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CLINICAL TRIALS STUDY

Analysis of YouTube™ videos related to bowel preparation for colonoscopy

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Abstract

AIM: To examine YouTube™ videos about bowel preparation procedure to better understand the quality of this information on the Internet.

METHODS: YouTube™ videos related to colonoscopy preparation were identified during the winter of 2014; only those with ≥ 5000 views were selected for analysis (n = 280). Creator of the video, length, date posted, whether the video was based upon personal experience, and theme was recorded. Bivariate analysis was conducted to examine differences between consumers *vs* healthcare professionals-created videos.

RESULTS: Most videos were based on personal experience. Half were created by consumers and 34% were ≥ 4.5 min long. Healthcare professional videos were viewed more often (> 19400, 59.4% *vs* 40.8%, P = 0.037, for healthcare professional and consumer, respectively) and more often focused on the purgative type and completing the preparation. Consumer videos received more comments (> 10 comments, 62.2% *vs* 42.7%, P = 0.001) and more often emphasized the palatability of the purgative, disgust, and hunger during the procedure. Content of colonoscopy bowel preparation YouTube™ videos is influenced by who creates the video and may affect views on colon cancer screening.

CONCLUSION: The impact of perspectives on the quality of health-related information found on the Internet requires further examination.

Key words: Colon cancer prevention; Bowel preparation; Colonoscopy; Screening; YouTube™; Social media

Core tip: YouTube™ is a major media channel viewed by millions each day. Despite this reach, there is a paucity of research on the nature and scope of communications related to cancer prevention and control. To our knowledge, this is the first published study analyzing communications through YouTube™ concerning bowel preparation. The content of the YouTube™ videos regarding colonoscopy bowel preparation is influenced by who creates the video. Consumer posted videos generated the majority of comments on this topic.

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INTRODUCTION

The Internet has become an increasingly popular source

of health information for consumers. With over half of United States Internet users searching for information on a specific medical procedure, the quality of information available and its impact on the public's thoughts are significant[1]. YouTube™ has monthly traffic volume of about 1 billion users and provides a unique platform for conveying health information where both consumer and professional videos can be accessed[2]. Despite widespread reach, limited research on this communication channel has been conducted to characterize the source and content of information conveyed.

The purpose of this study was to analyze source and content of information conveyed in frequently viewed YouTube™ videos about preparing for a colonoscopy. Colon cancer screening is an important preventive measure, which is recommended by the United States Preventive Services Task Force[3]. The American College of Gastroenterology has recommended CRC screening by colonoscopy as the preferred screening modality[4]. Despite the existence of these recommendations, rates of CRC screening in general and colonoscopy screening in particular are less than optimal[5]. One reason for this may be that preparing for a colonoscopy is typically considered the "worst part" of the colonoscopy procedure[6]. Inadequate bowel preparation, which has been shown to occur in as many as 20% of colonoscopies[7], can obscure vision, and pre-cancerous or cancerous polyps can be missed[7,8].

MATERIALS AND METHODS

Between January and February 2014, the YouTube™ website was searched using the following keywords: colonoscopy preparation (19000 videos), colonoscopy prep (5140 videos), colon prep (7570 videos), colon preparation (7950 videos), bowel preparation (1770 videos) and bowel prep (7770 videos). All videos were sorted to determine how many had over 5000 views and duplicate videos were removed (n = 280). Videos with the highest number of views were screened to verify that the focus was on preparation for colonoscopy. The source of each video was coded as being created by a consumer or a professional. We identified 98 videos created by consumers and 96 videos created by professionals that had ⩾ 5000 views, which were selected for analysis. These videos were coded based on total number of views received and subject matter. Subject matter coding included whether the topic was addressed by relating a personal experience, general information, completing the preparation, types of preparation, palatability, pain, time required, disgust, embarrassment, sleep deprivation, hunger, difficulty and fear. The length of each video was documented along with the time elapsed since it was uploaded and the number of comments recorded. These methods were piloted on 10 videos with fewer than 5000 views, which were not included in our sample. Coding of the videos was conducted by one of the authors (RFR) and by another author (CHB) for the 50 videos that received the most views. High inter-rater reliability was demonstrated using Cohen's Kappa (k = 0.89).

Descriptive analyses included frequencies, percentages, means, standard deviations, and ranges. Length of time since posting in months, length of the video in minutes, number of views, overall and per month, and total number comments were grouped by quartile. Analysis was performed using Chi-square for categorical variables and ANOVA for continuous variables. One-sided p values < 0.05 were considered statistically significant. All analyses were performed using IBM SPSS (version 21). All study procedures were reviewed by the institutional review boards of the authors' respective institutions and were deemed not related to human subjects.

Table 1 Characteristics of YouTube™ videos (n = 194) of colonoscopy bowel preparation n (%)

	Total (n = 194)	Consumer (n = 98)	Healthcare professional (n = 96)	P value
Year video uploaded				0.14
2006	5 (2.6)	4 (4.1)	1 (1.0)	
2007	14 (7.2)	7 (7.1)	7 (7.3)	
2008	25 (12.9)	12 (12.2)	13 (13.5)	
2009	48 (24.7)	25 (25.5)	23 (24.0)	
2010	29 (14.9)	10 (10.2)	19 (19.8)	
2011	39 (20.1)	16 (16.3)	23 (24.0)	
2012	25 (12.9)	18 (18.4)	7 (7.3)	
2013, 2014	9 (4.6)	6 (6.1)	3 (3.1)	
Time since posting (mo)				0.31
0-36 (2011-2014)	73 (37.6)	40 (40.8)	33 (34.4)	
37-48 (2010)	29 (14.9)	10 (10.2)	19 (19.8)	
49-60 (2009)	48 (24.7)	25 (25.5)	23 (24.0)	
> 60 (2006-2008)	44 (22.7)	23 (23.5)	21 (21.9)	
Length of video (min)				0.45
0.0-1.5	46 (23.7)	21 (21.4)	25 (26.0)	
1.6-3.0	42 (21.6)	18 (18.4)	24 (25.0)	
3.1-4.5	40 (20.6)	23 (23.5)	17 (17.7)	
> 4.5	66 (34.0)	36 (36.7)	30 (31.3)	
Number of video views				0.037
5028-13300	48 (24.7)	32 (32.7)	16 (16.7)	
13301-18400	49 (25.3)	26 (26.5)	23 (24.0)	
18401-66500	49 (25.3)	20 (20.4)	29 (30.2)	
66501-3933235	48 (24.7)	20 (20.4)	28 (29.2)	
Views per month				0.18
0-250	52 (26.8)	32 (32.7)	20 (20.8)	
251-500	40 (20.6)	21 (21.4)	19 (19.8)	
501-2000	59 (30.4)	28 (28.6)	31 (32.3)	
> 2000	43 (22.2)	17 (17.3)	26 (27.1)	
Number of comments				0.001
0-3	53 (27.3)	16 (16.3)	37 (38.5)	
4-9	39 (20.1)	21 (21.4)	18 (18.8)	
10-40	44 (22.7)	31 (31.6)	13 (13.5)	
> 40	58 (29.9)	30 (30.6)	28 (29.2)	
Comments per month				0.09
< 1	130 (67.0)	60 (61.2)	70 (72.9)	
1-2	26 (13.4)	18 (18.4)	8 (8.3)	
> 2	38 (19.6)	20 (20.4)	18 (18.8	

RESULTS

Consumers and healthcare professionals each created approximately one-half of the videos (Table 1). Videos

Table 2 Themes of YouTube™ videos *n* (%)

	Total (*n* = 194)	Consumer (*n* = 98)	Healthcare professional (*n* = 96)	*P* value
Based on personal experience				0.18
Yes	114 (58.8)	53 (54.1)	61 (63.5)	
No	80 (41.2)	45 (45.9)	35 (36.5)	
Themes				
General information				< 0.001
Yes	79 (40.9)	12 (12.4)	67 (69.8)	
No	114 (59.1)	85 (87.6)	29 (30.2)	
Completing the preparation				< 0.001
Yes	43 (22.2)	11 (11.2)	32 (33.3)	
No	151 (77.8)	87 (88.8)	64 (66.7)	
Types of preparation				< 0.001
Yes	20 (10.3)	3 (3.1)	17 (17.7)	
No	174 (89.7)	95 (96.9)	79 (82.3)	
Palatability				0.048
Yes	55 (28.4)	34 (34.7)	21 (21.9)	
No	139 (71.6)	64 (65.3)	75 (78.1)	
Pain				0.78
Yes	23 (11.9)	11 (11.2)	12 (12.5)	
No	171 (88.1)	87 (88.8)	84 (87.5)	
Time involved				0.68
Yes	49 (25.3)	26 (26.5)	23 (24.0)	
No	145 (74.7)	72 (73.5)	73 (76.0)	
Disgust				0.009
Yes	19 (9.8)	15 (15.3)	4 (4.2)	
No	175 (90.2)	83 (84.7)	92 (95.8)	
Embarrassment				0.08
Yes	17 (8.8)	12 (12.2)	5 (5.2)	
No	177 (91.2)	86 (87.8)	91 (94.8)	
Sleep deprivation				0.06
Yes	10 (5.2)	8 (8.2)	2 (2.1)	
No	184 (94.8)	90 (91.8)	94 (97.9)	
Hunger				0.009
Yes	19 (9.8)	15 (15.3)	4 (4.2)	
No	175 (90.2)	83 (84.7)	92 (95.8)	
Difficulty to perform				0.65
Yes	18 (9.3)	10 (10.2)	8 (8.3)	
No	176 (90.7)	88 (89.8)	88 (91.7)	
Fear				0.71
Yes	26 (13.4)	14 (14.3)	12 (12.5)	
No	168 (86.6)	84 (85.7)	84 (87.5)	

were uploaded between 2006 and 2014, with the majority (79.3%) posted after 2008. Just over one-third of the videos were > 4.5 min (SD 5.3) in length (range 0.4 to 53.3 min), with the remaining videos distributed fairly evenly across the three other categories. Combined, there were more than 12.7 million views of the sampled videos. The number of views per video varied greatly and was dependent upon the length of time the video was available for viewing (overall range 5028 to 3.9 million views, range per month 91 to 57003). The number of comments also differed widely overall, ranging from no comments posted to nearly 3000. The mean number of comments per month was 1.3 (SD 4.1).

Overall, healthcare professional-generated videos had greater numbers of views than did those created by consumers (> 19400, 59.4% *vs* 40.8%, $P = 0.037$, for healthcare professional and consumer, respectively). In contrast, videos created by consumers received more comments (> 10 comments, 62.2% *vs* 42.7%, $P = 0.001$). When examining the number of views and comments per month, this difference was no longer observed. Additionally, no differences between videos created by consumers *vs* healthcare professionals were observed for the year of posting or length in minutes.

Almost 60% ($n = 114$) of all of the videos sampled were based on personal experience, and there was no significant difference regarding this appeal based on the source of the communication (Table 2). Compared with consumer created videos, those created by healthcare professionals were much more likely to provide general information about the preparation process, (12.4% *vs* 69.8%, $P < 0.001$), include information about completing the preparation process (11.2% *vs* 33.3% $P < 0.001$), and the types of preparation options that are available (3.1% *vs* 17.7% $P < 0.001$). Overall, only approximately 10% of the videos addressed the different types of preparation purgatives, disgust, embarrassment, hunger, difficulty, and fear and only approximately 5% dealt with the topic of sleep deprivation. There were no significant differences between the videos created by consumers *vs* healthcare professionals with respect to palatability of the purgative, pain, time involved, embarrassment, sleep deprivation, difficulty, and fear. In contrast, compared with videos created by healthcare professionals, those created by consumers were more likely to address topics related to palatability of the purgative (21.9% *vs* 34.7%, $P < 0.05$), disgust (4.2% *vs* 15.3%, $P < 0.01$), and hunger (4.2% *vs* 15.3%, $P < 0.01$).

DISCUSSION

The clinical and public health benefits of colonoscopy screening can be compromised by poor quality preparation[7,9-11] as well as adding cost, risk and inconvenience due to repeated procedures[12]. Suboptimal preparation is not a rare occurrence[13,14] and appears to be more likely among those at greater risk for late stage of diagnosis and consequently worse prognosis[13]. Efforts to promote adequate (or ideally optimal) preparation are, therefore, warranted. Social media such as YouTube™ is a communication channel that is increasingly used by the public to acquire health information in general and colonoscopy preparation specifically.

This was the first study to assess colonoscopy preparation information on YouTube™. This sample of videos collectively had nearly 13 million views. Many of the videos were related to personal experience. Some important topics (*e.g.,* types of preparation purgatives, disgust, embarrassment, hunger, difficulty, fear and sleep deprivation) were not addressed by majority of the videos reviewed. Social media has both the promise of reaching a very large audience with important information, but may also provide misinformation. Even if the information conveyed is accurate, it may negatively influence views on colon cancer screening. Future studies are needed to verify the accuracy of information about colonoscopy

preparation and to assess the perspectives conveyed. Social media is currently underutilized by governmental agencies to convey important health information about colonoscopy preparation and this is a missed opportunity to provide accurate and accessible information to the public about this important public health topic.

COMMENTS

Background

Colonoscopy has emerged as the preferred colon cancer screening method. Bowel preparation for colonoscopy has been described as the worst part of the procedure. Many people seek health information from media outlets like YouTube™.

Research frontiers

To date, there are no published papers examining the content of these videos related to bowel preparation for the colonoscopy procedure.

Innovations and breakthroughs

There were no other studies on this topic identified in the published literature. This is an innovative study in that it is the first in the published literature to analyze source and content of information conveyed in frequently viewed YouTube ™ videos about preparing for a colonoscopy.

Applications

The practical applications of these findings are that endoscopists should be aware of misinformation that may impact beliefs and practices of a patient regarding colonoscopy preparation.

Terminology

YouTube™ is a popular video-sharing web site based in the United States.

Peer review

The results of present study have new and original finding. The study has been thought very well and its design is good.

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