

## The Effectiveness of Video-Based Education on the Knowledge of Oral Health Maintenance and Tooth-Brushing Behavior Among the Students of the STM IX in Lurah Jambi

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### Abstract

**Background:** Adolescents are one of the groups with health problems. Based on the results of the Basic Health Research of the Ministry of Health (Riskesmas) in 2018, based on the presence of dental and oral health problems in the age group 15-24 (51.9%) and only those handled by health workers (8.7%), the data also shows, The prevalence of caries in the age group 15-24 years was (75.3%) with caries and (61.1%) with root caries. Video-based counseling can increase students' knowledge of dental and oral health maintenance. This study aimed to determine the effectiveness of video media on dental and oral health knowledge and tooth brushing behavior in students of STM IX Lurah Jambi in 2022.

**Method:** The type of research was Quasi-Experimental with a one-group pre-test and post-test design a-research measuring instrument using a questionnaire. The sample is class XI STM IX Lurah Jambi. The sampling technique used the total sampling method with the number of respondents 20 people. This study uses the paired t-test hypothesis test.

**Results:** The results showed that the level of knowledge of dental and oral health maintenance before counseling had low criteria (10%), moderate (80%), and (10%) high, and after counseling had high criteria (100%). At the same time, the level of tooth brushing behavior before counseling had low criteria. (5%), moderate (85%) and (10%) high, and after counseling, the criteria were high (100%). **Conclusion:** There is a significant difference between the level of knowledge of dental and oral health maintenance and tooth brushing behavior before and after being given counseling using video media with a p-value of 0.001 ( $p < 0.05$ ).

**Keywords:** Video, Knowledge, Behavior, Brushing teeth

### INTRODUCTION

Adolescence is a significant phase in human life as the transition from childhood into adulthood entails rapid physical, psychological, and socio-psychological changes affecting all facets of existence. In this period, it becomes imperative to underscore the significance of one's outward appearance in the social process (14).

The World Health Organization (WHO)(20) stated that high school students, particularly adolescents, are the appropriate group for implementing health promotion initiatives about oral health and its associated support structures. The act of tooth brushing is considered a pivotal success factor in the prevention and maintenance of optimal oral hygiene (13):

Adolescents have a moderate level

of oral and dental health, with 51 individuals (42,5%) falling into this category. Respondents with good knowledge are 48 individuals (40%), and those with poor knowledge are 21 (17,5%). A person's knowledge will determine their behavior regarding their health (15).

The health behavior of high school teenagers of Jambi can be assessed based on their knowledge regarding oral and dental health maintenance and their attitudes and behaviors in this regard. Most adolescents have a high level of knowledge about dental cavities, with approximately 55,9% falling into this category; this may be because teenagers

have access to a wealth of information on how to maintain oral and dental health through social media or from their respective parents (3).

Teenagers have a positive attitude towards dental decay at a rate of 79,7%. This indicates that most high school teenagers in Jambi believe dental issues can be prevented and treated. However, having a positive attitude is not necessarily supported by good behavior when caring for cavities, with a majority falling into the low category at 61,9%. Generally, the wider community says dental and oral health issues are not considered life-threatening diseases. Even though their knowledge and attitude towards dental cavities can be considered good, it does not motivate them to prioritize oral health care (3).

The distribution of questionnaires to high school students resulted in the absence of good behavior regarding oral and dental health maintenance, with 0 individuals (0%). Likewise, there were no instances of poor behavior (0%). Most respondents exhibited moderate behavior, with 36 individuals (100%). This behavior is likely due to a lack of knowledge about oral and dental health maintenance (10).

Before implementing dental and oral health education for high school students, it was found that 51,94% of the students had a fair level of knowledge about dental and oral health maintenance. After providing education through video media on dental and oral health maintenance, the majority of the students demonstrated a good level of knowledge, amounting to 94,11%. This research highlights that video media can enhance students' knowledge of dental and oral health (7).

## RESEARCH METHODS

This study was conducted in April 2022. It is a quantitative study employing a quasi-experimental design with a One Group Pretest Posttest design. Measurements were taken before (pre-test) and after (post-test) the intervention,

aiming to assess the effectiveness of the video media in improving dental and oral health knowledge and tooth brushing behavior among the students at STM IX Lurah Jambi. As a result, the treatment outcomes can be more accurately determined by comparing them to the pre-intervention conditions (6). This study was conducted in STM IX Lurah Jambi and performed in April 2022.

The sample of this study consisted of 20 students from the eleventh grade at STM IX Lurah Jambi who met the inclusion criteria. The sampling method is employed using total sampling, a technique where all population members are used as the sample. This is often done when the population is small, typically less than 30 individuals (16).

In this study, a questionnaire was used to measure respondents' knowledge of dental and oral health maintenance. It consisted of 15 questions, with a correct answer receiving a score of 1, and an incorrect answer receiving a score of 0. The scores were then transformed into a range from 0 to 100 using the formula: the total correct answers divided by the total number of questions multiplied by 100. Subsequently, the knowledge scores were categorized into three groups: a range of 0-33 as a low category, a range of 40-66 as a moderate category, and a range of 73-100 as a high category.

The measurement tool for tooth brushing behavior consisted of 18 statements, where 'Yes' was 1, and 'No' was 0. The obtained scores were then transformed into a range from 0 to 100 using the formula: the total correct responses divided by the total number of statements multiplied by 100. Subsequently, the behavior scores were categorized into three groups: a range of 0-33 as a low category, a range of 38-66 as a moderate category, and a range of 72-100 as a high category.

**RESULT**

**1. The Characteristics of Respondents**

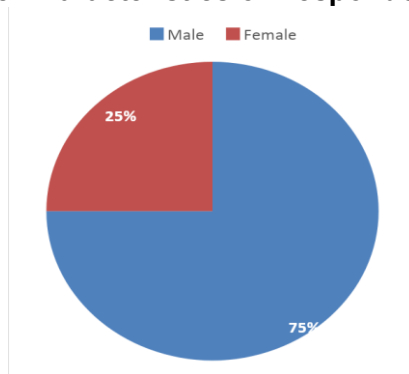


Table 1. The number of male students in eleventh grade at STM IX Lurah Jambi amounted to 15 individuals, accounting for 75% of the total, which was greater than the number of female students, totaling five individuals or 25%.

**2. Univariate Analysis**

**Table 1**  
**Assessment of Dental and Oral knowledge Levels Before and After Counseling Using Videos-Based Among Class XI Students at STM IX Jambi Lurah in 2022**

Behavior Categorise	Pre-test		Post-test	
High	2	10	20	100
Moderate	16	80	0	0
Low	2	10	0	0
<b>Total</b>	<b>20</b>	<b>100</b>	<b>20</b>	<b>100</b>

Based on Table 1, it is evident that the depiction of knowledge regarding dental and oral health maintenance before and after the video-based education among the eleventh-grade students at STM IX Lurah Jambi in 2022 was as follows: 2 respondents (10%) had low knowledge, 16 respondents (80%) had moderate knowledge, and two respondents (10%) had high knowledge. Subsequently, the knowledge of all students improved after the video-based education, with 20 respondents (100%) demonstrating high knowledge by answering the questionnaire correctly.

**Table 2**  
**Tooth-Brushing Behavior Before and After Video-Based Education**

Behavior Categories	Pre-Test		Post-Test	
	N	%	N	%
High	2	10	20	100
Moderate	17	85	0	0
Low	1	5	0	0
<b>Total</b>	<b>20</b>	<b>100</b>	<b>20</b>	<b>100</b>

Table 2 illustrates the tooth-brushing behavior of the respondents before receiving education through the video. One person (5%) exhibited low behavior, 17 individuals (85%) displayed moderate behavior, and two respondents (10%) had high behavior. Following the video-based education, the tooth-brushing behavior of all students significantly improved, with 20 individuals (100%) demonstrating high behavior.

**Table 1.3**  
**The Mean Values of the Frequency Distribution for Dental and Oral Health Knowledge, as well as Tooth Brushing Behavior Before and After Video-Based Education**

The Mean of the Knowledge Variable	Pre-Test Post-Test	
	8,25	13,35
<b>Difference</b>	<b>5,10</b>	

The Mean of the Behavior Variable	Pre-Test Post-Test	
	8,45	15,85
<b>Difference</b>	<b>7,40</b>	

Table 1.3 shows that the assessment of knowledge about dental and oral maintenance, as well as tooth brushing behavior, was conducted before and after video-based education among the eleventh-grade students at STM IX Lurah Jambi in 2022. In the pre-test phase for the knowledge variable, the initial mean was 8,25. After the educational intervention, the mean of post-test knowledge changed to 13,35, resulting in a difference of 5,10 between the pre-test and post-test scores.

As for the pre-test phase of the behavioral phase, the initial mean was 8,45, and after the intervention, the mean of the behavioral post-test changed to 15,85, resulting in a difference of 7,40 between the pre-test and post-test scores.

### 3. Bivariate Analysis

**Table 1.4**  
Kolmogorov-Smirnov Normality Test for Dental and Oral Health Maintenance Knowledge

Knowledge Variable	N	Sig.
<i>Pre-test</i> 20	0,893	
<i>Post-test</i> 20	0,137	

Based on Table 1.4 above, It is known that the result of the normality test on the knowledge variable before the intervention yielded a Sig value of 0,893, while after the intervention, the Sig value was 0,137. It can be concluded that both datasets follow a normal distribution.

**Table 1.5**  
Kolmogorov-Smirnov Normality Test for Tooth-Brushing Behavior

Behavioral Variable	N	Sig.
<i>Pre-test</i> 20	0,082	
<i>Post-test</i> 20	0,248	

Following Table 1.5, It is established that the result of the normality test for the behavioral variable before the video-based education yielded a Sig value of 0,082, while after the intervention, the Sig value was 0,248. It can be concluded that both datasets follow a normal distribution.

**Table 1.6**  
Paired T-Test for Dental and Oral Health Maintenance Knowledge Before and After Video-Based Education

Variable	Mean	P-Value
<i>Pre-test</i> 8,25		0,001
<i>Post-test</i> 13,35		

Table 1.6 shows that the mean score for dental and oral health maintenance

knowledge before the video-based education was 8,25. However, after education, it increased to 13,35. The statistical test results yielded a Sig value of 0,001 (p-value < 0,05), thus concluding that there is a significant difference in the level of knowledge regarding dental and oral health maintenance before and after video-based education. Therefore, the alternative hypothesis is accepted.

**Table 1.7**  
Paired T-Test for Tooth-Brushing Behavior Before and After Video-Based Education

Variable	Mean	P-Value
<i>Pre-test</i> 8,45		0,001
<i>Post-test</i> 15,85		

Table 1.7 shows that the average tooth-brushing behavior score before the video-based education among eleventh-grade students at STM IX Lurah Jambi was 8,45. In contrast, after the education, it improved to 15,85. The statistical test results yielded a Sig value of 0,001 (p-value < 0,05), thus concluding that there is a significant difference in the level of tooth-brushing behavior scores before and after the video-based education. Therefore, the alternative hypothesis is accepted.

## DISCUSSION

### A. Description of Dental and Oral Health Maintenance Knowledge Before and After Video-Based Education

Based on Table 1.1, it is noted that respondents with low-level knowledge amounted to 2 individuals (10%), those with moderate-level knowledge were 16 individuals (80%), and two individuals (10%) possessed high-level knowledge. Subsequently, after the video-based education, all students' knowledge improved, with 20 individuals (100%) achieving a high-level knowledge, correctly answering all 15 questions.

Following Table 1.3, the knowledge variable had an initial average of 8.25 for the pre-test phase. Following the

educational intervention, the post-test knowledge average increased to 13.35, resulting in a difference of 5.10 between the pre-test and post-test scores.

This research aligns with studies conducted among adolescents, revealing that some students had moderate-level knowledge prior to the dental and oral health education for high school students, accounting for 51,94%. Subsequently, after providing education through video media on dental and oral health maintenance, most students achieved good knowledge, reaching 94,11%. This study suggests that education through video media can enhance students' knowledge of dental and oral health maintenance (7).

## **B. Description Of Tooth-Brushing Behavior Before and After the Video-Based Education**

Based on Table 1.2, it is observed that respondents with low-level behavior accounted for one individual (5%), those with moderate-level behavior were 17 individuals (85%), and two individuals (10%) exhibited high-level behavior. However, after the video-based education, all students displayed improved tooth-brushing behavior, with 20 individuals (100%) now demonstrating high-level behavior.

As per Table 1.3, the behavior variable in the pre-test phase had an initial average of .45. Following the educational intervention, the post-test behavior average increased to 15.85, resulting in a difference of 7,40 between the pre-test and post-test scores.

This research aligns with similar studies conducted among the respondent group. Before receiving video-based education on tooth-brushing behavior, six individuals (25,0%) exhibited moderate-level behavior, 18 individuals (75,0%) had low-level behavior, and no respondents displayed good behavior. However, after the video-based education, all respondents demonstrated good tooth-

brushing behavior, with no individuals showing moderate or low behavior (5).

Health education is an activity based on learning principles, aiming to change knowledge and behavior among the public. These changes are directed toward achieving desired living conditions individually and collectively (17). Based on the data collected, it is evident that students' levels of knowledge and behavior showed improvement after participating in the education program compared to before.

The enhancement in students' knowledge and behavior, attributed to the audiovisual method or video media, is engaging. This media format presents educational content through tools that allow students to listen to or observe the materials directly, promoting in-depth understanding.

## **C. Effectiveness of Video-Based Education on Dental and Oral Health Maintenance Knowledge**

Table 1.6 shows that the Paired T-Test results yielded a Sig value of 0,001 (p-value < 0.05). Therefore, there is a significant difference in the Dental and Oral Health Maintenance Knowledge scores before and after video-based education, hence accepting the alternative hypothesis.

Another study also indicates a difference in measuring knowledge levels before and after Dental and Oral Health Maintenance Knowledge (PKG) using video media. Consequently, there is a substantial improvement from pre-test knowledge measurement scores to post-test scores, signifying the effectiveness of PKG using video media in enhancing students' knowledge levels (8).

Furthermore, other research suggests that an individual's knowledge about something can change and develop based on their abilities, experiential needs, and the extent of information mobility within their environment. This is because video media has the advantage of stimulating

motion effects, making it more engaging and facilitating cognitive, affective, and psychomotor understanding among students (18).

#### **D. Effectiveness of Video-Based Education on Tooth-Brushing Behavior**

Based on Table 1.7, it is known that the statistical test results yielded a Sig value of 0,001 ( $p$ -value < 0,05). It is concluded that there is a significant difference in tooth-brushing behavior level before and after education; hence, the alternative hypothesis is accepted.

The result of the study titled the impact of Health Education with Audiovisual Media on Clean and Healthy Living Behavior (PHBS) showed that health education with Audiovisual Media has an impact on clean and Healthy Living Behavior (PHBS) among students (2).

The choice of educational media is an essential factor as it can influence the effectiveness of educational activities. For instance, enhancing the public's knowledge, skills, and attitudes or behaviors is an outcome of a learning process within educational activities. The success of this process is significantly influenced by the effectiveness of media usage (9).

Using video media in learning can provide a more comprehensive, precise, diverse, engaging, and enjoyable learning experience (19). Video media falls under electronic educational media and possesses advantages such as engaging multiple senses, making it easier to comprehend, being more captivating due to audio and moving images, allowing face-to-face interaction, controllable presentation, wider reach, serving as a discussion tool, and permitting repetition (11). The use of video media requires supporting electronic equipment such as projectors, laptops, or video players, and, of course, a power source during usage.

Video media can also be utilized for nearly all topics, learning models, and

cognitive, affective, and psychomotor domains. Cognitively, watching videos can enhance students' understanding of instructional materials both before and after reading the materials. In the affective domain, videos can reinforce students' emotional elements and attitudes toward effective learning. In the psychomotor domain, videos excel in demonstrating how something works. Educational videos that record motor activities or movements allow students to observe and reevaluate these activities (1).

Video media has the advantage of stimulating motion effects, making it more engaging and facilitating cognitive, affective, and psychomotor understanding among students, even though video and flip chart media accompanied by lecture methods have the same concrete level. Both educational media engage the auditory and visual senses, enabling individuals to remember 50% of what is seen and heard. Additionally, the reach of providing Dental and Oral Health Maintenance Knowledge (PKG) using video media is relatively greater than flip chart media (12).

According to another study, it is revealed that instructional video media is efficacious in improving students' knowledge of dental and oral health maintenance as well as their behavior. The questionnaire results indicate this after providing instructional video media, where students could answer the questionnaire and fall into the effective category (4).

#### **CONCLUSION**

According to the result of the study that was done among eleventh-grade students at STM IX Lurah Jambi in 2022, it can be concluded that:

1. Description of dental and oral health maintenance knowledge before the video-based education showed a moderate level (80%). However, after providing video-based education to STM IX Lurah Jambi,

students' knowledge increased to a high level (100%).

2. Description of tooth-brushing behavior before the education also showed a moderate level (85%). Moreover, after providing video-based education to students at STM IX Lurah Jambi, tooth-brushing behavior among students improved to a high level (100%).
3. The effectiveness of video on dental and oral health maintenance knowledge among eleventh-grade students at STM IX Lurah Jambi in 2022, where the video education on dental and oral health maintenance was effective in enhancing students' knowledge, with the statistical test result yielded a Sig value of 0,001 (p-value < 0,05).
4. The effectiveness of the video on tooth-brushing behavior among eleventh-grade students at STM IX Lurah Jambi in 2022, where the video education on tooth-brushing behavior was influential in changing the students' behavior with a statistic test resulted in a Sig value of 0,001 (p-value < 0,05).

#### RECOMMENDATION

1. For STM IX Lurah Jambi  
Teachers can periodically present the video-based education method to enhance students' knowledge and behavior related to dental and oral maintenance knowledge and tooth-brushing behavior.
2. For the Dental Health Department  
It is desired that the Dental Health Department of the Poltekkes Kemenkes Jambi can collaborate with schools to regularly provide oral health services, particularly promotively, to enhance students' knowledge and behavior in both vocational or technical and high schools.
3. For Future Researchers  
Due to the limitations of the researchers, it is recommended for future researchers to develop studies on dental health further using

engaging and unique media.

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