

RESEARCH LETTER

Scoping Out Misinformation: Assessing Factual Inaccuracies Among Popular Colonoscopy-Related Videos on Social Media



Although colorectal cancer screening is recommended for all Americans at regular intervals, we have fallen short of screening goals such as the 80% by 2018 initiative led by the National Colorectal Cancer Round Table, leaving a significant proportion of eligible population still unscreened.¹ Online misinformation is a growing concern that may undermine public health efforts.² Specifically, misinformation regarding current recommendations, procedures, and result implications may contribute to the public's hesitancy toward colorectal cancer screening. The prevalence and predictors of misinformation among contents on social media platforms such as YouTube with regard to colonoscopy remain unknown. We aimed to assess the quality and identify predictors of misinformation among the most viewed YouTube videos related to colonoscopy.

We performed a cohort study assessing videos queried on November 21, 2020, with >250,000 views on YouTube under the search term “colonoscopy.” All videos were independently reviewed by 3 board-certified gastroenterologists from tertiary academic centers (C.T., R.S., and K.J.). Variables of interest included content type (instructional, vlog, comedy/nonmedical), total views, time since posting (days), content creator identity (societies/journals, physicians, patients, public figures, industry, other), and presence of endoscopy footage. Health professional (HP) content creators were defined as societies/journals

and physicians, and non-HP or lay content creators were defined as patients and nonmedical public figures. Video content was assessed using 2 validated instruments for consumer health information: the DISCERN instrument and the Patient Education Material Assessment Tool (PEMAT) understandability score.^{3,4} Videos with DISCERN <2 or PEMAT <50% were considered inaccurate or of low scientific quality per established standards.⁵ The likelihood to recommend a video to a patient was rated on a 5-point Likert scale. Univariate analyses were performed using chi-squared (categorical) or Student's *t*-test (continuous). Multivariable analyses were conducted using linear or logistic regression.

Of 69 YouTube videos with >250,000 views identified (Table A1), 30 were posted by HP and 39 were posted by non-HP. Overall, 52.2% and 59.4% were deemed inaccurate and of low scientific quality by DISCERN <2 and PEMAT <50%, respectively. Videos with an HP present demonstrated greater mean DISCERN (2.82 vs 1.42; $P < .0001$) and PEMAT (57% vs 24%; $P < .0001$) scores. More videos by HP content creators were accurate or of sufficient scientific quality by DISCERN ≥ 2 (83.3% vs 20.5%; $P < .0001$) or PEMAT $\geq 50\%$ (66.7% vs 20.5%; $P = .0001$; Figure). On univariate analyses, the mean DISCERN was lower for non-HP vs HP content creators (1.48 vs 2.89; $P < .0001$). Videos from HP content creators were also more likely to be recommended by reviewers on the 5-point Likert scale (3.14 vs 1.44; $P < .0001$; Table A2). Multivariable analysis demonstrated that HP content creators (β -coefficient 1.19; $P = .0003$) and instructional videos (β -coefficient 0.98; $P = .002$) were significantly associated with higher DISCERN; however, endoscopic footage was a negative effect modifier for the benefits of HP content creators (β -coefficient -0.61 ; $P = .03$). On

multivariable analysis for PEMAT, HP content creators (β -coefficient 30.5; $P = .003$) and instructional videos (β -coefficient 24.1; $P = .01$) were similarly associated with higher scores, with endoscopic footage being a negative effect modifier for HP content creators (β -coefficient -25.1 ; $P = .006$; Table A3). According to the area under the receiving operating characteristic curve, HP content creator was the most predictive factor for accurate and high scientific quality videos by DISCERN ≥ 2 (0.93) and PEMAT $\geq 50\%$ (0.8841).

As patients turn to the internet to seek health information, misinformation and disinformation online could potentially undermine efforts to reach population-wide screening goals. YouTube is considered the second largest search engine after Google with a reported 2 billion active monthly users. Despite mass appeal, YouTube videos lack peer review or other scientific oversight and are at high risk for factual inaccuracies. In fact, 2 prior studies have suggested YouTube videos to be a suboptimal gastroenterological resource for the public, although they were limited by the lack of validated instruments.^{6,7}

Our analysis demonstrates a disturbing proportion of inaccuracies and poor scientific quality information among the most viewed YouTube videos around colonoscopy using validated instruments for consumer information. Videos created by non-HP were more prevalent and less accurate. Some videos blatantly contradict current practice recommendations or deliberately overstate the risks of colonoscopy, whereas others might not be ill intentioned similar to one video by a non-HP content creator inappropriately recommending annual screening colonoscopy for all. Our study suggests that paying close attention to features such as content creator identity may help guide viewers toward more accurate health information.

Prevalence of Inaccurate Popular Colonoscopy-Related YouTube Videos per Validated Metrics

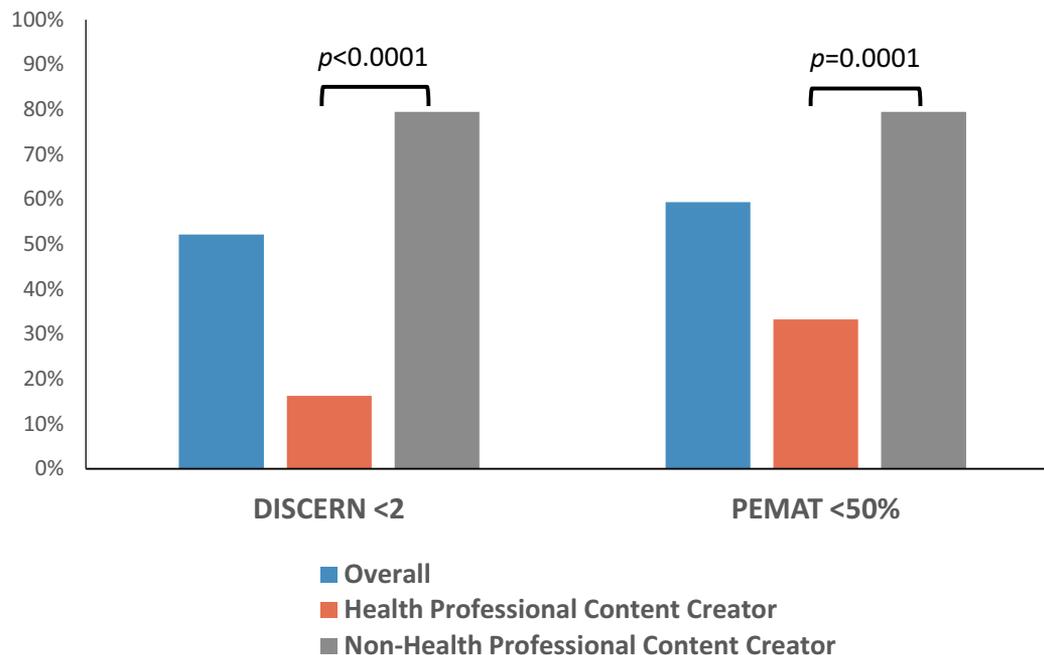


Figure. Prevalence of inaccurate or low scientific quality colonoscopy-related YouTube videos with at least 250,000 views, as defined by DISCERN instrument score <2 and PEMAT understandability score <50%. Professional posters were defined as accounts from societies, journals, and physicians. Nonprofessional posters included patients and nonmedical public figures. PEMAT, Patient Education Material Assessment Tool.

Of note, endoscopic videos were found to be a negative effect modifier of HP-posted content with regard to clarity and understandability, as measured by validated instruments. The main challenge of any video content is striking a balance between brevity and accuracy/comprehensiveness. When describing endoscopic videos to lay audiences, gastroenterologists must be careful to provide appropriate clinical context and use wording that is concise and easily comprehended.

Although it is disheartening to imagine the influence of these inaccurate videos on millions of people, it may be helpful to learn from them and dissect why they have succeeded in attracting viewers. Many of the top-viewed videos contain content such as comedians joking about their personal experience with colonoscopy or “shock factor” videos showing moving worms during a colonoscopy of patients’ parasitic infections. Moreover, a

significant number of the highly viewed videos containing inaccuracies were posted by non-HP content creators, often with large followings. Indeed, our cohort demonstrated a trend for higher average daily view for videos from non-HP than HP content creators (Table A2), highlighting the impact that non-HP social media influencers may exert on lay consumers of online contents. Therefore, beyond passive disavowment of existing online colonoscopy content, we propose the following multipronged approach by the professional gastroenterology community to proactively disseminate accurate health knowledge on social media:

1. Increasing professional participation on social media channels, especially to promote health equity and engage non-English-speaking and at-risk populations
2. Assistance for health care providers in content creation best

practices by professional organizations/societies such as the American Gastroenterological Association, including videography, storytelling, and editing

3. Partnering with popular, non-HP creators and influencers to effectively disseminate and raise awareness of accurate health information, similar to collaborative health promotion efforts already occurring in traditional media with public figures and celebrities

The limitations of our study include the moderate number of videos and raters, the cross-sectional nature of this study with ever-changing content and view count, and no available data on the demographics of viewers. However, the included videos represent the most viewed content and top search results for “colonoscopy” on YouTube, thereby supporting their reach to the public.

Recent events with the COVID-19 pandemic have driven social media platforms to pay closer attention to health information on their channels and engage HP to create more content online. Although the prevalence of inaccurate colonoscopy videos is concerning, an understanding of existing health misinformation and a proactive approach to cultivate professional content creation may help provide patients with high-quality information to help achieve colorectal cancer screening targets and improve health outcomes.

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Supplementary Materials

Material associated with this article can be found in the online version at <https://doi.org/10.1016/j.gastha.2022.07.005>.

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Abbreviations used in this paper: HP, Health professional; PEMAT, Patient Education Material Assessment Tool

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Conflicts of Interest:

These authors disclose the following: A.L.C. is an employee of Medtronic. A.L.C. is on the YouTube Health Advisory Board. The remaining authors disclose no conflicts.

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Ethical Statement:

The corresponding author, on behalf of all authors, jointly and severally, certifies that their institution has approved the protocol for any investigation involving humans or animals and that all experimentation was conducted in conformity with ethical and humane principles of research.

Data Transparency Statement:

The study data and analytic methods will be made available for a period of 5 years after the publication date upon request. The study material is included as a data supplement available with the online version of this article.