

Analysis of Social Media Content on Tiktok And Youtube Shorts Regarding The Representation of The Human Papillomavirus (HPV) Vaccine in Indonesia

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ABSTRACT

Background: Human Papillomavirus (HPV) is the primary cause of cervical cancer, making HPV vaccination a key strategy for cervical cancer prevention. As social media has become an increasingly important source of health information, evaluating the quality and credibility of HPV vaccine-related content on digital platforms is essential.

Objective: This study aimed to analyze the characteristics, quality, credibility, understandability, and educational value of HPV vaccine-related videos on TikTok and YouTube Shorts in Indonesia.

Method: A cross-sectional content analysis was conducted on 200 publicly accessible videos, comprising 100 TikTok videos and 100 YouTube Shorts videos identified using the keyword “HPV vaccine.” Video characteristics, uploader categories, content topics, and presentation styles were analyzed descriptively, while information quality was assessed using the Journal of the American Medical Association (JAMA) benchmark criteria, Global Quality Score (GQS), modified DISCERN (mDISCERN), and the Patient Education Materials Assessment Tool (PEMAT).

Result: TikTok videos generated substantially higher audience engagement than YouTube Shorts, whereas YouTube Shorts demonstrated greater information credibility and reliability based on higher JAMA and mDISCERN scores. Vaccination targets, vaccination schedules, and vaccine types were the most frequently discussed topics, while vaccine mechanisms, side effects, and misinformation were addressed less frequently. Both platforms demonstrated high educational quality, with a mean GQS score of 4.43 and PEMAT-T scores exceeding 98%, indicating excellent understandability and actionability. However, source attribution and scientific referencing remained limited across both platforms.

Conclusion: TikTok and YouTube Shorts have considerable potential as effective channels for HPV vaccine communication in Indonesia. Strengthening evidence-based communication practices and improving information transparency are essential to enhance public trust, increase vaccine confidence, and support cervical cancer prevention efforts.

Keywords: Content Analysis, Social Media, TikTok, Vaccine, YouTube Shorts.

Introduction

Human Papillomavirus (HPV) is known as the main cause of cervical cancer and is still a big reason for sickness and deaths among women around the world (Arbyn et al., 2020). In Indonesia, about 36,964 new cases of cervical cancer were expected in 2023, and the risk of death is high if proper prevention steps are not taken (Ferlay et al., 2024). To deal with this problem, the Indonesian Ministry of Health started a national HPV vaccination program in August 2023 as part of its plan to prevent cervical cancer (Athifa et al., 2025). Even though HPV vaccination is proven to be effective, raising public awareness and improving understanding of the vaccine remains a big challenge, especially in the fast-changing world of digital information (Ebrahimi et al., 2023).

Social media platforms have become important places for people to get health information, especially for teenagers and young adults (Plaisime et al., 2020). Among these, TikTok and YouTube Shorts are very popular because they offer short videos that reach a lot of people (Ren et al., 2019). In Indonesia, TikTok has more than 194 million active users (We Are Social & Meltwater, 2025), and YouTube is used by over 143 million people (Lintang, 2025). While these platforms offer good chances for spreading health messages and education, they also make it easy for false information to spread quickly, which can change how people think about and decide to get the HPV vaccine (Dang et al., 2024). The quick spread of short videos often outpaces fact-checking, leading to misunderstandings and negative views about HPV vaccines (Abdaljaleel et al., 2024).

Earlier studies have looked at HPV vaccine content on social media (Ortiz et al., 2019b) but most were done in other countries, especially the United States (Boatman et al., 2022) and China (Liu et al., 2024). For example, research in the U.S. found that even though many TikTok videos talked about HPV-related cancers, few focused on how HPV vaccination can prevent cancer (Boatman et al., 2022). Similarly, studies from China showed that the quality and trustworthiness of HPV vaccine information on TikTok, even when made by healthcare workers, were not very good (Lin et al., 2024). Although social media use is growing in Indonesia, there isn't much evidence about how HPV vaccination is shown on TikTok and YouTube Shorts. Because of this, this study looked at how HPV vaccine information is presented on these platforms in Indonesia, examining the characteristics, quality, trustworthiness, and educational value of the content available.

Objective

To analyze the representation of Human Papillomavirus (HPV) vaccine-related content on TikTok and YouTube Shorts in Indonesia. Specifically, this study aimed to:

1. To describe the characteristics of HPV vaccine-related videos and uploaders on TikTok and YouTube Shorts.
2. To identify the distribution of uploader categories, content topics, and video presentation styles related to the HPV vaccine.
3. To evaluate the credibility and quality of HPV vaccine-related videos using the Journal of the American Medical Association (JAMA) benchmark criteria, modified DISCERN (mDISCERN), Global Quality Score (GQS), and Patient Education Materials Assessment Tool (PEMAT).
4. To compare the educational quality, understandability, actionability, and credibility of HPV vaccine-related content between TikTok and YouTube Shorts.

To provide evidence regarding the potential of short-form social media platforms as channels for HPV vaccine communication and public health promotion in Indonesia.

Method

Study Design and Data Collection

This study employed a cross-sectional content analysis design to evaluate the representation of the Human Papillomavirus (HPV) vaccine in short-form videos available on TikTok and YouTube Shorts in Indonesia. Data collection was conducted from December 1 to December 14, 2025.

Videos were identified by manually searching both platforms using the keyword “vaksin HPV,” the common Indonesian term for “HPV vaccine.” To minimize algorithm-related bias, searches were performed using newly created accounts with cleared browsing and search histories prior to data collection.

A total of 100 videos from TikTok and 100 videos from YouTube Shorts were retrieved according to each platform’s default search ranking. Videos were included if they discussed HPV vaccination, were presented in Bahasa Indonesia or contained Indonesian subtitles, and were publicly accessible. Videos were excluded if they were unrelated to HPV vaccination, duplicated content, reuploads, or uploaded by accounts that were not the original content creators.

Video Characteristics

For each video that was included, the following details were noted: the date it was uploaded, how long the video is, how many days have passed since it was uploaded, the number of times it has been viewed, the number of likes, comments, and shares.

Uploaders were categorized as health professionals, health organizations, patients, or influencers/non-health professionals. Video originality was classified as either original content or reuploaded content.

Videos were further categorized according to their primary topic, including vaccination targets, vaccine side effects, mechanism of action, misinformation or myths, vaccine types, vaccination schedules, and dosage recommendations. Presentation style was classified as solo narration, question-and-answer format, classroom or presentation-based format, animation or dramatization, medical scenario, television-style documentary format, or other formats.

Video Quality Assessment

The JAMA benchmark criteria, modified DISCERN (mDISCERN), Global Quality Score (GQS), and Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT A/V) were first translated into Indonesian by the Language Center of Universitas Indonesia. The translated instruments were then independently reviewed by three experts, comprising two academic pharmacists with expertise in clinical pharmacy and one licensed practicing pharmacist, to evaluate their linguistic accuracy, conceptual equivalence, and content validity. Any differences in opinion were resolved through discussion until consensus was achieved. After completion of the translation and expert validation process, all eligible TikTok and YouTube Shorts videos were assessed by the researcher using the finalized Indonesian versions of these assessment instruments.

The JAMA benchmark criteria were used to check how credible the source was and how reliable the information was. This was done by looking at four areas: who wrote the content, if they gave credit, if they were honest about their role, and how up-to-date the information was. Each area was scored as either present (1) or not present (0), and the total score could be between 0 and 4. The higher the score, the more trustworthy the content was considered to be.

The modified DISCERN tool (mDISCERN) looked at the quality and completeness of the information in the videos. It had five areas to check: whether the video had clear goals, whether the information came from reliable sources, whether the information was balanced, whether there was enough evidence to support the content, and whether there were suggestions for more information. Each of these areas was scored as either yes (1) or no (0), and the higher the score, the better the quality of the information.

The Global Quality Score (GQS) was used to judge the overall educational value of the videos. This tool uses a five-point scale, where 1 means the content is of poor quality and 5 means it's excellent. Higher scores mean the content is more helpful, complete, and educational.

The PEMAT A/V tool was used to check how easy to understand and how useful the content was. The tool has 26 questions, with 19 asking about how easy the content is to understand and 7 about how helpful it is in terms of action. Each question was scored as agree (1), disagree (0), or not applicable. PEMAT-U, PEMAT-A, and PEMAT-T scores were calculated as percentages. Higher scores mean the content is clearer, easier to reach, and more practical for people to use.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 27.0. Data distribution was evaluated using the Shapiro–Wilk test. Categorical variables were summarized using frequencies and percentages. Continuous variables were reported as mean $\pm$ standard deviation for normally distributed data and as median with interquartile range (IQR) and minimum–maximum values for non-normally distributed data. Descriptive analyses were performed to summarize video characteristics, content categories, uploader characteristics, and quality assessment scores across both platforms.

Results and Discussion

Video Selection

A total of 200 videos about the HPV vaccine were included in the final analysis. These videos came from two platforms: 100 TikTok videos and 100 YouTube Shorts videos. The videos were found using the keyword "vaksin HPV" and were checked against specific rules to decide if they should be included or not. The process of video selection and screening is presented in **Figure 1**.

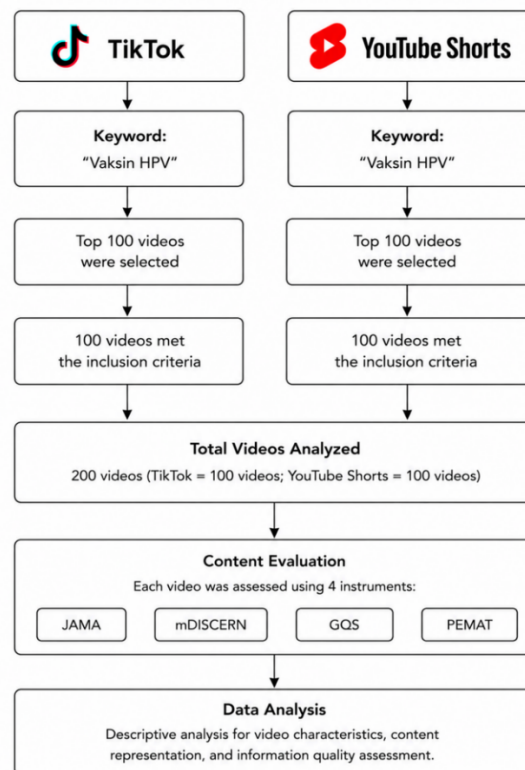


Figure 1. Flowchart of video identification, screening, inclusion, and quality assessment procedures for HPV vaccine-related videos on TikTok and YouTube Shorts Video and Uploader Characteristics.

The general characteristics of HPV vaccine-related videos and uploaders are summarized in **Table 1**. TikTok videos had a median upload age of 166 days (IQR: 60.75–404.50), whereas YouTube Shorts videos had been available for a longer period, with a median upload age of 282.5 days (IQR: 136.25–765.50).

The median video duration was 36 seconds (IQR: 18–64) on TikTok and 51 seconds (IQR: 36.75–60) on YouTube Shorts. TikTok videos demonstrated substantially higher audience engagement than YouTube Shorts. The median number of views was 35,250 (IQR: 1,863–187,300) on TikTok compared with 899.5 (IQR: 245.25–2,796.50) on YouTube Shorts. Similarly, the median number of likes was 374.5 (IQR: 56.75–9,024.50) on TikTok and 7.5 (IQR: 2.75–31.25) on YouTube Shorts.

The median number of comments was 17 (IQR: 4–231) on TikTok and 1 (IQR: 1–2) on YouTube Shorts. TikTok videos also received a median of 49 shares (IQR: 4–931.5). The median follower count of uploaders was 7,700 (IQR: 1,024–52,800) for TikTok accounts and 4,490 (IQR:

474.75–60,725) for YouTube Shorts accounts. The median number of videos uploaded per account was 326.5 (IQR: 104.75–761) on TikTok and 427 (IQR: 155.5–1,125) on YouTube Shorts.

Differences between TikTok and YouTube Shorts were further examined using the Mann–Whitney U test. Significant differences were observed in video duration ($p < 0.001$), number of likes ($p = 0.003$), number of comments ($p = 0.007$), and number of videos uploaded per account ($p < 0.001$). In contrast, no significant differences were found in days since upload ($p = 0.396$), number of views ($p = 0.566$), or number of followers ($p = 0.360$). The number of shares was not statistically compared because this variable was only available for TikTok videos.

Table 1. Characteristics of HPV Vaccine-Related Videos and Uploaders

Characteristic	TikTok	YouTube Shorts	P-value
Days since upload (days, median [IQR])	166 (60.75–404.5)	282.5 (136.25–765.5)	0.396
Video duration (seconds, median [IQR])	36 (18–64)	51 (36.75–60)	<0.001
Views (median [IQR])	35,250 (1,863–187,300)	899.5 (245.25–2,796.5)	0.566
Likes (median [IQR])	374.5 (56.75–9,024.5)	7.5 (2.75–31.25)	0.003
Shares (median [IQR])	49 (4–931.5)		
Comments (median [IQR])	17 (4–231)	1 (1–2)	0.007
Followers (median [IQR])	7,700 (1,024–52,800)	4,490 (474.75–60,725)	0.360
Videos per account (median [IQR])	326.5 (104.75–761)	427 (155.5–1,125)	<0.001

The comparison of overall quality assessment scores between TikTok and YouTube Shorts is presented in Table 2. Mann–Whitney U test demonstrated that YouTube Shorts achieved significantly higher JAMA scores than TikTok (2.20 vs. 1.88, $p = 0.005$). Similarly, the overall mDISCERN score was significantly higher for YouTube Shorts than TikTok (3.65 vs. 2.95, $p < 0.001$). Although both platforms showed identical mean GQS scores (4.43), no statistically significant

difference was observed ($p = 0.692$). In contrast, PEMAT scores were significantly higher for YouTube Shorts than TikTok (25.86 vs. 25.61, $p = 0.024$), indicating slightly better understandability and actionability.

Table 2. Comparison of Overall Quality Assessment Scores Between TikTok and YouTube Shorts Based on the Mann–Whitney U Test

Assessment Tool	TikTok	YouTube Shorts	P- value
Skor JAMA (mean)	1,88	2,20	0.005
Skor GQS (mean)	4,43	4,43	0.692
Skor mDISCERN (mean)	2,95	3,65	<0.001
Skor PEMAT (mean)	25,61	25,86	0.024

Characteristics of Video Content and Uploaders

The distribution of uploader categories is presented in **Figure 2**. Among all analyzed videos, health professionals accounted for 43 videos (21.5%), health organizations for 54 videos (27.0%), patients for 49 videos (24.5%), and influencers/non-health professionals for 54 videos (27.0%).

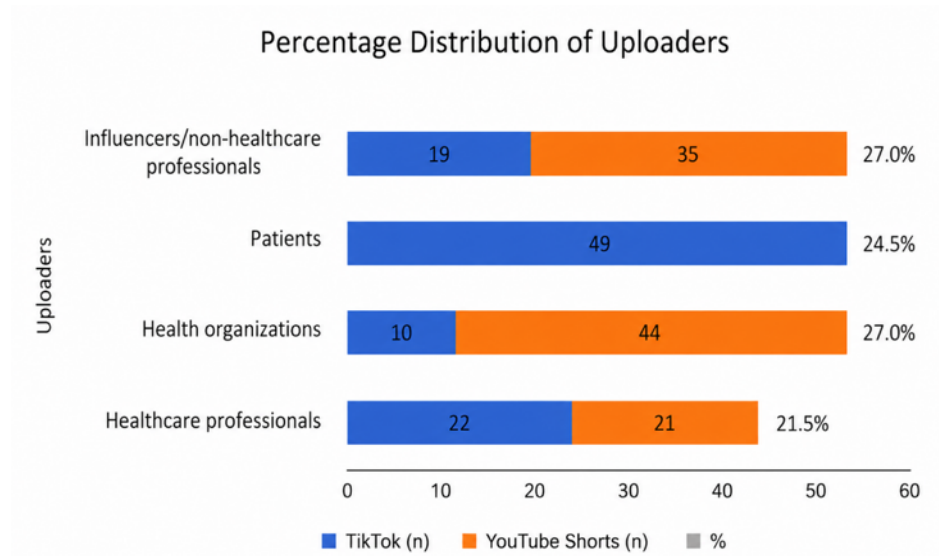


Figure 2. Distribution of uploader categories for HPV vaccine-related videos on TikTok and YouTube Shorts.

TikTok videos were predominantly uploaded by patients (n = 49) and health professionals (n = 22), whereas YouTube Shorts contained a greater proportion of videos uploaded by health organizations (n = 44) and influencers/non-health professionals (n = 35).

The distribution of video topics is shown in **Figure 3**. The most frequently discussed topic was vaccination targets (36.0%), followed by vaccination schedules (21.0%), vaccine types (12.5%), vaccine dosage (11.5%), misinformation or myths (8.0%), vaccine mechanisms (7.0%), and side effects (4.0%).

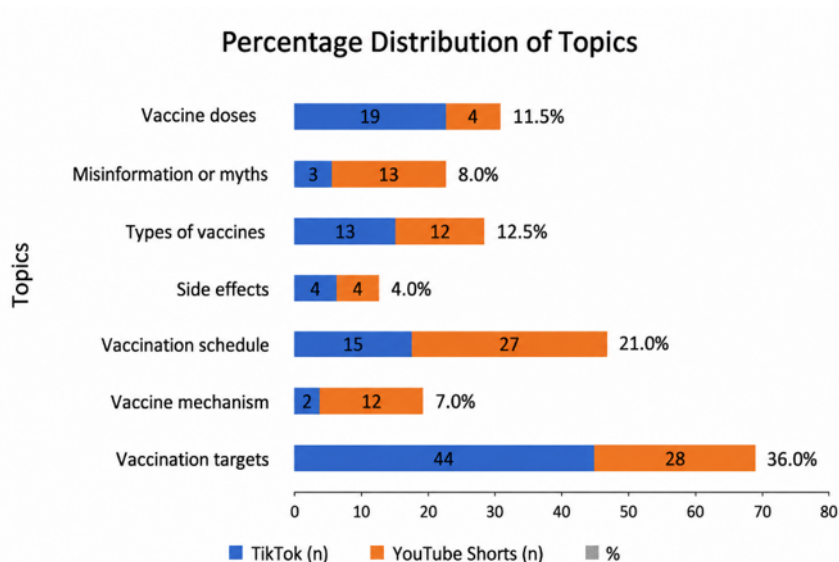


Figure 3. Distribution of content topics among HPV vaccine-related videos on TikTok and YouTube Shorts.

Figure 4 illustrates the presentation styles used in HPV vaccine-related videos. Solo narration was the most common format (58.5%), followed by television-style documentary content (15.5%), question-and-answer videos (15.0%), animation or dramatization (10.5%), and other formats (0.5%).

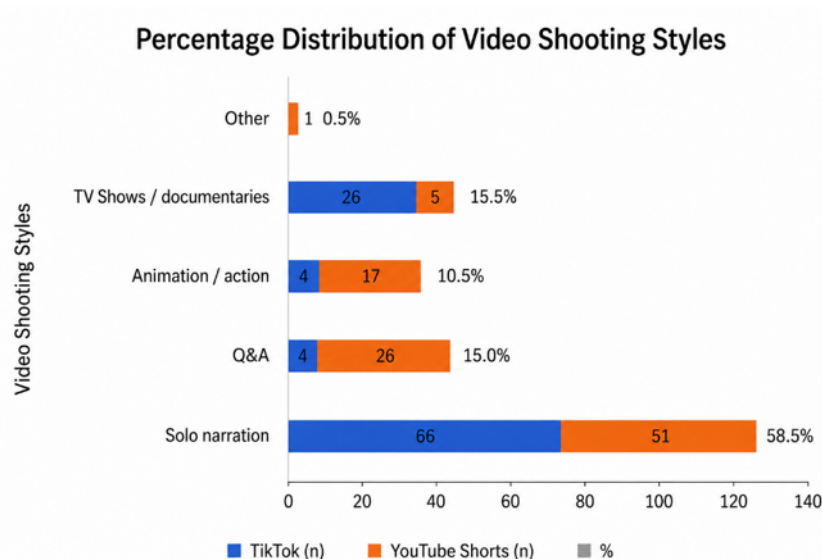


Figure 4. Distribution of video presentation styles among HPV vaccine-related videos on TikTok and YouTube Shorts.

Video Quality Assessment

The quality assessment results are summarized in Table 2 and Figure 5. Using the JAMA benchmark criteria, the mean total JAMA score was 1.88 for TikTok videos and 2.20 for YouTube Shorts videos. Across both platforms, the highest scoring JAMA component was currency (JAMA-4), with a perfect mean score of 1.00. Authorship scores were higher on YouTube Shorts (0.66) than on TikTok (0.26). Attribution scores remained relatively low on both platforms, with means of 0.13 and 0.26, respectively. The overall educational quality assessed by the Global Quality Score (GQS) showed identical mean scores for both platforms (4.43). Most videos were categorized within the “Good” and “Very Good” quality levels.

The mean mDISCERN score was 2.95 for TikTok and 3.65 for YouTube Shorts. The highest scoring mDISCERN component was clarity of aims (mDISCERN-1), which was present in 100% of TikTok videos and 99% of YouTube Shorts videos. Information balance and objectivity (mDISCERN-3) were observed in 84% of TikTok videos and 100% of YouTube Shorts videos. PEMAT evaluation demonstrated high understandability and actionability scores across both platforms. The mean PEMAT-U scores were 97.95 for TikTok and 99.26 for YouTube Shorts. Both platforms achieved a mean PEMAT-A score of 100. The overall PEMAT-T scores were 98.50 and 99.46 for TikTok and YouTube Shorts, respectively.

Table 3. Quality Assessment of HPV Vaccine-Related Videos on TikTok and YouTube Shorts.

Assesment Tools	TikTok			YouTube Shorts		
	Mean	Min-Max	IQR	Mean	Min-Max	IQR
JAMA-1	0.26	0-1	0-1	0.66	0-1	0-1
JAMA-2	0.13	0-1	0-0	0.26	0-1	0-1
JAMA-3	0.49	0-1	0-1	0.46	0-1	0-1
JAMA-4	1.00	1-1	1-1	1.00	1-1	1-1
GQS	4.43	3-4	4-5	4.43	3-5	4-5
mDISCERN-sum	2.95			3.65		
mDISCERN-1	1 (100%)			0.99 (99%)		
mDISCERN-2	0.15 (15%)			0.31 (31%)		
mDISCERN-3	0.84 (84%)			1 (100%)		
mDISCERN-4	0.34 (34%)			0.68 (68%)		
mDISCERN-5	0.62 (62%)			0.67 (67%)		
PEMAT-U	97.95	78.95-100	100-100	99.26	89.47-100	100-100
PEMAT-A	100	100-100	100-100	100	100-100	100-100
PEMAT-T	98.50	84.62-100	100-100	99.46	92.31-100	100-100



Figure 5. Radar chart visualization of JAMA, GQS, mDISCERN, and PEMAT assessment scores for HPV vaccine-related videos on TikTok and YouTube Shorts.

To the best of our knowledge, this is the first study to comprehensively compare HPV vaccine-related content on TikTok and YouTube Shorts in Indonesia using multiple validated assessment tools, including JAMA, GQS, mDISCERN, and PEMAT. As social media increasingly serves as a major source of health information, understanding the quality and credibility of HPV vaccine content is essential (Ortiz et al., 2019a). Overall, TikTok generated significantly greater audience engagement, whereas YouTube Shorts demonstrated superior information credibility and reliability. Despite these differences, both platforms showed high educational quality and excellent understandability.

One of the most notable findings was the substantially higher engagement observed on TikTok. Videos on TikTok accumulated more views, likes, comments, and shares than those on YouTube Shorts, despite being shorter and more recently uploaded. This finding is consistent with previous studies showing that TikTok's recommendation algorithm effectively amplifies health-related content beyond existing follower networks (Zeng et al., 2025). Similar patterns

have been reported for vaccine-related, cancer-related, and other public health content, where TikTok consistently achieves higher engagement than other social media platforms (Su et al., 2025). Given that HPV vaccination primarily targets adolescents and young adults, TikTok may represent a valuable channel for promoting vaccine awareness and preventive health behaviors (Apata et al., 2025).

The characteristics of content creators further illustrate the changing landscape of digital health communication. Although healthcare professionals and health organizations contributed substantially to HPV vaccine content, a considerable proportion of videos originated from influencers, patients, and non-health professionals. This democratization of health communication increases accessibility and audience reach but may also contribute to variability in information quality (Afful-Dadzie et al., 2023a). While influencers often possess strong communication skills and extensive audiences, simplified explanations or personal opinions may unintentionally distort scientific evidence (Davies & Hobbs, 2020). Therefore, the continued involvement of healthcare professionals remains essential to ensure accuracy while maintaining audience engagement (Thomas & Mathew, 2026).

Regarding content topics, most videos focused on practical vaccination information, particularly vaccination targets, schedules, and vaccine types. In contrast, relatively few videos addressed vaccine mechanisms, side effects, or misinformation. This pattern suggests that creators prioritize information perceived as immediately relevant and actionable (Han et al., 2020). Although such an approach may improve accessibility and engagement, it may also represent a missed opportunity to address vaccine hesitancy (Brumbaugh et al., 2025). Previous studies have shown that misinformation and limited understanding of vaccine science are major barriers to vaccine acceptance (Roy et al., 2022). Consequently, future educational content should combine practical information with evidence-based explanations and myth-correction strategies to strengthen public confidence in HPV vaccination (Opaleye & Esan, 2026).

The educational quality of videos across both platforms was generally encouraging. High GQS scores indicated that most videos provided useful and educational information, while excellent PEMAT scores demonstrated that the content was highly understandable and actionable. These findings suggest that short-form video platforms can serve as effective tools for health education when information is presented clearly and concisely (Xiao et al., 2026). The use of simple language, subtitles, visual demonstrations, and concise messaging likely

contributed to these favorable results (Tarchi et al., 2021). Such communication strategies are particularly important in Indonesia, where health literacy levels vary considerably across populations (Fitriyani, 2025).

Similar findings have been reported internationally. In China (Liang et al., 2024), social media users are particularly attracted to concise, visually appealing, and practical vaccine information, whereas detailed scientific explanations are less frequently emphasized. Likewise, studies in Indonesia (Sutan & Qodir, 2021) have demonstrated that social media plays a critical role in shaping public attitudes toward vaccination by rapidly disseminating health information while also creating opportunities for misinformation. Collectively, evidence from USA (Boatman et al., 2022) suggests that social media platforms have substantial potential to support vaccine promotion, provided that information quality and scientific accuracy are maintained.

A particularly important finding relates to transparency and source credibility. Although overall educational quality was high, both platforms demonstrated relatively low performance in source attribution and scientific referencing. The low JAMA attribution scores indicate that creators rarely cited scientific evidence, clinical guidelines, or authoritative health organizations. Similar deficiencies have been reported across studies evaluating health information on social media (Afful-Dadzie et al., 2023b). This discrepancy between educational quality and transparency is concerning because professionally presented content may still lack verifiable evidence (Beerens, 2020). Without explicit references, viewers cannot independently assess the validity of information or verify its consistency with current recommendations (Ferreira et al., 2019). These findings suggest that improving transparency and evidence disclosure should be a priority for future social media health communication initiatives (Singhal et al., 2024).

The public health implications of these findings are considerable. As Indonesia expands HPV vaccination programs as part of cervical cancer prevention efforts, social media platforms may serve as effective channels for delivering vaccine-related information (Hopfer et al., 2022). However, maximizing their potential will require collaboration among healthcare professionals, public health institutions, academic organizations, and content creators (Greenhalgh et al., 2016). Evidence-based communication strategies should be integrated into social media campaigns to ensure that information remains both engaging and scientifically accurate (Robbins, 2025). Greater visibility for content produced by trusted health organizations may also help improve public confidence in vaccine-related information (Puri et al., 2020).

This study has several strengths, including the comparison of HPV vaccine-related content across two major short-form video platforms using multiple validated assessment instruments. However, this study was limited by its cross-sectional design, inclusion of only Indonesian-language short videos, and the absence of analyses on audience comments, perceptions, and responses. Future studies should explore audience engagement, misinformation dynamics, and factors associated with higher-quality health information across multiple social media platforms.

Overall, TikTok and YouTube Shorts demonstrate considerable potential as platforms for HPV vaccine communication in Indonesia. While TikTok generated greater audience engagement, YouTube Shorts provided more credible and reliable information. Despite their high educational value, improvements in source attribution and transparency are still needed to strengthen evidence-based communication, increase public confidence in HPV vaccination, and support cervical cancer prevention efforts.

Conclusion

This study provides the first comparative evaluation of HPV vaccine-related content on TikTok and YouTube Shorts in Indonesia. The findings indicate that TikTok generates substantially higher audience engagement, whereas YouTube Shorts generally provides more credible and reliable information. Overall, content on both platforms demonstrated high educational quality, understandability, and actionability, suggesting their potential as effective channels for HPV vaccine communication and public health promotion. However, deficiencies in source attribution, scientific referencing, and transparency remain evident across both platforms, highlighting the need for improved evidence-based communication practices. Strengthening collaboration among healthcare professionals, public health organizations, and content creators may enhance the quality and credibility of HPV vaccine information disseminated through social media, thereby supporting vaccine confidence and contributing to cervical cancer prevention efforts in Indonesia.

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