

Social Media as Both a Challenge and a Tool for Anti-Tobacco Health Promotion in School Settings

Putri Prastiti Mubarakah^{1*}, Maulidha Maslahul Fiqriyah², Isah Fitriani³

¹AMC Muhammadiyah Hospital, Yogyakarta, Indonesia

²Bachelor of Applied Midwifery, Poltekkes Kemenkes Malang, Malang, Indonesia

³Faculty of Public Health, Universitas Ahmad Dahlan, Yogyakarta, Indonesia

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ABSTRACT

The use of social media among adolescents has increased rapidly and influences various health behaviors, including smoking and the use of e-cigarettes. In the school setting, social media can pose a challenge through exposure to tobacco-related content and advertisements, but it also has the potential to serve as an effective tool for anti-tobacco health promotion. This study aims to examine the role of social media as both a challenge and a tool for anti-smoking health promotion in school settings using a literature review method with a narrative approach. The literature search was conducted in the PubMed and Google Scholar databases using keywords related to social media, smoking, e-cigarettes, health promotion, schools, and adolescents. The articles included were original studies with quantitative, qualitative, or mixed-methods designs published between 2020 and 2024, available in full text, and relevant to the research topic. The review of eight articles revealed that exposure to tobacco or e-cigarette content and advertisements on social media is associated with an increased risk of smoking behavior among adolescents, particularly through the intensity of use of specific digital platforms. On the other hand, social media can also be utilized as a tool for health promotion through digital education, raising awareness of the dangers of smoking, implementing Smoke-Free Zones (SFZs), and school-based technological innovations. In conclusion, social media plays a dual role in the context of anti-tobacco health promotion in school settings as both a challenge and a tool for health promotion and therefore needs to be utilized appropriately to mitigate negative impacts and optimize its positive potential in preventing smoking behavior among adolescents.

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Corresponding Author:

Putri Prastiti Mubarakah

AMC Muhammadiyah Hospital

Jl. HOS Cokroaminoto No.17B, Pakuncen, Wirobrajan, Kota Yogyakarta

Email: p19prastiti@gmail.com

1. INTRODUCTION

In recent years, the development of social media has brought about significant changes in various aspects of human life, including in the fields of education and health. As part of the evolution of internet technology, social media enables individuals to communicate more quickly, express themselves, interact without the constraints of time and space, share information, and build virtual social networks on a large scale (Alawiyah et al., 2023). These

changes not only affect the way people communicate, but also shape how individuals access information and make decisions in their daily lives.

The growth of the internet and social media in Indonesia has also seen rapid expansion, in line with increasing access to digital technology across various regions. Data from 2023 shows that the number of internet users in Indonesia reached 212.9 million, with a penetration rate of approximately 77% of the total population (Akbar et al., 2023; Hamidah, 2023). These figures indicate that the internet has become an integral part of daily life for Indonesians, including teenagers and young adults. Furthermore, other national surveys have even shown that internet penetration rates can reach 79.5%, although disparities still exist between regions and certain socioeconomic groups (Aminudin et al., 2025). This situation indicates that, although internet access is becoming more widespread, ensuring equitable access to digital technology remains a challenge that requires attention.

By early 2024, the number of social media users in Indonesia is projected to reach approximately 139 million, or nearly half of the total population (Pandjaitan, 2024; Tewu et al., 2025). The high level of social media use is also evident in the amount of time Indonesians spend online, which averages about 7 hours and 38–42 minutes per day, with social media use accounting for about 3 hours and 11–18 minutes per day (Akbar et al., 2023; Tewu et al., 2025). The most widely used social media platforms in Indonesia include WhatsApp (90.9%), Instagram (85.3%), Facebook (81.6%), TikTok (73.5%), Telegram (61.3%), and X/Twitter (57.5%) (Pandjaitan, 2024). Internet and social media use is dominated by teenagers and young adults aged 15–35 (Rajagukguk et al., 2024) As a result, social media has a significant influence on teenagers' behavior, lifestyle, and daily interactions.

The rise of social media has both positive and negative effects on teenagers. On the one hand, social media can be used as a tool for education and health promotion. On the other hand, it has also become a platform for marketing various products, including cigarettes and e-cigarettes (Ramadhan, 2022). The marketing of tobacco and vape products on social media employs various strategies designed to attract the attention of teenagers and young adults, primarily through visual and lifestyle-oriented approaches. Content is typically created with bright colors, eye-catching designs, and emphasizes flavor profiles along with a “cool,” “trendy,” and “modern” image, including the formation of online communities such as hashtags (#vapefam) that help build users' social identities. These strategies are reinforced by the involvement of influencers, celebrities, bloggers, and rappers who promote the products, often without strict age restrictions, thereby reaching a broad teenage audience (Smith & Hilton, 2023). In addition, the ads also associate smoking and vaping with masculinity, self-confidence, maturity, and a luxurious lifestyle, as well as social interactions on major platforms such as Instagram, TikTok, Facebook, and YouTube all supported by price promotions, events, CSR initiatives, and community strategies to boost engagement (Kong et al., 2023; Sari et al., 2024).

The phenomenon described above indicates that smoking is a major global public health challenge, given that most smokers begin the habit during their teenage years (Arieselia et al., 2023). Adolescence is a period of high vulnerability to the development of smoking behavior, due to environmental and social factors as well as exposure to information across various media. In line with global trends, the rise in smoking among adolescents in Indonesia remains a serious issue, including the use of e-cigarettes. This is reflected in the results of the 2019 Global Youth Tobacco Survey by the Indonesian Ministry of Health, which showed that 78.9% of students had been exposed to anti-smoking messages through various media. However, out of 9,992 students in grades 7–12 who served as respondents, only 39.4% stated they intended to refrain from smoking after being exposed to anti-smoking advertisements (Fitriani et al., 2025).

Adolescents are a group that is vulnerable to environmental influences because they are in the process of establishing their identity and are highly curious, making them more likely to

try new behaviors, including smoking (Hadi et al., 2023). In fact, smoking can cause blood clots, heart disease, kidney failure, cancer, tuberculosis, and even death. Additionally, the nicotine in cigarettes can impair memory and brain function, thereby reducing an individual's problem-solving ability and negatively impacting academic performance. The high prevalence of smoking among adolescents is influenced by various factors, such as knowledge levels, attitudes, parental influence, peer influence, psychological conditions, and exposure to cigarette advertising and promotion across various media. The desire to look cool, be accepted by peers, and the belief that smoking relieves stress are the most common psychological factors among adolescents. Furthermore, imitative behavior toward the surrounding environment—particularly parents and peers—is the most dominant factor. Weak regulation of tobacco advertising and promotion also contributes to increased adolescent exposure to smoking behavior. (Fitriani et al., 2025). Therefore, the effectiveness of health messages still needs to be strengthened, both in terms of communication strategies and the media used, so that they can have a greater impact on adolescent behavior.

Schools are one of the main lines of defense in efforts to prevent smoking among adolescents. The educational environment is particularly strategic because students spend most of their time at school, making it a key factor in shaping their knowledge, attitudes, and health behaviors to prevent the risk of tobacco addiction from an early age (Yunarman et al., 2025). In addition, schools also serve as environments for fostering healthy lifestyles that can minimize exposure to risk factors, including the influence of negative information from social media. However, research on the use of social media as a tool for anti-smoking health promotion in school settings remains limited. In fact, advancements in digital technology open up opportunities to utilize social media as an innovative, interactive, and easily accessible health education medium for students. Therefore, a more comprehensive study is needed on the role of social media—not only as a challenge but also as an opportunity—in implementing anti-tobacco health promotion in schools.

2. METHOD

This study employs a literature review method with a narrative approach to examine the role of social media as both a challenge and a tool for anti-smoking health promotion in school settings. The literature search was conducted using the PubMed and Google Scholar databases with the keywords “social media,” “smoking,” “e-cigarette,” “health promotion,” “school,” and “adolescent.” The articles included were original studies with quantitative, qualitative, or mixed-methods designs published between 2020 and 2024 to ensure up-to-date and relevant literature post-COVID-19 pandemic. Inclusion criteria included full-text articles in Indonesian and English that discussed the relationship between social media and adolescent smoking behavior or its use in health promotion in schools, while duplicate, review, editorial, and irrelevant articles were excluded from the analysis. Article selection was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart.

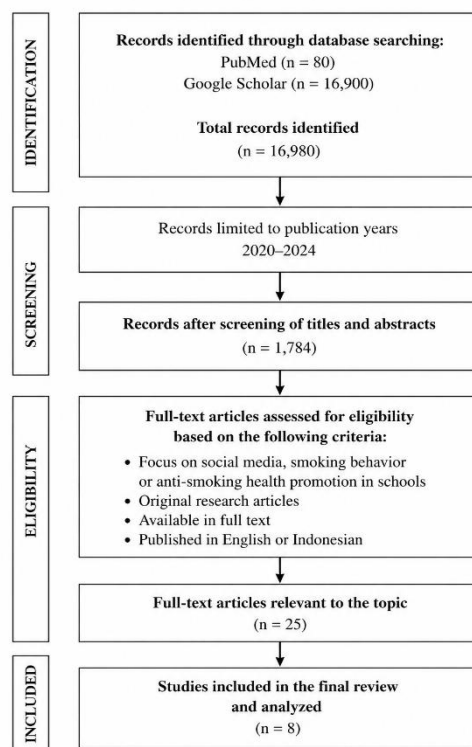


Figure 1. PRISMA Flowchart

3. RESULTS AND DISCUSSION

Based on the literature review, eight articles relevant to the topic of social media use as both a challenge and a tool for anti-tobacco health promotion in school settings were identified, published between 2020 and 2024. All articles were then analyzed in greater depth as outlined in Table 1. The review findings indicate that the advancement of digitalization, particularly the use of social media in daily life, has both positive and negative impacts on smoking behavior among adolescents and students. On one hand, social media can serve as a promotional and marketing platform for cigarettes that is easily accessible to adolescents. On the other hand, social media also holds significant potential as a more innovative, interactive, and easily accessible tool for anti-tobacco health education and promotion. In this context, schools, as educational institutions, bear a critical responsibility in shaping a healthy younger generation through appropriate health promotion strategies to reduce smoking rates among children and adolescents.

Table 1. Article Review Results

No.	Author	Article title	Result
1.	Pokhrel et al (2021)	<i>Social media's influence on e-cigarette use onset and escalation among young adults: What beliefs mediate the effects?</i>	The prevalence of e-cigarette content on social media has the potential to encourage young people to try them. This is because the content conveys the message that e-cigarettes are relaxing and can reduce stress. These products are claimed to be more environmentally friendly than conventional cigarettes, making them more socially acceptable
2.	Vassey et al (2022)	<i>Frequency of social media use and</i>	Adolescents are more likely to use e-cigarettes (AOR = 2.16; CI: 1.20–3.90) and

		<i>exposure to tobacco or nicotine-related content in association with E-cigarette use among youth: A cross-sectional and longitudinal survey analysis</i>	more likely to start using e-cigarettes (AOR = 2.97; CI: 1.53–5.77) if they use TikTok several times a day, compared to adolescents who rarely or never use TikTok
3.	Massey et al (2021)	Vaping, Smartphones, and Social Media Use among Young Adults: Snapchat is the Platform of Choice for Young Adult Vapers	Respondents who were more frequently exposed to vaping advertisements on their smartphones were more likely to vape (OR = 1.62, 95% CI = 1.02–2.60). Among the social media platforms examined, only the frequency of Snapchat use was associated with a higher likelihood of vaping (AOR: 1.22, 95% CI = 1.10–1.36)
4.	Rizki et al (2020)	The Influence of Social Media on the Smoking Behavior of Junior High School Students Aged 12-14 Years in Semarang City	Exposure to social media content related to cigarettes is very high, with 104 respondents (94.5%) stating that they have seen cigarette-related content on their social media. This high level of exposure has led 59.1% of respondents to become interested in cigarettes
5.	Putra et al (2020)	The Relationship of Social Media with Awareness of the Dangers of Cigarettes in High School Students in Makassar City	The results of the path analysis indicate that the social media content variable influences awareness of the dangers of smoking, with a p-value of 0.013 and a coefficient of 0.172
6.	Margiyati et al (2020)	Influence Edutainment Tekteksar Against the Level of Knowledge of Hazards Cigarettes in School-Age Children at MI Nashrul Fajar Semarang	Edutainment Tekteksar has an effect on the level of knowledge about the dangers of smoking among school-aged children, with a p-value of 0.000 in both the intervention and control groups
7.	Ulfa & Damayanti (2021)	Advocacy for the Implementation of No Smoking Areas in Schools	Students identify problems they encounter, formulate strategies, analyze targets, and carry out advocacy. The agreements reached included implementing smoke-free zones in accordance with the school's capabilities and conditions, installing smoke-free zone signs, operating a smoke-free zone task force, raising awareness about the dangers of smoking, and advocating with nearby shops to remove tobacco advertising banners.
8.	Ode et al (2020)	Prototype of a Smart System for Smoke-Free Areas in Schools Based on the Internet	The prototype design of an Internet of Things-based Smart Smoke-Free Zone System in Schools serves as a useful technology for monitoring and evaluating

of Things to Reduce the Prevalence of Child Smokers	smoking incidents among students at school. In practice, this technology operates under two scenarios: (1) monitoring the school environment and (2) triggering an alarm device—such as a buzzer—if a student is found smoking on school grounds.
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Based on the results of the literature review presented in the table above, it can be seen that there are several findings regarding the influence of social media on adolescent smoking behavior and its role in health promotion. The presence of social media in the information technology era essentially presents two possibilities: it can serve as both an opportunity and a challenge in the field of public health. In health promotion, social media can be utilized to reach a broader audience in disseminating health information and fostering healthy lifestyles. Social media can also support conventional health promotion methods through various interactive features that can more effectively increase individual and community participation (Wahyuni & Arisani, 2021). In addition, social media enables the rapid, cost-effective, and flexible dissemination of health information, making it a highly promising tool for health education among adolescents.

Essentially, schools are the vanguard of national education and play a vital role in achieving health education goals. A healthy school environment focuses not only on academic aspects but also encompasses students' physical, psychological, and social well-being. However, technological advancements, cultural globalization, and the use of social media have also introduced various health-related behavioral challenges within the school environment. Issues such as drug abuse, smoking, violence, pornography, and various other risky behaviors have become priority issues that require special attention (Kemendikbud RI, 2022).

The rise in smoking among adolescents and students is closely linked to the characteristics of adolescence, a phase marked by the search for self-identity and a strong curiosity about new things in their surroundings. During this phase, adolescents are also easily influenced by their social environment; consequently, in some cases, smoking is still perceived as a symbol of maturity, masculinity, or a form of acceptance within peer groups. In reality, cigarettes contain various harmful chemicals that can cause serious health problems, both in the short and long term. Beyond health impacts, the economic burden in Indonesia resulting from tobacco-related diseases is estimated to reach Rp. 17.9–27.7 trillion, highlighting the significant socioeconomic impact of smoking behavior. Smoking behavior among adolescents is influenced by various factors, such as knowledge levels, attitudes, peer influence, family support, tobacco product marketing, and tobacco advertising across various media (Azhar Muslim et al., 2023).

In line with this, the results of the literature review indicate that social media has a significant influence on adolescent smoking behavior, whether it involves conventional cigarettes or e-cigarettes. This is because social media serves not only as a means of communication but also as a platform for disseminating information and promoting products, which can shape certain perceptions and social norms among adolescents. Research Pokhrel et al., (2021) notes that the high exposure to e-cigarette advertisements on social media can foster the belief that vaping provides a soothing sensation, reduces stress, and is more socially acceptable. For e-cigarette users, social media also shapes the perception that vaping is a safer alternative to conventional cigarettes because it offers a variety of flavors and is believed to alleviate boredom.

Research Vassey et al., (2022) A survey of high school students in Los Angeles shows that the majority of teenagers use social media several times a day, with the highest usage rates on

Instagram (59%), TikTok (53%), and YouTube (46%). More than 20% of respondents reported seeing nicotine- or tobacco-related content every week on Instagram and TikTok, while about 16% saw similar content on YouTube. This situation indicates high exposure to tobacco-related information on digital platforms frequently accessed by teenagers. Teenagers who use TikTok several times a day were found to have a higher likelihood of using e-cigarettes (AOR = 2.16; CI: 1.20–3.90) and were at greater risk of initiating e-cigarette use (AOR = 2.97; CI: 1.53–5.77), confirming a link between the intensity of social media use and smoking behavior among teenagers.

In addition to TikTok and Instagram, the use of smartphones and other social media platforms such as Snapchat is also known to contribute to smoking behavior among adolescents. Research Massey et al., (2021) shows that respondents who more frequently view vaping advertisements on their smartphones are more likely to use e-cigarettes (OR = 1.62; 95% CI = 1.02–2.60). Among the various social media platforms studied, Snapchat was the platform most strongly associated with an increased likelihood of vaping among adolescents and young adults (AOR = 1.22; 95% CI = 1.10–1.36). This suggests that social media is not only a challenge in the form of exposure to content that may encourage smoking behavior, but also a strategic opportunity for strengthening health promotion through the appropriate regulation and utilization of digital platforms.

In Indonesia, research Rizki et al., (2020) A study of junior high school students aged 12–14 in Semarang City shows that exposure to tobacco-related content on social media is extremely high, with 94.5% of respondents reporting that they have seen such content on their social media feeds. Most of this content consists of tobacco advertisements (78.8%), and 59.1% of respondents admitted to being interested in trying cigarettes after seeing such content. These findings indicate that social media is one of the most effective channels for influencing adolescent smoking behavior. Although Indonesia has regulations regarding tobacco control, protection of children from exposure to tobacco advertising on digital media remains suboptimal. Children and adolescents can still easily access tobacco and vape promotions through various social media platforms. Therefore, there is a need to strengthen regulations and oversight of tobacco promotions on digital media through cross-sectoral collaboration, including educational institutions (Nabila & Sakti, 2023).

Social media is often associated with negative behavior, but the rise of digitalization has also opened up significant opportunities for health promotion. Social media can be leveraged as a more engaging, fast-paced, and easily accessible platform for health education among adolescents. Research Putra et al., (2020) indicates that social media content influences students' awareness of the dangers of smoking, with a p-value of 0.013 and a coefficient of 0.172. This suggests that social media not only has the potential to increase smoking behavior but can also be utilized as an effective tool for health campaigns when used appropriately.

Media-based health promotion is currently being widely developed by academics and health practitioners in school settings. One example is the use of the edutainment medium “Tekteksar” (Anti-Smoking Crossword Puzzles) with students at MI Nashrul Fajar in Semarang. This method combines health education with elements of games and entertainment, making the learning process more engaging for students. Research Margiyati et al., (2020) indicates that the method was able to significantly improve students' knowledge of the dangers of smoking, with the Wilcoxon test yielding a p-value of 0.000.

In addition to outreach and educational materials, anti-smoking health promotion in schools is also carried out through advocacy for the implementation of Smoke-Free Zones (SFZs). Research (Ulfa & Damayanti, 2021) This demonstrates that students were actively involved in identifying problems, developing strategies, analyzing targets, and carrying out advocacy efforts regarding the implementation of smoke-free zones in schools. Teachers served as facilitators in the program's implementation alongside the principal, guidance

counselors, and the Student Council advisor. The advocacy efforts resulted in several agreements, including the implementation of smoke-free zones tailored to the school's conditions, the installation of smoke-free zone signs, the formation of a smoke-free zone task force, awareness campaigns on the dangers of smoking, and advocacy efforts targeting businesses near the school to reduce tobacco advertising.

Regarding the implementation of the KTR, Ode et al., (2020) Developing a prototype of a Smart Smoke-Free Zone based on the Internet of Things (IoT) using NodeMCU ESP8266 devices. This system is equipped with MQ-2 sensors and the Thingier.io platform to monitor and store data related to smoking behavior in school environments. In its implementation, the Smart Smoke-Free Zone System employs two main scenarios: monitoring the school environment and activating a buzzer when smoking activity is detected on school grounds. The development of this technology demonstrates that digital innovation can serve as an alternative to support the monitoring and evaluation of Smoke-Free Zone programs in educational settings.

Overall, the results of the literature review indicate that social media plays a dual role in the context of anti-smoking health promotion in school settings. Social media not only poses a potential challenge through exposure to content and advertisements that may increase the risk of smoking among adolescents, but it can also be utilized as an effective health promotion tool through innovative, interactive, and easily accessible digital education. Therefore, the use of social media in health promotion efforts in school settings needs to be appropriately directed to minimize negative impacts while optimizing its positive potential in preventing smoking behavior among students.

4. CONCLUSION

In the context of health promotion in the digital age, social media plays an increasingly important role in influencing health behaviors, particularly among adolescents in school settings. Advances in digital technology have transformed social media not only into a means of communication and social interaction, but also into a powerful medium for shaping individuals' perceptions, attitudes, and behaviors, including health behaviors. This situation makes adolescents a group that is highly vulnerable to both the positive and negative influences of social media use.

Social media plays a complex role in the context of anti-tobacco health promotion within school settings. On one hand, social media poses a challenge due to the high exposure to content, advertisements, and the normalization of smoking behavior as well as the use of e-cigarettes, which can increase the risk of smoking initiation among adolescents. On the other hand, social media also holds significant potential as a tool for health promotion through more engaging and accessible digital education, raising awareness about the dangers of smoking, strengthening the implementation of Smoke-Free Zones (SFZs), and leveraging various technological innovations within the school environment to support prevention efforts. Therefore, the use of social media in health promotion within school settings must be directed appropriately, systematically, and strategically. An optimal approach is expected to minimize the negative impacts of social media while maximizing its positive potential in supporting sustainable efforts to prevent smoking behavior among adolescents in school settings.

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