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The Role Of Health Education Through Social Media In Detecting NCDs Among Adolescents

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ABSTRAK

Non-communicable diseases (NCDs) such as obesity, hypertension, and diabetes are increasingly becoming serious challenges to the health of adolescents in Indonesia, primarily due to modern lifestyles heavy on fast food consumption, low physical activity, and exposure to tobacco and alcohol. Recent data shows that the prevalence of overweight and obesity among Indonesian adolescents is at an alarming rate, yet awareness of early detection remains low, resulting in many cases going undiagnosed until they reach their productive years. Adolescence is a critical period in the formation of lifestyles that will have long-term impacts on health, so early educational interventions are crucial to instilling healthy lifestyles. In this context, social media is a strategic tool because it is closely related to the lives of millennials and Gen Z, who are active in the digital space. Platforms like Instagram, TikTok, and YouTube have proven effective in conveying health messages in a visual, interactive, and accessible manner. Integrating digital education strategies with health promotion theories such as the Health Belief Model and national policies through the Germas (Healthy Living Movement) and CERDIK campaigns allows for more contextual and applicable messages. Furthermore, the involvement of influencers and healthcare professionals increases the credibility of content and encourages changes in healthy behavior. With a cross-sectoral approach involving families, schools, communities, and government, social media can transform into a sustainable health education ecosystem. This effort is expected to reduce the prevalence of NCDs, improve adolescent health literacy, and develop a healthy, productive, and competitive young generation.

Keywords: *Health education; Social media; Non-communicable diseases (NCDs)*

INTRODUCTION

Non-communicable diseases (NCDs) such as obesity, hypertension, and diabetes are increasingly posing a serious threat to the health of adolescents in Indonesia. The 2023 Indonesian Health Survey showed that the prevalence of overweight and obesity among adolescents aged 13–15 years reached 16.2% nationally, while among elementary school-aged children (5–12 years) the figure reached 19.7% (Asnia et al., 2025). Cases of hypertension among young people also show a worrying trend, with a prevalence of 10.7% among those aged 18–24 years, but only 0.4% are diagnosed by medical personnel (BKPK, 2024). This gap between prevalence and diagnosis indicates low self-awareness of pre-existing

health conditions (Sagita, 2025). The high rate of NCDs among adolescents is exacerbated by unhealthy lifestyles, such as high-calorie food consumption, low physical activity, poor sleep habits, and high stress levels.

Adolescence is a critical period in the formation of lifestyles that will impact long-term health. During this phase, daily habits such as diet, physical activity, stress management, and sleep quality play a crucial role in establishing the foundation for health in adulthood. Therefore, early educational interventions are essential to increase understanding of NCD risk factors, encourage early detection, and instill healthy lifestyles. Recent studies confirm that community-based health promotion, such as the Posbindu program, is effective in increasing adolescents' knowledge and awareness of NCD prevention (Sari et al., 2025). With a good understanding of risk factors, adolescents can become active participants in disease prevention efforts.

In the context of health communication, social media is a strategic tool for reaching millennials and Gen Z, who are highly engaged with the digital world. Platforms such as Instagram, TikTok, and YouTube have proven effective in increasing adolescents' health literacy due to their visual, interactive, and easily accessible nature (Mustofa & Sani, 2024). Health education through social media is also more influential when it involves credible influencers or collaborates with health professionals (Prasetyo & Anggraeni, 2023). A study of Generation Z (aged 17–22) showed that health education content on social media can motivate behavioral change towards a healthy lifestyle (Juanta et al., 2025). This demonstrates that social media is not just a means of information, but also a crucial instrument in shaping health behaviors.

The theoretical framework underlying this approach is based on the Ottawa Charter for Health Promotion (1986), which emphasizes five main pillars: enhancing individual capabilities, creating a supportive environment, strengthening community action, developing public policy, and cross-sector partnerships (Watson & Neil, 2025). At the national level, the Healthy Living Community Movement (Germas) policy, initiated by the Indonesian Ministry of Health, serves as an important policy foundation. Germas encourages healthy lifestyles through educational campaigns, group exercise, health assessments, and nutrition counseling. In the digital era, the Ministry of Health has optimized the use of social media as a promotional channel for NCDs, presenting content such as CERDIK webinars (Regular Health Checks, Eliminate Smoking, Regular Exercise, Healthy Diet, Adequate Rest, Manage Stress), interactive infographics, and healthy lifestyle challenges on popular platforms. The Ministry of Health's 2023 performance report shows that this digital campaign optimization aligns with the principles of the Ottawa Charter, which emphasizes advocacy and cross-sector partnerships through social media-based health promotion strategies.

By combining the CERDIK concept, the Ottawa Charter health promotion theory, the Germas policy, and the Ministry of Health's digital strategy, NCD education for adolescents can be conducted holistically. This integration not only strengthens personal health literacy but also creates a digital social environment that supports a healthy lifestyle and encourages the active participation of the

government, communities, and families in instilling healthy habits from an early age. The prevalence of major NCDs such as obesity, premature hypertension, and diabetes continues to increase among Indonesian adolescents. In the 2015 GSHS national survey, 15.8% of adolescents were overweight or obese, while nearly 46.5% had at least three behavioral risk factors for NCDs, such as daily consumption of soft drinks, low physical activity, and minimal fruit and vegetable consumption (Pengpid & Peltzer, 2019). A cross-regional study of adolescents aged 15–19 in Indonesia showed the prevalence of prehypertension reached 16.8% and hypertension around 2.6%, figures that are considered high globally. Obesity itself is the biggest risk factor for hypertension, where the relationship between obesity and hypertension begins to form from adolescence (Sudikno et al., 2023).

An unhealthy lifestyle is a major factor contributing to the increased risk of non-communicable diseases (NCDs) among adolescents in Indonesia. A diet dominated by fast food high in fat, salt, and sugar, coupled with low fruit and vegetable intake, shows a worrying trend (Oddo et al., 2019; Sudarko et al., 2023). Low physical activity further exacerbates this risk. The 2015 Global Health Survey (GSHS) data noted that 87.8% of adolescents did not meet the recommended minimum of 60 minutes of physical activity per day, while 27.3% spent more than three hours per day in sedentary behavior (Pengpid & Peltzer, 2019). A 2022 WHO report also revealed that more than 80% of adolescents globally did not meet physical activity recommendations, reflecting a similar situation in Indonesia (Ulfa et al., 2024).

The World Obesity Federation, through its 2022 Indonesia Report Card, even gave an "F" grade for the "Overall Physical Activity" category for children and adolescents, indicating a low level of national physical fitness (Mahendra et al., 2022). The 2023 GSHS report by BRIN (2025) confirmed that lack of physical activity significantly contributes to the increasing prevalence of obesity and cardiovascular disease among adolescents. A study by Andriyani et al. (2020) noted that only 12.2–52.3% of Indonesian adolescents reported sufficient physical activity, while 24.5–33.8% exhibited sedentary behavior for ≥3 hours per day. Furthermore, smoking and alcohol consumption are also serious problems, with approximately 12.8% of adolescents reported smoking and 4.4% regularly consuming alcohol (Pengpid & Peltzer, 2019). As many as 27.9% of adolescents also regularly consume soft drinks, which has been shown to be correlated with an increased risk of obesity and diabetes (Statista, 2025).

On the other hand, social media usage among Indonesia's Generation Z shows a very high trend. According to the 2022 Indonesia Gen Z Report, Instagram is the most popular platform, with 74% of Gen Z using it daily, followed by YouTube (59%), Facebook (56%), and TikTok (40%). A study by Nurbaiti (2023) in South Jakarta found that YouTube and TikTok are the favorite platforms, especially for short and educational video content. WhatsApp, Instagram, and Facebook are also dominantly used as daily communication media (Shovamyanti et al., 2024). This data confirms that social media is not only

a means of entertainment but also plays a significant role in digital content consumption and shaping adolescent behavior.

However, despite the enormous opportunities offered by social media, many schools and youth communities lack engaging and informative health education content. Partners such as schools, youth health posts (Posyandu), or youth communities face the challenge of rising obesity, prehypertension, and diabetes risk factors, but lack structured digital-based education programs. Education about a balanced diet, the dangers of smoking, the importance of physical activity, and the risks of consuming high-sugar beverages remains very limited. Supporting facilities such as sports programs and mentoring are also suboptimal, compounded by minimal family involvement in developing healthy lifestyle habits. As a result, important health messages are often overshadowed by entertainment content that does not support healthy behavior change on social media. Therefore, designing a relevant, engaging, and sustainable social media-based health education strategy to increase awareness and early detection of NCDs among Indonesian youth is crucial.

RESEARCH METHODS

This research is a literature review that uses a descriptive qualitative approach to identify, evaluate, and interpret literature relevant to the role of social media in health education, particularly regarding the detection of Non-Communicable Diseases (NCDs) among adolescents. This literature review was chosen because it provides an opportunity for researchers to synthesize various primary research findings, resulting in a broader and deeper understanding of the phenomenon under study. A meta-synthesis approach was used in the analysis process to integrate diverse research findings and form comprehensive conclusions that support the formulation of answers to the research problem. Thus, this study not only collects relevant literature but also examines the relationships, gaps, and contributions of each study to the development of knowledge in the field of adolescent health.

The research was conducted online by accessing literature from various reputable scientific databases, including Google Scholar, PubMed, EBSCO, ScienceDirect, and ProQuest. Data sources were systematically selected to ensure credible and scientifically sound results. The research timeline aligned with the proposal development process and the final report, ensuring a consistent and organized data collection, analysis, and interpretation process. Through digital access, researchers were able to obtain up-to-date articles relevant to the research context, particularly those discussing the role of social media in supporting health education and early detection of NCDs in adolescents.

Inclusion and exclusion criteria were established to ensure the suitability of the analyzed literature to the research focus. Inclusion criteria included articles or journals published between 2015 and 2025, written in Indonesian or English, available in full-text format, discussing topics relevant to the role of social media in adolescent health education and the prevention or detection of NCDs, and originating from accredited scientific journals. Meanwhile, exclusion criteria

included articles irrelevant to social media and NCDs, articles discussing social media for non-health purposes, and articles not available in full format. With these criteria, literature selection can be more focused and produce a quality data set.

Data analysis was conducted using a thematic narrative synthesis approach through several systematic stages. The first stage is summarization, which summarizes important information from each article using the researcher's own language. The second stage is synthesizing, which combines the results of various studies to find patterns, similarities, or general trends. The third stage is comparing, which compares findings between studies to assess the effectiveness of social media use in adolescent health education. The fourth stage is contrasting, which aims to identify differences or discrepancies between studies, thus revealing variations in study results. The final stage is critiquing, which assesses the weaknesses, limitations, and gaps in previous research, enabling this study to present a more critical and comprehensive synthesis.

The presentation of research results is carried out systematically in two main formats: descriptive narrative and literature summary tables. Descriptive narrative is used to present the analysis results in a coherent and easy-to-understand flow, while summary tables are used to facilitate comparisons between studies. The tables contain important information such as the author's name, year of study, article title, method used, population or sample of the study, and the main findings of each study. With this combination of presentations, the research is expected to demonstrate the interconnectedness of the literature, emphasize the contribution of each previous study, and facilitate drawing conclusions relevant to the problem formulation.

RESULTS AND DISCUSSION

1. Adolescent Health Challenges and Risk Factors for NCDs

Adolescents in Indonesia currently face significant challenges related to the increasing risk of Non-Communicable Diseases (NCDs) triggered by changes in modern lifestyles. Consumption patterns of fast food high in fat, sugar, and salt, coupled with low fruit and vegetable intake, make this age group more vulnerable to obesity and metabolic disorders. This phenomenon is exacerbated by the dominance of a food environment filled with ultra-processed snacks and sweetened drinks, while nutritious food options are often unattractive or difficult to access. This situation places adolescents on a metabolic risk trajectory from an early age that has the potential to develop into serious health problems in adulthood (Nadya et al., 2025). UNICEF analysis even confirms an "early track" toward obesity, hypertension, and diabetes that begins in adolescence.

Beyond dietary factors, low physical activity is a significant issue. A very high proportion of Indonesian adolescents do not meet the recommended daily physical activity levels, in line with the global trend of over 80% of adolescents being insufficiently active. The tendency for sedentary behavior is increasing due to prolonged screen time, both for entertainment and device-based learning

activities. This condition reduces physical fitness, accelerates insulin resistance, and increases the risk of visceral fat accumulation (Hinga et al., 2025). The limited availability of safe public spaces for exercise in urban areas also exacerbates the situation, making it increasingly difficult for adolescents to engage in regular physical activity. The impact can be seen in increased blood pressure, impaired lipid profiles, and the risk of early-onset diabetes.

Tobacco and alcohol exposure are other increasingly concerning risk factors. The Global Youth Tobacco Survey in Indonesia showed that nearly one in five adolescents aged 13–15 have used tobacco products, with rates significantly higher among boys. Nicotine is known to worsen cardiometabolic health, increase blood pressure, and is closely linked to unhealthy eating habits. Meanwhile, alcohol consumption, although lower in prevalence, remains prevalent among students aged 13–17, influenced by social environmental factors and lack of family control. If not intervened early, these two behaviors will strengthen the risk pathways for NCDs and increase the burden of disease in productive age groups (Akseer et al., 2020).

A significant gap is also observed between the prevalence of NCD risk factors and the rate of medical diagnosis in adolescents. Most cases of hypertension, dyslipidemia, or prediabetes remain undetected due to a lack of awareness of the importance of regular health check-ups. This is similar to the Basic Health Research (Riskesdas) data in young adults, which shows that measured hypertension is much higher than the official diagnosis rate. A similar situation can occur in adolescents, where early signs of the disease often go undetected until they lead to serious complications later in life. The lack of screening in schools and adolescent health services further obscures this problem. Low health literacy is a major obstacle to early detection efforts.

Adolescence is a crucial phase for developing a healthy lifestyle that can prevent future NCDs (Watkins et al., 2019). Strategic interventions include improving school food environments, limiting advertising for unhealthy foods and cigarettes, providing spaces and curricula that encourage physical activity, and improving health literacy through social media platforms relevant to adolescents' lives. Digital education can help them recognize early signs of obesity, hypertension, or diabetes, while raising awareness of the importance of a healthy lifestyle. If implemented consistently through collaboration between families, schools, communities, and the government, adolescents' potential to grow up healthy and productive into adulthood can be achieved, and the national NCD burden can be significantly reduced.

2. The Strategic Role of Social Media as a Health Education Channel

Social media plays a strategic role as a health education channel due to its inclusive nature, easy access, and proximity to the lives of adolescents in the digital age. Millennials and Gen Z, who spend significant time on their devices, make social media the most relevant platform for conveying health messages. Compared to conventional media, social media allows for more intense two-way interactions, where adolescents not only receive information but also can ask

questions, provide responses, and even contribute to the dissemination of health messages. This makes social media a dynamic educational space present in everyday life, without appearing rigid or patronizing. Furthermore, the flexible nature of the content allows health messages to be packaged in a variety of more engaging formats, such as short videos, infographics, personal stories, and even challenges, which can increase adolescent active participation (Stellefson et al., 2020).

Another strategic advantage lies in social media's ability to adapt message formats to suit the platform's characteristics. Instagram, for example, is effective in presenting concise and visual information through short-form carousels and Reels. TikTok, with its trend- and entertainment-based algorithm, allows health messages to be disseminated in short, viral formats, reaching a wider audience. Meanwhile, YouTube is well-suited for longer-form educational content that requires detailed explanations, such as expert interviews or self-health checkup tutorials. Adapting messages to each platform's consumption style makes information easier for teenagers to understand, accept, and remember. Furthermore, educational success depends not only on the format but also on message design based on behavioral theories such as the Health Belief Model or Social Cognitive Theory, which emphasize tangible benefits, reduced barriers, and examples of healthy behaviors to emulate.

The credibility of the communicator is also key to this strategy. Health content will be more influential if it involves a combination of influencers and healthcare professionals. Influencers who are close to adolescents can attract attention, build emotional connection, and create new social norms related to healthy behaviors. Meanwhile, healthcare professionals act as guarantors of information accuracy and authoritative figures, increasing audience trust (Mutaqin et al., 2024). This collaborative strategy will be more effective when packaged creatively, for example, by having influencers share personal experiences or health challenges, which are then validated by healthcare professionals' explanations through live broadcasts or short videos. This format not only reinforces the message but also builds trust and motivates adolescents to take concrete action.

Furthermore, social media also provides significant opportunities for measuring the impact and effectiveness of health campaigns. Through analytics, it's possible to determine the extent to which health messages reach audiences, their level of engagement, and the concrete actions taken after exposure to the content. For example, teenagers participating in healthy step challenges, re-sharing educational content, or even conducting self-health checks. This evaluation is crucial for understanding which strategies are working, which need improvement, and how to tailor messages to the audience's needs. Furthermore, integrating social media with formal health services, such as links to online screenings, youth community health post schedules, or counseling hotlines, strengthens its function as a gateway to the health system. Thus, social media doesn't stand alone but rather serves as a bridge connecting digital education with real-world health services.

Communication governance and ethics must also be considered to ensure social media's role as a health education channel is optimal. Information disseminated should be based on scientific evidence, presented in simple language, and accompanied by a disclaimer to avoid misinterpretation. Protecting adolescents' privacy is crucial, especially in online interactions, so any invitations to participate should be directed through secure, official channels. Efforts to counter misinformation also need to be conducted wisely, by providing non-judgmental clarification but presenting concise, easy-to-understand evidence (Rahmadini & Ernawaty, 2024). Furthermore, content should consider audience diversity, for example by adding subtitles, alternative text, and inclusive visuals to ensure accessibility for all groups. With an ethical and inclusive approach, social media becomes not only a means of disseminating information but also a safe space for adolescents to learn, discuss, and build collective awareness about the importance of early detection of non-communicable diseases.

If this strategy is implemented consistently, social media can transform into a sustainable health learning ecosystem. Through a combination of creative content, expert validation, influencer engagement, and integration with formal health services, adolescents not only gain knowledge but are also motivated to develop healthy behaviors. Thus, social media is no longer seen simply as a platform for entertainment, but as a crucial instrument in the prevention and early detection of non-communicable diseases among adolescents. By harnessing the power of algorithms, interactivity, and social networks, this medium can create broader and deeper changes in the health behaviors of the younger generation.

3. Integration of Policy, Health Promotion Theory, and Digital Strategy

Integrating adolescent health education through social media requires close alignment between health promotion theoretical frameworks and national policies. The principles of the Ottawa Charter building healthy public policies, creating supportive environments, strengthening community action, developing individual skills, and reorienting health services are translated into the Indonesian context through the Healthy Living Community Movement (Germas) program and the CERDIK campaign. In practice, CERDIK messages form the foundation of digital educational content, while Germas serves as an umbrella for cross-sector coordination, from the Ministry of Health, the Ministry of Education, Culture, Research, and Technology, to schools and youth organizations. Social media is then utilized to strengthen health literacy, facilitate simple screenings, and connect students with nearby health services such as the Health Unit (UKS), Youth Integrated Health Posts (Posyandu Remaja), or Community Health Centers (Puskesmas).

Behavior change theory enriches the content strategy, ensuring it is not only informative but also encourages concrete action. The Health Belief Model emphasizes adolescents' understanding of the risks and benefits of early detection of NCDs, while the Theory of Planned Behavior is utilized to build

positive norms through peer testimonials and role models. Social Cognitive Theory forms the basis for modeling healthy behaviors and reinforcement systems such as digital badges or e-certificates. The COM-B approach also ensures that capacity building, opportunities for healthy behaviors, and motivation are facilitated through social media. Thus, each health message is presented in a relevant, contextual manner, and is easily implemented by adolescents in their daily lives (Mustofa & Sani, 2024).

Implementing integration also requires multi-stakeholder involvement within a single ecosystem. The government establishes policies and curates messages, schools act as implementation platforms, families reinforce norms, communities provide social support, and digital platforms serve as outreach multipliers. Student councils (OSIS), Red Cross (RMR), or Scouts (Pramuka) can be involved as health campaign ambassadors, while teachers and school health workers assist with screening and follow-up activities. Parents also play a role through communication in class WhatsApp groups or school forums, delivering concise, practical messages. Collaboration with local micro-influencers, such as physical education teachers or young doctors, can increase the credibility and reach of messages with the target audience.

The digital content strategy is designed based on age segmentation, platform preferences, and school context. TikTok and Instagram Reels are used to present short videos containing facts about face-to-face learning (PTM), simple physical activity tips, and even blood pressure check tutorials. Carousel and Stories feature CERDIK educational series, screening checklists, or interactive quizzes, while WhatsApp functions as a reminder for activities or parental permission. The edutainment concept is combined with short, consistent, daily micro-learning sessions and gamification in the form of class challenges or school leaderboards. The language used adapts to adolescents' communication styles, accompanied by inclusive and representative visuals appropriate to the local context. All materials are designed with adolescent safety in mind, such as avoiding body-shaming or encouraging extreme behavior (Pengpid & Peltzer, 2019).

The bridge between online education and offline action is clearly established so that each content can lead to real-life activities. Invitations to participate in NCD screening at schools, community health centers (Puskesmas), or adolescent health posts (Posyandu) are included in the form of registration links, QR codes, or calendars integrated with activity schedules. Simple screening results are communicated privately to students and parents, while aggregate data is used by schools and health offices for risk mapping. Schools with limited digital access remain accessible through the conversion of materials into offline kits, such as CERDIK posters, nutrition label pocket cards, or facilitator modules. Referral mechanisms are also strengthened so that adolescents with risk factors receive prompt, appropriate medical follow-up.

Monitoring and evaluation are conducted through a combination of digital and health indicators (Rustam & Riestiyowati, 2023). The digital aspect includes content reach, challenge participation, and clicks on calls to action, while the

health aspect includes the number of adolescents screened, NCD risk findings, and referral success. An evaluation approach based on A/B testing, regional segmentation analytics, and sentinel schools helps assess the strategy's effectiveness more accurately. Regular content audits ensure that the information delivered is accurate, culturally relevant, and safe for adolescents. Furthermore, the equity dimension is considered to ensure the program does not create disparities between urban and rural schools.

Governance and ethics are crucial for the ongoing integration of digital policies, theories, and strategies. Protection of adolescents' personal data, informed consent from parents, and data minimization principles must be consistently applied. Comment and content moderation is also needed to prevent the spread of hoaxes and potential bullying. Partnerships with digital platforms help label information as trustworthy and minimize misinformation. Educators and school health workers are also equipped with guidelines to ensure consistency in providing information and referrals. This overall integration makes adolescent health promotion not just a media campaign, but a measurable, sustainable, and equitable architecture for behavior change.

CONCLUSION

Indonesian adolescents currently face a significant challenge in the form of an increasing risk of Non-Communicable Diseases (NCDs) due to modern lifestyles characterized by fast food consumption, lack of physical activity, and increasingly alarming exposure to tobacco and alcohol. This situation is exacerbated by limited access to healthy food, limited public spaces for exercise, and minimal awareness of the importance of routine health screenings. As a result, many NCD risk factors in adolescents go undetected early, potentially leading to serious complications later in life. Social media serves as a strategic channel close to adolescents' lives, enabling health education to be packaged in an engaging, interactive, and easy-to-understand manner. Utilizing platforms like TikTok, Instagram, and YouTube allows health messages to reach a broad audience in formats tailored to their digital preferences. Content credibility is further strengthened by the involvement of relatable adolescent influencers and healthcare professionals as guarantors of the information's validity. The interactivity of social media also provides a space for adolescents to actively participate in spreading healthy messages and establishing new social norms. In addition to being an educational tool, social media can serve as a bridge to formal health services through online screenings, appointment reminders, or adolescent counseling. Integration with national policies such as Germas and CERDIK ensures that messages are aligned with government programs. Health promotion and behavioral theories, such as the Health Belief Model and Social Cognitive Theory, strengthen the effectiveness of educational strategies by encouraging concrete action, not just understanding. Cross-sector collaboration involving schools, families, communities, and government is key to creating an environment that supports healthy lifestyle changes. If implemented consistently, social media

can transform into a sustainable health learning ecosystem. Ultimately, these efforts not only protect adolescents from the risk of NCDs but also prepare a healthier, more productive, and more competitive young generation for the future.

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