Antibiotic Resistance: Is Youtube A Quality Communicator?

Saahil Baghel, Anuja Pai, Muhammed Rashid, Pradeep M Muragundi

Abstract: Rationale & Objective: YouTube is the number one internet-based video resource for any information. There are good number of videos available on antibiotic resistance, but the quality of the content is questionable. Hence, we aimed to assess the quality of those videos using a robust validated tool. Methodology: In Dec 2018 the term 'Antibiotic Resistance' was searched on You Tube and first 76 videos were selected for our assessment.. All the video characteristics were collected and the quality of videos was assessed using Global Quality Scale. Two reviewers were independently involved in data collection and quality assessment and any disagreementwas resolved through discussion or consulting the third reviewer. SPSS v. 16 was used for descriptive statistics. Results: A total of 76 videos were evaluated out of the first appeared search. The majority (46.1%) of videos were educational videos and 52.6% were professional videos. The average time since the video available online was 2.67±2.042 years. The videos on antibiotic resistance accepted by the users with a good number of views, likes, and subscribers. The majority (42.11%) was graded as high, followed by low (38. 16%) and the remaining (19.74%) was moderate in quality. Moreover, the quality was not associated with category (≤0.228), animation status (≤0.347) and the relevancy (≤0.079) of the videos. Conclusion: Our analysis revealed that the quality of videos on antibiotics appeared to be inconclusive and acceptability of videos is not a measure of quality. Moreover, there is a huge need to produce high-quality videos from authentic resources and antibiotic societies.

Index Terms: Antibiotics; Resistance; Internet; YouTube; Quality; Communicator; Video

1. INTRODUCTION

Antibiotics are the most contributing chemotherapeutic agents in the medical world, which helped to save many lives. Its history began since 350-550 CE as the traces of tetracycline found from the bone materials of ancient Sudanese Nubians. By documents, Pyocyanase developed by Emmerich and Löw in 1899 from Bacillus pycyaneus species was the very first hospital used an antibiotic [1]. Followed by, all other antimicrobials such as penicillin and sulfonamides began to invent. The up-to-the-minute era of antibiotics instigates with the name of Paul Ehrlich and Alexander Fleming, who patented the magic bullet concept and penicillin, respectively [1]. As the use of antibiotics increased, antibiotic resistance also proportionally grown [2], and now it became a significant threat in the world. The mortality statistics expected to have around two million deaths by the antibiotic resistance in India by 2050 [3]. Medical literature is the major sources of information which assist and chaperon the medical professionals to make the most appropriate plan to treat their patients [4]. There are tremendous resources such as journals, indexed databases, reference books and manuals etc. [5]. All these materials were available as hard copies or printed formats in olden days, then letters transformed into images then to videos and then to animated videos to make it more pleasant and acceptable to the audience through the newer technologies in our mobile phones and other electronic gadgets. Moreover, with the advancement of the technologies and the internet, not only the professionals but also common people also started acquiring the knowledge through these facilities. Google is the biggest internet search engine platform, which provides multidisciplinary services in various professional aspects including the information resources, entertainment, and so on.

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YouTube, taken care by Google, is the most used video viewing and sharing site today with more than 30 million daily active consumers and up to one billion operators apiece month [6], [7]. As the information provided through these medias needs to be evaluated for its quality, recent studies are available in the literature which assess the quality of YouTube videos related to the medical field such as first aid for burns [8], human papilloma virus [9], rheumatoid arthritis [10], inflammatory bowel disease [11], secukinumab [6] and psoriasis [7]. However, there are no studies which address the quality of YouTube videos on antibiotic resistance. Hence, we aimed to describe the context of videos on antibiotic resistance available from YouTube and to assess the quality of those videos using a robust tool.

2. METHODOLOGY

Search Strategy and video selection

YouTube (https://www.youtube.com/) was searched using the search term "Antibiotic resistance" in December 2018 which resulted an approximate count of 1, 20,000 videos. The first 76 videos in English language were considered for our review to increase the quality of the assessment. All the relevant data including title of the video; time since available in online (Years); number of views, likes, dislikes and subscribers; length of video (minutes); animation details; publisher; profession of authors and relevance in patient care were collected in a well-defined data collection form was prepared in Excel 2013. Two reviewers were independently involved in the data collection and any disagreements were resolved by consensus among the authors or by a discussion with third reviewer.

Quality assessment of videos

The Global Quality Scale (GQS) developed by Bernard et al. [Bernard 2007] was used for the quality assessment of selected videos. The score of GQS scale ranged from 0 to 5 (Table 1). The video quality is categorized as low (1 or 2), moderate (3) and high (4-5) according to the score [6]. Two authors independently assessed the quality and any disagreements were resolved by discussion among the authors or by a consulting a third reviewer.

Statistical analysis

All information was handled using the Microsoft Excel v.2013 and the statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) Version 16 developed by IBM [12]. All the data was represented as frequencies and percentages and the descriptive statistics was computed through software including mean or median with standard deviation or interquartile range, respectively. The chi-square test was used to compare the variables such as category, animation status and relevancy with the quality of analyzed studies and a p-value <0.05 was considered to be significant.

3. RESULTS

Characteristics of the included videos

A total of 76 first appeared YouTube videos describing the antibiotic resistance were included in our study. The majority (46.1%) of videos were educational videos, followed by science and technology (19.73%) and the least was gaming and entertainment (5.2%). Most of the videos found to be relevant (82.9%) and non-animated (65.8). There were 36 (47.4%) awareness and 40 (52.6%) professional videos. The length of video ranged from 1 to 60 minute with an average of 7.22±6.02 minute [Table 1].

Acceptance of the video

The acceptance of videos were found to be good among the viewers with a good number of views [Median (IQR): 11899 (1895-118388)]; likes [Median (IQR): 104 (18-654)]; dislikes [Median (IQR): 3 (0-18)]; and subscribers [Median (IQR): 62,230 (4012-2534582)]. The number of dislikes was comparatively very less than likes. The average time since the video available online was 2.67±2.042 years [Table 1].

Table 1: Characteristics and acceptance of the videos

Quality assessment of the videos

A total of 76 videos were considered for the quality assessment, in which majority (42.11%) were high quality with a score of 4 or 5, followed by low (38. 16%) and the least (19.74%) were graded as moderate quality [Table 2a]. The variable analysis revealed that the GQS score was not significantly associated with category (≤0.228), animation status (≤0.347) and the relevancy (≤0.079) of the videos [Table 2b].

DISCUSSION

Antibiotics are widely misused through prescribing for any minor illness especially in primary care set-ups even though there are prescribing guidelines are available [13]. This scenario of heal care practice gives higher chances of antimicrobial resistance, the situation where the microbial growth happens in presence of an antimicrobial agent [14]. Accurate knowledge of this aspect is very much essential to keep a healthy life and better living condition. Internet is popular as a wonderful source to gain knowledge on various aspects such as confirming the results of lab tests and treatment outcomes. Even patients and caregivers browse to get more understanding of doctors or physicians explanation [11]. Medical professionals and students more rely on the educational videos and other materials obtained through the internet source such as Google and YouTube and YouTube has become the biggest video site across the world used by the public for professional and non-professional activities [15]. Moreover, YouTube is referred by the professionals as well as the common people to get a thorough understanding and most newer information especially in case of health aspects including the introduction, diagnosis, treatment and prevention of disease. Interestingly, the videos related to the development, synthesis, chemical nature, mechanism of action, pharmacology, pharmacokinetics and dynamics, side effects and ADR of a pharmaceutical product or drugs are freely available on YouTube with a piece of elaborative constraint information. Our study also revealed that the majority (46.1%) of the videos were educational and relevant (82.9%), also 52.6% of the reviewed videos made for the professional purpose. This clearly indicates that there is more popularity for YouTube videos among health professionals with regard to the health-related subjects. The acceptance of the videos also was very high with a good number of views, likes, and subscribers, moreover dislikes were very less for majority of videos. Restriction of the usage to the professionals and needy people makes the health-related videos more acceptable. The dislike count was found to be very less (0-200) for most (84.2) of the videos. Medicine and health is a major concern of each individual in this world and human will go till any end to get a healthy good life. Use of antibiotic became very common among the public as it is easily available from any medical stores and there is an increasing trend of self-medication. The major cause of self-medication seems to be the confidence and self-knowledge in them that too by relying on the information from advertisements and other internet Media [16], [17]. This may lead to a major threat such as antibiotic resistance, side effects and other drug-related problems. So, caution should be taken while relying on the information from the social Medias such as YouTube and Facebook as the context, quality and sources of information they provide is questionable and there is a huge need of a robust mechanism to assess it. The majority (42.11%) of the videos we reviewed fell in high quality, but even the low-quality videos also were almost similar (38. 16%), which indicate that still there is a need to improve the quality of the information they provide. Interestingly, among the 32 high-quality videos, 23 (72%) were providing the awareness information and remaining were professional. Whereas, a study conducted by Azer et al. on the videos pertaining to the physical examination of the cardiovascular and respiratory systems revealed that majority of the videos were not educationally useful, but they recommend that these can be used for the educational purpose of individual students [15]. The quality of videos was not significantly correlated to the variables such as category (0.228), animation status (0.347) and the relevance (0.079) of videos. Kocyigit et al. described that the statistics of likes, views and dislikes of the videos are not a parameter to quantify the quality of videos, whereas, the source of information can be considered while capturing the information [6]. The study by Butler et al. on first aid for burn also reported that the YouTube videos were unsatisfactory and endorsed the production of high-quality videos from the side of burn managing organizations [8]. However, the videos on elbow dislocations appeared to be really beneficial for better understanding and rehabilitation processes [18]. The findings from our study indicate that there is a huge need of producing high-quality videos with complete clarification and explanation to address the antibiotic resistance from the relevant sources

such as different societies for antimicrobial chemotherapy, or else there will not any end to this. Antibiotic resistance is appeared to be a major issue even today and self-medication contribute a lot to it [21]. So, there should be a provision of appropriate high quality authentic information to the audience through the social Medias and other platforms. The evaluation less number of resources and restriction to English language was the limitation to our study. Moreover, the quality evaluation was subjective even though we used the GQS. The acceptance characteristics of videos such as views, likes, dislikes and subscribers and the number of videos appearing on the search may change anytime due to the dynamic nature of YouTube and YouTubers.

CONCLUSION

The findings from our study inferred that the quality of videos on antibiotic resistance is varying or inconclusive even though majority of lies in good quality. The quality of videos is not associated with the category, relevance and animation status of the videos. More high-quality videos with good clarity explanation from the relevant sources are required to promote the knowledge on antibacterial resistance.

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[20] Declaration of interest

[21] The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

Author contribution statement

S Baghel, A Pai, M Rashid and PM Muragundi contributed to the conceptualization and design of the study. S Baghel and A Pai involved in data collection and quality assessment; M Rashid and PM Muragundi reconciled and verified the information. M Rashid initially drafted the manuscript; S Baghel, A Pai and PM Muragundi helped in reviewing, revising the manuscript and provided assistance in the analysis and

interpretation of data. M Rashid involved in the preparation of data collection form. All authors approve this version of the manuscript and agree to be accountable for all the aspects of the work.

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Table 1: *Characteristics and acceptance of the videos*

Particulars	Description	Number (N=76)	Percentage (%)
Characteristics of the video			
Category	Education	35	46.1
	Entertainment & Gaming	4	5.2
	News & Politics	10	13.2
	Non-profits & Activism	6	7.9
	People & Blogs	6	7.9
	Science & Technology	15	19.73
Animation	Animated	26	34.2
	Non-Animated	50	65.8
Relevance	Relevant	63	82.9
	Irrelevant	13	17.1
Purpose	Awareness	36	47.4
	Professional	40	52.6
Length of the video	1-15min	62	81.6
	15-30min	8	10.5
	30-45min	3	3.9
	45-60min	3	3.9
	Average		
Acceptance of the video			
Time available in online (Mean ± SD)		2.67±2.042 years	
Views	0-1,00,0000	56	73.68
	1,00,001-2,00,000	7	9.20
	2,00,000-3,00,000	2	2.60
	3,00,000-4,00,000	1	1.30
	4,00,000-5,00,000	2	2.60
	above 5,00,000	7	9.20
	Average [Median (IQR)]	11899 (1895-118388)	
Likes	0-200	43	56.57
	201-400	6	7.90
	401-600	1	1.30
	601-800	3	3.90
	801-1000	2	2.60
	above1000	16	21.05
	Not given	5	6.60
	Average [Median (IQR)]	104 (18-654)	
Dislikes	0-200	64	84.2
	201-400	4	5.2
	401-600	2	2
	601-800	0	0.1
	801-1000	1	1.3
	None	5	6.5
	Average [Median (IQR)]	3 (0-18)	
Subscribers	0 - 1,00,000	43	57.9
	1,00,001-10,00,000	9	11.8
	10,00,001-1,00,00,000	14	18.4
	Above 1,00,00,000	7	9.2
	Not Available	3	3.6
	Average [Median (IQR)]	62,230 (4012-2534582)	

Table 2a: *GQS Score of videos*

Quality	Score	Number (N=76)	Percentage (%)	Total (%)
High	5	5	6.58	42.11
	4	27	35.53	
Moderate	3	15	19.74	19.74
Low	2	19	25.00	38. 16
	1	10	13.16	

Table 2b: *Factors influencing the quality of studies*

Variable	Description	GQS Score			Total	P-value
		Low	Moderate	High		
Category	Education, science & technology	20	11	19	50	0.228
	News & Politics	3	0	7	10	
	Non-profit and entertainment	2	3	5	10	
	Blogs and People	4	1	1	6	
Animation	Animated	12	3	10	25	0.347
	Non-Animated	17	12	22	51	
Relevancy	Relevant	20	13	29	62	0.079
	Non-relevant	9	2	3	14	