Middle Black Sea Journal of Health Science / Mid Blac Sea J Health Sci

February 2022;8(1):87-97

RESEARCH ARTICLE

DOI: 10.19127/mbsjohs.1030920

An Analysis of Youtube Videos on the Topics of Coronavirus and Dentistry

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Received: 01 December 2021, Accepted: 18 January 2022, Published online: 25 February 2022

Abstract

Objective: The World Health Organization declared a COVID-19 pandemic in March 2020. Dentists and their patients are at a particularly higher risk of infection, emphasizing the need for implementation of measures preventing the spread of the virus during emergency dental treatments. YouTube, a digital platform where anyone can upload videos and get feedback from other users about their content, represents a significant resource for accessing information. The aim of the current study was to analyze the content quality and reliability of YouTube videos on the topics of coronavirus and dentistry.

Methods: The keywords "coronavirus" and "dentistry" were used to identify relevant videos on YouTube. Approximately 120 videos uploaded between March and November 2020, were reviewed by two independent researchers. Of these, 91 videos fulfilled the inclusion criteria and were scored for content quality and reliability.

Results: The majority of videos analyzed were uploaded by public institutions, associations, or hospitals (35.2%) and had a target audience made up of the general population (79.1%). The coronavirus index and total index scores of the videos uploaded by public institutions were significantly higher than those uploaded by dentists ($p = 0.017$; $p < 0.05$; $p = 0.006$; $p < 0.01$). The mean modified DISCERN (mDISCERN) score, used to assess the reliability of the videos, was 2.88 ± 1.08.

Conclusion: The results of this study suggest that specialist physicians should play a more active role in sharing accurate educational videos. Although YouTube, a popular video streaming site, is a valuable resource for accessing useful and accurate information, it also contains large amounts of incomplete and incorrect information which is a significant disadvantage as it can confuse the general public and healthcare professionals and prevent identification of videos produced or verified by authorized healthcare professionals.

Key words: Coronavirüs, communicable diseases, dental education, public health dentistry, social media.

Suggested Citation Kurt A, Kalay T S, Kibaroglu E. An Analysis of Youtube Videos on the Topics Of Coronavirus and Dentistry. Mid Blac Sea Journal of Health Science, 2022;8(1):87-97

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INTRODUCTION

In December 2019, a sudden rise in the incidence of pneumonia of unknown origin in Wuhan, China, led to the discovery of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a novel human coronavirus that causes COVID-19. The World Health Organization declared a pandemic in March 2020, and rapid global transmission of the virus resulted in approximately 91 million cases of COVID-19 and 2 million associated deaths globally by the 15th of January 2021 (1,2). The first case of COVID-19 in Turkey was detected on the 10th of March 2020 (3,4).

Transmission of the virus may occur through direct contamination, inhalation of droplets produced during coughing or sneezing, or face-to-face contact with carriers of the virus or infected individuals or surfaces (2). The most common symptoms of COVID-19 include fever, cough, fatigue, shortness of breath and, in severe cases, pneumonia and respiratory tract disorders (5,6). According to the Occupational Safety and Health Administration (OSHA), healthcare workers such as dentists are at a higher risk of contracting SARS-COV-2 and becoming potential carriers of the virus as they work in close proximity to the patient's oral cavity and dental procedures often involve the use of aerosol-generating hand-pieces and rotary instruments (5). Therefore, a clearer understanding of the nature of the virus, its potential routes of transmission, its clinical characteristics, and the testing methods used are essential for effective prevention of transmission between healthcare workers and patients (7).

Dental procedures involve a high risk of cross-infection between patients and clinicians. The ways of transmission of this virus are through droplet inhalation or direct contact with the mucous membranes of the mouth, nose and eyes. High-speed handpieces used during dental treatments create aerosols from oral secretions, saliva and blood to the environment and can also be contaminated (8). Unfortunately, the symptoms of this disease are nonspecific and can progress to severe pneumonia while asymptomatic (9-11). Postponement of non-emergency procedures has been recommended during the COVID-19 pandemic. Effective infection control measures should be taken in response to emergencies (8,12). Precautionary measures such as measurement of body temperature using a thermometer; referral of patients with suspected infections to the nearest health institution; postponement of non-urgent dental treatments; incorporation of tele-dentistry where necessary; effective management of dental appointments; active screening of dentists and patients; and social distancing should be implemented before, during, and after all dental appointments. Additionally, all dental staff and patients should receive adequate training on the prevention of transmission and facial coverings should be utilized during dental appointments. The dental team should use personal protective equipment; pay special attention to hand hygiene; and administer antimicrobial mouthwash in the patient’s oral cavity prior to commencing treatment. During dental appointments, rubber dams, high-volume dental suctions, and extra-oral dental radiographs should be used where possible and aerosol-generating procedures should be avoided. Lastly, the workplace should be ventilated and thoroughly cleaned and disinfected on a regular basis (6,13).

Currently, digital platforms such as YouTube, a popular video-sharing website with an estimated monthly view of 1 billion, represent the most accessible sources of health-related information for the general population (5, 14). With the rapid increase in national and international use of YouTube for the purpose of accessing information on diseases, treatment options and protocols, prognoses, and patient experiences, evaluation of the extent to which this information may be misleading, inaccurate, or biased is essential (15). The density and complexity of information obtained through social media often makes it difficult for users to effectively recognize the quality and accuracy of this information, which can affect the treatment process (7,16).

The terms “coronavirus” and “COVID-19” were the most searched words on Google and YouTube in the first four months of 2021 (17,18). Establishment of efficient online resources providing high-quality accurate information on SARS-COV-2 is essential for effective counseling of patients (14). Therefore, the aim of this study was to analyze the content and quality of Turkish YouTube videos on the topics of “coronavirus” and “dentistry”.

METHODS

A new YouTube account was created for the study, and the terms "Dentistry" and "Coronavirus" were searched based on upload date sorting and saved to the account. 120 videos with Turkish content uploaded from March 2020, when the pandemic appeared in Turkey, to November, were listed. Inclusion criteria for the videos were containing Turkish narrators, lasting 1-90 minutes, and being compatible with the search terms. Of the 120 results, only one of the videos that were the same was recorded in the list to be evaluated. Those that do not contain a narrator or are not in Turkish were excluded from the list. The URLs of 91 content that met the inclusion criteria were electronically saved to prevent daily changes. All videos were analyzed by two different specialist dentists for inter-observer reliability. The first researcher examined 44 contents uploaded (videos published in the last half of November, October, September, August, July, June, and May), while the second researcher examined 47 contents (videos published in the first half of March, April, and May). For inter-observer reliability, the first observer re-evaluated 47 videos reviewed by the second researcher (Figure 1).

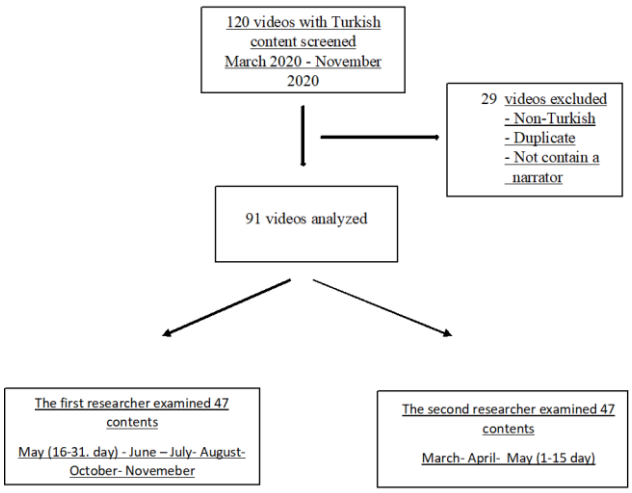

Figure 1. Flowchart of the study

Evaluation of video content

The broadcast date, duration in seconds, number of likes, broadcast source (dentist; news source; public institutions, associations or hospitals), target audience (e.g., dentists, general population), Coronavirus Index score, Dental Index score, Total

Index score, and modified DISCERN (mDISCERN) scores were recorded for each video.

The Coronavirus Index scoring evaluated the quality of information provided on the symptoms of the disease, methods of virus transmission and prevention of the disease, and the benefits to health services, while the Dental Index scoring assessed information provided on dental emergencies, tele-dentistry, and dental infection control measures. Each item was assigned 1 point, and scores ranged from 0 to 4 for each index. Using individual index scores, the videos were classified into less useful (0–1 points), moderately useful (2–3 points), and very useful (4 points). The Total Index score was calculated by summing the two indexes and was then categorized into less useful (0–2 points), moderately useful (3–5 points), and very useful (6–8 points).

Reliability was evaluated using the mDISCERN score which assesses the references cited, sources of information used, indications of uncertainties, clarity (title-content compatibility), and objectivity of the video. Each component of the mDISCERN score was evaluated using a 5-point Likert scale ranging from 1 (low quality) to 5 (high quality).

Statistical analysis

Statistical analyses were carried out using the NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) program, and the data were presented using descriptive statistical methods (mean, standard deviation, median, frequency, ratio, minimum, maximum). The Shapiro–Wilk Test was used to evaluate distribution, and the Mann–Whitney test was used to compare quantitative data between two groups that did not exhibit normal distribution. The Kruskal–Wallis test was used to compare three or more groups that did not exhibit normal distribution, and the Wilcoxon test was used to determine differences between the page viewers. Spearman's correlation analysis was used to determine the relationship between quantitative variables, and a p-value <0.05 was considered statistically significant.

RESULTS

The majority of broadcast sources for the 91 videos evaluated between 19th March and 29th November, 2020, were public institutions such as associations or hospitals (35.2%), followed by dentists (31.9%) and news sources (30%) (Table 1). The mean duration of the videos was 1177.4 ± 1425.75 seconds (range: 60 to 5260 seconds), while the mean number of likes was 17.48 ± 42.87 (range: 0 to 367) (Table 2).

Table 1. Distribution of videos by broadcast source and target audience

		N	%
Broadcast sources	**Dentist**	29	31.9
	News sources	30	33.0
	Public institutions	32	35.2
Target audiences	**Dentist**	19	20.9
	General population	72	79.1

The mean, standard deviation, and median values of the two indices and the mDISCERN score have been shown in Table 2.

Spearman's correlation analysis showed a highly significant positive correlation between the Coronavirus Index and Total Index scores (r= .795, p= 0.000); a moderately significant positive correlation between the Coronavirus Index and mDISCERN scores (r= .412, p= 0.000); a highly significant positive correlation between the Dental Index and Total Index scores (r = .659, p= 0.000); a weakly significant positive correlation between the

Dental Index and mDISCERN scores (r = .210, p= 0.045) ; and a moderately significant positive correlation between the Total Index and Mdıscern (r = .210, p= 0.045) scores (Table 3).

The first researcher reported significantly higher Coronavirus Index scores compared to the second researcher (p= 0.011). The Dental Index (p= 0.083), Total Index (p= 0.398), and mDISCERN scores (p= 0.388) did not significantly vary by the researchers (Table 4).

The length of the videos, number of likes, and Dental Index scores did not significantly differ by the broadcast source (p= 0.225). In contrast, the Coronavirus Index (p=0.017) and the Total Index scores (p= 0.006) were significantly lower for videos broadcasted by dentists compared to those broadcasted by public institutions, associations, or hospitals (Table 5).

The duration of videos with a target audience of dentists was significantly higher than those targeting the general population (p= 0.001), while the number of likes (p= 0.190) did not vary significantly by the target audience. The Coronavirus Index (p= 0.039) and mDISCERN scores (p= 0.001) were significantly higher for videos targeting dentists compared to those aimed at the general population. In contrast, the Dental Index scores (p= 0.230) did not vary significantly by the target population (Table 6).

Table 2. The mean, standard deviation, and median values of the two indices and the mDISCERN score

	Mean±Sd	***Min-Max (Median)***
Duration (sn)	1177.4±1425.75	60-5206 (408)
Number of likes	17.48±42.87	0-367 (8)
Coronavirus Index	1.05±1.1	0-4 (1)
Dental Index	2.41±0.94	0-4 (2)
Total Index	3.46±1.47	0-7 (3)
mDISCERN	2.88±1.08	0-5 (3)

Table 3. Correlation analysis of the "Coronavirus Index" and other variables

1. Coronavirus Index	r	1			
	p	.			
2. Dental Index	r	0.125	1		
	p	.239	.		
3. Total Index	r	.795**	.659**	1	
	p	.000	.000	.	
4. mDISCERN	r	.412**	.210*	.435**	1
	p	.000	.045	.000	.

Spearman's *p<0.05 **p<0.01

Tablo 4. Comparison of indexes by researchers

		2. Researcher	***1. Researcher***	***p***
Coronavirus Index	***Mean±Sd***	0.77±0.81	1.36±1.28	***0.011****
	Min-Max	0-3 (1)	0-4 (1)	
	(Median)			
Dental Index	***Mean±Sd***	2.57±0.83	2.23±1.03	0.083
	Min-Max	0-4 (3)	0-4 (2)	
	(Median)			
Total Index	***Mean±Sd***	3.34±1.31	3.59±1.65	0.398
	Min-Max	1-7 (3)	0-7 (3)	
	(Median)			
mDISCERN	***Mean±Sd***	2.79±0.98	2.98±1.19	0.388
	Min-Max	1-5 (3)	0-5 (3)	
	(Median)			

Wilcoxon Testi *p < 0.05

Table 5. Comparison of Scales by broadcast source

	N		*Mean±Sd*	*Min-Max (Median)*	*p*
Time	***Dentist***	29	796.59±1139.48	79-4882 (302)	
	News Source	30	858.73±1066.77	60-5206 (533)	0.225
	Institutions-Association-Hospital	32	1821.25±1732.75	85-4924 (1632)	
Number of Likes	***Dentist***	28	28.96±71.11	0-367 (12)	
	News Source	29	9.66±12.51	0-47 (3)	0.241
	Institutions-Association-Hospital	32	14.53±22.03	0-114 (8)	
Coronavirus İndex	***Dentist***	29	0.62±0.82	0-3 (0)	
	News Source	30	1.07±1.01	0-4 (1)	***0.017****
	Institutions-Association-Hospital	32	1.44±1.27	0-4 (1)	
Dental Index	***Dentist***	29	2.17±0.71	0-3 (2)	
	News Source	30	2.4±1.13	0-4 (3)	0.149
	Institutions-Association-Hospital	32	2.63±0.91	1-4 (3)	
Total Index	***Dentist***	29	2.79±1.05	1-5 (3)	
	News Source	30	3.47±1.55	0-7 (3,5)	***0.006****
	Institutions-Association-Hospital	32	4.06±1.52	2-7 (4)	
mDISCERN	***Dentist***	29	2.66±0.97	1-5 (2)	
	News Source	30	2.77±1.1	0-5 (3)	0.156
	Institutions-Association-Hospital	32	3.19±1.12	2-5 (3)	

Kruskal Wallis Testi *p<0.05 **p<0.01

Table 6. Comparison of Scales by Target Audience

	N		*Median±Sd*	*Min-Max (Median)*	*p*
Duration	***Dentists***	19	3088.47±1365.11	132-4924 (3165)	
	General Population	72	673.08±932.23	60-5206 (275)	***0.001****
Number of Likes	***Dentists***	19	40.39±87.64	0-367 (9)	
	General Population	72	11.68±16.61	0-114 (6)	0.190
Coronavirüs İndex	***Dentists***	19	1.68±1.49	0-4 (2)	
	General Population	72	0.89±0.91	0-4 (1)	***0.039****
Dental İndex	***Dentists***	19	2.21±0.98	0-4 (2)	
	General Population	72	2.46±0.93	0-4 (2,5)	0.230
Total İndex	***Dentists***	19	3.89±1.97	0-7 (4)	
	General Population	72	3.35±1.31	1-7 (3)	0.242
mDISCERN	***Dentists***	19	3.89±1.2	0-5 (4)	
	General Population	72	2.61±0.88	1-5 (2)	***0.001****
	N		***Ort±Ss***	***Min-Max (Median)***	***p***

Kruskal Wallis Testi *p<0.05 **p<0.01

DISCUSSION

Although the Internet represents one of the easiest and most widely preferred methods of accessing information, it is known that uploading data directly without applying any standard quality control causes serious information pollution, especially about medical facts (20,21). The responsibility of maintaining the scientific accuracy and quality of the information presented rests entirely with the uploader (22,23). The coronavirus pandemic has led to massive amounts of data being made public daily via social media networks, which often play a mediating role in connecting individuals with useful information. However, the lack of content and quality assessment strategies often results in the dissemination of large amounts of incorrect and unnecessary information, causing confusion among individuals seeking useful data (7,17). It is thought that technology and the internet will become an indispensable part of our daily life in the coming years, and even within a few years, the internet will be the primary source of information gathering. As the role of technology and the internet continues to expand, ensuring access to high quality videos on digital platforms is critical (24-26).

While previous studies have individually analyzed the quality and reliability of YouTube videos on the topic's coronavirus and dentistry (20,22,23,25-27) few have examined them together and the majority of these videos have been in English (7,16). To the best of our knowledge, this is the first study to assess the quality and reliability of YouTube videos with Turkish content on the topics of Coronavirus and Dentistry together. The majority of videos included in this study were published within 9 months of the start of the pandemic and were targeted at dentists and dental patients.

Previous content analyses of YouTube videos on the topic of SARS-COV-2 used various indexes (16,20,22) such as the Medical Information and Content Index score (15,23), defined by Nagpal et al. (19) during the Ebola epidemic, or those proposed by the Center for Disease Control and Prevention (CDC) (23).

Yuce et al. (16) evaluated YouTube videos containing information on dentistry and the coronavirus pandemic by creating relevant categories for scoring and then adapting the total score to the Global Quality Scale (GQS) scoring system. Ozdede et al. (7) designed a usefulness index consisting of eight questions which were assigned scores ranging from least useful to very useful and used this to evaluate YouTube videos that combined the terms dentistry and COVID-19. In the current study, we designed a scoring system that can be used as an alternative to those employed in previous studies. We evaluated 91 videos and scored them using 3 categories, namely, the coronavirus index, the dental index, and the total index. Our results showed that 74.8% of the videos were less useful and only 4.4% were very useful when evaluated using the coronavirus index, while 12.1% were less useful and 11.0% were very useful when using the dental index. Finally, 27.5% of the videos were considered less useful and 9.9% were very useful when assessed using the total index. Yuce et al. (16) found that 43.6% of the 55 videos analyzed were of poor quality and were deemed useless, while Ozdede et al. (7) reviewed 116 videos and found that 24.1% were less useful and 47.4% were useful.

In the current study, the mean mDISCERN score was 2.88 ± 1.08, indicating low reliability, and this was similar to the findings reported by Yüce et al. (16) who observed a mean mDISCERN score of 2.77 ± 0.99. Khatri et al. (20) reported mean values of 3.12 for videos with English content and found that 20% of the videos considered to be useful had mDISCERN scores < 3. Ozdede et al. (7) used the video information and quality index (VIQI) score to evaluate content quality and reliability and reported a mean value of 3.93 ± 0.97. The VIQI score, like the mDISCERN index, is not just specific to the field of health and can be used to detect reliability of all video content in general.

Institutions, government departments, and health professionals use social media on a daily basis as it is an easy way to reach large numbers of people at the same time. YouTube provides a unique platform where anyone can upload videos and get feedback from other users about their content. (24). Many YouTube videos focus on the topics of health and science and the platform has grown to represent a significant resource for information, particularly in the context of the Zika, H1N1, and swine flu epidemics and, more recently, the coronavirus pandemic (18,19,29). The uploaded videos can have a wide range of information sources, including news

agencies, public institutions such as universities and hospitals, specialist physicians, or individuals (17, 20). Previous studies examining video content during epidemics found that the majority were created by news agencies. Paraphoi et al. (17) examined content on coronavirus published in January, February, and March 2020 and found that the most common sources of information were news centers, and a very small proportion of videos were created by public institutions. Khatri et al. (20) reported similar results, with the vast majority of evaluated videos citing news agencies as the major source of information, followed by public institutions and organizations. Ozdede et al. (7) found that dentists were the most common sources of information in their study (%45.7), followed by public institutions and news agencies (%27.6), and this was similar to the study by Yuce et al. (16) who found that over 50% of the videos examined by them had dentists as the major sources of information (%58.2), followed by news agencies (%10.9).

In the current study, public institutions, associations, and hospitals were the major sources of information, followed by news sources and dentists. The coronavirus index and total index scores of videos broadcasted by dentists were significantly lower than those of videos broadcasted by public institutions. Ozdede et al. (7) reported that video quality differed significantly by the sources of information, with the VIQI scores of videos shared by public institutions being significantly higher than others. Yuce et al. (16) reported significantly higher GQS scores for video content from dental health centers compared to those produced by news agencies. Approximately 79.1% of the videos evaluated in the current study targeted the general population and 20.9% were addressed to dentists, and the mDISCERN and coronavirus index scores of the latter were significantly higher than the former. While Yüce et al. (16) did not take the target audience into consideration in their study, Ozdede et al. (7) divided them into two categories (dentists and patients) and found that the usefulness and VIQI score of videos targeting dentists were significantly higher.

Studies exploring coronavirus-related video content uploaded on YouTube during the pandemic period identified this social platform as an important resource for the dissemination of information on public health issues such as viral infection outbreaks (17,22,23). Researchers have suggested that international health and academic institutions should continue to publish more videos containing information on the recognition and detection of coronavirus (23). The videos included in the current study scored poorly on the Coronavirus Index, which assessed content on the routes of transmission, clinical symptoms and prevention of the disease, and the associated benefits to health services during the pandemic, highlighting the need for more information on these issues. In contrast, the videos scored moderately on the Dental Index, which evaluated information on precautions to be taken for the prevention of dental infection, dental emergency treatment protocols, preventive dentistry practices, and tele-dentistry. YouTube videos shared by public institutions and organizations had more accurate information and were of higher quality, suggesting that it would be beneficial if experts, universities, and other institutions uploaded scientific content of sufficient duration onto YouTube, especially during the pandemic. Based on the findings of the current study, we believe that video content shared on the internet, particularly in the field of health, should be

subjected to institutional approval and quality control systems. Reviewing and removing videos of poor quality and those containing unnecessary/false information would help improve the educational use of these videos for both healthcare professionals and patients.

CONCLUSIONS

The flow of information on social media platforms is an ongoing process. YouTube videos are constantly changing and renewed in terms of content and quality within the framework of current issues. Therefore, in our study, only videos from a certain time interval could be evaluated from the beginning of the pandemic. These videos, which are only in Turkish, have led us to obtain results in a limited area in terms of both time and language. However, the fact that there are only two studies published so far that evaluates videos with English content on the topics of Coronavirus and Dentistry together makes our study valuable. Within the limitations of this study, it can be suggested that dentists should take a more active role in educational information given on social media, especially on YouTube, to create more useful content for dentists and society. Further studies are needed to evaluate the content and quality changes of existing YouTube videos overtime during and after the pandemic.

Ethics Committee Approval: This study was approved by the Ministry of Health of the Republic of Turkey (No: 2020-11-20T14_31_34).

Peer-review: Externally peer-reviewed.

Author Contributions: Concept- AK; Design- AK, TSK; Literature search- AK, EK; Data Collection and Processing- AK, EK; Analysis or Interpretation AK, TSK; Writing- AK; Critical Review- AK; TSK.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The author declared that this study hasn't received no financial support.

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