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The role of YouTube® videos in heart surgery decision

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ABSTRACT

Introduction: Finding a surgeon and center they can trust is essential for a patient who will be for heart surgery. YouTube® is a modern method at this decision stage as a visual source of information that includes many user comments. In this study, we examined how accurately YouTube® resources guide patients.

Material and Method: The social media platform's official page (https://www.youtube.com) was used for this research. Keywords "heart surgery," "open-heart surgery," "robotic heart surgery" were selected as keywords for related video searches. Advertising promotions and videos with game content have been removed from search results. As the videos' evaluation criteria included in the study, relevance, date added, the number of views, views/likes rate, the descriptive response rate to comments, and video quality were determined.

Result: The most popular 1069 videos were evaluated between 05.10.2020-05.01.2021. Of these, 70 videos with the highest level of interest were evaluated. Video views median value is 26401 (Interquartile range [IQR]: 4968-1998337). The engagement rate median value was 0.55 (IQR: 0.40-0.88). The median average value was 1.67 (IQR: 0.35-10.68). The comment/subscriber rate median value was 0.001% (IQR: 0.0233%-0.0585%).

Conclusion: Despite the ease of access to information sources in the information age, the importance of face-to-face meetings is still indispensable in information transfer. Because when it comes to illness, people look for knowledge, trust, and complacency. Patients want to know the person they will entrust their health to and ask questions repeatedly, even if it is the same question. Video sources can still only give a preliminary idea.

Keywords: Heart surgery, YouTube® videos, patient care

INTRODUCTION

The number of centers using open-heart operations and minimally invasive methods are becoming widespread day by day. Centers performing robotic heart surgeries are also added to these operations in an increasing number (1). In the USA, an average of 500 thousand people undergoes heart surgery for various reasons every year. Individuals with heart disease may not look favorably upon the idea of surgery for various reasons at first and may try to delay the surgery. The majority of individuals who believe that the necessity of surgery is inevitable have a fear of death, fear of unable to return to their former living comfort, or cosmetic concerns (2,3). Every patient rightly wants the slightest trauma, the lowest risk, and the shortest return to normal. Various factors play a role in the selection of the doctor and hospital to perform the surgery. These may be current country conditions, socio-cultural situation, and economic parameters. Until recently, while family members and well-known physicians were consulted, the priority of receiving opinions shifted to digital environments with the increase in social media use and unlimited access to information in almost every field. YouTube is one of the most preferred platforms in this field in terms of visual information, user comments, and related links. YouTube supports 2 billion users and content per month in 80 different local languages in more than 100 countries (4). According to YouTube statistics, 73% of adults in the USA use YouTube (4). In addition to having the possibility to seek information for themselves regarding cardiac surgery, adults can also seek information as a parent of a pediatric case and may be included in this percentile.

Considering these numbers, we can say that it is an excellent opportunity for the correct data to reach the right people. Suppose the person or institution that gives the information shares the real story clearly with sufficient sincerity. In that case, it may be possible for people to establish the spiritual connection they seek in this environment.

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Another critical issue that should be considered in sharing is whether each information is provided and whether the published visual provides information about the whole process. Typically, all the possible results of a major surgical procedure such as heart surgery are presented clearly at the patient-physician meeting. Complications and secondary operations are discussed when necessary.

MATERIAL AND METHOD

This study does not require ethics committee approval. The data collected included reviewing the videos of the approved channels uploaded to YouTube®, the international social networking platform. The patient questionnaires, which are also mentioned in the references, are quoted from foreign clinics' studies.

The social media platform's official page (https://www.youtube.com) (1600 Amphitheater Parkway, Mountain View, CA 94043. Google LLC) was used for this research.

Keywords that are likely to be preferred in separate web tabs have been written into the search bar. These words were chosen as "heart surgery," "open-heart surgery," "robotic heart surgery." One thousand sixty-nine (1069) videos were shown in the search result. The first 70 videos were ranked according to study criteria. In this ranking, the default option of YouTube, "relevance," was used first. The recording time of the video streams also varied. Thus, we did not include the video time limit to no limit the training content. The video channels' names, URL addresses, video broadcast dates, and viewing/liking rates were recorded in the data template. With these data, duplication of videos encountered in every call was prevented. Advertising videos and game animations were excluded. Videos with non-English broadcast language or subtitle options were excluded. As the inclusion criteria, informative videos of people who have undergone heart surgery and present their experiences objectively, healthcare professionals or corporate publishers were selected. The duration of these videos, the quality of the broadcast, the number of views/likes, the number of comments received, the publication date, the type of content (education, person, etc.) were other inclusion criteria.

We calculated the engagement rate and average values to comment on the video benefits (**Information box**). The engagement rate is used to measure the engagement level of viewers from user-generated content. Likes, comments, and shares, if any, are included within this concept of interaction. Evaluating all of these gives more objective results than evaluating only one criterion. Besides, we determined the utilization characteristics of each video by using the Discern instrument (5). These criteria consisted of 3 parts and 16 questions and were made with a scoring system from 1 to 5 for each question. The videos' level of usefulness for patients was also evaluated with the Global Quality Score (GQS) evaluation (**Table 1**) (6). In this scoring system, every video had scored from 1 to 5 in general. The general summary of the video analysis is listed in **Table 2**.

Information box. Formulas for engagement rate and average calculation
Engagement rate: [(like+comment)/view]x100
Average: (view+comment)/subscriber

Table 1. The global quality score (GQS) criteria	
1	Poor quality; is unlikely to be used for patient education.
2	Poor quality; is of limited use to patients because only some information is present.
3	Suboptimal quality and flow; is somewhat useful to patients; essential topics are missing; some information is present.
4	Good quality and flow; useful to patients because most essential topics are covered.
5	Excellent quality and flow; are beneficial to patients.

Table 2. The analysis of the published videos

Characteristic	Mean	Median	IQR
Duration (day)	1756	1313	702-2998
View	423775	26401	4968-198337
Like	1915	130	25-611
Dislike	164	9.5	1.25-56.25
Engagement rate	1	0.55	0.4-0.88
Average	17	1.67	0.35-10.68
Recording time (min.)	12	7.3	3.5-13.9
Discern instrument	61	64	53-69
Global quality score	4	4	3-5

Statistical analysis was performed using IBM SPSS Statistics Software 22 (SPSS Inc, Chicago, IL). Descriptive statistics of continuous data were presented as median and IQR.

RESULT

Social media users who want to learn about the surgical treatment of heart diseases and benefit from the experiences of those who had surgery were searched with keywords they could use. We spotted 1069 videos in the search ranked by relevance. We found numerous repetitions among the available results. As the interest in these videos decreased, the number of promotional videos increased. In this framework, we examined in detail the first 70 videos that meet the inclusion criteria. 81.4% (n=57) of channels producing English content (including subtitles) originated from the United States of America (USA). 94.2% (n=66) of the publications were made through institutional channels. Fifty-two of these channels contained technical information about the operation and information about the preparation stages. On the other hand, 18 channels included information about the postoperative or post-discharge process. Despite the

operation information, there was little information about known surgical complications and complicated disease processes. Among the video rankings, only one video offered content about sternal dehiscence. The person who posted this video was a plastic and reconstructive surgery specialist. Characteristics such as the title of the personnel who broadcast the video and the preferred category are given in **Table 3**.

Table 3. Video presentation features

Informant	**Number of videos**	**%**
Patient	4	5.7%
Doctor	62	88.5%
Nurse	4	5.7%
Info type		
Containing surgical view	28	40%
Explaining the image	67	95.7%
Session (without image)	2	2.8%
Video without speech	3	4.2%
Stage		
About operation	52	
Postoperative process	18	
Country		
US	57	81.4%
Other	13	18.5%
Category		
Education	23	32.9%
Non-profit	13	18.6%
Tech	22	31.4%
HowTo	2	2.9%
News	1	1.4%
People	2	2.9%
Entertainment	1	1.4%
Uncategorized	6	8.6%
Videos of the same channel	4 (max.)	5.7% (max.)

The videos were also evaluated with the time categorization, which is the YouTube classification. The classification was made here as less than 4 minutes (L1), between 4 and 20 minutes (L2), and longer than 20 minutes (L3) (**Table 4**). However, durations were not used as exclusion criteria.

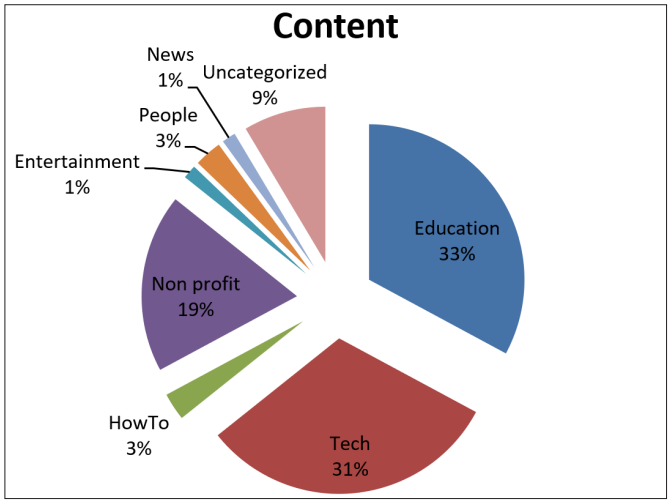
Table 4. Viewing rates by video duration

	Category (length)	**# video**	**Percent (%)**	**median view**	**IQR**
<4 min.	L1	22	31.40%	21205	4224-131857
4-20 min.	L2	39	55.70%	29411	5599-203996
>20 min.	L3	9	12.90%	26400	5068-198280

IOR; interquartile range

As indicated in **Table 4**, the users' choices to produce the most content were in the periods in the L2 category. Besides, the rate of getting the most viewers was also in this category. Although there were more videos with less than 4 minutes duration, viewers turned to videos with longer content (L3 category) to get enough information. When the short videos (L1 category) were examined, almost all of them were content provided by institutional resources. Although a YouTube viewer was interested in the first 15 seconds of videos on popular topics and videos that do not exceed 15 minutes under normal circumstances, these issues were not valid for serious health issues. Also, we did not find any "clickbait" situation in surgical videos of high relevance.

When we examine the channels according to their content types, 32.9% (n=23) are education, 31.4% (n=22) are technology (Tech), 18.6% (n=13) are non-profit organizations classified. The remaining 17.1% (n=12) had channels with "uncategorized", "people", "How-To", "entertainment" content (**Graphic 1**).



Graphic 1. Distribution of contents

The median value of video viewing times was 7.3 minutes (IQR: 3.5-13.9). The average length of stay on YouTube since the release date of videos was 1313 days (IQR: 702-2998). The median number of views was 26401 times (IQR: 4968-198337). The median value for the view/like ratio is 0.0051% (IQR: 0.0037-0.0083).

When the number of video views of the users and the release date of the video were examined, it was seen that the last published videos could also get a high number of views. The decisive point was the appeal of the video subject. Users were most interested in coronary bypass surgery videos. Besides, valve diseases surgery and pediatric heart surgery videos were also at the top. There was no relationship between the number of video likes and the number of comments. Seven channels even closed their video comment areas to users.

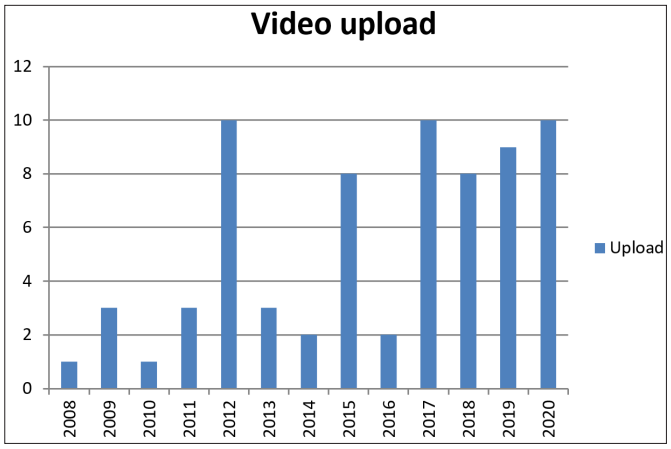
The characteristics of the content offered by social media users to their audience were statistically analyzed. A statistically significant relationship was found between the video's duration and the number of views (p= 0.01). It was determined that the highest number of views on videos was between 4-20 minutes. It was observed that

channels with more than 100 thousand subscribers also pay attention to these video durations' limits. However, there was no significant relationship between the number of subscribers and the number of views (p= 0.45).

Video views were independent of the number of subscribers of the channel. There were channels with 3-4k subscribers and more than 1 Mn views. Among the factors affecting the number of views was the sharing of images related to the surgical procedure. All of these videos had an informative speech recording and subtitle text simultaneously.

When the database in which video analysis was recorded was examined, it was seen that the vast majority of the videos serving the actual purpose originated from the locations with a high level of development. These locations were also the regions where cardiac surgery procedures progressed in correlation with the same development level.

When we looked at the dates when the videos about heart surgery were uploaded to the YouTube platform, the data for the last four years show that content production has increased. We have listed these data in **Graphic 2**.



Graphic 2. Upload amount by years

DISCUSSION

The variety of social media use and the number of users are increasing day by day, and the number of users who produce their content is also increasing. In addition to Instagram, Pinterest, Twitter, and Twitch, YouTube attracts great attention among social media platforms. According to YouTube statistics, one billion hours of content is watched every day (4). Most of the channels in which surgical treatment options, the subject of our study, were shared were institutional. However, there are limited personal experience videos that can help guide the decision-making process together. Despite this, it was observed that personal experiences were shared in some surgical centers. Professionally editing these video recordings and publishing them according to YouTube guidelines can be cumbersome. However, if it is desired to reach the target audience to a large extent, attention should be paid to details such as the beginning of the video, speech fluency, and image quality. The importance of these details can be determined with Discern instruments and GQS.

For the videos to meet the needs, the number of posts that convey personal experiences should increase. Thus, it will increase its preference over other social media tools that can be used more practically. The desired person and institution can be labeled in other applications, and comments can reach the target audience faster with instant notifications.

It is the most natural right of patients or their relatives to find the correct answers to the questions in mind, reach their physicians, and make detailed inquiries on social media platforms. The answers that both adult and pediatric cardiac surgery patients want to hear from a surgeon may differ. Adult patients or their relatives wish to question the factors that cause surgery, the duration of the surgery, which methods will cause fewer traumas, their speed of returning to their daily activities after surgery, and perhaps the fate of their sexual activities or sports life. The pediatric case family can question the surgery plan and wish that the growth process is not interrupted. He may also wonder if his children will need another surgery.

Moreover, as they value their children more than anything, they may wonder if they will get scars. And they are right in all these questions. Every patient is a unique entity. Therefore, the video's content should appeal to the broadest possible audience and contain transparent information that they can understand. Risks should be referred to in absolute numbers by showing sources where necessary. It does not seem easy to find the answers to all these questions that the physician will answer with empathy in the face-to-face meeting in the hospital with the same clearness and objectivity on social media. The video viewing and appreciation or comment rates in the study support this. As the personal comments show, we think the video content did not meet expectations.

In the video information sources, informing the patient with detailed visuals (for example, the surgical image) was an opportunity not found easily in previous years. The point that the patient should question is whether it is beneficial to watch the operation images. Such detailed images may be meaningful for a specialist physician. However, we think these images can be frightening and even mentally harmful for some people before surgery. A randomized controlled study reported that pre-operative training videos for patient preparation did not increase the patient's general readiness. However, they concluded that although the patient's time spent with the healthcare team did not increase at this stage of education, he made the patient feel ready with a positive perception (7). In another publication, the contribution of video-supported patient education by assistants to postoperative recovery

was investigated (8). They found that patients watching the videos were less disturbed. Although these studies have presented positive effects of video-supported patient education directly or indirectly on patients, the critical detail is that they were conducted in the hospital environment within the physician-patient relationship framework, not in the social media environment. In other words, an additional questionnaire form may be required to be given to the patients who will be hospitalized to know whether the information in the virtual environment will have the same effect.

One of the main factors affecting the view rate of YouTube shares is video recording time. When users want to get objective information about a topic, they should either watch the video entirely or read the comments, if any. That's why the first minutes of the video shouldn't bore the audience. Besides, the fact that the time is over 20 minutes is a negative factor, according to YouTube. The number of comments and directionality of the videos we evaluated in our study was low. Risks and complications were less frequently mentioned. Today, people on popular platforms other than YouTube can now direct their followers with instant live links.

The YouTube platform can guide information about physicians or institutions that have achieved successful work in their field. However, evaluating and sharing videos from a different perspective in terms of duration and qualification will increase diversity.

As long as natural persons do not go through several verification stages, the reliability of the comments we will encounter on digital platforms will remain low. It will also be much more enlightening for the person or institutions that publish the information to inform the audience of all kinds of complications and other information (somatic, psychological, financial expenses, etc.). We believe that the number of content should be increased, especially where personal experience stories are shared. Sharing a patient with problems due to complications or co-morbidity factors among real experiences may cause the patient in need of an operation to become anxious and abandon the procedure. Therefore, we believe that it will be safer to present valuable experiential educational videos in the hospital environment. The information and training given by physicians is still the most valuable argument. Of course, possible risks must be shared. However, these can be overcome in an environment of mutual trust between the patient and the physician.

In the age of digital information acquisition, not only feedback but also surveys in hospitals may be required to conclude whether social media is sufficient to guide and accurately source information in a significant surgical branch and every field. Perhaps shortly, we may see "referring information source" lines on patient admission forms.

CONCLUSION

As a result, the picture that appears is that it is early to make objective decisions with YouTube information or promotional videos.

ETHICAL DECLARATIONS

Ethics Committee Approval: This study does not require ethics committee approval. The data collected included reviewing the videos of the approved channels uploaded to YouTube®, the international social networking platform. The patient questionnaires, which are also mentioned in the references, are quoted from foreign clinics' studies.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper and that they have approved the final version.

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