

Conclusion

Research on the effectiveness of counseling using the puzzle method versus the lecture method on the debris index for students in grades IV and V at SD Muhammadiyah Meruyung Depok shows before counseling with the lecture method, 52% of students were in the medium category, and 48% in the poor category. After counseling, 9% reached the good category, 61% remained in the medium category, and 30% were still in the poor category. In another group using the lecture method, initially, 46% were in the medium category, 33% in the poor category, and 21% in the good category. After counseling, 30% moved to the good category, 40% remained in the medium category, and 30% were still in the poor category. Before counseling with the puzzle method, 10% of students were in the good category, 54% in the medium category, and 36% in the poor category. After counseling, 55% moved to the good category, and there were no students left in the poor category. In another group using the puzzle method, 10% were initially in the good category, 48% in the medium category, and 42% in the poor category. After counseling, 58% moved to the good category, 36% remained in the medium category, and only 6% were in the poor category. The puzzle method proved more effective than the lecture method, showing a higher average improvement in both debris and plaque indices. Statistical results indicated significance at <0.05 .

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