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Clinical study

The reliability of YouTube videos in patients education for Glioblastoma Treatment

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ABSTRACT

Background: Glioblastomas (GBMs) are one of the most devastating primary tumors in humans and often results in minimal survival rates. Over the past 2 decades, patients have accessed the internet to obtain information related to their diagnoses. In this study, we aimed to evaluate the accuracy and the reliability of GBM-related YouTube videos.

Methods: In June of 2017, a search was conducted on YouTube using 6 keywords. Videos were sorted using "Relevance-Based Ranking" option, and the first 3 pages for each search were selected for further analysis. Three independent reviewers evaluated the videos using the validated DISCERN Tool.

Results: After sorting 23,100 videos, 9 videos were identified and included for analysis. Of the 9 videos analyzed, 88% (8/9) were from hospitals affiliated with prestigious universities across the country. Of the nine videos included in the analysis, two (22%) scored above a 3. There was an average 55% overlap in the videos analyzed by key term and the keyword search of "Malignant Glioma Treatment" had the highest percentage of videos above a score of 3 (66%).

Conclusion: Many patients with GBM and their families access information on YouTube to familiarize themselves with the epidemiology, survival, and treatment options for this form of tumor. However, the information that is currently available online is not monitored or vetted using an official filtering process prior to its release. Medical institutions must work to produce more peer-reviewed content in order to improve the availability of credible health information on internet platforms.

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1. Introduction

Glioblastoma multiforme (GBM) is one of the most aggressive primary tumors in adults [1,2]. Despite vigorous efforts and novel treatment approaches to reduce their impact on mortality, the median overall survival rate remains approximately 12–16 months [3–6]. Therefore, as described in previously published articles [7–9], quality of life (QoL) is an important factor in formulating a treatment plan for patients with GBM [7–9]. In the new millennium, the internet has become a vital and increasingly convenient source for information for patients and their families [10]. YouTube is considered one of the largest internet platforms with over one billion users [11] and is the second most visited website behind the "Google" search engine [12]. Many patients and families access YouTube to acquire more information and knowledge regarding their disease and available treatment options [10]. Thus, there is a continuous need to critically evaluate the quality of the YouTube healthcare-related videos.

Previously published studies [13–17] have evaluated the reliability and accuracy of online YouTube videos related to the medical field such as femoroacetabular impingement [18]; movement disorders [19]; methotrexate self-injection[20]; and pediatric adenotonsillectomy and ear tube surgery [21]. The consensus from these studies was that while the internet provides easy and unlimited access to healthcare-related videos, the majority were proven to consist of unreliable educational information [18,19]. Furthermore, there is little literature regarding the reliability and accuracy of the YouTube video content covering GBM and other

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epidemiologically rare brain tumors [13–21]. In light of this knowledge gap, the aim of this study is to evaluate the quality and the reliability of GBM-related YouTube videos.

2. Materials and methods

2.1. Search strategy and data collection

The video-sharing website YouTube was queried in June of 2017 using the separate key terms "Glioblastoma Treatment, Glioblastoma Multiforme Treatment, GBM Treatment, malignant glioma treatment". Over 11,600, 4300, 5600, and 1600 results were identified from these searches, respectively. The YouTube search was sorted by the "Relevance-Based Ranking" [22] option of videos and the first three result pages of each search were assessed. Previous internet search engine analysis has shown that greater than 90% of users choose from results listed within the first three pages of the search engine, which represented the top 1.6% of all videos [23]. This study was exempt from Institutional Review Board Approval as it involved the use of public access data only.

2.2. Inclusion and exclusion criteria

The inclusion criteria were adapted and modified from prior studies [19,20]. Based on this modified criteria, 23,100 potential videos were identified for potential investigation. Only official videos uploaded by universities or hospitals and in English were included and considered for further analysis. Videos with multiple subparts were counted as one video. Duplicate, non-relevant videos, or videos of magic or non-scientific treatment methods were excluded from further analysis.

2.3. Variables extracted

Information collected for each video included: video ID, video name, dates uploaded, viewership, likes, dislikes, and video duration. Audience interaction with the video was assessed by examining the total number of views and viewer "likability", which was calculated as the number of likes per day on the video. We also determined the number of days online; views per day; likes per day; likes per view; and average duration.

2.4. Scoring system

Videos were assessed independently by three authors made up of two clinicians (K.R. and P.K.) and one non-clinician (Sh.T.) using the DISCERN Tool [24]. DISCERN is a grading scale/rubric designed to judge the quality and reliability of health information. Videos are scored based on a five-point scale ranging from poor to moderate to good. Evaluators select scores for fifteen points of criteria that serve as quality indicators along with selecting an overall quality rating. Each indicator represents a critical feature or standard that is considered an important characteristic of high quality information.

Videos with a DISCERN score greater than 3 were considered to be "good" quality videos. According to the DISCERN Tool, a video with a grade of 3 is "moderate" and of fair quality. Videos with a score of 3 are useful sources, but ultimately the patient would need additional sources of information. Videos with a score less than 3 were considered to be "poor" quality; these videos are not considered useful and should be avoided by patients. Continuous variables are summarized using medians with interquartile ranges and categorical variables using frequencies with proportions. Variables were compared between helpful and unhelpful videos using the Wilcoxon Rank Sum Test. Statistical analysis was conducted using R Studio (Version 1.0.143). A biostatistician contributed in the statistical analysis of this study (Sh.T.).

3. Results

Our search identified 11,600, 4300, 5600, and 1600 videos with the separate key terms "Glioblastoma Treatment, Glioblastoma Multiforme Treatment, GBM Treatment, Malignant Glioma Treatment", respectively (Table 1). After screening using our inclusion and exclusion criteria, nine (0.039%) videos were identified and selected to undergo further analysis. There was an average of 55% overlap between the keyword searches. The oldest video included was uploaded in 2010 (Table 2). 88% (8/9) of videos analyzed were uploaded by university hospitals (Table 2). 11% (1/9) of videos were not published by hospitals or academic institutions, with one video uploaded by a private medical institution (Table 2). Additionally, there was no correlation observed between video duration and the number of views. Of the nine videos included in the analysis, only two (22%) scored above a 3 out of 5 (Tables 1 and 2). The inter-grader reliability was 0.60 with a maximum of 3 point scoring difference. Of the four key term searches, "Malignant Glioma Treatment" had the highest percentage of "good" quality videos (66%) (Table 1). While the average DISCERN score was 4.06 out of 5 in terms of a clear purpose for the videos, discussion related to the risks and consequences of not receiving treatment scored an average of only 1.88 out of 5. Common themes across the videos included brief discussions of diagnosis followed by limited information on disease etiology; surgical intervention options; and potential prognosis. In congruence with other studies, our results demonstrated that common video-sorting criteria of likes, duration, views, and age had no effect on the quality of the video (Table 3).

4. Discussion

The internet has become a key catalyst in the distribution of readily accessible information to the general public [10,15,25,26]. YouTube has been constantly changing over the 12 years of its existence. It has become increasingly consumer-friendly, easily accessible, and free; therefore, many patients and families rely on YouTube videos to obtain information on disease diagnosis and management. There are previously published studies [13–17] evaluating the reliability and accuracy of these online resources regarding different epidemiological diseases [18–21]. However,

Table 1
Assessment of videos.

Variable	Keyword				Total
	Glioblastoma Multiforme treatment	Glioblastoma Treatment	GBM treatment	Malignant Glioma Treatment	
Videos Found	11,600	4300	5600	1600	23,100
Assessed	6	5	6	3	9*
Rated as helpful	1 (0.17)	1 (0.20)	2 (0.33)	2(0.66)	2 + (0.22)

* Search resulted in several overlaps between key term searches.

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