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Quality analysis of YouTube videos in the management of hyperlipidemia in adults

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ABSTRACT

Aims: We aimed to evaluate the quality of video content about hyperlipidemia and its treatment on YouTube which is used as an information source.

Methods: This study has a cross-sectional design. A hundred videos were reviewed. Journal of the American Medical Association (JAMA) score, Global quality score (GQS), modified DISCERN and Hyperlipidemia YouTube Score (HYS) were used for the quality analysis of the videos. Video duration (minutes), time since upload (months), Number of views/comments/likes were analyzed.

Results: GQS was 1.58±0.94 for Turkish videos and 2.28±1.21 for English videos ($p<0.001$). mDISCERN, JAMA and HYS scores were higher in English videos ($p<0.05$). 62% of English videos and 80% of Turkish videos were of low quality.

Conclusion: The overall quality of information on hyperlipidemia and its treatment on YouTube remains poor. The establishment of a control institution for preventive medicine and the inclusion of videos on YouTube about health issues to raise public awareness on this subject will be beneficial for accessing accurate and reliable information.

Keywords: Hyperlipidemia, YouTube, quality, public health, web-based health information

INTRODUCTION

Lipid metabolism or lipoproteins are of great importance for life. They are essential for the management and oversight of cellular functions, as well as forming essential components in cell membranes. Disturbance in cholesterol metabolism has been shown to be an independent predictor of many cardiovascular and cerebrovascular events globally.[1] An important mechanism of hyperlipidemia is atherosclerosis; encompasses both inflammatory and immunological responses. The most initial atherogenic event is the deposition of low-density lipoprotein (LDL) in the subendothelial matrix. This situation is optimal when circulating LDL amounts increase and high-density lipoprotein (HDL) decreases.[2] Therefore, the control of dyslipidemia has prognostic importance for myocardial infarction and strokes.[3]

It is possible to manage the risk factors associated with atherosclerosis and its accompanying cardiovascular diseases and to prevent the development of the disease. The cornerstones for hyperlipidemia treatment, including healthy diet and lifestyle behaviors, lower the LDL and triglyceride levels.[4] Dietary and lifestyle changes can prevent approximately 80% of cardiovascular disease mortality.[5] Additional pharmacological treatment may be recommended according to the severity of dyslipidemia and total cardiovascular disease risk score. The agents that alter the lipid level are statins, fibric acid derivatives, bile acid sequestrants, cholesterol absorption inhibitors and nicotinic acid.[6,7]

YouTube is the world's largest video website with 122 million active daily users and 5 billion daily watched videos.8 It has gained popularity as an online resource for medical information and a social networking platform for sharing health information among audiences. However, these health-related videos carry the risk of misleading and misdirecting information about important health topics.9 Individuals can shape their current treatments by watching these videos. Besides, it is important for public health to examine the authorship, quality, accuracy and validity of the information in the videos. Therefore, we aimed to evaluate the quality of the videos about hyperlipidemia and its treatment on YouTube, a large social networking platform.

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METHODS

All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. The collected data included the review of videos available on the international social networking platform YouTube. Ethics committee approval was not obtained as there was no human/animal participated in the study and all videos used for the study were available on a public social media website.

Video Search on YouTube

The official page of the social media platform (https://www.YouTube.com) was used. The phrases "medical treatment of high cholesterol", "cholesterol management" for English videos and "high cholesterol treatment" for Turkish videos, were searched on the web between 01.04.2023 and 07.04.2023. Only English and Turkish videos were included in the study. There was no video time limit in the study. The 180 most watched videos in English were evaluated. 98 videos non-English, 4 video commercials, 4 videos duplicate videos, 17 videos herbal treatment suggestions, 1 video non-audio narration, 6 irrelevant videos were excluded from the study. 50 English videos were included in the study. The most watched 135 videos from Turkish videos were evaluated. 11 videos of commercials, 12 videos of duplicate videos, 3 videos of non-Turkish, 35 videos of herbal treatment suggestions, 2 videos of non-audio narration, 22 irrelevant videos were excluded from the study. 50 Turkish videos were included in the study (Figure 1).

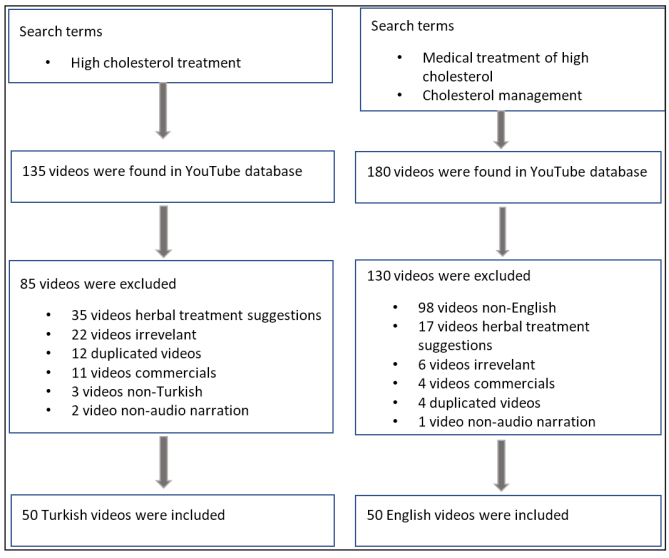

Figure I. Working flow

Video Characteristics

The characteristics of videos, including number of views, time since upload date (months), view ratio (views/day), duration, video source/uploader, number of likes and comments, were analyzed.

Video Sources

Video sources was categorized into physician or academic (authors/uploaders with university affiliations), medical sources (content from health-focused websites), pharmaceutical companies (with advertisement content), TV program.

Video Quality Analysis

Video contents were evaluated by two independent specialists (MT, CMC). A consensus was reached on the differently scored scores and a common score was given.

The Journal of the American Medical Association (JAMA) benchmark criteria, Global Quality Score (GQS) and modified DISCERN were used for each video to evaluate video quality. JAMA benchmarks are used to determine the reliability of online resources. It is formed by scoring criteria such as authorship, attribution, validity and explanation. A total score of '4' indicates high reliability, and '0' indicates low reliability. The GQS is a fivepoint Likert scale based on the quality of information, the flow of information found online, and ease of use, with 1 point very bad-5 points excellent quality. DISCERN is an information quality assessment tool created by Charnock et al.[10] It was modified as a questionnaire consisting of 5 questions by Singh et al in 2012.[11] The total score ranges from 0-5 points, with higher scores indicating greater reliability.

Hyperlipidemia YouTube Score (HYS) is a form created by us that includes definition, complications of hyperlipidemia, symptoms/signs, screening groups/risk factors, lifestyle changes, medical treatment and side effects. '1' if each criterion is deemed sufficient; If it was found insufficient, it was scored with '0'. However, similar tools exist in recent literature methods for assessing the overall educational quality of a video.[12,13]

Statistical Analysis

All statistical tests were performed using SPSS version 21 (IBM®, Chicago, USA). The normal and abnormal distribution of the variables was analyzed with the "Shapiro-Wilk test". Video characteristics, video reliability, and quality scores were analyzed through descriptive statistics Descriptive statistics were expressed as mean and standard deviation in normally distributed numerical data, median (minimum-maximum) in abnormally distributed data, number and percentage in nominal data. "Mann-Whitney U" and "Kruskal-Wallis test" were used in the analysis of non-normally distributed variables. Nominal data were compared using "Chi-square analysis". In correlation analysis, "Spearman's correlation analysis" was used between non-normally distributed data. P value of 0.05 was set to denote statistically significant findings.

RESULTS

50 Turkish and 50 English videos were analyzed. English and Turkish videos were compared in terms of definition, complications of hyperlipidemia, symptoms/signs, screening groups/risk factors, lifestyle changes, medical treatment and side effects. Recommendations regarding lifestyle changes were found to be significantly higher in English videos (p=0.013). There was no significant difference between the two groups in terms of other criteria (p≥0.05).

The characteristics and comparison of the English and Turkish videos are shown in Table 1.

Table 1. Descriptive characteristics and comparison of the English and Turkish videos

		English (n=50)	Turkish (n=50)	p value
Definition*	n (%)	30 (60)	24 (48)	0.229
Symptoms/signs*	n (%)	11 (22)	8 (16)	0.444
Complications of hyperlipidemia*	n (%)	42 (84)	40 (80)	0.603
Screening groups/risk factors*	n (%)	22 (44)	24 (48)	0.688
Lifestyle changes*	n (%)	42 (84)	31 (62)	0.013
Medical treatment*	n (%)	34 (68)	28 (56)	0.216
Side effects*	n (%)	12 (24)	9 (18)	0.461
Medication recommendation*	n (%)			0.911
Recommended		30 (60)	28 (56)	
Not recommended		4 (8)	4 (8)	
Not mentioned		16 (32)	18 (36)	

*Chi-square test

When English and Turkish videos were compared according to video characteristics, English videos had significantly higher number of views, view ratio (views/day), duration, number of likes and comments than Turkish videos (p<0.05). There was no significant difference between the two groups in terms of time since upload date (p=0.978). However, English videos had significantly higher scores when compared by quality index scores (GQS, mDISCERN, JAMA) (p<0.05). HYS scores were also significantly higher in English videos (p=0.049). In the classification according to GQS, 80% of Turkish videos were low quality, while 62% of English videos were low quality. (24&14%) medium quality and (14&6%) high quality for English and Turkish videos respectively. However, there was no significant relationship between the two groups.

There was no statistically significant difference in the number of follow-ups according to drug treatment recommendations (p=0.147). However, those who did not mention or recommend drug treatment had higher median values.

Video characteristics and quality scores of English and Turkish videos are shown in Table 2.

When English and Turkish videos are compared in terms of their sources, 50% of English videos were uploaded by professionals, while 38% of Turkish videos were uploaded by professionals. For English and Turkish videos, (32% vs 28%) medical resources and (14% vs 34%) TV programs were found to be the most important sources of information, respectively. 4% of the videos in English were uploaded by pharmaceutical companies. However, there was no significant relationship between the two groups.

Comparisons according to video sources are shown in Table 3.

Table 3. Comparisons according to video sources

		English (n=50)	Turkish (n=50)	p value
Physician or academic*	n (%)	25 (50)	19 (38)	0.068
Medical sources*	n (%)	16 (32)	14 (28)	
Pharmaceutical companies*	n (%)	2 (4)	-	
TV program*	n (%)	7 (14)	17 (34)	

TV: Television, *: Chi-square test

Table 2. Video characteristics and quality scores of English and Turkish videos

		English (N=50)	Turkish (N=50)	p value
Number of views**	Median (min-max)	276249.5 (486-4031490)	19737 (111-2034504)	≤0.001
Time since upload date (months)**	Median (min-max)	36 (1-120)	36 (3-132)	0.978
View ratio (views/day)**	Median (min-max)	224.95 (2.03-13866.67)	17.96 (0.08-5651.40)	≤0.001
Duration (minute)**	Median (min-max)	8.19 (1-70.18)	3.36 (0.43-49.17)	0.004
Number of likes**	Median (min-max)	4250 (0-46000)	107 (0-17000)	≤0.001
Number of comments**	Median (min-max)	219.5 (0-3000)	10 (0-418)	≤0.001
GQS**	Mean±sd	2,28±1.21	1.58±0.94	0.001
GQS group*	n (%)			0.132
Low quality (1-2)		31 (62)	40 (80)	
Moderate quality (3)		12 (24)	7 (14)	
High quality (4-5)		7 (14)	3 (6)	
mDISCERN **	Mean±sd	1.96±1.26	1.24±0.91	≤0.001
JAMA**	Mean±sd	1.58±1.05	1.04±0.66	0.002
HYS**	Mean±sd	3.86±1.35	3.28±1.34	0.049

GQS; Global Quality Score, JAMA; Journal of the American Medical Association, HYS; Hyperlipidemia YouTube Score. **Mann Whitney U Test; *Chi-square test.

In the correlation analysis, a significant positive correlation was found between video quality index scores and duration (p<0.001). Moreover, view ratio and GQS and mDISCERN were correlate. However, no correlation was found between other parameters. When quality index scores were analyzed, JAMA, mDISCERN, GQS showed significant positive correlations with each other (p<0.001). There was a significant positive correlation between HYS, mDISCERN and GQS, while no correlation was found between JAMA and HYS (p=0.149).

The correlation analysis between quality index scores and video characteristics is shown in Table 4.

Table 4. The correlation analysis between quality index scores and video characteristics

		GQS	JAMA	mDISCERN	HYS
Duration¥	rho	0.630	0.411	0.607	0.474
	p	<0.001	<0.001	<0.001	<0.001
Views¥	rho	0.146	0.114	0.166	0.071
	p	0.147	0.261	0.100	0.481
View ratio¥	rho	0.205	0.143	0.221	0.112
	p	0.040	0.157	0.027	0.267
Likes¥	rho	0.173	0.163	0.181	0
	p	0.086	0.105	0.072	0.998
Comment¥	rho	0.083	0.079	0.098	-0.012
	p	0.410	0.432	0.330	0.906
GQS	rho	-	0.533	0.814	0.557
	p	-	<0.001	<0.001	<0.001
JAMA	rho	0.533	-	0.662	0.145
	p	<0.001	-	<0.001	0.149
mDISCERN	rho	0.814	0.662	-	0.490
	p	<0.001	<0.001	-	<0.001
HYS	rho	0.557	0.145	0.490	-
	p	<0.001	0.149	<0.001	-

GQS; Global Quality Score, JAMA; Journal of the American Medical Association, HYS; Hyperlipidemia YouTube Score. ¥Spearman correlation analysis

When the quality of the videos was analyzed according to their sources, there was no significant relationship between the groups in terms of GQS and HYS, but there was a significant difference in terms of mDISCERN and JAMA. In pairwise comparisons, there was a significant difference between physician/ academic and medical sources for JAMA (p<0.001) and mDISCERN (p=0.027) scores, but not for HYS (p=0.812) and GQS (p=0.184) scores. There was a significant difference between physician/ academic and TV program in GQS (p=0.036) and mDISCERN (p=0.029) scores, but not in HYS (p=0.109) and JAMA (p=0.218) scores. There was a significant difference between TV programs and medical sources in terms of JAMA (p=0.019) scores; however, no significant association was found for HYS (p=0.129), GQS (p=0.320) and mDISCERN (p=0.529). The number of videos with the content of pharmaceutical companies was not included in the statistical analysis due to two videos.

Quality analysis of videos by source is shown in Table 5.

Table 5. Quality analysis of videos by source

		Physician/ academic	Medical sources	TV program	p value
GQS	Mean±sd	2.22±1.29	1.80±0.99	1.58±0.92	0.085
JAMA	Mean±sd	1.63±0.99	0.86±0.86	1.29±0.62	0.001
mDISCERN	Mean±sd	2±1.38	1.30±0.59	1.29±1.08	0.025
HYS	Mean±sd	3.75±1.55	3.70±1.11	3.16±1.27	0.212

GQS; Global Quality Score, JAMA; Journal of the American Medical Association, HYS; Hyperlipidemia YouTube Score

DISCUSSION

YouTube, a very popular video site worldwide, has a wide range of health information. Being a free online resource, it has a large user base with easy uploading, downloading and commenting on videos by participants. However, the reliability and guidance of the information in these videos has raised concerns among many health experts. Recently, there have been numerous studies in the literature examining the reliability and quality of YouTube videos.[13-17] However, to the best of our knowledge, there is no study evaluating hyperlipidemia videos on YouTube in the literature.

The present study showed that both Turkish and English videos were of low quality with the rate of 80% and 62%, respectively. Similar to our results, Akkus et al.[13] reported that English videos on Trichotillomania were of low quality with a rate of 68.6%. In a study evaluating the content of exercise videos released during the COVID-19 pandemic, the reliability and quality of most videos were classified as "very poor".[16] Tastemur et al.[14] stated that rate of poor quality of the videos on kidney transplantation were 72.6%. Another study evaluating videos on adhesive capsulitis also found low video quality with DISCERN of 2.73 and GQS of 2.38.[18] Also, in a study comparing English and Turkish videos on Alzheimer's disease in Turkey, English videos had significantly higher scores in quality analysis using GQS and mDISCERN.[19] Similiarly, the GQS, mDISCERN, JAMA and HYS scores of English videos were higher in our study. Therefore, the scarcity of high-quality information is of concern because it affects patients'access to correct information and self decision-making processes.

In the literature, the length of videos was found to be between 5.85 and 10.37 minutes on average in many studies on different topics.[16,20,21] In our study, the average duration of the videos was 8.19 minutes, and the duration of English and Turkish videos were similar. reported similar results. However, Kaşıkçı et al.[19] reported that Turkish videos were longer.

The quality of the videos may vary depending on the uploader. Wilkens et al.[22] conducted quality analysis with DISCERN and HONcode and found no correlation between the quality scores of video uploader resources.

However, Tang et al.[18] found the highest quality scores in academic sources. Similarly, in our study, the highest scores belonged to academic sources. In addition, 50% of the videos uploaded in English are uploaded by academic sources, this rate was 38% in Turkish videos. This is in accordance with the studies in the literature.[19]

The present study revealed that lifestyle changes, which are the cornerstone of hyperlipidemia treatment, were mentioned 84% of the time in English videos, but this rate was significantly lower in Turkish videos with 62%. In addition, 8% of the videos in both languages did not recommend the use of medication, 32% and 36% did not mention it at all.

HYS is a scoring system that we developed. It has not been used in any other study before. It includes definition of hyperlipidaemia, complications, symptoms/signs, screening groups/risk factors, lifestyle changes, medical treatment and side effects. '1' if each criterion is considered adequate; '0' if found inadequate. HYS was found to be higher in English videos. Correlation analysis showed a significant positive correlation between HYS, mDISCERN and GQS, while no correlation was found between JAMA and HYS. This result suggests that English videos are more scientific and useful, but there is no similar study to compare our results. Our results are therefore open to interpretation.

Duration, number of likes, number of comments, views and quality rating scores were higher than the characteristics of English videos. There are limited studies in the literature comparing English and Turkish videos. Similar results were found by Kaşıkçı et al.[19] This seems to be due to the fact that English is a globally accepted language. The important factor here is the language considered.

Our study had some limitations. The number of videos watched may be partially insufficient. In future studies, it may be recommended to watch more videos with more keywords according to relevance.

CONCLUSION

In this study, we analyzed YouTube videos on hyperlipidemia, and we found that both English and Turkish videos were of lower quality. The high number and viewership rates of low quality, incomplete and misinformed videos support our justified concerns on this issue. Better quality and reliability of these videos, which guide the public on all kinds of health issues, may increase our chances of patient treatment. Authorized institutions can also improve the quality of YouTube videos through audits or awareness-raising campaigns. We think it is a necessary measure for preventive medicine.

ETHICAL DECLARATIONS

Ethics Committee Approval: The collected data included the review of videos available on the international social networking platform YouTube. Ethics committee approval was not obtained as there was no human/animal participated in the study and all videos used for the study were available on a public social media website.

Informed consent: Informed consent was not obtained as there was no human/animal participated in the study and all videos used for the study were available on a public social media website.

Referee Evaluation Process: Externally peer reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All 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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