THE EFFECTS OF THE MOST POPULAR VIDEO-SHARING SOCIAL MEDIA PLATFORM ON INFORMATION RELATED TO COVID-19 IN TURKEY

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ABSTRACT

Background: *Video-sharing social media platforms are considered prominent sources of knowledge, particularly by young people. In this study, we aimed to categorize YouTube© videos in the Turkish language according to their contents and perform an evaluation based on DISCERN criteria.*

Methods: *After obtaining permission from the Ministry of Health, we performed a search on YouTube© by entering the keyword "koronavirüs" (coronavirus in Turkish) on December 5, 2020. The most viewed 100 videos were investigated considering view counts, likes, dislikes, video durations, and date of upload. Then, the videos were divided into four categories as Interviews, News, Documentaries and Entertainment videos. DISCERN method (consisting of 15 key questions plus an overall quality rating) was applied to videos to investigate their quality. Each component was evaluated using a 5-point Likert scale ranging from 1 (poor quality) to 5 (high quality). The groups were compared according to these variables. Also, the top 10 videos in each category were analysed in detail.*

Results: *The videos cumulatively attracted 79.443.977 times and totaled 15.3 hours of duration. All four categories got low DISCERN scores (News: 2.6, Documentary: 3, Interview: 2.6, Entertainment: 2.8) indicating poor quality. The mean duration of videos in the News category was significantly shorter when compared to other categories (1,9 minutes, p<0,05). The number of mean views of videos in the Documentary category was significantly higher (n=929,999, p<0,05) than the News category (n=673,641). Entertainment videos were both liked and disliked significantly higher than the others (n=16.818, n=1.578, respectively, p<0,05). Only two government-supported public information videos could take place in the list and these videos gained the highest DISCERN scores (4 and 5, respectively). Interestingly, Entertainment videos achieved a higher DISCERN score when compared to the News and Interview videos.*

Conclusion: *Social media is considered the main source of information by many individuals. However, our results revealed that people are under threat of misinformation spreading from social media. Health Organizations and social media representatives should work in collaboration to keep this platform clean.*

Keywords: *COVID-19, YouTube, misinformation, DISCERN score.*

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Introduction

In December 2019, a series of pneumonia cases of unknown origin were identified in Wuhan, China. Lately, the etiological agent was defined as the 2019 novel coronavirus (2019-nCoV), and the disease was recently declared by the World Health Organization (WHO) as coronavirus disease 2019 (COVID-19)[1]. Based on previous experience of management of Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) infections, the WHO also recommends avoiding close contact with people suffering from acute respiratory infections, frequent hand-washing especially after direct contact with ill people or their environment, and avoiding unprotected contact with farm or wild animals[2]. In times of disaster, misinformation is a critical problem; people do not tend to critically assess the information they have been exposed to[3]. YouTube© (an online video-

sharing platform) is the second most popular website worldwide[4]. The case of the COVID-19 epidemic shows the critical impact of this new information environment. The information spreading may strongly affect people's behavior and alter the effectiveness of the countermeasures deployed by governments[5]. It was reported that internet search is considered a source for health and healthcare-related information by over 70% of adults[6]. However, social media platforms, such as YouTube© and Twitter©, provide direct access to an unprecedented amount of content and may become a source of rumors, misinformation or, at least, questionable information. Given the users' preferences and attitudes, algorithms mediate and facilitate content promotion and thus information spreading[7]. Hence, the trustworthiness of the information obtained from social media arises as an issue.

DISCERN is the first standardised quality index of consumer health information that can be used by producers, health professionals, and patients to appraise written information on treatment choices. DISCERN consists of 15 key questions plus an overall quality rating. Each of the 15 key questions represents a separate quality criterion-an essential feature or standard that is a critical part of good quality information on treatment choices[8].

The equivalents of the scores were made according to the following criteria:

• Score 1: poor quality, poor flow, most information missing, not useful;

• Score 2: generally poor quality, poor flow, very limited information;

• Score 3: moderate quality, moderate flow, some significant information is available but others are not, somewhat useful;

• Score 4: good quality, good flow, most of the relevant information is available, but there are deficiencies in the topics, useful;

• Score 5: excellent quality, excellent flow, very useful[9].

In this study, we aimed to categorize YouTube© videos in Turkish according to their contents and perform an evaluation based on DISCERN criteria. We also aimed to provide a summary of the top viewed videos in each category.

Materials and methods

This study was approved by the Ministry of Health and conducted by entering the keyword "koronavirüs" (coronavirus in Turkish) to the popular video-sharing platform, YouTube© on December 5, 2020. The videos were filtered according to view count. The most viewed 100 videos were scanned considering their benefits in informing the public. Videos with Turkish content or with Turkish subtitles were included in this study.

Videos that were duplicates, non-audio and non-visual, live and unrelated to COVID-19 were excluded from this study.

The videos were classified into four categories as follows:

• Interviews: This category includes interviews with experts, journalists, politicians and individuals who experienced COVID-19.

• Entertainment Videos: Into this category, videos of popular social media people (so-called "YouTubers"), funny videos and music videos were included.

• Documentaries: Videos presented as if based on scientific researches and real events were included in this category.

• News: Videos uploaded from press news (either from national or social media) were included in this category.

The most viewed 100 videos were evaluated by three researchers. The days since upload, durations, likes, dislikes, and ratings of the videos were recorded. To evaluate the quality of the videos, DISCERN instrument was used. DISCERN consists of 15 key questions plus an overall quality rating. Each of the 15 key questions represents a separate quality criterion – an essential feature or standard that is an essential part of good quality information on treatment choices[10]. The contents of the index included flow, information accuracy, quality (images, animations, interviews, subtitles, and summary), and precision (title–content compatibility) indices. Each component was evaluated using a 5-point Likert scale ranging from 1 (poor quality) to 5 (high quality)[9].

• High[5]: The publication rated high (4 or above) on the majority of questions. A high overall quality rating indicates the publication is 'good' quality-it is a useful and appropriate source of information about treatment choices.

• Moderate[3]: The publication rated high and low on a similar number of questions, or the majority of questions rated in the mid-range. A moderate overall quality rating indicates the publication is 'fair' quality-it is a useful source of information

about treatment choices but has some limitations. Additional information or support would definitely be needed.

• Low[1]: The publication rated low (2 or below) on the majority of questions. A low overall quality rating indicates the publication is 'poor' quality- it has severe shortcomings and is not a useful or appropriate source of information about treatment choices. It is unlikely to be of any benefit and should not be used[11].

Chi-square tests were administered appropriately for data analysis. A p-value of less than 0.05 was considered statistically significant. All calculations were performed using SPSS Statistics for Windows, Version 21.0 (IBM Corp, Armonk, NY). The data were presented as numbers and percentages depending on the nature of the data.

Results

Of 100 videos extracted, the average day since upload was 280 (min: 10 days, maximum: 11 months). The earliest video was uploaded on January 27 and the latest video was uploaded on December 2. The analyzed videos were viewed 79.443.977 times and totaled 15.3 hours of content. There were 36 videos in the News Category. The total view time of the videos was 24,251,098 (mean: 673,641). Videos in the News category had 183,534 likes (mean: 5098) and 13,070 dislikes (mean: 363). The mean duration of the videos was 1,9 minutes. Total DISCERN Score was 95 (mean: 2.6). The most viewed video (2.096.428 times, 8600 likes and 902 dislikes) in this category was a video from a Turkish news channel that presented "confessions" of a group of Chinese scientists who claimed that the government was misinforming the World about COVID-19.

In the Documentary category, there were 25 videos. The total view time of the videos was 23,249,975 (mean: 929,999). Videos in the Documentary category had 232.009 likes (mean: 9.667) and 10.992 dislikes (mean: 458). The mean duration of the videos was 8.8 minutes. The total DISCERN Score was 77 (mean: 3). The most viewed video (3.435.745 times, 72000 likes and 1100 dislikes) in this category was a video from a Turkish news channel that presented a day of hospital staff struggling against COVID-19.

The Interviews category involved 23 videos. The total view time of the videos was 20.244.063 (mean: 880,176). Videos in the Interview category had 223.500 likes (mean: 9.717) and 13.081 dislikes (mean: 568). The mean duration of the videos was 16.4 minutes. The total DISCERN Score was 61 (mean: 2.6). The most viewed video (4.532.529 times, 46000 likes and 1800 dislikes) in this category was a video from a foreign news channel which presents a 39-year-old female COVID-19 patient filming her own in the Intensive Care Unit.

The number of videos in the Entertainment Category was 16. The total view time of the videos was 11.698.841(mean: 731.177). Videos in the Entertainment category had 269.100 likes (mean: 16.818) and 25.250 dislikes (mean: 1.578). The mean duration of the videos was 12.8 minutes. Total DISCERN Score was 46 (mean: 2.8). The most viewed video (2.868.165 times, 49000 likes and 1600 dislikes) in this category was a video of a Turkish female YouTuber who provided information about "edible" masks, soaps and gloves, and "drinkable" colognes and disinfectants.

Among the top 100 videos, the number of videos broadcasted by the Ministry of Health to inform the public was only two, of which DISCERN scores were 4 and 5, respectively. When the four categories presented above were compared in this study, the mean duration of videos in the News category was significantly shorter when compared to other categories (1,9 minutes, $p<0,05$).

The number of mean views of videos in the Documentary category was significantly higher (n=929,999, $p<0,05$) than the News category (n=673,641). Entertainment videos were both liked and disliked significantly higher than the others (n=16.818, n=1.578, respectively, $p<0,05$). A comparison of the categories is summarized in Table 1. Additionally, the top 10 videos in each category are summarized in Table 2.

Category (n)	Mean Views n, (%)	Mean Likes (%)	Mean Dislikes (%)	Mean Duration	DISCERN Score
News (36)	673,641 (20.9)	5098 (12.3)	363 (12.2)	1,9 minutes*	2.6
Documentary (25)	929,999* (28.9)	9.667 (23.4)	458 (15.4)	8.8 minutes	3
Interview (23)	880,176 (27.3)	9.717 (23.5)	568 (19.1)	16.4 minutes	2.6
Entertainment (16)	731.177 (22.7)	16.818* (40.7)	1.578* (53.1)	12.8 minutes	2.8

Table 1: Characteristics of the videos according to categories.
**Statistically significant.*

Category	Rank	View Counts	Likes	Dislikes	Date of upload	Duration (minute)	Summary
News	1	2.096.722	8600	902	March 17	1:55	A group of Chinese scientists complaining about the government.
	2	1.578.301	11000	1000	May 3	5:03	A video from the funeral of a theologist and writer.
	3	1.396.425	4600	506	May 5	4:59	The swab technique is described.
	4	1.389.458	6800	555	March 27	2:17	New cemeteries are created in İstanbul and people in the neighborhood are reacting.
	5	1.250.057	6500	606	March 20	3:50	Symptoms of COVID-19 are described day by day.
	6	1.158.270	5500	307	February 10	1:19	Death of the Chinese physician who announced COVID-19 to the World
	7	1.075.031	9600	408	January 20	2:06	Measures taken in the İstanbul Airport when a Chinese traveler arrives.
	8	901.244	5900	517	March 25	2:03	Report of a Chinese person who died suddenly on a bus and lately diagnosed as infected by Hantavirus
	9	797.366	5000	489	March 25	1:48	Speculates the effects of temperature and humidity on virus spread.
	10	795.170	3500	576	March 22	7:17	Police make announcements to attract people's attention to the pandemic in a city of Turkey.
Documentary	1	3.435.885	72000	1100	April 17	19:13	A day of hospital staff in the warfare against COVID-19 in İstanbul.
	2	2.935.721	9900	921	March 20	2:13	Initial symptoms of the disease such as fever, sore throat and shortness of breath are given.
	3	2.053.965	12000	1900	April 14	0:25	A governmental public information video emphasizing the importance of staying at home.
	4	1.560.277	20000	3000	December 1	4:18	Conspiracy theories on coronavirus production in Chinese laboratories.
	5	1.228.830	0	0	Not specified	2:08	Social appearance of Wuhan after the pandemic
	6	1.048.364	5700	602	September 25	5:41	The pandemic is presented as a part of the road to the new World order.
	7	969.440	5200	397	October 20	6:19	Emphasizes the importance of loss of taste and smell as initial symptoms of COVID-19.
	8	895.240	46000	851	March 17	1:55	A governmental public information video on prevention methods in daily life.
	9	871.074	9100	319	March 7	44:13	The documentary titled "Coronavirus: The Silent Killer".
	10	829.646	6300	235	March 14	3:23	The coronavirus chronicles. Effect of the virus on Daily life in Wuhan.
Interview	1	4.532.576	46000	1800	March 21	2:02	A self-interview of a patient in a hospital giving information about her status and experiences.
	2	1.604.917	7700	433	March 16	1:45	Experiences of a Turkish TV-programmer from a hospital.
	3	1.281.090	9700	320	March 12	3:18	Experiences of an English person with COVID-19 living in Wuhan.
	4	1.226.598	7800	776	April 1	26:32	A famous Turkish historian talking about the effects of the pandemic on the European Union.
	5	1.055.276	12000	1000	February 8	22:43	A conversation on termination of the pandemic and vaccine production.
	6	1.028.662	10000	616	February 13	6:56	A conversation with a mediatic scientist comparing flu and COVID-19.
	7	1.039.426	3900	511	May 16	14:09	An interview with a pharmacologist on effects of blood types and virus transmission.
	8	1.011.015	11000	1800	March 13	10:48	A scientist emphasizing the importance of transparency of information regarding COVID-19.
	9	926.775	10000	763	February 5	3:21	A presentation of a mediatic scientist on similarities between flu and COVID-19.
	10	737.378	18000	359	December 3	9:55	A professor talks about current medications in COVID-19, particularly blood thinners.
Entertainment	1	2.873.877	49000	16000	July 3	18:24	A Youtuber eating fake masks, gloves and drinking colognes and disinfectants.
	2	2.076.090	19000	1500	March 13	1:18	A funny song on coronaviruses.
	3	996.288	34000	965	April 17	14:53	A compilation of funny videos popular during quarantine days.
	4	610.946	34000	379	March 24	18:51	Several YouTubers talk about actual events and experiences on quarantine days.
	5	576.793	31000	2100	February 4	15:49	YouTubers play a video game with pandemic scenario.
	6	571.637	14000	477	March 17	23:40	A Youtuber goes shopping day after the pandemic arrives Turkey.
	7	525.368	4500	231	February 18	9:53	A scene from a TV series on medicine. Patients present with COVID-19 suspicion.
	8	516.755	3200	112	November 21	3:16	Part of a magazine programme. A famous person tells how he infected her girlfirend and shares his experiences.
	9	486.388	4300	227	September 18	16:21	A scene from a TV series on crime. Coronavirus infects a family member.
	10	465.812	17000	539	April 14	8:45	A Youtuber makes philosophical speeches on effects of coronaviruses on humans, animals and nature.

Table 2: Top 10 videos in each category.

Discussion

YouTube© is one of the most popular online information sources and 2 billion users generate videos with billions of daily views[12]. Parallel to the virus spread, global search queries on YouTube© for coronavirus spiked between mid-February and the beginning of April 2020[13]. Most studies analyzing the content of YouTube© as a tool for medical information have confined their research to English alone. However, it has been shown that misleading content is generated in languages and regions around the World since videos in other languages may generate a large proportion of the viewership[14]. For instance, misleading information was detected in 10.9% of the Spanish videos[15]. When Turkish

videos were considered, all four categories in our study presented low DISCERN scores indicating low quality. In concordance with our results, in another study, the mean DISCERN score was 31.33 out of 75 possible points, which indicated that the quality of YouTube© videos on COVID-19 was poor[16]. Similarly, the overall mean DISCERN Score of 2.62 in another study also indicated that the YouTube© content suggested poor validity. As an alarming fact, 9.16% of the videos scored zero in a study in six languages - English, Arabic, Bengali, Dutch, Hindi, and Nigerian[14].

In a study with videos regarding COVID-19 on YouTube© in English, 27.5% contained non-factual information originating from entertainment news, internet news and consumer sources[17]. Similarly, the News category presented the lowest DISCERN score and least likes in our study. Our results revealed that the most viewed videos were documentaries. In a similar study, 52.5% of videos were Informative, 23.75% were News Updates, and 8.33% were Personal Experiences. Additionally, 10% of the videos were found to present medically misleading information[14]. The low DISCERN score of documentaries in our study may be related to the subjectivity of the producers and the involvement of too many conspiracy theories.

Previously, 105 videos were evaluated according to quality and information accuracy. Of the 105 videos, 37.14% contained misleading information. Additionally, independent user-generated videos showed the highest proportion of misleading information at 68.09%, while all of the government-generated videos were useful. It was revealed that government agency–generated videos achieved the highest median DISCERN score of 5[18]. The only two government-supported videos had the highest DISCERN scores. It was previously stated that videos from professional and government organisations were the most informative and had the highest quality content but were significantly under-represented considering viewership[17].

This result shows that governments should focus on broadcasting more videos to prevent misinformation on social media. Although the highest mean DISCERN score was achieved in Documentaries, a score of 3 is still very low. We agree with a YouTube© spokesperson stated, "We're committed to providing timely and helpful information at this critical time, including raising authoritative content, reducing the spread of harmful misinformation, and showing information panels, using data from the WHO and the NHS, to help combat misinformation."[19]. An essential component of the battle to reduce the spread of harmful misinformation and prevent the pandemic from turning into an infodemic is minimizing the effects of bots and automated accounts[5]. Governments should provide a close relationship with YouTube© and other video-sharing platforms, and a scientific system for early intervention to videos with incorrect information should be established.

Moon et al. investigated YouTube videos on COVID-19 in the Korean language and determined that misleading videos had more likes, fewer comments, and longer running times than useful videos. Korean-language YouTube© videos on COVID-19 uploaded by different sources varied significantly considering reliability, overall quality, and title–content consistency, but the content coverage was not significantly different[18]. In our study, videos in the Interviews category revealed the lowest mean DISCERN score and longest video duration. Interviews are generally performed without preliminary rehearsal and occur spontaneously. Such a format carries a high risk for false rhetoric including misinformation, hate speech and conspiracy theories. When all these facts are considered, as an additional finding, our results showed that as the duration of videos increases, the false information rate increases. However, it is interesting that videos in the News category also got a low mean DISCERN score despite their relatively shorter durations. Anxiety for attracting the attention of the audience and reporting on every new development may lead to misinformation.

Entertainment videos were ranked 2nd according to view counts in our study. However, these videos gained a considerable amount of reaction from followers regarding both likes and dislikes. Since the audience of entertainment videos is mainly teenagers, it is not surprising that they tend to express themselves by reacting to the videos. It was stated that YouTubers generally speak directly to the camera, making their videos feel more personal than a typical mainstream broadcast[19].

This format makes these people prone to be criticised. The most interesting finding in our study was that the Entertainment videos achieved a higher DISCERN score when compared to Interviews and News. The authors of this article reached a consensus that this result relates not to the accuracy of Entertainment videos but notable inappropriateness of videos in other categories.

Limitations of the study

This study also has limitations to consider. The primary limitation of our study is that our study is limited to Turkish videos. Since this is a cross-sectional study performed at a one-time point, results may change in a dynamic environment like YouTube© over time.

Conclusion

Our study is the pioneering analysis to provide data on information related to COVID-19 detected specifically in YouTube© videos in Turkish. When utilized properly, YouTube content can benefit health organizations in ensuring that the population adequately implements measures to control the spread of the disease. On the other hand, misleading videos may contribute to failure to confine the infection[20]. Insights obtained from this study may help improve the quality of information that the public can find through YouTube©[21].

Collaboration between healthcare organizations and social media platforms is required to minimize statements consisting of conspiracy theories, non-factual information, inappropriate recommendations, inconsistent with current official government and health agency guidelines, discriminating statements, hate speech and racism. As the current outbreak evolves, international health agencies and academic institutions should be supported by governments and release more videos with information about COVID-19. YouTube© should, within legal limits, consider screening and removing videos with misinformation to prevent public panic in the current state of emergency.

Data availability statement: the data used to support the findings of this study are available from the corresponding author upon reasonable request.

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