



An overview of youtube videos as an information and education source for idiopathic ventricular arrhythmia

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Abstract

Aim: The Internet is a widespread and increasingly used resource for obtaining medical information by both patients and public health care providers. Our aim in this study was to evaluate the accuracy and quality of the information in idiopathic ventricular arrhythmia (IVA) videos posted on YouTube.

Materials and Methods: "Idiopathic Ventricular Dysrhythmia" or "Idiopathic Ventricular Arrhythmia" keywords of YouTube search engine were queried. 48 videos suitable for 2-15 minutes were included in the study. The popularity of videos was judged by an index called the video strength index (VPI). The reliability of the videos was assessed with the DISCERN score. The quality of the information resource measured using the Global Quality Score (GQS).

Results: The average duration of the videos was 444 ± 220 seconds, and the average number of views is 11241 ± 865 , with a median view count of 1085 (151-22012). The median VPI value of the videos was 4 (0-34), the mean DISCERN score was 3.1 ± 0.5 , and the mean GQS score was 3.6 ± 1.1 .

Conclusion: YouTube serves as an easily accessible and inexpensive data center for patient education and understanding the illness. However, the popular YouTube videos on IVA administration appear to be largely lacking in accuracy, reliability, and consistency, as they are vulnerable to unreliable information.



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Introduction

Premature ventricular contraction (PVC) is common in individuals without structural heart disease (SHD) and the frequency of PVC increases with age [1,2]. Several studies have shown that the prevalence of PVC in 24-hour rhythm holter recordings in these individuals varies between 40% and 100% [3-7]. The idiopathic PVC is one of the most common cardiac arrhythmia seen in individuals without SHD and generally, they have a good prognosis [8]. However, the clinical presentations of these individuals may include a wide range of arrhythmias, such as symptomatic tachycardia, heart rate variability, isolated PVC, non-sustained or sustained ventricular tachycardia (VT), and ventricular fibrillation (VF) [9, 10]. It is also known

that the frequent PVCs are associated with cardiomyopathy [11]. The diagnosis and follow-up of the disease are essential for cardiologists. It is unavoidable for both the patients and health care providers to reach up-to-date and different information about the disease.

Currently, the technology of the internet and computer science has reached advanced levels, and social platforms using these technologies have become widespread. Social media platforms may establish a fast and easily accessible source of information in the field of health as in other fields [12]. Approximately one-third of internet users in the United States use social media such as YouTube, Facebook, and Twitter to obtain medical information [13].

Currently, the patients to be involved in treatment decisions, especially in cardiovascular medicine, and social platforms might be considered as a valuable resource for obtaining medical information [14]. However, the quality, reliability, and accuracy of the information obtained

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Table 1. The DISCERN (Reliability) Score Questions*

	Questions of The DISCERN Score	Yes / No
1	Are the aims clear and achieved?	1 / 0
2	Are reliable sources of information used?	1 / 0
3	Is the information presented both balanced and unbiased?	1 / 0
4	Are additional sources of information listed for patient reference?	1 / 0
5	Are areas of uncertainty mentioned?	1 / 0

*The scale consists of five questions with yes or no answers. All “no” answers were considered negative and corresponded to “0” points, “yes” answers were considered to “1” points. The total score ranged from zero to five.

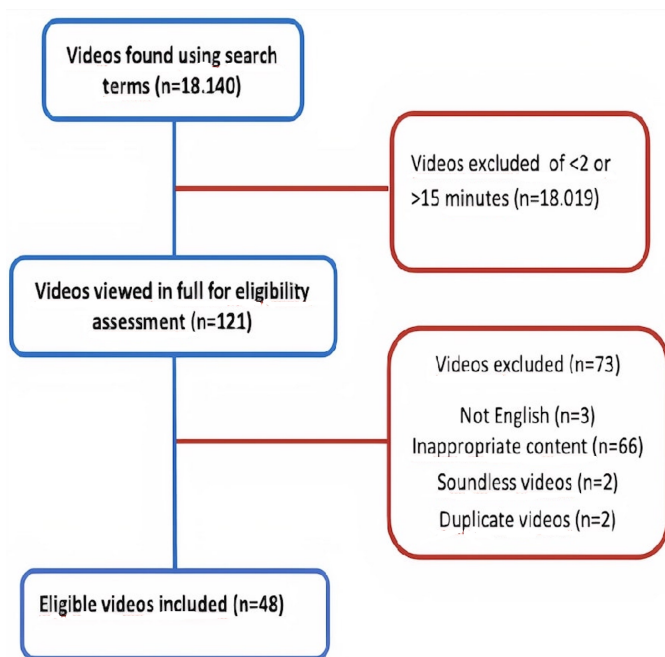


Figure 1. Flowchart demonstrating the process of video selection used in this study.

from these resources may be limited and it may not be possible for everyone to assess these parameters appropriately. In the literature, the quality and reliability of YouTube-based videos to obtain medical information have been investigated. To our knowledge, no previous study has evaluated YouTube videos on idiopathic ventricular arrhythmias (IVA).

This study is aimed to examine the popularity of YouTube videos that address IVA, assess them within a standart quality classification, and identify video sources that provide quality content.

Materials and Methods

Search strategy

YouTube’s search engine (<https://www.youtube.com>) was queried for the keywords “Idiopathic Ventricular Dysrhythmia” or “Idiopathic Ventricular Arrhythmia” on January 16, 2021. 18.140 videos were found using these search

terms. The videos shorter than two minutes and longer than fifteen minutes were excluded from the study. We have chosen this methodology due to the fact that the video ranking systems have shown an increase in popularity of videos after two minutes and reached the highest value in fifteen minutes [15]. 121 videos left viewed for full eligibility with this methodology. As the search results on YouTube are constantly changing, the collected videos were saved in a different file for future analysis. Besides, the videos prepared in a language other than English, repetitive videos, and silent videos were excluded from the study. After the exclusion criteria were applied, the remaining 48 videos were included in the study. This data collecting was shown in a flowchart (Figure 1).

Data assessment

Two independent authors reviewed and analyzed all videos for relevance and content; when there was any discrepancy between authors, the consensus was established based on a third author’s review. The following descriptive features of each video were recorded: the length of the videos (Second), the duration of the videos (day), views per day (views/day), view count, likes, dislikes, comments, the like ratio [likes x 100/ (like+dislikes)], and the name of the channel. The video power index (VPI) was also calculated (Like ratio x view ratio/100). Thus, it was possible to assess the content of the video with scoring systems and to evaluate the popularity of the videos [16].

The DISCERN score was used to assess the usefulness, reliability, and quality of each video [17,18,19]. The scale consists of five questions with yes or no answers. All “no” answers were considered negative and corresponded to zero points. The total score ranged from zero to five. The questions used to determine the DISCERN score are shown in Table 1. Furthermore, the educational value of each video was assessed with the Global Quality Score (GQS), which is a five-point rating scale. The relevant point which is from “1” to “5” is given according to which quality score scale the video matches [18, 20]. This scoring system is known to assess medical websites in a non-specific way. The GQS score system was shown in Table 2. After this categorization, quality definition with GQS was described if a video score is 4 or 5 points, it is considered as a “high quality”, 3 points is considered as an “intermediate quality”, and 1 or 2 points is considered as a “low quality” [21]. All scores were calculated separately by the authors of the study. The videos with different scores were re-evaluated by the third author.

Data analysis

The videos were categorized into six and five groups in terms of their sources and contents of videos, respectively. The categories by source are; 1) academic (author/authors affiliated to a university or research institute), 2) medical doctor (MD) (author/authors affiliated to a hospital or working privately), physician, 3) health care providers other than the medical doctor (HCPoMD), non-physician, 4) medical animations, 5) independent user, 6) commercial. The categories by video content are: 1) prevalence, 2) transmission, 3) signs/symptoms, 4) screening/testing, 5) treatment/outcome. The authors, who viewed the videos,

Table 2. Global Quality Scale (GQS)*

Point	GQS	Description
1	Poor Quality	Poor flow of the video, most information missing, not at all useful for patients
2	Generally Poor Quality	Poor flow, some information listed but many important topics missing, of very limited use to patients
3	Moderate Quality	Suboptimal flow, some important information is adequately discussed but others poorly discussed, somewhat useful for patients
4	Good Quality	Generally good flow. Most of the relevant information is listed, but some topics not covered, useful for patients
5	Excellent Quality	Perfect flow, very useful for patients

*The educational value of each video was assessed with the Global Quality Score (GQS), which is a five-point rating scale. The relevant point which is from "1" to "5" is given according to which quality score scale the video matches. If a video score is 4 or 5 points, it is considered as "high quality", 3 points is considered as an "intermediate quality", and 1 or 2 points is considered as a "low quality".

used the above guidelines to decide the type, efficiency, and quality of the videos. While videos are categorized as "informative" if they provide scientifically correct information about epidemiology, etiopathology, symptoms, prevention techniques, lifestyle changes, and proven treatment modalities; it was categorized as "misleading" if it contained information that contradicted the current scientific guidelines or existed personal propaganda. The videos contain the individual experiences of the patients who were categorized as "personal experiences". The videos uploaded by news agencies detailing the updated demographic characteristics of the disease were categorized as "news updates". On account of the fact that YouTube is a public website, this study did not contain any special patient data and the ethics committee approval was not required.

Statistical analysis

The numbers of videos to be used in the study were determined to include all videos scanned with the mentioned keywords and obtained by applying exclusion criteria on youtube as of the specified date. It has been observed that similar number of videos have been used in similar-purpose studies in the literature [16, 22].

Descriptive statistics of the quantitative variables were calculated as mean±standart deviation (SD), median (IQR). For the categorical variables are expressed as percentages. The Shapiro Wilk test was used to analyze the normality of the numerical variables. DISCERN score was calculated as the sum of the answers as yes/no to the 5 questions, and the results were non-normally distributed quantitative variable expressed as scores ranging from 0-5. The GQS score was defined as a Likert type non-normally distributed quantitative variable with a result ranging from 1 to 5. The VPI score, on the other hand, was determined as a non-normally distributed quantitative variable as percentage. The Kruskal-Wallis test was used to compare Video sources in terms of DISCERN, VPI, and GQS scores (Table 4). The agreement between the two physicians was assessed using the Kappa coefficient. Significance level was accepted as p<0.05. All statistical analysis were done using the SPSS (IBM Corp. Released 2013. IBM SPSS for Windows, Version 22.0, Armonk, NY: IBM Corp, USA).

Table 3. The demographic characteristics of videos with idiopathic ventricular arrhythmia (IVA).

Descriptive statistics	Mean±SD	Median (IQR)
Duration (second)	444 ± 220	380 (281-641)
Time since upload date (day)	11241 ± 865	869 (373-1775)
Number of total views	29728 ± 87040	1085 (151-22012)
View ratio	21 ± 41	3 (0-34)
Number of likes	251 ± 627	18 (2-265)
Number of dislikes	7 ± 21	0 (0-7)
Number of comments	26 ± 65	3 (0-23)
VPI score	24 ± 43	4 (0-34)
DISCERN score	3.1 ± 0.5	3 (3-3)
GQS score	3.6 ± 1.1	4 (3-5)

VPI: Video Power Index, GQS: Global Quality Score, IQR: Interquartile range (%25-75), SD: Standard Deviation.

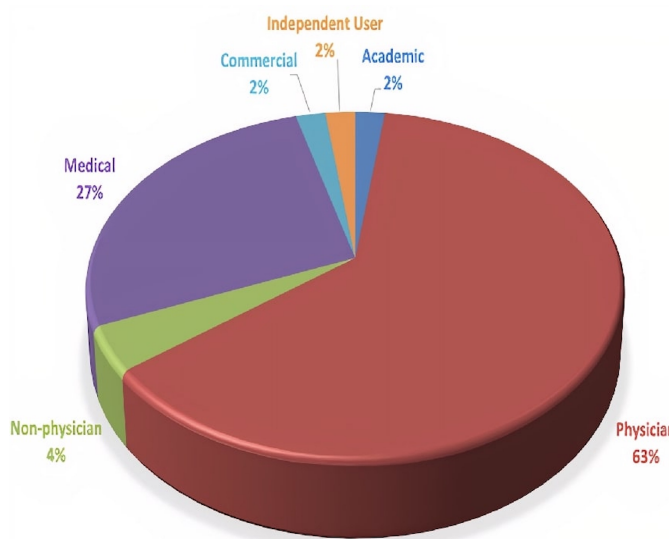


Figure 2. Categorical distribution of the videos based on source.

Results

A total of 73 videos were excluded from the study due to duplication (n=2), soundless (n=2), inappropriate con-

Table 4. The comparison of video sources in terms of VPI, DISCERN, and GQS scores.

Video Source	VPI		DISCERN		GQS	
	Mean±SD	Median(IQR)	Mean±SD	Median(IQR)	Mean±SD	Median(IQR)
Academic (n=1)	16±0	16 (16-16)	3±0	3 (3-3)	4±0	4 (4-4)
Physician (MD) (n=30)	9.2±17.8	1 (0-10)	3.2±0.6	3 (3-3)	3.8±1.1	4 (3-5)
Non-physician (n=2)	40.2±52.9	40	4±0	4	3.5±0.7	3.5 (3-4)
Medical (n=13)	48.7±62.9	34 (2-76)	3.0±0.4	3 (3-3)	3.3±1.1	3 (3-4)
Independent User(n=1)	4.9±0	4.9	3±0	3	2±0	2
Commercial (n=1)	13.2±0	13.2	3±0	3	4±0	4
p value		0.055		0.288		0.556

VPI: Video Power Index, GQS: Global Quality Score, IQR: Interquartile range (%25-75), SD: Standard Deviation.

Table 5. The descriptive assessment of VPI, DISCERN, and GQS scores according to mentioned content in videos.

Video Content	n (%) [*]	VPI		DISCERN		GQS	
		Mean±SD	Median(IQR)	Mean±SD	Median(IQR)	Mean±SD	Median(IQR)
Prevalence	9 (19)	21.3±34.9	0(0-50)	3.5±0.7	3(3-4)	4.4±0.7	5(4-5)
Transmission	29 (60)	26.7±48.2	4(0-34)	3.1±0.5	3(3-3)	3.5±1.1	4(3-4)
Signs and symptoms	22 (46)	23.9±32.0	5(0-43)	3.2±0.6	3(3-3)	4.0±0.9	4(3-5)
Screening/Testing	34 (71)	16.6±26.1	2(0-33)	3.1±0.5	3(3-3)	3.4±1.1	3(3-4)
Treatment/Outcome	9 (19)	20.5±31.5	2(0-16)	2.8±0.3	3(3-3)	2.5±1.1	4(3-5)
p value			0.080		0.162		0.118

VPI: Video Power Index, GQS: Global Quality Score, IQR: Interquartile range (%25-75), SD: Standard Deviation

^{*} Number and percentage of videos with the aforementioned content.

tent (n=66), and a language other than English (n=3). After the exclusion criteria were applied, the remaining 48 videos were included in the study. The descriptive statistical values of the videos are presented in Table 3. The average duration of the videos was 11,241±865 days, the average length of the videos was 444±220 seconds. The median view count was 1,085 (151- 22012), and the median view count per day was 3 (0-34). The median numbers of likes, dislikes, and comments were 18 (2-265), 0 (0-7), 3 (0-23), respectively. The median VPI value of the videos was 4 (0-34), the mean DISCERN score was 3.1±0.5, and the mean GQS score was 3.6±1.1. The target audience of the videos was medical doctors (n=26, 54%) and patients (n=22, 46%). According to the efficacy criteria, 43 (90%), 3 (6%), 2 (4%) videos were informative, individual experience, news update, respectively. However, there were no videos in the misleading category. When the videos were categorized in terms of their source, the number of the academic video was 1 (2%), the number of the videos presented by medical doctors was 30 (63%), the number of videos presented by health care providers other than medical doctors (HCPoMD) was 2 (4%), the number of medical videos was 13 (27%), the number of the commercial videos was 1 (2%), and the number of independent user video was 1 (2%) (Figure 2).

The results of VPI, DISCERN, and GQS scores comparing with regard to the sources of videos are presented in Table 4. The VPI scores of the videos were the highest in the medical and HCPoMD groups (34(2-76)/40 respectively) while the lowest in the independent user and MD groups (4.9, 1 (0-10, respectively). When the all source of video

groups compared according to VPI scores, there was no significant statistical difference (p=0.055). The DISCERN scores of videos were higher in the HCPoMD (4±0) and MD (3.2±0.6) groups compared to the others, in which groups' values were similar (3±0), (p=0.288). The quality of the videos was assessed with a GQS score and the highest quality was seen in academic, physician, and commercial groups (4, 4, 4 (median), respectively) according to quality definition with GQS. Medical and non-physician groups were determined as intermediate quality (3, 3 (median), respectively). The lowest quality was seen in the independent user group (2 (median)). When all groups compared with GQS, there was no significant statistical differences, (p=0.556).

The description of VPI, DISCERN, and GQS scores in terms of video contents is presented in Table 5. The VPI score of the videos was the highest in the transmission and signs/symptom groups (4 (0-34), 5 (0-43), respectively), while the lowest values were seen in the screening/testing group (2 (0-33)). According to the content of the videos, the DISCERN scores were higher in the prevalence group (3.5±0.7) compared to the other groups (2.8±0.3). The quality of the videos was assessed with the GQS score and the highest score was seen in the prevalence group (4.4±0.7). The lowest quality was seen in the treatment/outcome group (2.5±1.1). When the all groups compared according to VPI, DISCERN, GQS, there was no statistically significant difference was observed (p=0.080, p=0.162, p=0.118, respectively). The content of the videos was analyzed and a total of 28 (58%), 31 (64%), 5 (10%), 10 (21%) videos were about ablation therapy, electrocar-

diography, rhythm holter monitorization, echocardiography, respectively. The aforementioned videos were assessed with regard to the age groups on youtube and it is shown that a total of 41 (85%), 4 (8%), 2 (4%) patients were in adult, elderly, pediatric groups, respectively. Also, the imaging methods in the video content were evaluated, ECG was found to be the most used method with the rate of 64%.

The agreement between two separate physicians (interobserver variability analysis) with regard to DISCERN and GQS score were found as perfect or nearly perfect (Kappa values are 1.0 and 0.91 respectively, p values <0.001 for each).

Discussion

This study showed that the YouTube platform is an information source for IVA but this source is not fully reliable and videos prepared by different users may contain misleading information. The VPI and DISCERN scores used in this study provides information about the purposes and benefits of the videos [23] while the GQS score evaluates the quality of the videos [24]. IVAs are one of the most common arrhythmias in clinical practice. In general, patients with IVA have a good prognosis. This group of patients may have various arrhythmias, such as symptomatic tachycardia, heart rate variability, isolated PVC, non-sustained or sustained VT, and VF [9, 10]. While the symptoms it creates may cause just a decrease in the quality of life (QOL), it may trigger the development of cardiomyopathy in some patients due to the IVA load [25-27]. The goal of treatment is to provide symptomatic relief and to prevent or reverse arrhythmia-induced cardiomyopathy. Non-pharmacological, pharmacological and invasive treatment methods are suggested for this disease group [28]. Due to the variable course of the disease and the different approaches of treatment, it is important to provide reliable information in easily accessible information environments such as youtube. In this context, we examined the situation of IVAs in social media in this study.

This research classified the videos as academic, MD's, HCPoMD's (non-physician), medical, independent users, and commercial with regard to their source. The VPI score was the highest in the medical and non-physician groups while it was the lowest in the independent user and MD groups. The results obtained in the MD group were consistent with the literature and the results in the other groups were different which might be due to the different grouping and/or the number of videos in the groups [29, 30]. These results caused doubts about the reliability of the videos watched more on YouTube and the high VPI score of the videos also did not mean that they would be reliable. B.Yuksel et al., in a study investigating pregnancy on youtube, showed that the videos had high viewing rates, but were generally low in quality and reliability [31]. The VPI score was lower in the independent user group and it was observed that the content, comprehensibility, presentation language, and visual effects of the videos affect the viewing rates. The DISCERN score values were assessed, the similar rates were found between the groups, and they were relatively high in the groups of MD and non-physician. The previous study showed

that the DISCERN scores were found to be the highest in the MD group and the lowest in the independent user group [30]. In a study, although there is a difference in the DISCERN score in the videos uploaded by physicians and non-physicians, it was seen that this reliability score were low in the physicians group, too. In our study, although there was no statistical significant difference between these video source groups, the DISCERN score was generally low in all groups [32]. The main reason for the low score is considered to be misleading and non-factual errors in the videos. This situation is important in terms of demonstrating the necessity of physicians and experts to create more reliable and quality videos about IVA. On the other hand, this difference in results may be due to the fact that we categorize our groups differently, the number of videos and source diversity is low due to the specificity of the subject, and the score is used by modifying it. The GQS score, assessing the video quality, demonstrated that the videos prepared for Academic, physician, and Commercial purposes got higher scores, and were described as high quality according to quality definition with GQS. Raddadiya et al. [33], in their study of colonoscopy videos on youtube, they state that it continues to be a poor source of evidence-based quality information. But also they state that if this are to be used as a source, videos of academic society and medical professionals' sources should be selected. It was consistent with our findings, although there was no statistical significance due to the low number of videos in our study, Similarly, Zengin et al. [21] in their study, they stated that the quality of education increases when YouTube content is uploaded, especially by health professionals and academics. It was known that the "attractiveness" and "readability" rates of the video affect the number of views of the video as well as the accuracy of the information in the video [16]. In light of obtained results from this study, we considered that the videos prepared for commercial and advertising-like purposes could affect the attractivity and quality. The videos were assessed in terms of video contents. No statistically significant difference was observed in VPI, DISCERN, GQS scores according to subject content, but the VPI scores were the highest in the transmission and signs/symptoms groups and the lowest in the screening/testing group. In the previous studies, a different scoring system was used and the screening/testing title had a lower score compared to other titles [31]. It was thought that the changes that occurred in screening/testing could confuse. It was thought that the lack of an approach to the IVA of screening/testing in large masses may explain the lower score of this group. On the contrary, the high VPI score in videos with the group of transmission and Sign/Symptom was explained by the more clear and understandable preparation and viewing of the videos. The DISCERN and GQS scores were higher in the prevalence group compared to the other groups, while it was lower in the treatment/outcome group, which may be explained by the higher quality of prevalence studies. The reason why the rate of watching videos is higher in the adult group may be that the videos appeal to the adult group more than the pediatric and geriatric population, and the age of IVA incidence, interests and internet usage rates of other age groups differ [34].

Limitations

The present study had some limitations. Firstly, the videos in a single snapshot were listed and assessed from this video list. YouTube is a dynamic platform and new videos are added, commented on, and displayed over time. Therefore, our analysis is limited to the current state of YouTube. Secondly, our study did not include online videos posted outside of YouTube. Since our strategy is limited to YouTube search, we may exclude videos that have been indexed on other platforms, such as health information websites that are also easily accessible by patients. Thirdly, our search was limited to 2 to 15 minutes of video for each keyword, so we excluded data outside of these results. Fourthly, the searches were pragmatically limited to the English language. As a result, some videos were not included in this analysis although a wide variety of search terms are used, this issue has been minimized by deleting the browser search history, as a video search can be affected by the search history. Fifthly, geographical location and language may potentially affect search results. Finally, the relatively small sample size can be considered as another limitation.

Conclusion

The popular YouTube videos on IVA administration appear to be largely lacking in accuracy, reliability, and consistency, as they are vulnerable to unreliable information. It is clear that the online content contributes to evidence showing that individuals diagnosed with IVA may be misled. Having high video views on social platforms does not always mean that there is quality and reliable content. This research shows that it is important to develop a suitable free IVA video resource to ensure that patients can get enough accurate information online. The videos on YouTube need to be improved and further standardization before they can be considered as an effective source of information on their impact on IVA. Academics, universities, and healthcare professionals should create videos on YouTube to enable Internet users to access more useful, high-quality, and accurate information.

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Ethics approval

The study does not have any participant data and is not a human and experimental study. Our source of information is a public platform. The research uses non-live publicly available data. Therefore, we declare that ethic committee permission is not required according to TR index ethical principles in this study.

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