

EFFECTIVENESS OF INTERACTIVE AUDIOVISUAL MEDIA ON THE LEVEL OF KNOWLEDGE, ATTITUDE OF CHILDREN AND DENTAL ORAL HEALTH

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ABSTRACT

*Dental and oral health in children is an important factor that must be considered, because tooth decay that occurs at the age of children can affect further tooth growth. **Objectives:** This study is a quasi-experimental with a pre-post-test group design with aims to analyze the effect of using interactive audiovisual media on the level of knowledge and attitudes of children in improving children's dental and oral health. The sample of this study was 30 grade III elementary school students who were divided into 3 groups, namely group I (whatsapp group media), group II (lecture + video) and group III (control). Data analysis used the dependent T test, independent T test, and one way ANOVA test with a significance of $p < 0.05$. The results showed that the level of knowledge of children before and after the intervention experienced a more significant difference ($p < 0.000$), compared to the attitude variable ($p > 0.05$). The average difference between pre and post intervention based on knowledge, attitude and dental plaque index variables showed that group II had the highest average difference. **Conclusion:** The conclusion in this study is that the use of lectures accompanied by videos is better in increasing children's knowledge and attitudes in maintaining dental and oral health than audiovisual media What's up group.*

Keywords: attitude; audiovisual media; dental plaque index; knowledge

INTRODUCTION

Dental and oral health in children is an important factor that must be considered, because tooth decay that occurs at the age of children can affect further tooth growth. (Anil and Anand, 2017) The process of tooth decay itself lasts a long time, it may even begin when your baby's teeth are about to erupt. This happens because of the low concern of parents for the growth and development of children, including the oral cavity, even though dental and oral health that is not considered will have an impact on the child's overall ability, both physically and intellectually. (Achmad *et al.*, 2021)

Based on data from Riskesdas (Riskesdas, 2018), 57.6% of the Indonesian population experienced dental and oral problems, and only 10.2% received dental medical treatment, and the prevalence of dental caries in children reached 93%. A total of 94.7% percentage of

Indonesian people have brushed their teeth every day but only 2.8% are correct in brushing their teeth. In North Sumatra, the number of people who brush their teeth every day is 92.9% but only 1.6% of them have the correct time to brush their teeth, if you look at the age group, namely the age group of children 5-9 years. The percentage of children who brush their teeth every day is 93.2% but only 1.4% of children brush their teeth properly. This shows that the knowledge and concern of the Indonesian people about the importance of brushing their teeth properly and correctly is in a worrying condition.(Riskasdas, 2018)

One of the causes of dental and oral problems in children is the behavior or attitude of the mother ignoring dental and oral hygiene.(Abadi and Suparno, 2019) This is based on the mother's lack of knowledge about the importance of maintaining oral and dental hygiene.(Cahyaningrum, 2017) Maintaining hygiene and dental and oral health in children is very important because the current condition of the milk teeth (deciduous teeth) greatly determines the replacement of permanent teeth.(Oktaviani, Sofiyah and Lusiani, 2020)

The results of previous studies on elementary school students showed that the incidence of caries was still in the high category.(Mayasari, 2021) The problem of dental caries in early childhood has a fairly dangerous impact, namely the teeth become porous, cavities, and even fractures so that children experience loss of chewing power and interfere with digestion.(Rahayu *et al.*, 2022) This is caused by several factors, such as the diet of children who prefer sweet foods, lack of knowledge, awareness and independence of children in maintaining dental and oral health and hygiene, as well as the lack of awareness of parents to take their children to have their teeth checked.(Dewi, Mahirawatie and Ulfah, 2022) Children are generally more a mother's business, so the good or bad of the child is reflected in the mother's attitude towards the child. Therefore, if in the family, the teeth of the children are healthy, it can be concluded that the mother of the family is a mother who is good at taking care of and wise to the family.(Jyoti *et al.*, 2019)

Health communication is a systematic effort that positively influences health practices in large and small populations.(Pariati and Jumriani, 2021) Health communication, especially dental and oral health, can be done in various ways, one of which is health promotion using WhatsApp.(Jumriani *et al.*, 2022) The goal is to improve health in terms of practice and, in turn, health status. On WhatsApp media, groups (groups/online communities) can be formed to focus on conveying information, reading information equipped with animated images, and interactive videos and facilitating interattitude so that it can inspire someone to change behavior to be healthy. Through website-based audiovisual media, the provision of information becomes

a new experience for the recipients. In this case regarding the dental and oral health of children who are nurtured from an early age. Changes in behavior obtained by parents certainly provide changes in the decrease in the dental plaque index of children (Asda and Rahayu, 2018). The purpose of this study was to analyze the effect of using interactive audiovisual media on the level of knowledge, attitudes, and also plaque index of children in improving children's dental, oral health.

METHOD

This research was a quasi-experimental research with pre-post-test group design, In this study the intervention was counseling using interactive audiovisual media, in increase the knowledge, attitudes, and actions of children to reduce dental plaque index. Data collected by using questionnaire instrument and oral examination. The research ethnics commission of Politeknik Kesehatan Kementerian Kesehatan Medan approved this study (No. 1054/KEPK/POLTEKKES KEMENKES MEDAN/2021.

A total of 30 person as the sample with aged 8-10 years, were selected randomly using simple random sampling and divided into 3 groups, each group consist of 10 subjects. Group I was treatment group given information about maintenance oral dental health through interactive videos by Whats App (Wa) group which is shared every night before going to bed ie at 20.00 – 21.00 WIB. Group II was Treatment group given information about maintenance oral dental health at home through lectures accompanied by the media audio visual video before/after the learning process teaching takes place in classes that last for 10 minute, and group III was control without treatment. The inclusion criteria were the children with early knowledge, attitudes, and actions in the low category, dental plaque index criteria are moderate-bad, communicative, cooperative, and willing to sign the informed consent, while the children with the disease systemic or in sick condition were excluded.

Interaktif Audiovisual media that used in this study was consist of 3 animated videos containing topics about how to brush your teeth the right way (1.31 minutes), about Cavities Process (2.54 minutes), and about Impact Not Maintaining Dental and Oral Health (1.50 minutes). This topic was not different with the topics that delivered through lecture/speech in another group. The instrument for examining the plaque index was diagnostic set (mouth mirror, explorer, pinset), toothbrush and sheet examination.

Knowledge measurement consists of questions with multiple methods choice. The questionnaire consists of 20 questions. Each questions that answered correctly were given a

value of 1 and value of 0 for wrong answered. The average of the overall subject scores divided into 3 categoric namely: The lowest is Knowledge 0-6: not enough, 7-13: enough, and 14-20: good. The attitude measurement using a Likert Scale. The Likert scale is a scale that can be used to measure attitude, opinion, and one's perception of a symptom or certain phenomenon. For positive statements, Very good answer choices answers are given a value of 4, , Agree answer choices is given a value of 3, Disagree answer choices is given a value of 2 and Disagree is given a value of 1. All the questionnaire consisted of 15 questions for each measurement. The average of the overall value of the subject's attitude, for then grouped namely 60 and the lowest is 15. Value 15-37 categorized as a negative attitude, a value of 38-44 is categorized as a positive attitude, and a value of 45-60 is categorized as a very positive attitude.

The plaque index measurement based on the extent of the build up plaque on the tooth surface. Measurements on each tooth on 2 sides (buccal and lingual) except teeth with patches.

$$\text{Plaque score} = \frac{\text{Total score}}{\text{The total of tooth surfaces}}$$

The Implementation of Interventions in groups 1 and 2 was given 1 time per day, before starting the lesson and finishing learning. While the Interactive audiovisuals Media are delivered to the group's Whatsapp application on time prescribed 1 time a day (evening before bedtime). Implementation of the intervention for these two groups was carried out for 3 (three) week except Sunday.

RESULTS AND DISCUSSION

This research was carried out within two months, between March to October 2021. The questionnaires were administered before and after the intervention. Data collection includes questionnaire data and dental plaque index data in children in the intervention group (I and II) and control group (baseline) before and after intervention (endline data). Meanwhile, the implementation of mentoring to schools is carried out three times a week alternately before starting learning, before taking a break, and after finishing learning. The characteristics of the study respondents shown in Table 1.

Table 1. Characteristics of respondents by socio-demographic variables (n=10)

| Characteristics | Group I | | Group II | | Group III | | Total | |
|-----------------|---------|---|----------|---|-----------|---|-------|---|
| | n | % | n | % | n | % | n | % |
| | | | | | | | | |

| | | | | | | | | | |
|---------------------|------------------|---|----|---|----|---|----|----|----|
| Gender | | | | | | | | | |
| - | Male | 3 | 30 | 4 | 40 | 6 | 60 | 13 | 43 |
| - | Female | 7 | 70 | 6 | 60 | 4 | 40 | 17 | 57 |
| Age (Years) | | | | | | | | | |
| - | 8 th | 8 | 80 | 4 | 40 | 3 | 30 | 15 | 50 |
| - | 9 th | 2 | 20 | 6 | 60 | 3 | 30 | 11 | 37 |
| - | 10 th | 0 | 0 | 0 | 0 | 4 | 40 | 4 | 13 |
| Mother's Occupation | | | | | | | | | |
| - | Housewife | 7 | 70 | 8 | 80 | 8 | 80 | 23 | 77 |
| - | Worker | 3 | 30 | 2 | 20 | 2 | 20 | 7 | 23 |

It was found that women were dominant (57%) than male (43%). The percentage of subjects 8 years old was higher (50%) than subjects 9 years old (37%) and subjects 10 years old (13%). Based on the level of mother's occupation, the frequencies of mothers who do not work or as housewives as many as 23 people (77%) and work (sales in the market, nurses/midwives) as many as 7 people (23%). Results of statistical tests to determine the homogeneity of the initial data (baseline) between the control and intervention groups according to the variables of the knowledge level measurement results in the intervention and control groups are described in Table 2.

| Group | Knowledge Mean (Baseline) | Attitudes Mean (Baseline) |
|----------------|---------------------------------|---------------------------------|
| I | 9.6 ± 2.27 | 17.4 ± 2.36 |
| II | 9.5 ± 2.17 | 18.1 ± 1.96 |
| III | 8.6 ± 1.34 | 16.0 ± 2.62 |
| <i>p-value</i> | 0.26* | 0.724* |

*:significance of homogeneity ($p > 0.05$)

Table 2 shows the initial data before the intervention (baseline) both knowledge and attitude were homogeneous ($p > 0.05$). It means that data analyzed using a parametric test, namely the dependent and independent T-test. The debris index data was also measured to determine the risk of dental caries in the three study groups and it shown in Table 3.

| Group | Dental Plak Amount (Mean ± SD) |
|-------|-----------------------------------|
|-------|-----------------------------------|

| | |
|-------------------|-------------|
| I Wa Group | 1.60 ± 0.55 |
| II Lecturer+video | 1.26 ± 0.57 |
| III Control | 1.15 ± 0.27 |
| <i>pValue</i> | 0.758* |

*:significance of homogeneity (p>0.05)

Table 3 shown the initial data on dental plaque index numbers between the control and intervention groups did not differ (homogeneous). The amount of plaque measured in the subject is in the moderate/sufficient category. After going through two weeks of observation and mentoring in the intervention group, the measurement of the level of knowledge, attitudes and attitudes after the intervention was carried out. This measurement will compare the final data between the control group and the intervention group using the Kruskal Wallis test and the dependent T-test to determine the difference in the data before and after the intervention in the control and intervention groups.

Table 4. The differences level of knowledge of students pre and post intervention with the T-test dependent

| Group | Knowledge Level | | <i>p-Value</i> | Mean Difference Δ |
|-------|--------------------|--------------------|----------------|----------------------|
| | Pre (Mean ± SD) | Post (Mean± SD) | | |
| I | 9.6 ± 2.27 | 11.8 ± 3,19 | 0.084 | 3.3 |
| II | 9.5 ± 2.17 | 12.5 ± 2,99 | 0.040* | 3.9 |
| III | 8.6 ± 1.34 | 8.20 ± 1,61 | 0.104 | -3.6 |

*: significance of significance (p<0.05)

Table 4 shown there was a significant difference between knowledge levels in group II before and after the intervention (p=0.040) with the average differences of 3.2. While in the intervention group I it was known that after the intervention the results were not significantly different (p>0.05).

Table 5. Differences in students attitude pre and post intervention with T-test dependent

| Group | Attitude | | <i>p-Value</i> | Δ |
|-------|--------------------|---------------------|----------------|-----|
| | Pre (Mean ± SD) | Post (Mean ± SD) | | |
| I | 17.4 ± 2.36 | 18.3 ± 1.33 | 0.041* | 0.9 |
| II | 18.1 ± 1.96 | 19.3 ± 0.82 | 0.024* | 1.2 |
| III | 16.0 ± 2.62 | 16.1 ± 2.28 | 0.591 | 0.1 |

*: significance of significance ($p < 0.05$)

Based on table 5 there was significant differences in the attitudes taken meaningful between before and after being given counseling intervention using audiovisual video media both in the lecture group and the WA group. In addition to the assessment before and after the intervention, the data after the intervention was tested between the three groups using the One Way Anova test. The results of this test calculation are shown in the following table 7.

Table 6. Differences in Knowledge and Attitudes post inter-group intervention

| Group | Mean Knowledge (Mean \pm SD) | Mean Attitude (Mean \pm SD) |
|----------------|-----------------------------------|----------------------------------|
| I | 11.8 \pm 3.19 | 18.3 \pm 1.33 |
| II | 12.5 \pm 2.99 | 19.3 \pm 0.82 |
| III | 8.20 \pm 1.61 | 16.1 \pm 2.28 |
| <i>p value</i> | 0.00* | 0.03* |

Based on the *post hoc test* in table 6, it is known that there was a very significant difference in knowledge and attitudes between the WA group and the control group and between the lecture group and the control group. From table 6, comparing of post intervention both of 3 groups, the very significance differences value is known in knowledge level with $p = 0,00$. From table 7 shown that there is a very significant difference in the incidence of plaque index in group II before and after the intervention.

Table 7. Dental plaque index measurement based on *T- test Depend* and One way Anova

| Groups | Pre (Mean \pm SD) | Post (Mean \pm SD) | p Value (<i>T Test Depend</i>) |
|----------------|------------------------|-------------------------|-------------------------------------|
| I | 1.60 \pm 0.55 | 1.15 \pm 0.40 | 0.08 |
| II | 1.26 \pm 0.57 | 0.67 \pm 0.34 | 0.000* |
| III | 1.15 \pm 0.27 | 1.20 \pm 0.24 | 0.373 |
| <i>p-Value</i> | 0.120 | 0.003* | |

*: significance ($p < 0.05$)

Based on the results of data processing, it was found that there was a significant difference in the level of knowledge between the lecture group accompanied by audiovisual media compared to the WA group and control group (p value < 0.05). The results of changes in the debris index in group II (lectures with audio-visual media) showed a significant difference. This is in accordance with the statement of Notoatmodjo that lectures are one of the best methods used in

dental and oral health education for elementary school children.(Notoadmodjo, 2010) However, Notoatmojo added that this method is good for highly educated targets because it is a one-way method and is monotonous.(Notoadmodjo, 2010) For elementary school age children, it is necessary to set a good example and use a simple technique that must be made as attractive as possible. For example, through attractive counseling without reducing the content of education, direct demonstrations and audiovisual programs.(Siahaan, 2016)

According to Heriyanto, video is a one-way method, while the two-way method consists of interviews, demonstrations, plays, simulations, brainstorming, roll playing, and questions and answers.(Heriyanto and Haryani, 2014) To get changes in increasing knowledge, collaboration between one-way and two-way methods is needed. This is in accordance with the method used in group II by conducting a lecture method to explain the contents of the video on dental and oral health maintenance and conducting demonstrations using phantom media to improve students' understanding because they were seen directly so that they were able to practice according to the material presented.(Heriyanto and Haryani, 2014) The results of this study are in line with the results of Trirahayu, Which states that by conducting family empowerment programs in handling cases of asthma for the intervention group through lectures, and educational video/film demonstrations.(Trirahayu, 2015)The results showed that there was a very significant difference in the level of knowledge before and after the lecture intervention, accompanied by an educational film demonstration ($p < 0.001$). (Trirahayu, 2015)

The obstacles faced in group I were the lack of consistent feedback/questions and answers from time to time; and network constraints as well as the lack of involvement of mothers in guiding children to explain the meaning of the videos provided. While the obstacles faced in group II were in data collection, there were some respondents who were less focused at the time of interviews and for filling out questionnaires and during counseling with video media there were some respondents who experienced anxiety due to interference from other respondents who were gathered in one room so that become less conducive. However, this can be circumvented by showing interesting videos so that children/students become interested and listen to the contents of the videos displayed.

Based on the results of the researcher's study, in group I with the WA group media, it needs support and empowerment from the family, in this case the mother of the student/child, to be able to explain the intent and purpose of the video being shared. The use of audio-visual technology that is presented combined with whatsapp up groups can be an alternative in conducting counseling in the current millennial and all-digital era, as well as being more

intensive and 2-way in nature. Thus, this media is expected to make it easier for the audience to receive and understand the health information conveyed.

Parents are the closest family for a child. The attitudes and behavior of parents can be an example for their children. Judging from the high prevalence of children experiencing dental caries, it is necessary to know how the role of parents in assisting children in caring for children's oral and dental hygiene.(Prasasti, 2016) Therefore, it is necessary to empower the family, which is a process or effort to increase the knowledge, awareness, and willingness of the family in maintaining and improving the patient's health status. With family empowerment, it is hoped that each family has family independence to be able to identify the problem for themselves, be able to overcome the problem, and be able to use the potential that exists in the family and take advantage of the opportunities that exist in their environment as much as possible to overcome their dental health problems.(Mangeli M *et al.*, 2017)

According to Marwansyah *et al.*, families often do not know what attitudes to take to help the disease prevention process. Changes in the level of respondent's attitudes in the intervention group (table 5) can be temporary, so that changes in appropriate attitudes must be carried out continuously in a conscious and responsible manner.(Marwansyah, Sholikhah and Heny, 2015)

In conclusion in this study that the use of interactive audiovisual media like video through WhatsApp groups combine with lecturing can increase students' knowledge about dental and oral health maintenance. Brushing your teeth using your own toothbrush (not alternately), and diligently rinsing your mouth. The dental plaque index of students experienced a significant decrease in the intervention group with more changes in group II, namely the use of interactive audio-visual media with lectures.

CONCLUSION

The use of interactive audiovisual media accompanied by lectures can increase students' knowledge about dental and oral health maintenance. There has not been a significant change in the child's attitude before and after the provision of interactive audiovisual media regarding the maintenance of oral health. The attitude in question is routine dental health control every 6 (six) months and diligent brushing teeth before going to bed. The use of interactive audiovisual media accompanied by lectures and through Wa groups can change students' actions to maintain dental and oral health. The action in question is brushing your teeth using your own toothbrush (not taking turns), and diligently rinsing your mouth. The dental plaque index of students experienced

a significant decrease in the intervention group with more changes in group II, namely the use of interactive audio-visual media accompanied by lectures.

ACKNOWLEDGEMENT

The authors deny any conflict of interest related to this study. The authors would like to express their sincere gratitude to the headmaster of Mis Al-Hidayah Medan, who granted permission for this research. Also to the director of Politeknik Kesehatan Kementerian Kesehatan Medan (Indonesia), for providing finance contributions to this study.

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