

ORIGINAL ARTICLE

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Instagram as a platform for tetanus awareness: A cross-sectional analysis

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Abstract

Tetanus is a potentially fatal disease caused by the exotoxin of *Clostridium tetani*, characterized by acute muscle stiffness and convulsive spasms. Despite being entirely preventable through vaccination, it remains a significant public health issue, particularly in regions with low vaccination rates and inadequate health education. The rise of digital platforms, including Instagram, provides new opportunities for disseminating health-related information, yet concerns about content accuracy and reliability persist. This study aims to evaluate the quality and reliability of tetanus-related videos on Instagram. A cross-sectional analytical design was employed to analyze tetanus-related videos on Instagram. Using a newly created account to avoid algorithmic biases, the keyword "tetanus" was searched, and the top 100 videos were identified. After excluding irrelevant, repetitive, and videos shorter than 30 seconds, 39 videos were included in the study. These videos were categorized by source (e.g., healthcare professionals, private institutions) and assessed for content accuracy based on World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC) guidelines across five domains: causative agent and transmission, symptoms, diagnosis, treatment, and prevention. Viewer engagement metrics, including views, likes, and comments, were recorded. Out of 39 analyzed videos, 59% were created by healthcare professionals, while the rest originated from private institutions and unidentified sources. Content quality was found to vary significantly, with many videos providing incomplete information. Engagement metrics, such as view and like counts, showed no significant correlation with video quality. Additionally, videos by healthcare professionals did not significantly differ in quality compared to those from other sources. Instagram offers significant potential for health communication; however, the platform also poses risks of misinformation due to the lack of quality control mechanisms. Strategies to enhance the accuracy and reliability of health-related content are urgently needed. This study highlights the importance of collaboration among health professionals, policymakers, and content creators to maximize Instagram's role as an effective health tool.

Keywords: Tetanus, Instagram, digital communication, vaccination

Introduction

Tetanus is a severe and often fatal disease characterized by muscle rigidity and convulsive spasms, caused by the exotoxin produced by *Clostridium tetani* bacteria [1,2]. The disease is not transmitted through person-to-person contact but arises when bacterial spores infect open wounds [1,2]. Despite being entirely preventable through vaccination, tetanus remains a significant public health challenge, particularly in regions with low immunization coverage and insufficient health education [3,4]. These deficiencies disproportionately impact neonatal and elderly populations, contributing to substantial global morbidity and mortality [3,4]. Thus, implementing comprehensive awareness-raising initiatives is critical to addressing this public health issue effectively.

The rapid evolution of digital platforms has transformed access to health information, making social media an indispensable element of daily life [5,6]. Among these platforms, Instagram has emerged as a prominent medium for disseminating health-related information due to its capacity to share visually engaging content accompanied by textual explanations [5]. With over 1 billion monthly active users and 500 million daily active users worldwide, Instagram's popularity continues to rise, particularly among adolescents and young adults [7-9]. While this expansive user base offers unprecedented opportunities for the dissemination of health information, it also raises critical concerns regarding the accuracy, reliability, and overall quality of shared content [10]. Although Instagram facilitates visual-centric and interactive content delivery, the absence of stringent

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regulatory oversight constrains its potential to serve as an effective tool for health education and communication [10]. Research highlights Instagram as one of the most commonly utilized social media platforms for seeking health information; however, it is simultaneously one of the leading channels for the dissemination of misinformation [11]. Thus, the dual nature of such platforms necessitates a balanced consideration of their advantages and inherent risks in the context of health communication.

This study evaluates the quality and reliability of tetanus-related videos on Instagram by analyzing content creators, viewership metrics, and their adherence to guidelines established by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). By addressing critical gaps in the literature, this research aims to elucidate Instagram's role as a potential instrument for health communication and its effectiveness in combating misinformation. The findings of this study seek to provide actionable insights for health professionals, policymakers, and content creators, emphasizing evidence-based strategies to enhance communication and health outcomes.

Material and Methods

This study employed a cross-sectional analytical design to evaluate the quality and accuracy of tetanus-related videos available on Instagram (Instagram®, <https://www.instagram.com>; LLC, San Bruno, CA, USA). To minimize the potential influence of prior user data and search records, a new Instagram account was created. Videos were identified using the search term "tetanus" and ranked for relevance on the platform. In accordance with the literature, the first 100 English-language videos were included in the analysis without imposing restrictions on the upload date [12,13]. Videos that were unrelated to tetanus, repetitive, or shorter than 30 seconds were excluded from the study. The video selection and analysis process concluded on December 31, 2024.

The videos were evaluated based on their content creators, viewership metrics, and adherence to guidelines established by authoritative organizations. Metrics such as video duration, number of views, the interval between the upload date and the evaluation date, and the number of likes were systematically recorded. Two physicians independently assessed the videos, and any discrepancies in their evaluations were resolved through consultation with a third physician.

The sources of the included videos were categorized as follows:

- **Official medical organizations:** Universities, professional communities, etc.
- **Healthcare professionals:** Physicians, veterinarians, nurses, paramedical staff, etc.
- **Private institutions**
- **Patients or patient relatives**
- **News outlets**
- **Unidentified sources:** Uploaders not associated with any of the above categories or using anonymous aliases.

The content of the videos was evaluated based on criteria derived from tetanus guidelines published by the WHO and CDC [1, 2]. Each video was scored on five thematic areas: Causative Agent and Transmission Routes, Symptoms, Diagnosis, Treatment, and Prevention. Scoring was assigned as follows: complete response (10 points), partial response (5 points), and no response (0 points). The videos were assessed on a cumulative scale with a maximum score of 50 points.

Statistical Analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 22.0. The normality of data distribution was assessed using the Kolmogorov-Smirnov test. Descriptive statistical methods, including frequency (n), percentage (%), median, and interquartile range (Q25-Q75) for non-normally distributed numerical data, were utilized. For inferential statistics, the Mann-Whitney U test was applied to compare non-normally distributed qualitative variables, while Spearman's correlation analysis was employed to assess relationships between variables. A p-value of <0.05 was considered indicative of statistical significance.

Ethical Considerations

This study exclusively evaluated publicly accessible videos on Instagram. No interventions were conducted, and no participants were involved. Consequently, similar to comparable studies in the literature, obtaining ethical committee approval was deemed unnecessary [14,15].

Results

No duplicates were identified among the 100 videos listed during the initial screening. Videos that were unrelated to the topic of tetanus were excluded, resulting in 48 videos being selected for further analysis. Among these, videos that lacked educational content (n=2), contained advertisement or entertainment content (n=2), or were devoid of medical content (n=5) were excluded. Consequently, the final analysis was conducted with a total of 39 videos (Figure 1).

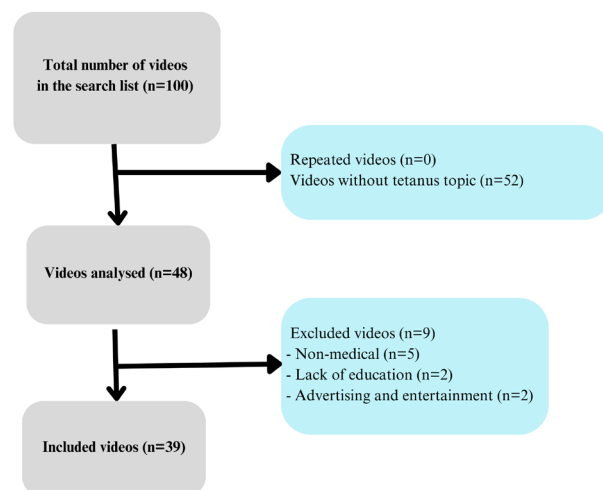


Figure 1. Study workflow

Upon examining the sources of the videos included in the study, a total of 39 videos were analyzed. These comprised 23 videos (59%) created by health professionals, 3 videos (7.7%) produced by private organizations, and 14 videos (36%) from unidentified sources. Notably, no videos prepared by official organizations, news outlets, or patients were identified within the dataset.

The characteristics of the included videos, including their length, number of views, number of likes, number of comments, and duration on the platform, are presented in Table 1.

No significant differences were observed in the video characteristics based on whether they were published by healthcare professionals ($p>0.05$) (Table 2).

No significant differences were identified between video evaluations and their publication status by healthcare professionals ($p>0.05$) (Table 3).

The video characteristics, including length, number of views, number of likes, number of comments, and duration on the platform, were divided into two groups based on their median values. Analysis revealed no significant differences between video evaluations and these characteristics, including length, number of views, number of likes, number of comments, and duration of availability ($p>0.05$) (Table 4).

As the score for causative agent and transmission increased, there were corresponding increases in the scores for symptoms, diagnosis, treatment, and total evaluation ($p<0.001$, $p=0.011$, $p=0.004$, and $p<0.001$, respectively). Similarly, an increase in the symptoms score was associated with higher diagnosis, treatment, and total scores ($p<0.001$ for all). Additionally, as the diagnosis score increased, the treatment and total scores also rose significantly ($p<0.001$ for both). Finally, an increase in the prevention score was significantly correlated with an increase in the total score ($p=0.001$) (Table 5).

Table 1. Descriptive statistics of video characteristics

	Median	Q25-75
Video duration (seconds)	60	50-88
Number of views	4320	377-29200
Number of likes	142	25-530
Number of comments	3	0-23
Duration on platform (months)	7	2-14
Q25-Q75: 1st and 3rd quartiles		

Table 2. Comparison of video characteristics based on source

	Healthcare professionals Median (Q25-Q75)		p*
	No	Yes	
Video duration (seconds)	60 (47-88)	62 (52-86)	0.764
Number of views	1165 (169-12550)	9159 (784-29500)	0.130
Number of likes	29 (3-438)	154 (45-552)	0.111
Number of comments	1 (0-19)	4 (0-23)	0.374
Duration on platform (months)	7.5 (4-12)	7 (2-20)	0.954

*The p-values were calculated using the Mann-Whitney U test

Table 3. Comparison of video evaluations by publication status

	Healthcare professionals Median (Q25-Q75)		p*
	No	Yes	
Causative agent and transmission	5 (0-10)	0 (0-5)	0.417
Symptoms	5 (0-10)	0 (0-5)	0.078
Diagnosis	0 (0-0)	0 (0-0)	0.403
Treatment	0 (0-2.5)	0 (0-0)	0.727
Prevention	5 (0-5)	5 (0-10)	0.121
Total score	10 (5-25)	10 (5-15)	0.727

*The p-values were calculated using the Mann-Whitney U test

Table 4. Comparison of video evaluations based on median grouping of video characteristics

	Video evaluations Median (Q25-Q75)					
	Causative agent and transmission	Symptoms	Diagnosis	Treatment	Prevention	Total score
Video duration (seconds)						
Short	5 (0-5)	0 (0-5)	0 (0-0)	0 (0-0)	5 (5-10)	10 (5-20)
Long	0 (0-10)	0 (0-5)	0 (0-0)	0 (0-5)	5 (5-5)	10 (5-25)
p*	0.723	0.887	0.734	0.491	0.478	0.774
Number of views						
Less	5 (0-10)	2.5 (0-5)	0 (0-0)	0 (0-2.5)	5 (5-7.5)	12.5 (7-20)
More	0 (0-5)	0 (0-5)	0 (0-0)	0 (0-0)	5 (5-5)	5 (5-15)
p*	0.099	0.272	0.365	0.871	0.973	0.177
Number of likes						
Less	5 (0-10)	0 (0-5)	0 (0-0)	0 (0-0)	5 (5-10)	10 (5-20)
More	0 (0-5)	0 (0-5)	0 (0-0)	0 (0-0)	5 (5-10)	10 (5-25)
p*	0.163	0.584	0.955	0.932	0.973	0.385
Number of comments						
Less	5 (0-5)	5 (0-5)	0 (0-0)	0 (0-0)	5 (5-10)	15 (10-20)
More	0 (0-10)	0 (0-5)	0 (0-0)	0 (0-0)	5 (5-5)	7.5 (5-25)
p*	0.498	0.368	0.734	0.863	0.508	0.234
Duration on platform (years)						
Short	0 (0-7.5)	0 (0-5)	0 (0-0)	0 (0-0)	5 (5-10)	10 (5-17.5)
Long	5 (0-10)	0 (0-5)	0 (0-0)	0 (0-5)	5 (5-5)	10 (5-25)
p*	0.712	0.694	0.645	0.086	0.479	0.864

*The p-values were calculated using the Mann-Whitney U test.

Table 5. Correlation between evaluation criteria and total scores in tetanus-related Instagram videos

		Causative agent and transmission	Symptoms	Diagnosis	Treatment	Prevention	Total score
Causative agent and transmission	r	1					
	p	.					
Symptoms	r	0.604	1				
	p	<0.001	.				
Diagnosis	r	0.402	0.566	1			
	p	0.011	<0.001	.			
Treatment	r	0.454	0.566	0.589	1		
	p	0.004	<0.001	<0.001	.		
Prevention	r	0.130	-0.006	0.062	0.096	1	
	p	0.431	0.972	0.709	0.560	.	
Total Score	r	0.807	0.767	0.567	0.640	0.475	1
	p	<0.001	<0.001	<0.001	<0.001	0.002	.

Discussion

This study evaluated the role of Instagram as a platform for disseminating health-related content, with a particular focus on tetanus. Instagram has potential as a public health communication tool; however, our findings reveal notable challenges regarding the quality and reliability of the shared content. Notably, approximately 60% of the videos analyzed were produced by healthcare professionals, underscoring their critical role as primary contributors to medical information on social media platforms [16,17].

Our analysis revealed that engagement metrics such as the number of likes, comments, and views were not indicative of the accuracy or quality of the videos. For instance, while videos produced by healthcare professionals were presumed to be the most reliable, they did not outperform other videos in terms of engagement. This raises concerns regarding social media algorithms, which often prioritize popularity over accuracy—a phenomenon documented in previous studies on health misinformation [5,6,12]. These algorithms frequently amplify visually appealing but potentially inaccurate content, thereby undermining the credibility of evidence-based materials [5,8].

The study further found no statistically significant association between video quality and the uploader's category. Many videos scored poorly in critical areas such as symptoms, diagnosis, and treatment of tetanus, reflecting limited adherence to evidence-based guidelines [1,2]. Interestingly, the prevention category consistently achieved higher scores, potentially due to the straightforward nature of vaccination recommendations. This suggests that while Instagram may serve as an educational platform, its capacity to convey comprehensive and accurate medical information remains limited [8].

These findings align with previous research indicating that Instagram is a prominent source of health misinformation [10]. For example, Vitale et al. reported that approximately 40% of health-related content on Instagram contains misinformation [11]. This represents a significant public health concern, as false narratives can undermine vaccination campaigns and propagate misconceptions regarding tetanus prevention and treatment [9,10]. In a study examining the impact of social media on COVID-19 vaccinations, Ghaddar et al. highlighted Instagram's role in disseminating misleading information [10]. Misinformation about vaccine safety has been directly linked to declining immunization rates globally, complicating efforts to eradicate preventable diseases such as tetanus [18,19].

An important deficiency identified in our findings was the absence of videos produced by official institutions such as international organizations, universities, and ministries of health. This aligns with the findings of Pinto et al., who reported similarly unsatisfactory results regarding the representation of official organizations in public health efforts on Instagram [20]. The underrepresentation of official health organizations leaves a significant gap often filled by less reliable sources. This

observation reinforces the conclusions of studies emphasizing the importance of institutional engagement on social media to counter misinformation and build trust among users [13,15,18,21,22].

The implications of these findings are profound. First, there is an urgent need for health professionals and official organizations to adopt a more proactive approach in creating and disseminating high-quality, visually engaging, and user-friendly content on platforms like Instagram [23,24]. Public health campaigns should leverage Instagram's visual-centric format to deliver accurate and captivating narratives tailored to diverse audiences [18,25]. Without such initiatives, the platform risks being dominated by content that may not align with public health goals. For instance, Barry et al. highlighted the prevalence of alcohol advertisements targeting young audiences on Instagram, while Richardson et al. documented a famous rapper promoting tobacco use on the platform [26,27]. These examples illustrate how unregulated and potentially harmful content can negatively influence public health.

Secondly, stricter content regulation policies by social media platforms are essential to mitigating the spread of misinformation [28]. Measures such as flagging false content, prioritizing credible sources, and integrating educational resources have shown promise [21,22,24,29]. Instagram's application of artificial intelligence to filter anti-vaccine content demonstrates the potential of technology in combating misinformation [21,22]. Moreover, as Stellefson et al. noted, collaboration between public health authorities and social media companies can significantly enhance the reliability of health-related content on these platforms [22].

Finally, educational interventions aimed at improving social media literacy are necessary to empower users to discern credible information from unreliable sources [24]. Encouraging critical engagement with online content can reduce the influence of misinformation and foster informed health decisions [13,22,29].

Limitations and Future Directions

This study has several limitations that should be acknowledged. The relatively small sample size of videos analyzed may restrict the generalizability of the findings. Additionally, the focus on publicly available English-language content excludes videos in other languages and private accounts, potentially limiting the scope of the analysis. Future research should examine a broader range of languages, cultural contexts, and user interactions to develop a more comprehensive understanding of Instagram's role in public health communication.

Conclusion

While Instagram holds significant potential as a platform for health communication, this study underscores critical challenges regarding the quality and reliability of tetanus-related content. Addressing these issues necessitates a multifaceted approach involving health professionals, public health organizations, social media platforms, and users. Collaboration and innovation

are key to transforming Instagram from a platform vulnerable to misinformation into a vital resource for global health education and awareness. Further research into the effectiveness of algorithmic interventions and partnerships between public health authorities and social media platforms is recommended to enhance the reliability of online health information.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

This study exclusively evaluated publicly accessible videos on Instagram. No interventions were conducted, and no participants were involved. Consequently, similar to comparable studies in the literature, obtaining ethical committee approval was deemed unnecessary.

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