

DENTAL HEALTH EDUCATION USING DEMONSTRATION AND VIDEOS ON STUDENTS' TOOTHBRUSHING BEHAVIOR CHANGES AT SDS AL- AZHAR BUKITTINGGI

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ABSTRACT

Dental health education is one of the programs to tackle dental health problems in Indonesia. The selection of the appropriate method in delivering educational material significantly contributes to the achievement of the targeted behavior change. Demonstration is one of the methods commonly used in this process. The demonstration method can be amplified by incorporating audio-visual media. It can be used to deliver the material more interestingly so that learning can be more interactive. This study aims to determine dental health education using demonstrations and videos on toothbrushing behavior changes among primary school students aged 9-12 years old.

This research is quasi-experimental with Pretest-Posttest Group Design. The research samples are students aged 9-12 years old at SDS Al-Azhar Bukittinggi with a total number of 100 students. These samples were collected by simple random sampling. The research procedure started by giving a pre-test followed by a demonstration and video presentation about toothbrushing for different groups. The research then ended with a post-test to find out toothbrushing behavior. The data were analyzed using Wilcoxon and Mann-Whitney test.

From the results of the Wilcoxon test, dental health education with demonstration method and video before and after the treatment obtained a significance value of $0.000 < 0.05$. It indicates that dental health education with demonstration method and video effectively improves the respondent's toothbrushing behavior. The Mann-Whitney test showed a significance value of $0.000 < 0.05$. It indicates that there is a difference in toothbrushing behavior between the demonstration method and video

Dental health education with the demonstration method is more effective in changing the respondent's toothbrushing behavior. Therefore, it is recommended for school teachers and UKGS officers to conduct dental health education using the demonstration method to change the toothbrushing behavior of elementary school students.

Keywords: *demonstration, dental health education, video*

Introduction

It is necessary to maintain dental health from an early age, but many people still ignore their oral and dental health. The results of the Basic Health Research (Riskesdas) in Indonesia in 2007 (Depkes RI, 2007) revealed that 91.1% of the population, aged ten years and over, performed toothbrushing every day, but only 12.6% of the population performed toothbrushing in the morning and at night, 28.7% of them before bed at night, and 7.3% of them after breakfast and before bed as it is recommended. The results of Riskesdas 2013 indicated that 76.6% of the Indonesian population showed good toothbrushing behavior in the morning and at night, and only 2.3% of them performed toothbrushing in the morning after breakfast and at night before bed (Kemenkes RI, 2013).

The results of 2007 Riskesdas for the province of West Sumatra indicated that 92.7% of the population, aged ten years and over, performed toothbrushing every day; 85.9% of them performed toothbrushing in the morning and at night; only 5.0% of them performed it after breakfast and 20.1% before bed. The results of the 2013 Riskesdas for West Sumatra that 97.3% of the population, aged ten years and over, performed toothbrushing every day; 70.8% of them performed toothbrushing in the morning and at night; only 2.5% of them performed it after breakfast and 21.6% before bed. Based on these data, it can be seen that the toothbrushing behavior among the population aged ten years and over, especially in the province of West Sumatra, is not good.

One of the efforts to prevent and overcome dental health problems is through the Dental Health Education (DHE) approach. Dental health education delivered to individuals or communities is expected to change their dental health behavior. The dental health education program is one of the programs that should be implemented by the Public Health Center (Puskesmas) integrated with other health promotion efforts. It is aimed at individuals who come to the center or community groups in its work area (Budiharto, 2010).

Dental and oral health services for school children are carried out through basic dental, and oral health activities at the Public Health Center integrated with the main activities of the School Health Unit (UKS) in the form of the School Dental Health Unit (UKGS) program. UKGS program is a public health effort aimed at maintaining and improving all students' dental and oral health in the target schools supported by personal health promotion through promotive and preventive measures (Kemenkes RI, 2012). One of the promotive efforts in the UKGS program is providing counseling on dental and oral health about proper and correct toothbrushing, such as the good type of toothbrush and toothpaste, the correct method of toothbrushing, and the correct time and frequency of toothbrushing (Dewanti, 2012).

Behavior changes in knowledge, attitudes, and skills occur because of the interaction between new experiences and previous ones. The learning process involving more senses, for example, by combining the sense of sight hearing, will be more readily accepted and remembered by students than those involving only one sense.

Direct counseling is one of the efforts to improve children's dental and oral health. The counseling method commonly used is demonstration. The demonstration method presents information by showing an object or demonstrating a procedure directly. Visual aids, questions, and answers accompany the presentation of the materials with the demonstration. This method can demonstrate how to maintain dental and oral health by demonstrating the correct way of toothbrushing, using a good toothbrush and dental visual aids (models). The demonstration method can be amplified

with audio-visual media. This method can be used to deliver material more interestingly so that learning can be more interactive (Siahaan et al., 2016).

The study by Maria (2016) (Siahaan et al., 2016) on the effectiveness of the combination of audio-visual and the demonstration method to mothers on reducing children's plaque index showed that the combined audio-visual and demonstration method was more effective than the single demonstration method in lowering children's plaque index. Based on the research by Ridwan et al. (2019) (Febrianta et al., 2019) on the effect of video media on knowledge and attitudes of pregnant women about anemia in the Nanggulan Public Health Center area of Kulon Progo Regency, there was an increase in knowledge and attitudes of pregnant women about the problem of anemia by using video media.

Method

This study is pre-experimental with a pretest-posttest group design to determine phenomena or effects resulting from specific treatments. With this design, the same questionnaire was tested on the same respondents twice, before the treatment with the demonstration method and videos and after the treatment with the demonstration method and videos. This research was conducted at SDS Al Azhar, Bukittinggi, in October 2018. The population in this study are students aged 9-12 years old at SDS Al Azhar Bukittinggi. The sample size in this study was determined by using the Lemeshow formula (Dahlan, 2014), with a total sample of 100 students for the two groups. Samples were selected through simple random sampling.

The instrument used in this research was a toothbrushing behavior questionnaire, which contained questions regarding knowledge, attitudes, and behavior about toothbrushing (good types of brush and toothpaste, correct toothbrushing methods, toothbrushing time, and frequency). Toothbrushing videos contained sounds and pictures about toothbrushing (good types of brush and toothpaste, proper toothbrushing methods, toothbrushing time, and frequency).

The data were collected by conducting a pre-test using the questionnaire about toothbrushing behavior to Groups I and II to measure their knowledge, attitudes, and toothbrushing behavior. Then, the counseling about toothbrushing was given to group I with the demonstration method and group II with video presentation. Furthermore, the second behavioral measurement after the treatment was performed. Data analysis was carried out using univariate and bivariate analysis. Bivariate analysis was conducted to see a difference between the two groups before and after the treatment. Because the data were not normally distributed, the test used was the non-parametric test, namely the Wilcoxon and Mann-Whitney test to see differences in toothbrushing behavior with the demonstration method and video presentation.

Findings and Discussion

1. Distribution of Respondents by Age and Sex

Table 1. Distribution of Respondents by Age and Sex

Characteristics	Demonstration		Video presentation	
	Number	%	Number	%
Age				
9 years old	3	6	12	24
10 years old	10	20	25	50
11 years old	22	44	12	24

12 years old	15	30	1	2
Total	50	100	50	100
Sex				
Male	22	44	32	64
Female	28	56	18	36
Total	50	100	50	100

Table 1 shows that the sex of most respondents in the demonstration group is female (56%), while the video group is mostly male (64%). Based on the age of the respondents, the demonstration group is mostly 11 years old (44%), while the video group is mostly 10 years old (50%).

2. Research Findings on Knowledge with Demonstration and Video presentation

Table 2. Findings on Analysis of Knowledge with Demonstration and Video presentation

Category	Demonstration				Video presentation			
	<i>Pre-test</i>	%	<i>Posttest</i>	%	<i>Pre-test</i>	%	<i>Posttest</i>	%
Good	28	56	35	70	28	56	28	56
Less	22	44	15	30	22	44	22	44
Total	50	100	50	100	50	100	50	100
<i>P-value</i>	0.000				0.000			

Based on table 2, respondents' knowledge before the demonstration is in the good category (56%), and it is also in the same category after the demonstration (70%). There is an increase of 14% in respondents' knowledge after the demonstration. Meanwhile, in the video group, respondents' knowledge, both before and after the treatment, is in the same category with no change in its percentage (56%). Based on the Wilcoxon test, the significance value of the demonstration and videos is $0.000 < 0.05$ for both. It indicates a difference in knowledge of toothbrushing before and after dental health education with the demonstration method and video presentation.

Respondents' answers showed that only 1 respondent could correctly answer all questions about toothbrushing in both the demonstration and video group. It happened because students did not understand how to brush their teeth properly and correctly. Based on interviews with UKS teachers at SDS Al-Azhar, Bukittinggi City, dental health workers did not routinely carry out UKGS (School Dental Health Unit) activities at the SDS. The action of toothbrushing at school was not routinely carried out either.

The analysis of the average pre-test score of the demonstration and video group showed no significant difference in the respondents' knowledge between the two groups. The average score for the demonstration group was 8 and 7.5 for the video group. This shows that the knowledge possessed by the two groups of respondents is relatively the same.

Respondents' knowledge about toothbrushing in the demonstration group before the treatment is in the good category (56%) and the good category after the demonstration (76%), so there is an increase of 14%. Based on the Wilcoxon test, a significance value of $0.000 < 0.05$ was obtained. It shows that dental health education with the demonstration method can increase respondents' knowledge.

These findings align with the research conducted by Usman (2006) (Usman, 2006) at SDN Labuhan Haji, which revealed that dental counseling with the demonstration method effectively increased children's oral health knowledge. There was a difference in children's knowledge before and after the treatment. Children's knowledge before the treatment was 45% in the sufficient category and 55% in the less category. After the treatment with the demonstration, the rate increased to 45% with the good knowledge category, 55% with the sufficient, and no respondent with less knowledge category.

The respondents' knowledge of toothbrushing in the video group before treatment is in a good category (56%) and also 56% after the treatment. However, the obtained positive rank value of 31 indicates thirty one respondents experienced an increase in their knowledge about toothbrushing after the treatment with an average increase of 17.58. Based on the Wilcoxon test, a significance value of $0.000 < 0.05$ is obtained. It suggests a difference in the respondent's knowledge of toothbrushing before and after the video presentation. It indicates that dental health education by the video presentation can increase respondents' knowledge.

The results of this study are in line with research conducted by Kantohe et al. (2016) (Kantohe et al., 2016) at SDN Kolongan on the comparison of the effectiveness of dental health education using video and flip charts on increasing children's dental and oral health knowledge. This study showed that dental health education using video and flip charts effectively increased children's knowledge of dental and oral health.

Knowledge is the result of someone's knowing about an object through the senses they have. Sensing until producing knowledge is strongly influenced by the intensity of attention and perception towards the object. Most of a person's knowledge is obtained through the sense of hearing and the sense of sight (Notoatmodjo, 2012). Demonstration and videos both use the sense of hearing and sight. Dale (1969) said that the knowledge a person gains is influenced by the senses used; the more senses used to receive something, the clearer the understanding obtained (Adiko et al., 2008).

3. Research Findings on Attitude with Demonstration and Video presentation

Table 3. Findings on Analysis of Attitude with Demonstration and Video Presentation

Category	Demonstration				Video presentation			
	<i>Pre-test</i>	%	<i>Posttest</i>	%	<i>Pre-test</i>	%	<i>Posttest</i>	%
Good	33	66	43	86	33	66	38	76
Less	17	34	7	14	17	34	12	24
Total	50	100	50	100	50	100	50	100
<i>P-value</i>	0.000				0.000			

Based on table 3, the attitude of respondents before the demonstration is in the good category (66%), and it is also in the same category after the demonstration (86%). There is an increase of 20% in respondents' attitudes after the demonstration. Meanwhile, in the video group, respondents' attitude before the treatment is in the good category (66%), and it is also in the same category after the treatment (76%). There is an increase of 20% in respondents' attitudes after the video presentation. Based on the Wilcoxon test, the significance value of the demonstration and videos presentation is $0.000 < 0.05$ for both. It indicates a difference in attitude towards toothbrushing before and after dental health education with the demonstration method and video presentation.

There is an increase of 20% in respondents' attitude with demonstration and 10% with video presentation with a significance value $0.000 < 0.05$ for both. Thus, it can be said that dental health education with the demonstration and video presentation is equally effective in improving respondents' attitudes towards toothbrushing.

The results of this study are different from those conducted by Hestiani et al. (2017) (Hestiani et al., 2017), which stated that the demonstration method in preventing dental caries was not effective in increasing knowledge, attitudes, and actions regarding the prevention of dental caries in fourth and fifth-grade students of SDN 1 Ranteangin, North Kolaka Regency.

Attitude is the most important concept in social psychology. One thing that must be considered when discussing life and social change is the individuals' attitude. Through attitudes, we can understand the process of consciousness that determines the real actions individuals may take in their social life. One of the determining factors in the formation of attitudes is personal experiences. Personal experiences directly experienced have a stronger influence than indirect experiences (Wawan & M., 2011). Dental health education with the demonstration and video presentation is a method that involves the senses of hearing and the senses of sight. The learning experience provided is a direct experience, in which the students feel the learning atmosphere themselves.

4. Research Findings on Action with Demonstration and Video presentation

Table 4. Findings on Analysis of Action with Demonstration and Video Presentation

Category	Demonstration				Video Presentation			
	<i>Pre-test</i>	%	<i>Posttest</i>	%	<i>Pre-test</i>	%	<i>Posttest</i>	%
Good	28	56	27	54	28	56	37	74
Less	22	44	23	46	22	44	13	26
Total	50	100	50	100	50	100	50	100
<i>P-value</i>	0.001				0.000			

Based on table 2, respondents' action before the demonstration is in the good category (56%) and changes into 54% after the demonstration. Meanwhile, respondents' action before the video presentation is in the good category (56%) and increases to 74% after the video. Based on the Wilcoxon test, the significance value of the demonstration is 0.001 and $0.000 < 0.05$ for video presentation. It indicates a difference in the action of toothbrushing before and after dental health education with the demonstration method and video presentation.

Table 4 shows respondents' action before the demonstration is in the good category (56%) and changes into 54% after the demonstration, so there is a 2% decrease. It is probably caused by children's tendency to be more interested in audio-visual media such as television and video than the demonstration. However, the obtained positive rank value of 29 indicates twenty nine respondents experienced an increase in their toothbrushing action after the treatment, with an average increase of 20.22.

Meanwhile, respondents' action in the video presentation is in the good category (56%) and increases to 74% after the presentation, so there is an 18% increase. The obtained positive rank value of 29 indicates twenty nine respondents experienced an increase in their toothbrushing action after the treatment, with an average increase of 18.00. The Wilcoxon test obtains a significance value of $0.000 < 0.05$. Therefore, it can

be said that dental health education with the demonstration method and videos is equally effective in increasing respondents' toothbrushing action.

These findings are in line with those by Hidayati et al. (2013) (Hidayati et al., 2013), whose study revealed that health education with the demonstration method of SADARI practical skills affected students' SADARI practical skills in SMA Futuhiyyah Mranggen, Demak Regency.

5. Research Findings on Behavior with Demonstration and Video presentation

Table 5. Findings on Analysis of Behavior with Demonstration and Video Presentation

Category	Demonstration				Video Presentation			
	<i>Pre-test</i>	%	<i>Posttest</i>	%	<i>Pre-test</i>	%	<i>Posttest</i>	%
Good	26	52	31	62	31	62	35	70
Less	24	48	19	38	19	38	15	30
Total	50	100	50	100	50	100	50	100
<i>P-value</i>	0.000				0.000			

Based on table 5, respondents' toothbrushing behavior before the demonstration is mostly in the good category (52%), increasing to 62% after the demonstration. Meanwhile, respondents' behavior before video presentation is mostly in the good category (62%), increasing to 70% after the video presentation. Based on the Wilcoxon test, the significance value of demonstration and video presentation is $0.000 < 0.05$ for both. It indicates a difference in toothbrushing behavior before and after dental health education with the demonstration method and video presentation.

Table 6. Findings on Analysis of Behavior with Demonstration and Video Presentation Using Wilcoxon Test

Group	Ranks		Wilcoxon Test	
	<i>Mean Rank</i>	<i>Sum of Rank</i>	<i>Z</i>	<i>P-value</i>
Behavior before the demonstration-Behavior after the demonstration	26.30	1210.00	-5.956	0.000
Behavior before the video presentation-Behavior after the video presentation	24.09	1060.00	-5.694	0.000

Based on table 6, the Wilcoxon Signed Ranks Test analysis results obtain a *p*-value of $0.000 < 0.05$. Thus, it can be concluded that there is a difference in toothbrushing behavior before and after the demonstration method and videopresentation. The positive mean rank value for the demonstration is 26.30, meaning that twenty six students experienced an increase in their toothbrushing behavior from pre- test to post-test. Meanwhile, for video presentation, the positive mean rank value is 24.09, meaning that twenty four students experienced an increase in their toothbrushing behavior from pre-test to post-test.

These test results prove that the two methods used in this study can improve respondents' toothbrushing behavior. The selection of the appropriate method in delivering educational material significantly contributes to the achievement of the targeted behavior change (Herijulianti et al., 2001). Strategies and methods and learning media used in the educational process will affect the success of an education (Usman,

2006). The research conducted by Ridwan (et al., 2019) (Febrianta et al., 2019) in Nanggulan public health center Kulon Progo showed an increase in knowledge and attitudes of pregnant women about the problem of anemia using video media.

Table 7. Analysis of the Effect of Dental Health Education with Demonstration and Video Presentation Using Mann-Whitney Test

Group	Ranks		Uji Statistik	
	Mean Rank	Sum of Rank	Z	P-value
Toothbrushing behavior with demonstration	64.73	3236.50		
Toothbrushing behavior with video presentation	36.27	1813.50	-4.927	0.000

Based on the Mann Whitney test (table 7), the mean rank value for the demonstration is 64.73 and 36.27 for the video presentation. This suggests that the average increase in respondents' toothbrushing behavior after the demonstration is 64.73, and the average increase in respondents' toothbrushing behavior after the video presentation is 36.27. The significant value of the respondent's toothbrushing behavior after dental health education carried out with the demonstration and video presentation is $0.000 < 0.05$. This indicates a difference in toothbrushing behavior between the demonstration method and video presentation. The demonstration method is more effective in improving respondents' toothbrushing behavior than the video presentation.

The research conducted by Ilyas & Putri (2012) (Ilyas & Putri, 2012) on the sixth-grade elementary school students in Padang Loang, Patampanoa, Pinrang Regency revealed that dental and oral health education through the demonstration method was effective in reducing dental plaque index. Another study conducted by Ali et al. (2016) (Ali et al., 2016) at SD GMIM Manado showed that Dental Health Education (DHE), through the demonstration of how to perform toothbrushing properly, was more effective in reducing the debris index than DHE without the demonstration.

Behavior changes in knowledge, attitudes, and skills occur because of the interaction between new experiences and previous ones. The learning process involving more senses, for example, by combining the sense of sight and hearing, will be more easily accepted and remembered by students than those that only involve one sense.

One of the most widely used theoretical bases for media use in the learning process is Dale's Cone of Experience (1969). The cone shows that one's learning outcomes are obtained from direct (concrete) experience, the reality in one's living environment, then through artificial objects, to verbal symbols (abstract). Dale's Cone of Experience shows demonstration is in level four while video/film is in level seven. It means that based on this theory, demonstration has a higher intensity than video in targets' perception of the educational materials given, so it facilitates the absorption of the information conveyed easily (Adiko et al., 2008).

Demonstration presents information by showing an object, process, or procedure directly. The use of visual aids usually accompanies it. The advantage of using this method is that the targets' acceptance process of the educational material is much higher, so they will get a better and perfect understanding of the materials given, especially if they actively participate in the demonstration. The method can also reduce errors more effectively than reading and listening because the targets obtain clear

perception from the results of the direct observation, and the objects used are real, so that the motivation to know more deeply and in detail is developed (Nurbayani & Tauchid, 2014).

Conclusion and Suggestion

This study concludes that there is a difference in toothbrushing behavior between the demonstration method and video presentation. The demonstration method is more effective in improving respondents' toothbrushing behavior than the video presentation.

It is suggested to the school, especially UKS teachers, to pay more attention to SDS Al-Azhar students' dental and oral health by demonstrating proper toothbrushing at least once a week by using the demonstration method to improve students' toothbrushing behavior. Future researchers are advised to research other methods of dental health education that are more effective in improving toothbrushing behavior.

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