The Benefit of YouTube Videos as a Source of Information on Tinnitus for Patients

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Abstract

Introduction   Tinnitus is one of the most common otological complaints encountered. Patients often use the internet, especially YouTube videos, as a source of information regarding their health condition. There is a need to analyze the standard and quality of information in these videos so that the patients receive correct information.

Objective   The purpose of the present study was to evaluate the reliability and utility of YouTube videos on tinnitus.

Methods   The first 100 videos on YouTube using the search terms *tinnitus* and *ringing in the ear* were identified. Three subject experts assessed the reliability using the modified five-point DISCERN score and utility using a usefulness score. Various indices like view ratio, like ratio, video power index, and interaction index were also calculated.

Results   Out of the 100 videos selected, 34 were excluded; collectively the remaining 66 videos were viewed 12,797,730 times. The most common upload sources were hospital/physician (39%), paramedic health care providers (19%), and alternative medicine (19%). The discern score was the highest in hospital/physician group (mean 19.3) and lowest in patient experience group (mean 13.4). A negative correlation was observed between the number of views (correlation coefficient −0.214), number of likes (correlation coefficient −0.242), number of comments (correlation coefficient −0.242), and the usefulness score.

Conclusion   Although there are multiple videos on YouTube regarding tinnitus, the overall educational content and reliability of the videos are poor. Video popularity is not associated with usefulness. Healthcare providers should counsel patients regarding videos on YouTube and try to create more comprehensive videos.

Keywords
► tinnitus
► health Education
► social media
► complimentary therapies

Introduction

The internet is one of the most easily available sources for health care information for patients. Around 60% of adults in a survey reported having accessed health-related information online in the month prior to the survey.[1] One of the most popular resources on the internet is YouTube, which has an ever-expanding library of health-related videos and has more than 2 billion user visits in a month.[2] Any registered user has the opportunity to upload videos on YouTube without any check on the standardization or accuracy of the content. The lack of quality control measures presents a major flaw, as many of the videos may be inaccurate and can mislead patients.[3] This, in turn, can impact the management of the medical condition, as patients may be prejudiced against a particular treatment based on the videos.

Tinnitus is the perception of sound in the absence of a corresponding external stimulus.[4] It is one of the most common otological problems encountered, with a prevalence ranging from 10 to 15%.[5] Although many people eventually get habituated, in around 1 to 2%, the quality of life is severely impaired.[5] Tinnitus can lead to anxiety, depression, insomnia, concentration difficulty, and even suicide. It is likely that many patients with tinnitus will turn to YouTube for information regarding their condition and its management. If these videos are of poor quality, they can lead to delayed diagnosis or treatment of these patients. We were unable to find any articles in the literature with respect to the utility of YouTube as a source of information for patients with tinnitus, and, hence, the study was undertaken.

Methodology

A cross-sectional review study was done to assess the utility of the videos on tinnitus available on YouTube on April 4th, 2020. The search was conducted on YouTube using the keywords *tinnitus* and *ringing in ear*. The first 100 videos that came up on the search were selected for the study. The exclusion criteria were non-English content, soundtrack only, irrelevant videos, duplicates, and poor audio/video quality [►**Fig. 1**].

Based on the preliminary screening, 34 videos were excluded, and only 66 videos were eligible for the study. Each video was viewed by a panel of three otolaryngologists, and scoring was done by consensus among the specialists.

Study Tool

The study tool contained three sections. The first section aimed to collect the basic details of the videos, like duration, source, type of content, number of views, number of likes, number of dislikes, number of comments, and number of days the video was available on YouTube. The second and third sections were the modified DISCERN score and the usefulness score, respectively.

Section 1 - Basic Details

The sources of video were classified as: alternative medicine (non-allopathic practitioners), commercial, hospital/physician/
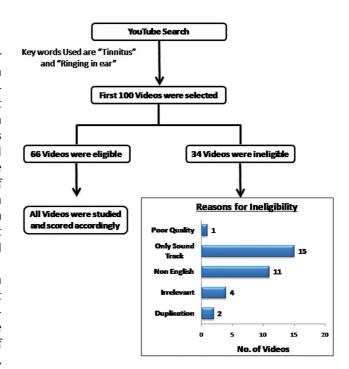

Fig. 1 Flow chart depicting the methodology.

academic association, paramedic, or patient. The content of videos was classified as

1. Advertisement – videos which aimed to advertise product or services
2. Educational – videos which were made for health education
3. Patient experience- videos of patients sharing their experiences

The number of views, likes, dislikes, days of availability on YouTube, and numbers of comments were calculated as on data collection date. Based on these values, the following utilization ratio and indexes were calculated

$$\text{Like ratio} = \text{Like ratio} = \frac{No.of\ Likes}{Nr.\ of\ likes + Nr.\ of\ dislikes} * 100$$

$$\text{View ratio} = \text{View ratio} = \frac{No.of\ Views}{Nr.\ of\ days\ the\ video\ was\ available}$$

$$\text{Video power index} = \text{Video power index} = \frac{Like\ ratio}{View\ ratio} * 100$$

$$\text{Interaction index} = \text{Interaction index} = \frac{No.of\ likes - No.of\ dislikes}{No.of\ views} * 100$$

Scoring

A total of two scores were used, the first one is the modified DISCERN score, which relates to the reliability of the upload source. The criteria were scored from 1 to 5 and included (a) Are objectives clear and achieved? (b) Are the sources of information used reliable? (c) Is the information presented balanced and unbiased? (d) Are additional sources of information listed for patient reference? (e) Are areas of uncertainty mentioned? A score of 1 meant that the information was absent, a score between 2 and 4 meant that the

Table 1 Usefulness score

Section	Question	Score
Definition	Describe the condition	1
Associated symptoms	Hearing loss	1
Etiology	Noise induced	1
	Drug induced	1
	Other	1
Diagnosis	Audiometry	1
Treatment	Hearing aid/masking	1
	Medical	1
	Tinnitus retraining therapy	1
	Alternative therapy	1
Total	10	

information was partial, and a score of 5 meant that the information was complete.[6]

The usefulness score attempted to provide the overall usefulness of the video and was based on the European guidelines on tinnitus.[7] The score contained a total of 10 items and included information regarding the description, diagnosis, investigation, and management of tinnitus. Each item was scored either 0 or 1 based on the absence or presence on the information, and the maximum score was 10 (►**Table 1**). Although this tool needs more validation, the use of a novel, non-validated tool to assess online video educational quality has been demonstrated in previous studies.[8] Both these scores were obtained by consensus among specialists.

Data Collection and Analysis
The data was collected on April 2020 using the Microsoft Excel software (Microsoft Corp., Redmond, WA, USA), and the analysis was done using the R software.

Statistical Analysis Plan
The categorical variables were summarized as frequency and proportion. The continuous variables were summarized as mean and standard deviation (SD). The association between categorical and continuous variables was analyzed by independent t-test and analysis of variance (ANOVA). The correlation between continuous variables was analyzed using the Spearman correlation. A p-value < 0.05 are considered as statistically significant.

Results

Out of the 66 eligible videos that were screened, most of their sources were from hospital /physician/ academic associations (25 / 38%) followed by those from paramedics (13 / 20%). The average duration of videos was 6.4 minutes and longest mean duration videos were from hospital /physician/academic association group (10.1 minutes). The average number of view of videos was 193,905, and it was highest for paramedic videos (404,577.2). The average number of likes was highest for paramedic videos (6,788.8), whereas the average number of comments was highest for videos made by alternative medicine personnel (919.4). Even though the average days of video availability was low for videos by paramedic personnel (689.6 days), videos utility indicators such as like ratio, view ratio and interaction index were highest for them (94.5, 619.7, and 1.7). The video power index was high for patient videos (3,866.9) (►**Table 2**).

The mean (SD) video reliability DISCERN score was 16.2 (4.8). The DISCERN score was highest for videos by hospital /physician/academic association (►**Table 3**). The mean usefulness score was highest for the videos by hospital /physician/academic associations (5.3 ± 2.4) and lowest for patient videos (2.5 ± 2.2), whereas the overall mean usefulness score was 4.0 ± 2.6. This difference in usefulness score, based on the source of videos was found to be statistically significant (p-value: 0.018).

Table 2 Basic details of videos based on source of video distribution source

Items	Alternative medicine personnel ($n = 12$)	Commercial ($n = 6$)	Hospital /physician/ academic association ($n = 25$)	Paramedic ($n = 13$)	Patient ($n = 10$)	Average ($n = 66$)
Duration	3.6	3.0	10.1	4.7	4.4	6.4
No. of views	317,262.3	662,22.8	117,034.7	404,577.2	40,787.4	19,3905.0
No. of like	4,424.3	237.5	801.4	6788.8	247.0	2,504.2
No. of dislikes	173.8	92.3	121.8	312.6	16.1	150.2
No. of comments	919.4	56.8	363.2	868.7	128.0	500.4
No. of days Video available	1,387.6	1,344.8	1,630.7	689.6	1,018.2	1,282.3
Like ratio	92.7	75.7	81.9	94.5	94.1	87.7
View ratio	334.2	34.5	112.0	619.7	45.1	231.1
Video power index	644.6	567.9	1,240.7	1,423.2	386,6.9	1,510.4
Interaction index	1.0	0.4	0.5	1.7	1.0	0.9

Table 3 DISCERN and usefulness scores per video distribution source

	DISCERN score	p-value	Usefulness score	p-value
Alternative medicine personnel (n = 12)	16.5 (5.2)	0.001	3.3 (2.9)	0.018
Commercial (n = 6)	14.7 (6.3)		4.5 (2.7)	
Hospital /physician/academic association (n = 25)	19.0 (3.2)		5.3 (2.4)	
Paramedic (n = 13)	13.5 (4.6)		3.5 (1.9)	
Patient (n = 10)	13.4 (3.9)		2.5 (2.2)	
Total (n = 66)	16.2 (4.8)		4.0 (2.6)	

Table 4 Correlation of the usefulness score with videos' characteristics

Usefulness score	Duration	Nr. of views	Nr. of like	Nr. of comments	Like ratio	View ratio	Video power index	Interaction index
Correlation co-efficient	0.036	−0.214	−0.242*	−0.242*	−0.176	−0.218	−0.039	−0.170
p-value	0.773	0.082	0.048	0.048	0.157	0.081	0.755	0.169

The usefulness score had a negative correlation with most of the videos' characteristics. Among the videos' characteristics, the number of likes (−0.214) and comments (−0.242) were found to have a statistically significant negative correlation with the usefulness score (►**Table 4**).

Discussion

YouTube represents a vast source of information for patients, caregivers, and education; however, this information may be inadequate or incorrect. Tinnitus is a chronic condition and can be debilitating in some patients. It has been reported that in at least 75% of patients with chronic conditions the last online search on the illness affected a decision about their treatment.[1] Hence, patients with tinnitus may also follow treatment based the information from the videos on YouTube. A need to screen the source of these videos to reduce the misinformation regarding other medical conditions has already been highlighted in previous studies.[9,10]

Tinnitus can be chronically debilitating and result in various psychological symptoms, like depression and anxiety. Although most cases are idiopathic, underlying pathologies, such as drug-induced, sensorineural deafness, tumors, etc, need to be ruled out in patients with prolonged tinnitus.[11] Most of the videos which were uploaded contained inadequate information regarding the causes of tinnitus; in such a scenario, it is possible that patients may not delay seeking medical intervention and present with complications of the underlying pathology

The longest videos were found in the source category *hospital /physician/academic association*, indicating that delivering accurate and complete information by health care providers takes longer; on the other hand, the most viewed and liked videos were in the source category *patient*, which is probably because those are easier for people without a medical background to understand by and considered more patient-friendly.

The high discrepancy between the usefulness of videos and the high number of views and likes constitutes an important dilemma. This was also seen in previous studies, in which videos with low scientific content/poor quality had more views and likes when compared with those with accurate and valid content.[9,10]

This points to the shortcoming of the healthcare providers and is a wakeup call to be more proactive in creating more patient friendly videos which are simple to understand and have accurate scientific content. It is also the duty of health care professionals to guide the patients in choosing validated professional videos and information on YouTube.

Previous research has shown that patient testimonials affect patient decision-making,[12,13] but certain patient testimonials on YouTube may be anecdotal or biased and lack important information.[12,13] This has also been observed in our study. Of the total number of patient testimonials, only 1 out of 10 was complete and useful for the patient, and the rest were of poor quality.

Although patient experiences allow people to share their views, videos uploaded by professional health institutions often have more instructive content.[14] However, these videos tend to have more technical content and are of longer duration. In our study, too, videos by professional health institutions and physicians were of longer duration (mean 10.1 minutes) and were more useful (mean usefulness score 5.3).

There are a few limitations to the present study. First, we only analyzed the first 100 videos results. This is based on the methodology followed by previous such studies and the fact

that patients usually do not go beyond the first few pages of the search.[15] In addition, this list is dynamic, with constant uploads and deletions, and the order keeps changing as it is based on the number of views; therefore, reproducibility of the results may be difficult. We have analyzed only a snap-shot of the available videos on the search date, and it is by no means an exhaustive list. In addition, we have used a non-validated usefulness score for analyzing the usefulness of the video. Although this methodology has been followed in previous studies, further studies to validate the score need to be undertaken. Another limitation is the subjectivity of the DISCERN score, as certain items are not applicable to the uploaded videos. However, we have tried to overcome this by developing a consensus regarding each video. We have used specific words like tinnitus and ringing sensation in the ear because they are the most commonly used words; however, it is possible that patients may use other words, such as buzzing, roaring, or whooshing in the ear. Lastly, we have analyzed videos in English language only, although videos in other languages, such as Hindi, Spanish, etc, were also available.

Conclusion

YouTube has become a major source of medical-related information on the internet. There is a plethora of videos on tinnitus on YouTube; however, the overall educational content and reliability of the videos is poor. Video popularity, based on the number of views, comments, and likes, is not associated with usefulness. There is a need for healthcare providers to create more comprehensive videos which are useful, compact, and easy to understand. In addition, we must help patients choose the right videos on YouTube as an additional source of information.

Conflict of Interests
The authors declare that there is no conflict of interests.

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