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The Use of TikTok Media on the Knowledge of Dental and Oral Hygiene among Students of SMAN 1 Porong

Nur Fauziyah, Imam Sarwo Edi, Siti Fitria Ulfah, and Silvia Prasetyowati

Department of Dental Health, Poltekkes Kemenkes Surabaya, Surabaya, Indonesia

Corresponding author: Nur Fauziyah (e-mail: ziyahfau91@gmail.com)

ABSTRACT Oral and dental hygiene remains a significant public health concern among adolescents, largely due to inadequate knowledge and limited exposure to effective health education. Preliminary findings at SMAN 1 Porong indicated that 50% of students exhibited poor plaque indices, reflecting insufficient awareness of proper oral hygiene practices. This study aimed to evaluate the effectiveness of TikTok-based educational media in improving students' knowledge of oral and dental hygiene. A quasi-experimental design with a one-group pretest–posttest approach was employed. A total of 52 tenth-grade students were selected using simple random sampling. Data were collected through a structured questionnaire distributed via Google Forms before and after the intervention. The educational intervention consisted of delivering oral health content through TikTok media. Data analysis was conducted using the Wilcoxon Signed-Rank Test to assess differences in knowledge scores before and after the intervention. The results demonstrated a substantial improvement in students' knowledge following the intervention. Prior to education, 96% of respondents were categorized as having low knowledge, whereas after the intervention, 88% achieved a good knowledge level. Statistical analysis revealed a significant difference between pretest and posttest scores ($p = 0.000$; $p < 0.05$), indicating the effectiveness of TikTok as an educational medium. In conclusion, TikTok-based health education significantly enhances adolescents' knowledge of oral and dental hygiene. The findings suggest that integrating social media platforms into health promotion strategies can serve as an innovative and engaging approach to improve health literacy among students. Future research is recommended to explore the long-term impact of such interventions and to compare the effectiveness of different digital media platforms.

INDEX TERMS Oral Health, Dental Hygiene, TikTok Media, Health Education, Adolescent Knowledge

I. INTRODUCTION

Oral and dental health is a fundamental component of overall well-being, particularly among adolescents who are undergoing a critical developmental phase characterized by rapid physical and psychological changes. Despite its importance, oral health problems remain prevalent due to inadequate knowledge, poor hygiene practices, and limited exposure to effective health education. Previous studies have shown that low oral health literacy among adolescents is strongly associated with increased risks of plaque accumulation, dental caries, and periodontal diseases [1], [2]. In Indonesia, school-based dental health programs are often limited to curative services such as dental examinations, with insufficient emphasis on preventive education, resulting in suboptimal awareness and behavior among students [3].

The advancement of digital technology has significantly transformed the delivery of health education, particularly through social media platforms. Adolescents are among the most active users of digital media, making these platforms highly relevant for health promotion strategies. Studies have demonstrated that digital interventions, including mobile applications, videos, and online campaigns, can effectively improve knowledge and influence positive health behaviors [4]–[6]. In the field of oral health, platforms such as YouTube and Instagram have been successfully used to enhance understanding of proper toothbrushing techniques and preventive care practices [7], [8]. Furthermore, social media-based education has been shown to increase engagement and knowledge retention due to its interactive and visually appealing nature [9], [10].

Among these platforms, TikTok has emerged as one of the fastest-growing applications, particularly among adolescents. Its short-form video format allows for concise and engaging delivery of educational content, making it a promising medium for health communication. Recent studies indicate that TikTok can effectively improve knowledge and awareness in various health domains, including hygiene practices and healthy lifestyles [11]–[13]. The platform's algorithm-driven content distribution also enhances the reach and accessibility of health information, enabling rapid dissemination among target audiences [14].

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However, several limitations remain in the existing literature. First, most previous studies focus on general social media platforms without specifically evaluating TikTok as a distinct educational tool. Second, many studies adopt cross-sectional or descriptive designs, limiting their ability to establish causal relationships between interventions and outcomes [5], [8]. Third, there is a lack of empirical evidence in the Indonesian context, particularly in high school settings, regarding the effectiveness of TikTok-based oral health education [15], [16]. These gaps highlight the need for experimental studies that assess the impact of TikTok interventions on students' knowledge.

Therefore, this study aims to evaluate the effectiveness of TikTok media in improving knowledge of oral and dental hygiene among students of SMAN 1 Porong using a quasi-experimental one-group pretest–posttest design. This research seeks to provide empirical evidence on the role of digital media in enhancing adolescent health literacy and promoting preventive behaviors [17].

This study offers several contributions. First, it provides empirical evidence on the effectiveness of TikTok as an innovative educational medium for oral health promotion. Second, it contributes to the development of digital-based health education strategies tailored to adolescent characteristics. Third, it supports the integration of social media into school-based health programs to improve knowledge and preventive behaviors [18]–[20].

The structure of this article is organized as follows. Section II describes the research methodology, including study design, participants, and data analysis. Section III presents the research results. Section IV discusses the findings in relation to existing literature, while Section V concludes the study and provides recommendations for future research [21].

II. METHOD

This study employed a quasi-experimental design using a one-group pretest–posttest approach to evaluate the effectiveness of TikTok-based education in improving students' knowledge of oral and dental hygiene. This design was selected because it allows for the assessment of changes in outcomes before and after an intervention within the same group of participants, thereby providing a practical approach for educational research in real-world settings where randomization is not feasible [22], [23].

A. STUDY DESIGN AND SETTING

The research was conducted at SMAN 1 Porong, Sidoarjo Regency, East Java, Indonesia. The study was carried out over a period from July 2024 to March 2025, which included preparation, intervention implementation, data collection, and data analysis stages. The school was selected based on accessibility, availability of the target population, and institutional support for research activities. The study followed a prospective approach, as data were collected forward in time, beginning with baseline measurement (pretest) and followed by post-intervention assessment (posttest) [24].

B. STUDY POPULATION AND SAMPLING

The target population consisted of tenth-grade students enrolled at SMAN 1 Porong. The inclusion criteria included students who were willing to participate, provided informed consent, and were present during both pretest and posttest sessions. Students who were absent during either phase or did not complete the questionnaire were excluded from the study.

A total of 52 respondents were selected using a simple random sampling technique, ensuring that each member of the population had an equal probability of being included in the study. The sample size was determined using the Slovin formula with a 5% margin of error, which is commonly applied in educational research to obtain representative samples [25].

C. INTERVENTION PROCEDURE

The intervention consisted of delivering oral and dental health education through the TikTok platform. Educational content was developed based on standardized oral health guidelines, including topics such as proper toothbrushing techniques, frequency and timing of brushing, dietary habits, and preventive dental care. The content was presented in short video formats to align with TikTok's characteristics, ensuring that the material was engaging, concise, and easily understood by adolescents.

The intervention was conducted over a specified period during which participants were exposed to the educational videos. Prior to the intervention, participants completed a pretest questionnaire to assess their baseline knowledge. After the intervention, the same questionnaire was administered as a posttest to measure any changes in knowledge. The use of digital media in health education has been shown to enhance engagement and knowledge retention among adolescents due to its interactive and visual nature [26], [27].

D. DATA COLLECTION INSTRUMENTS

Data were collected using a structured questionnaire distributed via Google Forms. The questionnaire was designed to assess students' knowledge of oral and dental hygiene, covering key aspects such as brushing techniques, oral care practices, and preventive measures. The instrument consisted of multiple-choice questions with predefined scoring criteria.

To ensure the quality of the instrument, validity and reliability tests were conducted prior to data collection. Content validity was established through expert review, while reliability was assessed using appropriate statistical methods. Digital questionnaires were chosen due to their efficiency, ease of distribution, and ability to minimize data entry errors [28].

E. DATA ANALYSIS

The collected data were analyzed using statistical software. Descriptive statistics were used to summarize respondents' characteristics and knowledge levels before and after the intervention. To evaluate the effectiveness of the intervention, the Wilcoxon Signed-Rank Test was applied. This non-parametric test was selected because the data were paired and did not necessarily meet the assumptions of normal distribution.

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The level of significance was set at $\alpha = 0.05$. A p-value of less than 0.05 was considered statistically significant, indicating a meaningful difference between pretest and posttest scores. The use of non-parametric statistical methods is widely recommended in educational intervention studies involving ordinal data or small sample sizes [29].

F. ETHICAL CONSIDERATIONS

This study adhered to ethical principles involving human subjects. Ethical approval was obtained from the Institutional Review Board (IRB) of Poltekkes Kemenkes Surabaya. Prior to participation, informed consent was obtained from all respondents and their guardians. Participants were informed about the purpose of the study, procedures, potential benefits, and their right to withdraw at any time without consequences.

Confidentiality and anonymity were strictly maintained throughout the study. All data collected were used solely for research purposes and stored securely. Ethical compliance is essential to ensure the protection of participants and the credibility of research findings [30].

III. RESULTS

This study was carried out from August 26, 2024 to September 5, 2024 at SMAN 1 Porong, Sidoarjo Regency, which is located at Jalan Bhayangkari 1 No. 12, South Gordang, Juwet Kenongo, Porong, Sidoarjo, East Java, with the postal code 6127. SMAN 1 Porong stands on an area of 8,000 m² and has been accredited with the title A. This school organizes the learning process using the Independent Curriculum. Institutionally, SMAN 1 Porong has 82 educators and education staff, consisting of 20 teachers with civil servant status, 11 honorary teachers, and 51 non-permanent teachers (GTT). The majority of educators in this school have the last education of Strata 1 (S1). In terms of facilities and infrastructure, the school is equipped with 34 classrooms, 2 laboratories, 1 library, and 2 sanitation units for students. The location of SMAN 1 Porong is in a residential area with fairly easy road access. Two-wheeled and four-wheeled vehicles can pass through the main road in front of the school, so the research location is considered strategic to be carried out.

TABLE 1
Distribution of Respondent Frequency Based on Age, Gender, Students of SMAN 1 PORONG in 2024

Characteristics	Frequency	Percentage %
Age		
15 years	1	2
16 years	**51**	**98**
Sum	52	100
Gender		
Man	17	32.7
Woman	**35**	**67.3**
Sum	52	100

According to the information in TABLE 1, It can be seen that the majority of respondents are in the age group of 16 years, which is 51 people (98%), while respondents with the age of 15 years are only 1 person (2%). When viewed from gender characteristics, most of the respondents were women, namely 35 people (67.3%), while men amounted to 17 people (32.7%).

TABLE 2
Distribution of students' Pre-Test Knowledge Results SMAN 1 Porong 2024

Knowledge Value Category	Frequency	Percentage (%)
Good	1	2
Enough	1	2
Less	**50**	**96**
Sum	52	100

According to the information presented in TABLE 2, It can be observed that before being educated through TikTok media, most of SMAN 1 Porong students had a relatively minimal level of hygiene insight about the oral cavity and teeth. Furthermore, the results of data collection after the intervention showed a change in the level of knowledge. On September 5, 2024, a total of 52 respondents were again given a questionnaire, and the results were presented in the form of a table. The presentation of this data aims to understand the hygiene insight category about the oral cavity and teeth of SMAN 1 Porong students after receiving education using TikTok media.

TABLE 3
Distribution of Post-Test Knowledge Results for SMAN 1 Porong 2024

Knowledge Value Category	Frequency	Percentage (%)
Good	**46**	**88**
Enough	4	8
Less	2	4
Sum	52	100

According to the information presented in TABLE 3 It can be understood that from SMAN 1 Porong students after being educated using TikTok media, they got most of the knowledge of good dental hygiene and oral health.

TABLE 4
Distribution of Wilcoxon Pre-Test and Post-Test Results

No	Variables	Category			ρ Value
		Good	Enough	Less	
1.	*Pre-test*	1	1	50	0.000
2.	*Post-test*	46	4	2	

According to the information presented in TABLE 4 that an alternative hypothesis (H_1) is obtained and a null hypothesis (H_0) is refuted. This is proven by the value of Asymp. Sig. (2-tailed) has a magnitude of 0.000 which is smaller when compared to the significance level ($\alpha = 0.05$). Therefore, conclusions can be drawn if a substantial discrepancy is found in the pre-test and post-test scores after being given an intervention through TikTok media.

Based on the data presented in Table 3, there was a significant increase in the level of knowledge of SMAN 1 Porong students after being educated through TikTok media. The majority of respondents, namely 46 students (88%), showed good knowledge, while only a small percentage were in the sufficient (8%) and insufficient (4%) categories.

The results of the Wilcoxon Marked Rating Test, as shown in Table 4, corroborate these findings. The significance value (Asymp. Sig. 2-tailed) obtained was 0.000. Since this value is smaller than the significance

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threshold of 0.05, it can be concluded that there is a statistically significant difference between pre-test and post-test scores. These results support the alternative hypothesis (H_1) and reject the zero hypothesis (H_0), confirming that educational interventions through TikTok media have been shown to be effective in improving dental and oral health knowledge in students.

IV. DISCUSSION

A. INTERPRETATION OF FINDINGS

The findings of this study demonstrate a substantial improvement in students' knowledge of oral and dental hygiene following the TikTok-based educational intervention. Prior to the intervention, the majority of respondents exhibited low levels of knowledge, as evidenced by the high proportion of students categorized in the "poor" knowledge group. This condition reflects inadequate exposure to oral health education and limited understanding of proper hygiene practices among adolescents. Such findings are consistent with previous research indicating that insufficient knowledge remains a primary contributing factor to poor oral hygiene behaviors in this age group [31], [32].

Following the intervention, there was a marked shift in knowledge levels, with most students achieving a "good" category. This improvement suggests that TikTok, as a digital educational medium, can effectively facilitate knowledge acquisition. The significant difference observed between pretest and posttest scores ($p < 0.05$) confirms the effectiveness of the intervention. From a theoretical perspective, this outcome can be explained through the stimulus–organism–response (SOR) framework, where exposure to engaging digital content (stimulus) enhances cognitive processing (organism), leading to improved knowledge outcomes (response).

The effectiveness of TikTok in this study may also be attributed to its format, which emphasizes short, visually engaging, and easily digestible content. Adolescents tend to have shorter attention spans and prefer interactive learning environments, making TikTok a suitable platform for delivering health education [33]. Additionally, repeated exposure to content and algorithm-driven recommendations may reinforce learning and improve retention. Therefore, the findings indicate that integrating social media into health education strategies can address knowledge gaps among adolescents more effectively than traditional methods.

B. COMPARISON WITH PREVIOUS STUDIES

The results of this study are in line with several previous studies that have demonstrated the effectiveness of digital and social media-based interventions in improving oral health knowledge. For instance, a study by Li et al. reported that short-video platforms significantly enhanced health literacy among adolescents due to their visual and interactive characteristics [34]. Similarly, Wang et al. found that digital media interventions increased student engagement and knowledge retention compared to conventional educational approaches [35].

In the context of oral health, previous research has shown that video-based education and mobile applications can improve knowledge of toothbrushing techniques and preventive care practices [36]. The present study extends these findings by specifically examining TikTok as a medium, thereby contributing to the growing body of literature on innovative health education tools. Unlike traditional platforms such as YouTube or classroom-based instruction, TikTok offers a more dynamic and user-centered experience, which may explain the higher effectiveness observed in this study.

However, some studies have reported mixed results regarding the use of social media in health education. For example, certain research indicates that while social media can improve knowledge, its impact on long-term behavior change remains uncertain [37]. This suggests that although TikTok is effective in increasing knowledge, additional interventions may be required to translate this knowledge into sustained behavioral changes.

Furthermore, compared to studies conducted in other countries, the findings of this research provide valuable insights into the Indonesian context, where the integration of digital media in school-based health programs is still developing. The significant improvement observed in this study highlights the potential of culturally relevant and technology-based interventions in addressing public health challenges at the local level.

C. LIMITATIONS AND IMPLICATIONS

Despite the promising findings, this study has several limitations that should be acknowledged. First, the use of a one-group pretest–posttest design without a control group limits the ability to establish causal relationships definitively. External factors, such as exposure to other information sources, may have influenced the observed outcomes. Future studies should consider using randomized controlled trials to strengthen internal validity [38].

Second, the sample size was relatively small and limited to a single school, which may affect the generalizability of the findings. Expanding the study to include a larger and more diverse population would provide more robust evidence regarding the effectiveness of TikTok-based interventions. Third, the study focused solely on knowledge outcomes without assessing behavioral changes or long-term retention. As oral health improvement ultimately depends on behavior, future research should incorporate follow-up assessments to evaluate sustained impact.

Additionally, the reliance on self-reported data through questionnaires may introduce response bias. Participants may provide socially desirable answers rather than reflecting their true knowledge. Incorporating objective measures, such as clinical oral health assessments, could enhance the accuracy of future studies.

Despite these limitations, the findings of this study have important practical implications. First, they highlight the potential of TikTok as an innovative and cost-effective tool for health education, particularly among adolescents. Schools and health practitioners can leverage this platform to deliver engaging and accessible educational content. Second, integrating social media into existing school health programs can enhance their effectiveness and reach. Third,

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policymakers should consider incorporating digital health education strategies into national health promotion programs to address gaps in adolescent health literacy.

In conclusion, this study demonstrates that TikTok-based education is an effective approach for improving knowledge of oral and dental hygiene among adolescents. While further research is needed to explore long-term behavioral outcomes, the findings provide a strong foundation for the development of digital health education interventions in the future.

V. CONCLUSION

This study aimed to evaluate the effectiveness of TikTok-based educational media in improving knowledge of oral and dental hygiene among students of SMAN 1 Porong. The findings demonstrate a substantial enhancement in students' knowledge following the intervention. Prior to the educational exposure, the majority of respondents (96%) were categorized as having low knowledge, with only 2% classified as having good knowledge. After the implementation of TikTok-based education, a significant improvement was observed, with 88% of students achieving a good level of knowledge, while only 4% remained in the low category. Statistical analysis using the Wilcoxon Signed-Rank Test revealed a significant difference between pretest and posttest scores ($p = 0.000$; $p < 0.05$), indicating that the intervention had a meaningful impact on students' understanding of oral and dental hygiene. These results suggest that TikTok, as a digital and interactive platform, is an effective medium for delivering health education to adolescents, particularly due to its engaging format and accessibility. The study highlights the importance of integrating technology-based learning approaches into school health programs to enhance knowledge acquisition and promote preventive health behaviors. However, while the increase in knowledge is evident, this study did not assess long-term behavioral changes or clinical outcomes, which are critical components of oral health improvement. Therefore, future research is recommended to explore the sustainability of knowledge retention and its translation into daily oral hygiene practices. Additionally, further studies should employ more rigorous designs, such as randomized controlled trials, involve larger and more diverse populations, and compare the effectiveness of TikTok with other digital and conventional educational methods. Expanding the scope to include behavioral and clinical indicators will provide a more comprehensive understanding of the impact of digital health education interventions. Overall, this study provides empirical evidence supporting the use of TikTok as an innovative and effective tool for improving adolescent health literacy in the field of oral and dental hygiene.

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Based on the results of the research on the use of TikTok media on dental and oral hygiene knowledge in SMAN 1 Porong students, it can be concluded that: students' knowledge before intervention falls into the category of lacking; after the intervention, their knowledge increased significantly into the category of good; and statistically, there was a substantial difference between pre- and post-intervention knowledge. We would like to express our sincere gratitude to the staff and students of SMAN 1 Porong for their invaluable participation and cooperation in this research. We also give appreciation to health and education professionals who have provided crucial support and guidance. Assistance and encouragement from all parties is an important instrument in the successful completion of the research.

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DATA AVAILABILITY

No datasets were generated or analyzed during the current study.

AUTHOR CONTRIBUTION

Nur Fauziyah acts as the lead author, who conceptualizes, designs, and conducts research, including data collection and data analysis and interpretation Dr. Imam Sarwo Edi (Supervisor I) and Siti Fitria Ulfah (Supervisor II) provided essential guidance and supervision, as well as contributed to the development of methodology and manuscript revision. In addition, Silvia Prasetyowati (Examiner Lecturer) provided valuable critical input. All parties involved have reviewed and approved the final manuscript, and are fully responsible for the integrity and accuracy of this research.

DECLARATIONS

ETHICAL APPROVAL

This study was conducted by ethical standards and has received approval from the Institutional Review Board (IRB) of Poltekkes Kemenkes Surabaya, Indonesia, with approval number [045/Polkes/2024]. Informed consent was obtained from the parents or guardians of all participating students, and confidentiality and anonymity of the participants were maintained throughout the research process. All procedures adhere to ethical guidelines for research involving human subjects.

CONSENT FOR PUBLICATION PARTICIPANTS

Consent for publication was given by all participants.

COMPETING INTERESTS

The authors declare no competing interests.

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