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A Content Analysis of YouTube™ Videos Related to Prostate Cancer

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Abstract

In the United States, prostate cancer is the most common type of cancer in men after skin cancer. There is a paucity of research devoted to the types of prostate cancer information available on social media outlets. YouTube™ is a widely used video sharing website, which is emerging as commonplace for information related to health. The purpose of this study was to describe the most widely viewed YouTube™ videos related to prostate cancer. The 100 videos were watched a total of 50,278,770 times. The majority of videos were uploaded by consumers (45.0%) and medical or government professionals (30%). The purpose of most videos (78.0%) was to provide information, followed by discussions of prostate cancer treatment (51%) and prostate-specific antigen testing and routine screening (26%). All videos uploaded by medical and government professionals and 93.8% of videos uploaded by news sources provided information compared with about two thirds of consumer and less than one half of commercial and advertisement videos ($p < .001$). As society becomes increasingly technology-based, there is a need to help consumers acquire knowledge and skills to identify credible information to help inform their decisions.

Keywords

prostate cancer, PSA, social media, YouTube™

Introduction

In the United States, prostate cancer is the most common type of cancer in men after skin cancer (Centers for Disease Control and Prevention, 2016a). Risk of developing prostate cancer increases with age (Centers for Disease Control and Prevention, 2015). Due to the slow growing nature of prostate cancer, signs and symptoms indicating a man is developing cancer are often not apparent. Doctors still screen their male patients using two types of techniques: the digital rectal exam, which involves estimating the size of the prostate and feeling for any abnormalities (Centers for Disease Control and Prevention, 2016a), and a test measuring the level of prostate-specific antigen (PSA) in the blood (Centers for Disease Control and Prevention, 2016a). Together, these tests provide a more accurate picture of prostate health than either test alone. Higher PSA levels in the blood may indicate prostate cancer is present, but there are other conditions unrelated to cancer affecting the prostate that may elevate PSA levels (National Cancer Institute, 2012). Even though it is widely used (Drazer, Huo, & Eggener, 2015), the U.S. Preventive Services Task Force (USPSTF; 2015) recommends against PSA-based screening; however, professional organizations and other guideline making agencies (Carter et al., 2013; Centers for Disease Control and Prevention, 2016b) who discourage the routine use of prostate cancer screening with both PSA and digital rectal exam, advocate for individualized screening decision making. The American Cancer Society still includes this test in the recommendations for early detection (American Cancer Society, 2016a). Current attitudes toward PSA screening for prostate cancer are varied and can be influenced by source of information (Mosconi, Colombo, Satolli, Carzaniga, & Steering Committee and the Scientific Committee, 2016).

Given that prostate cancer is a common form of cancer in men (American Cancer Society, 2016b), it is important for health care professionals to understand the type of

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information available via social media outlets regarding this topic. For example, Prabhu et al. (2015) conducted a study of Twitter users to analyze the reaction to the USPSTF's reformed recommendations. Most of the users (68%) disagreed with the completed recommendations (Prabhu et al., 2015). This provides an example of one study using social media as a way of observing health content, issues, and society's knowledge of public health. The Internet is an important source of health-related information. A survey indicated that 72% of those who use the Internet stated that they had utilized the Internet as a medium for searching for health information (Pew Research Center, 2013).

YouTube™ is a social media website with worldwide users totaling over one billion (YouTube™, n.d.). Due to the fact that YouTube™ has such a large and diverse community of users, it could be a media channel for improving public awareness and understanding, or conversely, for disseminating information that may cause harm with potentially misleading or invalid information. With the great potential YouTube™ has for outreach, research regarding videos on this site related to public health is of great importance. The purpose of this study was to describe the most widely viewed YouTube™ videos related to prostate cancer and information presented on PSA testing, the test most commonly associated with prostate cancer screening by the general public (Drazer et al., 2015).

Method

A search was conducted using the search term "prostate cancer." The 100 most viewed videos were reviewed, as view count serves as an indication for popularity, regardless of date of the video posting to approximate the information most frequently seen by seekers of prostate cancer information. Videos were assessed and coded for number of views prior to review, length in minutes, number of likes and dislikes, upload source, and content. The viewing of the video for the purpose of coding was not counted in the total view count. The sources were classified as follows: (a) Consumer—an individual without any professional connection uploaded the non-news video; (b) Medical or government professional affiliation; (c) News source—a video clip was uploaded directly from a television or Internet-based news source or by a consumer who had accessed the clip; and (d) Commercial media or advertisement—a video uploaded by a commercial television, radio, or print resource, including advertisements for hospitals and services.

Each video was assessed to determine if the video was informational in content or served another purpose and whether the information provided in the video addressed either PSA testing or prostate cancer in general (e.g., symptoms, disease development, treatment, support). Content associated with the PSA test included information regarding the test and screening, encouragement to complete a PSA test, stating that the test was required, any pain associated with the test, and anxiety or fear of both the administration of the test or possible diagnosis of prostate cancer.

Assessment of encouragement consisted of any person or persons in the video insinuating that screening for prostate cancer would be beneficial to their health (Wong, 2015). The level of encouragement was assessed as whether or not the speaker(s) motivated their viewers to get screened for prostate cancer. If the speaker(s) in the video focused on screening and/or promoted positive messages about screening, the video was coded as "strongly encouraging," and if the speaker(s) advised not to get screened for prostate cancer, especially the PSA, those videos were coded as "strongly discouraging." If any video did not contain someone advising to get screened for prostate cancer, the video was coded as "neither strongly encouraging nor discouraging."

Content related to prostate cancer included risk factors, treatment, and prevention methods. Accuracy of this content was determined by comparing statements in the videos with the American Cancer Society (2016a, 2016b) publications covering risk factors and prevention and treatment guidelines stated in the National Comprehensive Cancer Network (2016). These agencies were chosen as they focus on evidence-based practice and are well-rounded sources of information for patients. Information presented that deviated from that published in the reference materials was considered to be "inaccurate." A single researcher (AM) was responsible for having sorted and analyzed all videos in this sample. A random number generator was used to select 10% of videos that were coded by a second researcher (CB). A kappa of 0.98 indicated a very high level of agreement between reviewers.

Frequencies, percentages, means, ranges, and 95% confidence intervals were calculated using IBM SPSS (Version 22). Analysis of variance was used to compare video characteristics (number of views, length in minutes, number of likes and dislikes) expressed as continuous variables; differences in video content (categorical variables) by the source of the video were examined using chi-square analysis. Human subjects are not included in the research, therefore review by the Institutional Review Boards at William Paterson University and at Teachers College is not required.

Results

The 100 videos were watched a total of 50,278,770 times and the number of views per video ranged between 34,004 and 13,312,255 (Table 1). The majority of videos were uploaded by consumers (45.0%) and medical or government professionals (30%). The mean length of a video was 7.9 minutes (SD = 13.3). The date of upload of the videos ranged from 2003 to 2016. In general, videos were "liked"

Table 1. Characteristics of 100 YouTube.com Videos on Prostate Cancer.

		Video upload source				
	Total (N = 100)	Consumer, n = 45	Medical or government professional, n = 30	News source, n = 16	Commercial media or advertisement, n = 9	p
Video characteristics						
Video, number of views						
Mean (*SD*)	502787.7 (1887118.6)	562956.2 (2022503.2)	575585.0 (2244817.9)	411109.5 (1276715.8)	122271.0 (169943.7)	.44
95% CI	[132919.3, 872656.1]	[0.0, 1153879.4]	[0.0, 1378868.0]	[0.0, 1036688.7]	[11243.2, 233298.8]	
Range	34,004-13,312,255	34,004-1,331,225	34,542-12,286,309	39,996-5,195,332	34,320-56,992	
Video length in minutes						
Mean (*SD*)	7.9 (13.3)	5.6 (7.9)	11.8 (19.8)	8.9 (12.7)	4.8 (3.3)	.30
95% CI	[5.9, 10.5]	[3.3, 7.9]	[4.7, 18.9]	[2.7, 15.1]	[2.6, 7.0]	
Range	0.4-76.1	0.4-45.0	1.1-76.1	2.1-53.3	0.5-9.0	
Video, number of "likes"						
Mean (*SD*)	1387.5 (8840.6)	516.2 (1334.4)	329.7 (913.7)	6529.9 (21801.6)	127.8 (111.0)	.41
95% CI	[0, 3119.7]	[126.3, 906.1]	[2.7, 656.7]	[0, 17256.6]	[55.3, 200.3]	
Range	0-87,810	0-7,276	0-4,992	37-87,810	1-296	
Video, number of "dislikes"						
Mean (*SD*)	102.2 (466.1)	135.3 (624.7)	85.4 (328.7)	88.6 (266.9)	16.7 (34.2)	.25
95% CI	[10.8, 193.6]	[0, 317.8]	[0, 203.0]	[0, 219.4]	[0, 39.0]	
Range	0-4,202	0-4,202	0-1,795	2-1,086	0-106	
Video content,[a] *n* (%)						
Purpose to provide information	78 (78.0)	29 (64.4)	30 (100.0)	15 (93.8)	4 (44.4)	<.001
PSA, n (%)						
Testing and routine screening	26 (26.0)	15 (33.3)	7 (23.3)	4 (25.0)	0 (0.0)	.21
Encourages test	12 (12.0)	4 (8.9)	1 (3.3)	3 (18.8)	4 (44.4)	.01
Test required	3 (3.0)	2 (4.4)	0 (0.0)	0 (0.0)	1 (11.1)	.29
Pain associated	3 (3.0)	0 (0.0)	2 (6.7)	0 (0.0)	1 (11.1)	.15
Anxiety/fear of diagnosis/screening	8 (8.0)	3 (6.7)	2 (6.7)	1 (6.3)	2 (22.2)	.44
Prostate cancer, n (%)						
Risk factors	16 (16.0)	6 (13.3)	7 (23.3)	3 (18.8)	0 (0.0)	.36
Treatment	51 (51.0)	21 (46.7)	14 (46.7)	12 (75.0)	4 (44.4)	.22
Prevention	18 (18.0)	8 (17.8)	6 (20.0)	4 (25.0)	0 (0.0)	.46

Note. CI = confidence interval; PSA = prostate-specific antigen.
[a]Categories overlap and do not add up to 100%.

more often than "disliked" (mean number of "likes" 1387.5 vs. mean number of "dislikes" 102.2). The purpose of most videos (78.0%) was to provide information, followed by discussions of prostate cancer treatment (51%) and PSA testing and routine screening (26%). By source of the upload, there were no statistical differences between the sources of the video upload and the characteristics of the videos (e.g., number of views, length, etc.). All videos uploaded by medical and government professionals and 93.8% of videos uploaded by news sources provided information compared with about two thirds of consumer and less than one half of commercial and advertisement videos ($p < .001$). Commercial and advertisement videos also more often encouraged PSA screening (44.4%) compared with videos uploaded by other sources ($p = .01$).

Discussion

To the authors' knowledge, this is the first study to describe the most popular YouTube™ videos related to prostate cancer. This study demonstrates that YouTube™ videos reviewed in this sample strongly encourage PSA testing, particularly those uploaded as commercial media or advertisements, despite the recommendation of the USPSTF. Although 26% of videos provided information on testing and routine screening, less than half of these videos actually encouraged the test.

A substantial number of asymptomatic men screened with PSA will be diagnosed with disease, which may never progress or become symptomatic, and thus are considered to be "overscreened" or to have "pseudo-disease" (USPSTF, 2015). Current estimates indicate that 20 million men partake in PSA screening annually (Drazer et al., 2015). This, combined with an estimate of about 220,000 new cases of prostate cancer per year, the audience for this information is immense (Siegel, Miller, & Jemal, 2015). A 2005 article indicated that Internet is used as an aid in the decision-making process regarding prostate cancer treatment (Gwede et al., 2005). An earlier study examining the content of 51 YouTube™ videos related to PSA, radiotherapy, and surgery for the detection and treatment of prostate cancer reported that the information content

regarding prostate cancer was fair or poor in 73% of the videos (Steinberg et al., 2010). As with the current study, the reason for this may be due to the high proportion of consumers who uploaded content. In addition, the most popular videos in this study included commercials and advertisements, which may reflect a biased opinion toward prostate cancer and PSA testing. Another factor regarding accuracy of content is that YouTube™ is a globally used resource and videos may reflect standards for other countries versus those followed in the United States, causing confusion among users trying to obtain "accurate" information. It is important to note that this study is limited by the ever-changing content of the Internet, which cannot be captured using a cross-sectional design In addition, 36 of the 100 videos were uploaded prior to 2011, and therefore, it is important to note that these may not be consistent with the updated recommendations for PSA screening. In addition, the information from two agencies were chosen as a standard for comparison. Many agencies offer this information and could have been used for this purpose. Future studies could expand on the sample size, broaden the search terms, follow videos over time, and include a detailed analysis of the comments.

Conclusion

As society becomes increasingly technology-based, there is a need to help consumers acquire knowledge and skills to identify credible information to help inform their decisions. While YouTube™ is a widespread venue for delivering messages, including those related to health (Lauckner & Whitten, 2016), this study raises concern about the accuracy of content about prostate cancer messages. Future research is needed to improve understanding about ways to help the public understand and use information contained in YouTube™ as well as other digital media.

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