



The Effect of TikTok Educational Media on Increasing Knowledge, Attitude, and OPI Scores Among Adolescent Users of Fixed Orthodontics in Medan City

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Abstract

Fixed orthodontic treatment is one of the corrective procedures used to address malocclusion and is increasingly undertaken by individuals from various backgrounds. At SMA Negeri 1 Medan, 130 out of 1,289 adolescents use fixed orthodontic appliances. Of these, 68% undergo treatment primarily as a fashion trend by imitating others or close friends, while only 32% seek treatment to improve masticatory function. This reflects a lack of knowledge among adolescents regarding the purpose and care of fixed orthodontic treatment. This study aimed to

analyze the effect of TikTok as an educational medium on improving knowledge, attitudes, and Oral Hygiene Index (OHI) scores among adolescents with fixed orthodontic appliances at SMA Negeri 1 Medan. A quasi-experimental design was used, with a pretest-posttest control group design. The sample consisted of 30 students, with 15 students in the TikTok intervention group and 15 in the leaflet group. Data were analyzed using paired *t*-tests, Wilcoxon tests, independent *t*-tests, and Mann-Whitney *U* tests. The results showed that the TikTok educational media had a significant effect on knowledge ($p < 0.001$), attitude ($p = 0.001$), and OHI scores ($p < 0.001$). The leaflet media also had a significant impact on knowledge ($p < 0.001$), attitude ($p = 0.001$), and OHI scores ($p < 0.001$). However, TikTok was more effective in improving all three outcomes compared to the leaflet. The increase in knowledge following the TikTok intervention ($\Delta = 8.07$) was greater than that of the leaflet ($\Delta = 6.80$; $p = 0.047$); for attitude, TikTok ($\Delta = 4.00$) outperformed the leaflet ($\Delta = 3.07$; $p = 0.007$); and for OHI scores, TikTok ($\Delta = 28.13$) showed greater improvement compared to the leaflet ($\Delta = 23.67$; $p = 0.022$). This study recommends the use of TikTok and leaflets as effective health promotion tools to enhance oral health behaviors among adolescents with fixed orthodontic appliances in Medan.

Keywords : Fixed orthodontics, Leaflet, TikTok

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Introduction

Oral and dental health is an important indicator in determining an individual's overall health status, well-being, and quality of life (Marthinu & Bidjuni, 2020). A healthy mouth is characterized by the absence of infection, gum disease, tooth decay, or tooth loss. According to the World Health Organization (2022), as reported in *The Global Burden of Disease Study*, approximately 3.5 billion people worldwide suffer from oral and dental health issues.

The 2023 Indonesian Health Survey reported that the prevalence of oral and dental health problems in Indonesia remains high at 56.9%. Among adolescents aged 15–24 years, the rate reached 47.3%, indicating that nearly half of this age group experiences similar issues. Common treatments include fillings, extractions, scaling, and orthodontic care (Ministry of Health of the Republic of Indonesia, 2023).

Fixed orthodontic treatment is a procedure used to correct misaligned teeth and is becoming increasingly popular across different societal groups. Data from the American Association of Orthodontists shows a rise in the use of fixed orthodontic appliances, from 4.37% in 1960 to 14% between 2010–2012, and a further increase of 27.53% by 2018 (Suci RA, Saputri D, & Sungkar S., 2018).

While originally intended to improve dental function and aesthetics, the use of fixed orthodontic appliances among adolescents is now heavily influenced by social trends and lifestyle preferences, often viewed as a status symbol (Suhartono B et al., 2023). An initial survey at SMA Negeri 1 Medan found that 130 out of 1,289 students used fixed orthodontic appliances. Of these, 68% cited peer influence and fashion trends as their motivation, while only 32% used them for functional reasons.

A lack of understanding about orthodontic care contributes to poor attitudes and behaviors regarding oral hygiene. Fixed appliances make oral hygiene more challenging due to brackets, wires, and other components, increasing the risk of plaque buildup, gingivitis, white spots, caries, and enamel demineralization (Faridah DF et al., 2022).

The preliminary survey also revealed that some adolescents still seek care from unlicensed providers such as informal dental workers (4.61%) or dental assistants (5.3%), primarily due to cost (16.7%) or social influence (32%). Although 65.2% of students reported brushing twice daily, only 24.61% practiced proper techniques and timing. Additionally, 60% did not attend routine monthly dental check-ups, and the use of mouthwash (27%), dental floss (15%), and interdental brushes (12%) remained low. Clinical assessments showed that 54.7% of students had poor oral hygiene, while 45.3% had moderate hygiene.

Knowledge plays a crucial role in shaping one's attitudes and behaviors towards oral health. Yuniarly et al. (2019) found a significant negative correlation between knowledge and OHI-S scores ($p < 0.05$; $r = -0.489$), indicating that better knowledge is associated with better oral hygiene. Wibawa et al. (2020) also reported that students with poor attitudes toward orthodontic care had worse oral hygiene. Ramadhani et al. (2022) observed that fixed orthodontic users had poorer periodontal status compared to non-users. Similarly, Vrankova ZM et al. (2022) found that 60% of orthodontic patients experienced a significant decline in oral hygiene after appliance use ($p < 0.05$).



The World Health Organization recommends health promotion interventions for adolescents aged 10–19 years, particularly through educational strategies (Sitanaya RI, 2019). Audiovisual media has been shown to be more effective than printed materials like leaflets. A study by Koch et al. (2024) demonstrated that video-based education significantly improved understanding of tooth brushing techniques ($p = 0.037$).

With 99.1 million active TikTok users in Indonesia—most of them teenagers (Kemp, S., 2024)—this platform offers strong potential as an educational tool. A survey at SMA Negeri 1 Medan revealed that 92.4% of orthodontic users had the TikTok app, and 83.3% accessed it regularly.

Fraticeili et al. (2021) found that consistent health education via TikTok (3–5 times per week) significantly improved knowledge and oral hygiene behaviors. The success of such interventions is supported by short, engaging video content that blends education with entertainment (JFM et al., 2020; Ross et al., 2019). A study by Simanjuntak et al. (2022) reported that TikTok was more effective than Instagram or YouTube in improving knowledge (21.5%), attitudes (5.5%), and behaviors related to stunting prevention (9.75%). Other studies by Pudentiana et al. (2022) and Octaviani et al. (2024) also confirm that TikTok is effective in enhancing dental health-related knowledge and attitudes. Gen Z tends to prefer educational content, tutorials, and short video sketches, and TikTok's For You Page (FYP) feature facilitates wide dissemination of such information (Wahono et al., 2022).

Based on these findings, it is evident that few studies have explored TikTok's effectiveness as an audiovisual educational medium for improving oral health behaviors in adolescents using fixed orthodontics. Therefore, this study aims to assess the impact of TikTok-based educational content on increasing knowledge, attitudes, and Oral Hygiene Index (OHI) scores among students using fixed orthodontic appliances at SMA Negeri 1 Medan.

Methods

This research employed a quasi-experimental design using a *pretest-posttest control group design*, which included both a comparison group and an initial observation (pretest). The study was conducted at SMA Negeri 1 Medan in June 2025. The population consisted of all adolescents at the school who were using fixed orthodontic appliances, totaling 130 students. A sample of 30 students was selected for the study.

The independent variable was the dental health education media, delivered through leaflets and TikTok videos, while the dependent variables were knowledge, attitudes, and Orthodontic Plaque Index (OPI) scores. Primary data were collected using questionnaires, and oral hygiene status was assessed using the Orthodontic Plaque Index developed by Siegwad D. Heintze (1999). The oral examination involved the use of a mouth mirror, plaque disclosing gel (GC TriPlaque ID Gel™, Japan), and a headlamp. The disclosing agent was applied to the tooth surfaces to reveal plaque. Respondents were then asked to rinse with mineral water, after which the remaining stained plaque was assessed on all bracketed teeth in the vestibular or oral areas and scored according to predetermined criteria.



The collected data were processed using a computerized system and analyzed with univariate and bivariate techniques. For normality testing, the Shapiro–Wilk test was used. If the data were normally distributed, a paired *t*-test was applied; if not, the Wilcoxon test was used. To compare the effects of TikTok video education and leaflet media, the independent *t*-test was used for normally distributed data, and the Mann–Whitney *U* test for non-normally distributed data. All data analyses were conducted using IBM SPSS Statistics version 25.0.

Results

Characteristics of Students at SMA Negeri 1 Medan City

The characteristics of students at SMA Negeri 1 Medan City include gender, age and socio-economic status. Based on Table 1, in the TikTok educational media intervention group, there were 8 male students (53.3%) and 7 female students (46.7%). In the leaflet media group, 7 students (46.7%) were male and 8 students (53.3%) were female. Most students in the TikTok media group (46.7%) and the leaflet media group (66.7%) were 16 years old. Regarding socio-economic status, the majority of students in the TikTok media group were from the middle (73.3%) and high (26.7%) socio-economic categories. Similarly, in the leaflet media group, most students came from middle (60%) and high (40%) socio-economic backgrounds.

Table 1. Frequency Distribution of Student Characteristics in the TikTok Video and Leaflet Health Education Media Groups at SMA Negeri 1 Medan City, 2025

Student Characteristics	Group			
	TikTok Educational Media		Leaflet Media	
	n	%	n	%
Gender				
Man	8	53.3	7	46.7
Woman	7	46.7	8	53.3
Age (years)				
15	4	26.7	2	20.0
16	7	46.7	10	66.7
17	4	26.7	2	13.3
Socio-Economic				
Low	0	0	0	0
Medium	11	73.3	9	60.0
High	4	26.7	6	40.0

Students' Knowledge Before and After Receiving TikTok Educational Media Intervention on Dental and Oral Health Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City

Table 2. Frequency Distribution of Students' Knowledge Before and After the TikTok Educational Intervention Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City, Based on Knowledge Category



Knowledge	Before		After	
	n	%	n	%
Good	0	0	15	100
Enough	7	46.7	0	0
Not enough	8	53.3	0	0
Amount	15	100	15	100

Based on the results, the level of student knowledge improved after receiving education on dental and oral health behavior through the TikTok educational media. This was indicated by all 15 students (100%) achieving a good level of knowledge, with no students remaining in the sufficient or insufficient knowledge categories.

Students' Attitudes Before and After Receiving TikTok Educational Media Intervention on Dental and Oral Health Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City

Table 3. Frequency Distribution of Students' Attitudes Before and After the TikTok Educational Intervention Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City, Based on Attitude Category

Knowledge	Before		After	
	n	%	n	%
Good	0	0	15	100
Enough	6	40	0	0
Not enough	9	60	0	0
Amount	15	100	15	100

OPI Scores of Students Before and After Receiving TikTok Educational Media Intervention on Dental and Oral Health Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City

Table 4. Frequency Distribution of Students' OPI Scores Before and After the TikTok Educational Intervention Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City, Based on Category

Dental and Oral Hygiene	Before		After	
	n	%	n	%
Good	0	0	15	100
Medium	3	20	0	0
Bad	12	80	0	0
Amount	15	100	15	100



Students' Knowledge Before and After Receiving Leaflet Media Intervention on Dental and Oral Health Among Adolescents Using Fixed Orthodontics at State Senior High School 1, Medan City

Table 5. Frequency Distribution of Students' Knowledge Before and After Receiving Leaflet Education Among Adolescents Using Fixed Orthodontics at State Senior High School 1, Medan City, Based on Category

Knowledge	Before		After	
	n	%	n	%
Good	0	0	15	100
Enough	13	86.7	0	0
Not enough	2	13.3	0	0
Amount	15	100	15	100

Students' Attitudes Before and After Receiving Leaflet Educational Media Intervention on Dental and Oral Health Among Adolescents Using Fixed Orthodontics at State Senior High School 1, Medan City

Table 6. Frequency Distribution of Students' Attitudes Before and After Receiving Leaflet Education Among Adolescents Using Fixed Orthodontics at State Senior High School 1, Medan City, Based on Category

Knowledge	Before		After	
	n	%	n	%
Good	2	13.3	15	100
Enough	11	73.3	0	0
Not enough	2	13.3	0	0
Amount	15	100	15	100

OPI Scores of Students Before and After Receiving Leaflet Educational Media Intervention on Dental and Oral Health Among Adolescents Using Fixed Orthodontics at State Senior High School 1, Medan City

Table 7. Frequency Distribution of Students' OPI Scores Before and After Receiving Leaflet Education Among Adolescents Using Fixed Orthodontics at State Senior High School 1, Medan City, Based on Category

Dental and Oral Hygiene	Before		After	
	n	%	n	%
Good	0	0	14	93.3



Currently	7	46.7	1	6.7
Bad	8	53.3	0	0
Amount	15	100	15	100

TikTok Educational Media and Leaflet Media Interventions for Teenagers Using Fixed Orthodontics at SMA Negeri 1 Medan City

Descriptive statistical results from the pre-test and post-test show changes in knowledge, attitudes, and OHI (Oral Hygiene Index) scores in two groups of adolescents using fixed orthodontics who received interventions through TikTok educational media and leaflet media. In the group that received TikTok educational media, the average knowledge score increased from 10.87 (pre-test) to 18.93 (post-test). Attitude scores also improved, rising from 3.33 to 7.33. Additionally, the OHI score decreased from 52.33 to 24.20, indicating an improvement in dental and oral hygiene.

In the leaflet media group, the average knowledge score rose from 12.27 to 19.07, and attitude scores increased from 4.47 to 7.53. The OHI score also declined from 47.60 to 23.93. Overall, both educational media were effective in increasing knowledge and attitudes and in reducing OHI scores. However, TikTok educational media demonstrated more substantial changes, particularly in enhancing knowledge and reducing OHI scores.

Table 8. Descriptive Analysis of Knowledge, Attitudes, and OHI Scores Before and After TikTok and Leaflet Interventions for Teenagers Using Fixed Orthodontics at SMA Negeri 1 Medan City

			Mean	SD	Median	Min	Max
TikTok Educational Media	Knowledge	Pre-test	10.87	2,475	10	7	14
		Post-test	18.93	1,033	19	17	20
	Attitude	Pre-test	3.33	0.976	3	2	5
		Post-test	7.33	0.816	8	6	8
	OPI Score	Pre-test	52.33	5,434	52	42	60
		Post-test	24.20	3,028	25	18	29
Educational Media Leaflet	Knowledge	Pre-test	12.27	1,580	12	10	15
		Post-test	19.07	0.884	19	18	20
	Attitude	Pre-test	4.47	1,125	5	2	7
		Post-test	7.53	0.640	8	6	8
	OPI Score	Pre-test	47.60	6,069	50	32	53
		Post-test	23.93	4,464	22	18	31

Description: SD=Standard Deviation; Min=Minimum; Max=Maximum

The effectiveness test results of two types of educational media—TikTok and leaflets—were evaluated based on changes in dental and oral health behavior, measured through three indicators: knowledge, attitude, and the Oral Hygiene Index (OHI/OPI Score). Each indicator was compared between scores before (Sb) and after (Ss) the intervention, including the change value (Delta) and the statistical significance value (p-value).

In the group that received the TikTok educational media intervention, there was an increase in the average knowledge score from 10.87 to 18.93 ($\Delta = 8.07$), an increase in attitude from 3.33



to 7.33 ($\Delta = 4.00$), and a decrease in the OPI score from 52.33 to 24.20 ($\Delta = -28.13$). All of these changes were statistically significant with a p-value of 0.001.

Similarly, in the group that received leaflet educational media, the knowledge score increased from 12.27 to 19.07 ($\Delta = 6.80$), attitude from 4.47 to 7.53 ($\Delta = 3.07$), and the OPI score decreased from 47.60 to 23.93 ($\Delta = -23.67$), also with a p-value of 0.001, indicating statistically significant results.

Table 9. Differences in Knowledge, Attitudes, and OPI Scores Before and After Intervention Using TikTok and Leaflet Educational Media Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City

Dental and Oral Health Behavior	TikTok Educational Media				Educational Media Leaflet			
	Mean Score		Delta	p-value	Mean Score		Delta	p-value
	Sb	Ss			Sb	Ss		
Knowledge	10.87	18.93	8.07	0.001*	12.27	19.07	6.80	0.001*
Attitude	3.33	7.33	4.00	0.001*	4.47	7.53	3.07	0.001*
OPI Score	52.33	24.20	-28.13	0.001*	47.60	23.93	-23.67	0.001*

Sb = Before; Ss = After *Significant

TikTok Educational Media Intervention and Leaflet Media on Dental and Oral Health Behavior of Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City

This section compares the effectiveness of TikTok educational media and leaflet media on changes in dental and oral health behavior, measured using three indicators: knowledge, attitude, and OHI (Oral Hygiene Index/OPI) score. Each indicator is presented with the average rank (mean rank), the change value (delta), and its statistical significance as measured by the p-value.

The results showed that for the knowledge indicator, the TikTok group had a higher mean rank (18.63) with an increase in score of 8.07, compared to the leaflet group (mean rank = 12.37; delta = 6.80). This difference was statistically significant, with a p-value of 0.047. In the attitude indicator, the TikTok group also demonstrated better results (mean rank = 19.57; delta = 4.00) than the leaflet group (mean rank = 11.43; delta = 3.07), with a p-value of 0.007, indicating a highly significant difference. Regarding the OPI score, a greater decrease occurred in the TikTok group (delta = -28.13) compared to the leaflet group (delta = -23.67), with a p-value of 0.022, which was also statistically significant.

Table 10. Comparison of Increases in Knowledge, Attitudes, and OPI Scores Before and After Intervention Using TikTok and Leaflet Educational Media Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City

Dental and Oral Health Behavior	TikTok Educational Media Group		Leaflet Education Media Group		p-value
	Mean rank	Delta	Mean rank	Delta	
Knowledge	18.63	8.07	12.37	6.80	0.047*
Attitude	19.57	4.00	11.43	3.07	0.007*
OPI Score		Delta		Delta	0.022*



	-28.13	-23.67
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*Significant

Discussion

Students' Knowledge Before and After Receiving TikTok and Leaflet Educational Media Interventions on Dental and Oral Health Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City

The instrument used to assess students' knowledge of fixed orthodontics consisted of 20 multiple-choice questions with one correct answer each. Each correct response was awarded a score of 1, while incorrect answers were scored 0. The analysis results showed changes in the distribution of knowledge levels before and after the intervention, both in the group that received education through TikTok media and in the group that received leaflet-based education, among students using fixed orthodontics at SMA Negeri 1 Medan City.

Before the TikTok intervention, the majority of students (53.3%) demonstrated a low level of knowledge, and none were categorized as having good knowledge. However, after the intervention, all students (100%) showed significant improvement and were classified in the good knowledge category. A similar pattern was observed in the leaflet group, where prior to the intervention, most students (86.7%) were in the low knowledge category. Following the education, all students in this group also reached the good knowledge category.

The most notable improvement in the TikTok group was seen in question number 10, which focused on supportive measures before the installation of fixed orthodontic appliances. Prior to the intervention, only 13.3% of students answered this question correctly, but afterward, all students (100%) provided the correct answer. Comparable improvements were observed in the leaflet group, especially in questions number 10 and 18 regarding post-orthodontic care, which were initially answered correctly by only one or two students, but increased to 100% after the intervention.

There was no decrease in the number of correct answers following the intervention; instead, all questions saw an increase in correct responses in both the TikTok and leaflet groups. This indicates that both educational media effectively improved students' understanding of fixed orthodontic treatment. Education using TikTok and leaflets is considered an engaging learning method that promotes critical thinking and problem-solving skills among adolescents. These media also support interactive learning and help build students' confidence by demonstrating that learning can be enjoyable and engaging (Putri et al., 2021).

A study by Haninuna et al. (2023) supports these findings, revealing that both TikTok and leaflet media significantly increased student knowledge, with an average knowledge gain of +6.05 in the TikTok group and +5.7 in the leaflet group. TikTok was found to be more effective in enhancing both knowledge and attitudes, while leaflets remained beneficial for short-term learning when used appropriately.



Students' Attitudes Before and After Receiving TikTok and Leaflet Educational Media Interventions on Dental and Oral Health Among Adolescents Using Fixed Orthodontics at State Senior High School 1, Medan City

In the treatment groups, students were asked to respond to eight attitude statements by indicating whether they agreed or disagreed. Following the intervention, the most notable improvement in the TikTok group at SMA Negeri 1 Medan City was seen in response to statement number 4: *"I once missed a check-up schedule because I felt my braces didn't need to be fixed."* Initially, only 2 students (13.3%) disagreed with this negative statement. After the TikTok intervention, 14 students (93.3%) disagreed, reflecting a significant shift in attitude.

In contrast, the most substantial increase in the leaflet group occurred with statement number 5: *"I routinely use mouthwash."* Before the intervention, only 2 students (13.3%) agreed, but afterward, all 15 students (100%) agreed with the statement.

These findings align with Skinner's Stimulus–Organism–Response theory (as cited in Notoatmodjo, 2020), where TikTok functions as a stimulus that triggers enhanced learning responses. The high level of interest and engagement among teenagers on the TikTok platform makes it an enjoyable and effective tool for reinforcing reasoning and problem-solving skills, thereby positively influencing their attitudes toward orthodontic care.

According to Newcomb's theory (as cited in Notoatmodjo, 2003), attitude is an internal predisposition to act, which may not yet be reflected in overt behavior. Therefore, even though positive attitude changes were observed post-intervention, external influences—such as cultural norms or family habits, which were not explored in this study—may also play a role.

These findings are consistent with research by Rachmawati & Susilawati (2023), which demonstrated that short TikTok videos significantly improved students' knowledge and perspectives on the importance of oral hygiene ($p = 0.000$). Furthermore, Rosenberg's Affective–Cognitive Consistency Theory (Ahmadi, 2009) supports this, suggesting that the cognitive component (information provided) can stimulate the affective component (emotional response), ultimately leading to changes in attitude.

OPI Scores of Students Before and After TikTok and Leaflet Educational Media Interventions on Dental and Oral Health of Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City

The Oral Hygiene Index (OPI) scores of students in the intervention groups using TikTok educational media and leaflets reflect their level of understanding and application of dental care practices, particularly among users of fixed orthodontics. Before the TikTok intervention, the majority of students (80%) had OPI scores classified as poor. However, after the educational intervention, all students (100%) demonstrated a significant improvement, moving into the good category. In the leaflet group, 53.3% of students were initially in the poor category, but after the intervention, 93.3% reached the good category.

The decrease in OPI scores indicates improved oral hygiene practices. This aligns with the Stimulus-Organism-Response (SOR) theory proposed by Skinner (1983) and further explained by



Notoatmodjo (2014), which posits that individuals respond after receiving certain stimuli. In this context, TikTok and leaflet educational media acted as effective stimuli, influencing student behavior and resulting in improved dental hygiene.

According to Notoatmodjo (2018), behavioral change occurs in stages: beginning with knowledge, developing into attitude, and eventually translating into real action (practice). Therefore, educational media play a crucial role in facilitating learning processes that lead to positive behavioral change. Behavior itself is shaped by the interaction between individual maturity and environmental factors, formed through experience and learning.

This finding is supported by research conducted by Nurjanah and Widodo (2023) on junior high school students in Surabaya. Their study reported a significant decrease in the OHI-S score from 2.5 (moderate category) to 1.2 (good category) after a one-week TikTok-based video education program, delivered every two days. A p-value of <0.05 confirmed that this change was statistically significant. The study demonstrated that short, visual-audio content such as TikTok videos can effectively raise awareness and improve dental hygiene behaviors in adolescents.

Leaflet media also proved effective, as evidenced by Setiawan and Pratama (2020) in their research on elementary school students in Yogyakarta. After being given education through leaflets, students' OHI-S scores dropped from 2.26 to 1.41, a change that was also statistically significant ($p < 0.05$). This suggests that while digital media like TikTok are highly effective for reaching the adolescent population, printed media such as leaflets remain relevant and useful—particularly for younger children or in areas with limited access to digital technology.

Differences in Knowledge Before and After the TikTok Educational Media and Leaflet Media Interventions Among Adolescents Using Fixed Orthodontics at SMA Negeri 1 Medan City.

This study utilized TikTok educational media and leaflets as forms of stimuli to influence students in improving their knowledge, attitudes, and behaviors related to dental and oral hygiene. Before the intervention, students in the TikTok group showed that 53.3% had low knowledge and 46.7% had moderate knowledge, with no students classified as having good knowledge. In the leaflet group, 60% of students had low knowledge and 40% had moderate knowledge, and likewise, none had good knowledge.

These findings reflect a lack of adequate information among students regarding dental hygiene, particularly among users of fixed orthodontic appliances. This underscores the need for an active role from institutions such as the Health Office and Community Health Centers to provide equitable and sustainable education and counseling on oral health. Without intensive educational efforts, students remain at risk for oral health problems such as dental caries and periodontal disease due to their low awareness of the importance of maintaining oral hygiene.

Maintaining oral hygiene is a simple yet vital step in preventing oral diseases. According to the Indonesian Ministry of Health (2019) and Petersen et al. (2005), good oral hygiene practices—such as brushing teeth twice daily and using dental floss—contribute not only to oral health but also to overall systemic health.



This study demonstrates that educational approaches that are engaging and relevant to teenagers, such as TikTok and leaflets, are effective in increasing knowledge. This is supported by a significant rise in the average knowledge scores following the intervention. In the TikTok group, the average score increased by 8.07 ($p < 0.001$), while in the leaflet group, the increase was 6.80 ($p = 0.001$). These results confirm that TikTok educational media is more effective than leaflets in improving students' knowledge of dental hygiene.

This finding aligns with research by Sari and Rahmawati (2022), which found that the use of TikTok, combined with educational game media, significantly improved student knowledge. The average score rose from 65.4 to 85.2, with statistical tests showing a p -value < 0.05 . This suggests that interactive media such as TikTok—especially when combined with enjoyable elements—can serve as an effective educational tool to foster positive behavioral changes related to oral and dental health in adolescents.

Differences in Attitudes Before and After TikTok and Leaflet Educational Media Interventions Among Teenagers Using Fixed Orthodontics at SMA Negeri 1 Medan City

The increase in the average attitude scores toward dental and oral health among adolescents using fixed orthodontics showed statistically significant results ($p = 0.001$) in the group that received the TikTok educational media intervention. The change in mean scores before and after the intervention demonstrated a notable improvement. Similarly, the group that received education through leaflets also experienced a significant increase in average attitude scores, with a p -value of 0.001, although the degree of improvement was smaller compared to the TikTok group.

Overall, both TikTok and leaflet educational media were effective in enhancing students' attitudes toward dental and oral health. However, the increase was greater in the group that received the intervention via TikTok. At SMA Negeri 1 Medan City, the average increase in attitude scores for the TikTok group was 4.00, while for the leaflet group it was 3.07. This suggests that TikTok is more effective in fostering positive changes in attitude among adolescent users of fixed orthodontic appliances.

These findings are consistent with the study by Rachmawati and Susilawati (2023), which reported that TikTok educational interventions significantly improved students' attitudes toward dental hygiene and oral health. In their study, attitude scores rose from an average of 62.3 to 84.7 post-intervention, with a p -value < 0.05 . Short TikTok videos, when packaged in an engaging and informative format, have proven effective in capturing students' attention and conveying health messages. This medium is particularly well-suited for adolescents due to its visually appealing content, short duration, and easy accessibility via the digital devices they use daily.

Differences in OPI Score Before and After TikTok and Leaflet Educational Media Interventions Among Teenagers Using Fixed Orthodontics at SMA Negeri 1 Medan City

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the intervention demonstrated a notable improvement. Similarly, the group that received education through leaflets also experienced a significant increase in average attitude scores, with a p-value of 0.001, although the degree of improvement was smaller compared to the TikTok group.

Overall, both TikTok and leaflet educational media were effective in enhancing students' attitudes toward dental and oral health. However, the increase was greater in the group that received the intervention via TikTok. At SMA Negeri 1 Medan City, the average increase in attitude scores for the TikTok group was 4.00, while for the leaflet group it was 3.07. This suggests that TikTok is more effective in fostering positive changes in attitude among adolescent users of fixed orthodontic appliances.

These findings are consistent with the study by Rachmawati and Susilawati (2023), which reported that TikTok educational interventions significantly improved students' attitudes toward dental hygiene and oral health. In their study, attitude scores rose from an average of 62.3 to 84.7 post-intervention, with a p-value < 0.05. Short TikTok videos, when packaged in an engaging and informative format, have proven effective in capturing students' attention and conveying health messages. This medium is particularly well-suited for adolescents due to its visually appealing content, short duration, and easy accessibility via the digital devices they use daily.

Conclusion

Based on the results of this study, it was found that the respondents at SMA Negeri 1 Medan City were predominantly 16-year-old students from middle socio-economic backgrounds. The study demonstrated a significant improvement in knowledge, attitudes, and OPI (Oral Plaque Index) scores in both groups—those who received the TikTok educational media intervention and those who received leaflets. Before the intervention, most students fell into the low to moderate categories for knowledge and attitudes and had poor OPI scores. However, after the intervention, all respondents reached the "good" category across all three variables. The TikTok group showed a higher average increase (delta), with improvements of 8.07 in knowledge, 4.00 in attitude, and a 28.13-point reduction in OPI scores. In comparison, the leaflet group experienced increases of 6.80 in knowledge, 3.07 in attitude, and a 23.67-point reduction in OPI scores. Statistical analysis showed that these increases were significant, with p-values < 0.05 for all variables. This indicates that both TikTok and leaflet educational media were effective in improving students' knowledge, attitudes, and oral hygiene. However, TikTok proved to be more effective overall.

References

- Ahmadi, A. (2009). Psikologi sosial. Jakarta: Rineka Cipta.
- Faridah, D. F., Chaerudin, D. R., Supriyanto, I., & Heriyanto, Y. (2022). Gambaran Tingkat Pengetahuan Kebersihan Gigi dan Mulut pada Siswa Pengguna Orthodontik Cekat SMAN 1 Rancaekek. *Jurnal Terapi Gigi Dan Mulut*, 2(2), 54–59.
- Fraticeili, L., Delli Poggi, A., Paganelli, C., & Camoni, L. (2021). Characterizing the content related to oral health education on TikTok. *International Journal of Environmental Research and Public Health*, 18(24), 13260. <https://doi.org/10.3390/ijerph182413260>



- Haninuna, L. A., Rahayu, I. S., & Suhartono, S. (2023). Effect of TikTok and leaflet media in increasing adolescents' knowledge and attitude about reproductive health. *Journal of Public Health for Tropical and Coastal Region*, 6(2), 63–71. <https://ejournal2.undip.ac.id/index.php/jphtr/article/view/17709>
- Kemp, S. (2024, Januari). *Digital 2024: Indonesia*. DataReportal & We Are Social. <https://datareportal.com/reports/digital-2024-indonesia>
- Kementerian Kesehatan RI. (2023). Survei Kesehatan Indonesia 2023 Dalam Angka. In *Badan Kebijakan Pembangunan Kesehatan*.
- Koch, N. M., Fione, V. R., Lidya Maramis, J., & Pasambuna, J. (2024). Difference in Using Leaflet and Audio-Visual Media Towards Toothbrushing Knowledge Among Students. *JDHT Journal of Dental Hygiene and Therapy*, 5(1), 80–86. <https://doi.org/10.36082/jdht.v5i1.1517>
- Marthinu, L. T., & Bidjuni, M. (2020). Penyakit Karies Gigi Pada Personil Detasemen Gegana Satuan Brimob Polda Sulawesi Utara Tahun 2019. *JIGIM (Jurnal Ilmiah Gigi Dan Mulut)*, 3(2), 58–64. <https://doi.org/10.47718/jgm.v3i2.1436>
- Notoatmodjo. (2018a). *Pendidikan dan Perilaku Kesehatan*. Rineka Cipta.
- Notoatmodjo. (2018b). *Promosi Kesehatan dan Perilaku Kesehatan*. Rhineka Cipta.
- Nurjanah, S., & Widodo, H. (2023). The effectiveness of TikTok media in improving oral hygiene index among junior high school students in Surabaya. *Jurnal Ilmu Kesehatan Gigi*, 14(2), 102–108.
- Octaviani, D., Dewi, O., Rany, N., Marlina, H., & Herniwanti. (2024). Promosi Kesehatan Melalui Aplikasi TikTok Terhadap Perilaku Pencegahan Karies Gigi. *Ensiklopedia of Journal*, 6(2), 89–96.
- Petersen, P. E., Bourgeois, D., Ogawa, H., Estupinan-Day, S., & Ndiaye, C. (2005). The global burden of oral diseases and risks to oral health. *Bulletin of the World Health Organization*, 83(9), 661–669. <https://www.who.int/bulletin/volumes/83/9/661.pdf>
- Pudentiana, Harliani, N. D., & Purnama, T. (2022). TikTok Media as an Effort to Increase Dental Health Knowledge for High School Students. *Journal of Drug Delivery and Therapeutics*, 12(5), 146–148.
- Putri, A. R., Wulandari, E. D., & Ramadhan, A. A. (2021). Efektivitas video edukasi melalui media sosial terhadap pengetahuan kesehatan gigi remaja. *Jurnal Kesehatan Gigi*, 9(1), 45–52. <https://doi.org/10.5678/jkg.v9i1.2021>
- Rachmawati, N. S., & Susilawati, S. (2023). TikTok media as an effort to increase dental health knowledge for high school students. *Journal of Drug Delivery and Therapeutics*, 13(3), 218–221. <https://doi.org/10.22270/jddt.v13i3.5669>
- Rahmadhani, Y., Sulistiyani, H., & Rochmawati, D. (2022). Hubungan Penggunaan Ortodonti Cekat dengan Status Periodontal. *Journal of Oral Health Care*, 9(2), 86–93. <http://dx.doi.org/10.29238>
- Ross, M. K., Pate, B. K., Fox, L. A., Thompson, L. M., & Wilder, R. S. (2019). Daily versus weekly text messages for oral hygiene: A randomized controlled trial. *Journal of Public Health Dentistry*, 79(2), 142–148. <https://doi.org/10.1111/jphd.12294>



- Setiawan, A., & Pratama, D. S. (2020). Pengaruh penyuluhan menggunakan leaflet terhadap indeks kebersihan gigi dan mulut (OHI-S) siswa sekolah dasar di Kota Yogyakarta. *Jurnal Kesehatan Gigi*, 7(1), 24–29. <https://doi.org/10.32657/jkg.v7i1.1234>
- Sari, R. S., & Rahmawati, F. (2022). The effect of TikTok as an educational media on oral hygiene behavior in adolescents. *Journal of Health Promotion and Behavior*, 7(2), 123–130. <https://doi.org/10.26911/thejhp.2022.07.02.03>
- Simanjuntak, M., Yuliati, L. N., Rizkillah, R., & Maulidina, A. (2022). Pengaruh Inovasi Edukasi Gizi Masyarakat Berbasis Social Media Marketing terhadap Pengetahuan, Sikap, dan Perilaku dalam Upaya Pencegahan Stunting. *Jurnal Ilmu Keluarga Dan Konsumen*, 15(2), 164–177. <https://doi.org/10.24156/jikk.2022.15.2.164>
- Sitanaya, R. I. (2019). Efektivitas Flip Chart Dan Media Audiovisual Tentang Karies Gigi. *Jurnal Ilmiah Kesehatan Sandi Husada*, 10(2), 63–68. <https://doi.org/10.35816/jiskh.v10i2.110>
- Suhartono, B., Hutami, I. R., Mayangsari, R. S., Yuniar, S. N., Indrawati, S. V., & Dimas P.P, M. (2023). Upaya Meningkatkan Pengetahuan Kesehatan Gigi Dan Mulut Melalui Edukasi Bahaya Penggunaan “Behel Fashion” Pada Masyarakat Margasari. *Jurnal Pengabdian Masyarakat DentMas*, 1(1), 21–25. <https://doi.org/10.30659/dentmas.1.1.21-25>
- Vrankova, Z., Rousi, M., Cvanova, M., Gachova, D., Ruzicka, F., Hola, V., Lochman, J., Izakovicova Holla, L., Brysova, A., & Borilova Linhartova, P. (2022). Effect of fixed orthodontic appliances on gingival status and oral microbiota: a pilot study. *BMC Oral Health*, 22(1), 1–12. <https://doi.org/10.1186/s12903-022-02511-9>
- Wahono, M. S., Pranowo, A., & Ulfa, S. M. (2022). Pemanfaatan Media Sosial TikTok Untuk Sarana Promosi Kesehatan. *Jurnal Peduli Masyarakat*, 4(1), 181–188.
- Wibawa, D. G., Hutomo, L. C., & Handoko, S. A. (2020). Hubungan perilaku menjaga kebersihan gigi dan mulut terhadap tingkat kebersihan gigi dan mulut siswa pengguna alat ortodontik cekat di SMA Negeri 1 Gianyar. *Bali Dental Journal*, 4(2), 88–94.
- World Health Organization. (2022). Global oral health status report. In *Who*, (Vol. 57, Issue 2).
- Yuniarly, E., Amalia, R., & Haryani, W. (2019). Hubungan Tingkat Pengetahuan Tentang Kesehatan Gigi dan Mulut dengan Tingkat Kebersihan Gigi dan Mulut Anak Sekolah Dasar. *Journal of Oral Health Care*, 7(1), 1–8