YouTube as a source of information about COVID-19 for children: Content quality, reliability, and audience participation analysis

Merve Azak, RN, MSc, Kadriye Şahin, RN, MSc *, Nihan Korkmaz, RN, MSc, Suzan Yıldız, RN, PhD

Research Assistant, Istanbul University- Cerrahpasa, Florence Nightingale Faculty of Nursing, Department of Pediatric Nursing, Abide-i Hürriyet Street, 34381 Sisli, Istanbul, Turkey

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ABSTRACT

Purpose: This study aimed to evaluate the content quality, reliability, and audience participation analysis of YouTube videos as a source of information about COVID-19 for children.

Design and methods: This study was conducted in a descriptive design. The keywords "COVID-19, explain, children" were searched on the YouTube platform on March 17, 2021, and 294 videos were reviewed. The content of the selected videos was analyzed by 2 independent reviewers. Meet the inclusion criteria, 57 videos were evaluated according to the presenter source and the presented audience with the COVID-19 for Children Checklist (CCC), DISCERN score and the Global Quality Score (GQS).

Results: When the contents of 57 videos included in the study were reviewed, it was determined that 56.1% ($n = 32$) were informative and 43.9% ($n = 25$) were misleading. Kappa value among the two independent observers was 0.89. 17.5% ($n = 10$) of the videos scored 5 points from DISCERN and 31.6% ($n = 18$) scored 4 points from GQS. The mean scores of GQS, DISCERN and CCC of videos with the grouped as informative were found to be statistically higher. There was a significant difference between the DISCERN mean score of ministry/academic/ hospital/physician channel videos was higher than the mean score of entertainment/individual channel videos.

Conclusions: This study has shown that videos explaining COVID-19 to children have high viewing rates, but also videos that are low in terms of quality and reliability.

Practice implications: It is thought that this study will reduce the rates of hospitalization by protecting children from COVID-19 by providing them access to healthier and more reliable sources.

Introduction

New Coronavirus Disease (COVID-19) was first reported in Wuhan, China in December 2019, spread rapidly all over the world, and was declared as a global pandemic by the World Health Organization (WHO) as of March 11, 2020. Approximately 180 million people were infected, and 3,9 million people died as of June 25, 2021 (WHO, 2021). While transmission mostly occurs through sick people, asymptomatic cases play a critical role in the spread of the disease (Wu et al., 2020). Therefore, in the management of the pandemic, it is crucial for individuals in the community to understand the basic characteristics of the coronavirus, to be aware of the disease threat, and to take appropriate measures (hand washing, using masks, social distancing, etc.) for their own health and public health (Szmuda et al., 2020a, 2020b).

Today, like every individual, children are also experiencing the pandemic and the social changes it brings. In this period, children may have difficulties in understanding an abstract concept like a

virus and in understanding why individual and social protection methods should be used during the epidemic process, and ultimately they may produce dysfunctional thoughts that can increase their anxiety and fears (Çaykuş & Çaykuş, 2020; O'Sullivan et al., 2021; Usta & Gökcan, 2020). UNICEF (2020) points out that children may have difficulty understanding what they see and hear about the pandemic and may be particularly vulnerable to feelings of anxiety, stress, and sadness. Therefore, as in previous pandemics, it is very important for children to have access to accurate and reliable information about the disease and pandemic process in order to ensure they comply with infection control measures in the COVID-19 pandemic (Maharaj & Kleczkowski, 2012). It is stated that parents should listen to children's fears and concerns when talking with them about COVID-19 and provide accurate information in accordance with the age and development level of the children (CDC, 2020; UNICEF, 2020). In the literature, it is recommended that this information should include the definition of COVID-19, its transmission routes, symptoms, and methods of preventing transmission between individuals (i.e. Handwashing regularly with soap and water, using antiseptic containing alcohol if there is no water and soap, avoiding touching eyes, nose or mouth, wearing a mask to cover the nose and mouth, social

* Corresponding author.
  E-mail address: kadriye.sahin@iuc.edu.tr (K. Şahin).

distancing, when sneezing/coughing covering nose and mouth with a flexed elbow or a tissue, social isolation, etc.) (CDC, 2020; UNICEF, 2020). In the international guidelines published for parents on COVID-19, recommendations have been made to parents to protect their children's mental health as well as their physical health (Children's Commissioner, 2020; UNICEF, 2020).

Today, the internet has become an important source of information on health, with the developing technology (Drozd et al., 2018). YouTube is the wold's most popular video sharing platform and the second largest search engine in the world (Chae, 2021; Szmuda et al., 2020a, 2020b; Chatzopoulou et al., 2010.). It is one of the most dominant online information sources, generating billions of views day-to-day with over two billion users (Chatzopoulou et al., 2010; Cheng et al., 2008). YouTube has an important place in providing individuals with fast and easy access to information on health. However, it has not been determined how accurate, valid, reliable and useful the information obtained from there is (Drozd et al., 2018). The spread of false information during an epidemic can hamper efforts to contain the epidemic (Bora et al., 2018; Gonsalves & Staley, 2014; Merino, 2014). Recently, the majority of children aged 8–11 prefer to watch YouTube videos instead of watching TV programs on TV (Ofcom, 2018). In the national and international literature, there is no study that evaluates the content quality of the videos that provide information about the COVID-19 disease for children on the YouTube platform. Based on this deficiency in the literature, this study aimed to evaluate the content, reliability, and quality of YouTube videos as a source of information about COVID-19 for children. It is thought that the results of the study will contribute positively to child health and public health during the pandemic process and will guide the creation of videos about COVID-19 for children.

Research questions

1. What are the contents of YouTube videos on explaining COVID-19 for children? (informative or misleading).
2. How reliable are YouTube videos on explaining COVID-19 for children?
3. What are the quality levels of YouTube videos on explaining COVID-19 for children?

Materials and methods

The purpose of this study, which is designed in a descriptive model, is to examine the videos on YouTube as a source of information about COVID-19 for children in terms of their content, quality and reliability. A single search was made for these videos with the keywords "COVID-19, explain, children" on March 17, 2021. The total sample size was calculated as 116 using the G*Power software version 3.1.9.7, according to Cohen's effect size (0.40 effect size), 85% power and 0.05 error margin. Anticipating the possible video losses, 294 videos were evaluated. A new YouTube account has been used for the search so that the existing cache and cookies do not affect the new search. Due to the international adoption of English as a universal language in different countries of the world as a search language only videos in English were included in the study. The videos were sorted by relevance like anyone new to search. Graphics show that videos reach their highest value in 15 to 16 min in the video sequencing systems (Cheng et al., 2007). Therefore, videos that exceed 20 min in duration, 300 or less views, and unrelated videos as a source of COVID-19 information for children were excluded. 10 of the videos taken under review were excluded due to duplication and the remaining videos were viewed. Of the videos, 2 were in a non-English language, 6 were longer than 20 min in duration, 208 were unrelated, and 11 had less than 300 views. Fig. 1 shows the flow diagram of the study. Since the search results on Youtube change every day, 57 videos included in the study were recorded and saved in the playlist. The URLs of the videos under review were copied and saved as a separate file. All videos were examined by two independent reviewers (MA and KS) separately, and analyzed by the third reviewer (NK). Those who reviewed and analyzed the videos were Ph.D. candidates in Pediatric Nursing. Following data capture, the contents of the videos were reviewed by 2 independent people (MA and KS) and classified as informative and misleading. Videos classified as informative was the scientifically correct information as judged by the guidelines of major public health agencies (eg AAP, CDC, WHO, UNICEF) at the time of the video's release. Videos classified as misleading was contained one or more false or missing information, as declared by these agencies. When no consensus was reached, SY who is expert and senior author was consulted. The senior author is a professor of Pediatric Nursing. These were then evaluated by other reviewer (NK). Then, DISCERN
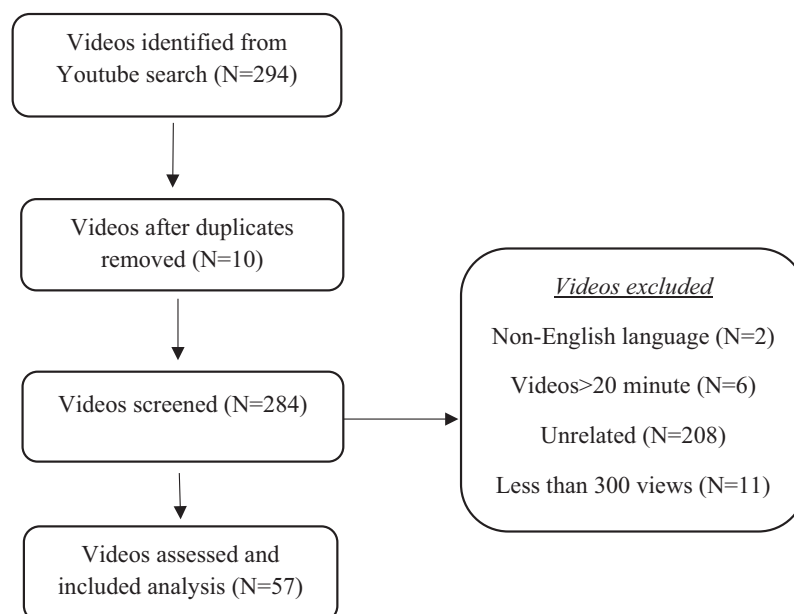

Fig. 1. Flow diagram for review of YouTube videos on explaining COVID-19 for children.

(Charnock et al., 1999), Global Quality Score (GQS) (Bernard et al., 2007), and COVID-19 for Children Checklist (CCC) scores of each video were calculated. After all this process, the other author (NK) analyzed the data obtained from the videos. Institutional Review Board approval was not required for this study, as Youtube videos are public and do not contain any patient data.

Evaluation of videos

The descriptive features of all videos including video title, URLs, time on YouTube, video length, number of views-likes-dislikes-comments, country of publication, institution/person who prepared the video, etc. were recorded. The contents of the evaluation tools used in evaluating the video content are given in Table 1.

Comprehensiveness evaluation of videos

There was no validated tool available to assess online information of YouTube videos on explaining COVID-19 to children. Therefore, a new 10-item COVID-19 Checklist for Children (CCC) was developed by the researchers to assess the video content for the average child viewer. In the development of this tool the recommendations published by international organizations (AAP, 2020; CDC, 2020; UNICEF, 2020) about talking to a child on COVID-19 were used. The scores that can be obtained from the checklist prepared by the researchers are between 0 and 10. For each item from the checklist a "yes" answer was scored as 1, "no" answer was scored as 0. The higher total score indicates the higher comprehensiveness of the video (Table 1).

Evaluation of the reliability of videos

The reliability of the videos included in this study was scored with the DISCERN developed by Charnock et al. (1999) (Table 1). The lowest and highest possible score that can be obtained from this tool is within the range of 0–5. For each item from the DISCERN, a "yes" answer was scored as 1, "no" answer was scored as 0. Videos which scored less than 3 are bad quality videos. The use of these videos is not recommended. Videos as scored 3 are considered medium quality. These

Table 1
Reliability, quality and comprehensiveness assessment tools of internet videos on explaining COVID-19 for children.

Comprehensiveness
1. COVID-19 definition
2. COVID-19 transmission
3. COVID-19 symptoms
4. Washing hands regularly with soap and running water
5. Avoiding touching eyes, nose or mouth
6. Covering nose and mouth with a flexed elbow or tissue when coughing/sneezing
7. Wearing a mask
8. Social distancing/Staying at home/Lockdown
9. Expressing feelings about COVID-19
10. Relaxing activities during the COVID-19 pandemic

Discern
1. Are the explanations given in the video clear and understandable?
2. Are useful reference sources given? (publication cited, from valid studies)
3. Is the information in the video balanced and neutral?
4. Are additional sources of information given from which the viewer can benefit?
5. Does the video evaluate areas that are controversial or uncertain?

Global quality scale
1. Poor quality, poor flow, most information missing, not helpful for patients
2. Generally poor, some information given but of limited use to patients
3. Moderate quality, some important information is adequately discussed
4. Good quality good flow, most relevant information is covered, useful for patients
5. Excellent quality and excellent flow, very useful for patients

videos should require additional sources of information. Videos scored greater than 3 contain useful information for audience and are quality videos.

Evaluation of the quality of videos

The 5-point GQS developed by Bernard et al. (2007) was used to evaluate the overall quality of the videos included in the study (Table 1). The quality of the videos was evaluated and scored as "1: poor quality, 2: low quality - limited use, 3: somewhat useful, 4: useful, 5: useful-excellent quality".

Statistical analysis

SPSS for Windows (Statistical Package for Social Sciences for Windows, Version 25.0) was used for the analysis of the data obtained in the study. Kolmogorov-Smirnov test was used in the assessment of the conformity of the data for normal distribution. Levene test was used to test homogeneity of variances. Descriptive data were used to define continuous variables (mean, standard deviation, minimum-maximum, median and interquartile range). The Kruskal-Wallis test and Mann Whitney U test, were used when data that were not normally distributed. The agreement between the two independent observers was calculated with the Kappa value. Spearman correlation analysis was performed to examine possible correlations of the total content score with DISCERN, GQS, CCC score, and video characteristics. A p-value <.05 was considered significant.

Results

The median score of the number of views of 57 videos included in the study was 62,323 (min-max 339–3,610,841). The median scores of the number of likes, dislikes and comments of the videos were 435 (min-max 0–161,505), 48 (min-max 0–2659), 0 (min-max 0–1675), respectively. The median score for the duration of videos on YouTube was 13 days (2–14) and the median score for the length of videos was 237 s (60–1080). When the content of the videos was reviewed, it was seen that 56.1% ($N = 32$) were informative and 43.9% ($N = 25$) were misleading. Two independent observers' kappa value was 0.89. Of the videos, 42.1% ($N = 24$) were from America, 10.5% ($N = 6$) were from India, 8.8% ($N = 5$) were from Canada, 7% ($N = 4$) were from England, 5.3% ($N = 3$) were from Ireland and 26.3% ($N = 15$) were published from other countries (Australia, South Africa, etc.). Of the published videos, 29.8% ($N = 17$) were prepared by ministry/academic/hospital/physician channel, 14% ($N = 8$) by News-publisher channel, 15.8% ($N = 9$), 24.6% ($N = 14$) by educational channel and 31.6% ($N = 18$) were prepared by entertainment/individual channel. Animation characters/puppets took part in 63.1% ($N = 34$), physician in 8.8% ($N = 5$), others (teacher, parents, children, announcer) in 28.1% ($N = 16$). From the DISCERN, 17.5% ($N = 10$) of the videos scored 5 points, and 17.5% ($N = 10$) scored 4 points. From the GQS, 15.8% ($N = 9$) of the videos scored 5 points and 31.6% ($N = 18$) scored 4 points (Table 2). The total mean scores of GQS, DISCERN, CCC of videos were 3.26 (SD 1.20), 3.22 (SD 1.11), 6.36 (SD 2.52), respectively (Table 3).

The GQS, DISCERN, and CCC total mean scores of the informative videos were 4.09 (SD 0.67), 3.81 (SD 0.95), 8.15 (1.22), respectively. The total mean GQS, DISCERN and CCC scores of the deceptive videos were 2.12 (SD 0.74), 2.41 (SD 0.77) and 3.91 (SD 1.61), respectively (Table 4). It was found that the videos grouped as informative scored significantly higher in GQS, DISCERN, and CCC scores compared to videos grouped as misleading ($p < .001$). It was found that there is a statistically significant difference between the GQS average score according to the source of publication of the videos as a result of the Kruskal Wallis test ($p < .05$). However, in paired comparisons, it was determined that the difference between the GQS average score

Table 2
Summary characteristics of the videos (N = 57).

Variables	N	%
Country of origin of the videos		
USA	24	42.1
England	4	7.0
India	6	10.5
Canada	5	8.8
Ireland	3	5.3
Others	15	26.3
Source of release		
Ministry/academic/hospital/physician channel	17	29.8
News-publisher channel	8	14.0
Educational channel	14	24.6
Entertainment/individual channel	18	31.6
Who took part in the videos		
Animation/puppet	36	63.1
Physician	5	8.8
Others (teacher, parents, children, announcer)	16	28.1
Video type		
Informative	32	56.1
Misleading	25	43.9
Quality score of the videos (GQS tool)		
Videos with total score 1	5	8.8
Videos with total score 2	11	19.3
Videos with total score 3	14	24.6
Videos with total score 4	18	31.6
Videos with total score 5	9	15.8
Reliability score of the videos (DISCERN tool)		
Videos with total score 1	3	5.3
Videos with total score 2	11	19.3
Videos with total score 3	23	40.4
Videos with total score 4	10	17.5
Videos with total score 5	10	17.5
	Median (IQR)	**Min-Max**
Video metrics		
Video length	237.00 (219.50)	60.00–1080.00
No of views	62,323.00 (358,426.50)	339.00–3,610,841
Likes	435.00 (1700.50)	0.00–161,505.0
Dislikes	48.00 (161.00)	0.00–2659.00
Comments	0.00 (0.00)	0.00–1675.00
No of days in YouTube	13.00 (1.00)	2.00–14.00

IQR: Interquartile Range, GQS: Global Quality Score.

Table 3
Distribution of the GQS, DISCERN and CCC Scores of Videos (N = 57).

Scales	Mean (SD)	Median (IQR[a])	Min-Max
GQS	3.26 (1.20)	3.00 (2.00)	1.00–5.00
DISCERN	3.22 (1.11)	3.00 (1.50)	1.00–5.00
CCC	6.36 (2.52)	7.00 (4.00)	1.00–10.00

[a] IQR: Interquartile range.

according to the source of the videos was insignificant since the *p*-value obtained as a result of the Bonferroni correction was $p > .008$ ($p > .05$). It was found that there was a significant difference between the mean score of DISCERN according to the source of publication of the videos ($p < .05$), and the mean DISCERN score of Ministry/academic/hospital/physician channel videos was higher than the mean score of entertainment/individual channel videos ($p < .05$) (Table 4).

When the correlation analysis of the data is examined; it was found that there is a very strong positive correlation between CCC and GQS scores (rs:0.937, $p = .000$), and there is a strong positive correlation between DISCERN and GQS and CCC scores (respectively, rs:0.792, $p = .000$; rs:0.701, $p = .000$). There was a very strong positive correlation between the number of views of the videos and the number of likes and dislikes (rs:0.939, $p = .000$, respectively; rs:0.960, $p = .000$). In

addition, a very strong positive correlation was found between the number of likes and dislikes of the videos (r$_s$:0.941, $p = .000$) (Table 5).

Interobserver reliability of GQS, DISCERN, and CCC mean scores are given in Table 6. The GQS scored 3.26 (SD 1.20) points from the first reviewer and 3.24 (SD 1.18) points from the second reviewer. DISCERN was scored as 3.22 (SD 1.11) by the first reviewer and 3.17 (SD 1.22) by the second reviewer. CCC scored 6.36 (SD 2.52) by the first investigator and 6.31 (SD 2.45) by the second investigator. Therefore, there was good agreement between the 2 reviewers in terms of GQS, DISCERN and CCC mean scores (respectively, ICC:0.978, ICC:0.977, ICC:0.982). It was determined that there was a strong relationship between the first and the second observers' evaluations in GQS, DISCERN, CCC (respectively, r$_s$:0.954, $p = .000$; r$_s$:0.961, $p = .000$; r$_s$:0.958, $p = .000$) (Table 6).

Discussion

The COVID-19 pandemic has created difficult living conditions for many people. Children have adapted with more difficultly than adults to the emerging pandemic conditions. Reliable sources are needed to explain COVID-19 for children directly affected by the pandemic (Mitchell, 2020). Recently, patients are turning to more and more online information resources to make informed decisions. YouTube is a free, easy and fast-access video sharing platform that has the potential to be a source of information on health (Onder & Zengin, 2021). However, the scientific accuracy, reliability, and quality of the medical information contained in the videos vary. Information shared on YouTube is published directly without any quality control. The accuracy of the information is entirely under the initiative and responsibility of the person uploading the video. This situation leads to information pollution as well as useful information (Ozdede & Peker, 2020). In a study, 3154 families were included and it was shown that 80% of 0–7 year-old-children use YouTube and 59% of them use YouTube Kids (Marsh et al., 2019). YouTube is easily accessible by children and, the multimodal features capture children's attention such as audio, text, special effects, animations. The children can access YouTube through different digital devices (e.g., tablet, phone, laptop) connected to the internet. They can easily access content by searching keywords via a simple home page layout (Neumann & Herodotou, 2020a).

In the literature, although it is reported that YouTube videos are an educational tool and a source of information for children (Neumann & Herodotou, 2020a), no study has been found on analyzing YouTube videos containing health information for children.

Studies analyzing whether videos for children on YouTube have valid, reliable, and accurate information are also inadequate (Neumann & Herodotou, 2020b; Turkoglu et al., 2020). In the studies on the analysis of videos about COVID-19 on YouTube the ways of transmission of disease, prevention measures (Basch et al., 2020; D'Souza et al., 2020; Ramírez et al., 2020; Szmuda et al., 2020a, 2020b) videos published in different languages such as Korean, Spanish (Hernández-García & Giménez-Júlvez, 2020; Moon & Lee, 2020) were discussed. Except for these studies, during the COVID-19 pandemic process, there were studies that analyze videos for areas such as dentistry (Ozdede & Peker, 2020; Ozden-Yuce et al., 2021), pregnancy (Yuksel & Cakmak, 2020), andrology (Demir et al., 2021), and chronic diseases such as rheumatic diseases (Kocyigit et al., 2020) and gout (Onder & Zengin, 2021). In addition to these studies, there are a limited number of studies focusing on the analysis of YouTube videos watched by children (Neumann & Herodotou, 2020b; Turkoglu et al., 2020).

During the COVID-19 pandemic, many parents are seeking information on how to provide their children with disease-related information and can use YouTube videos. However, the present study is the first analysis to focus on videos about explaining COVID-19 to children. This study evaluated the most widely viewed videos' accuracy, usability, reliability and quality on YouTube about explaining COVID-19 to

Table 4
Comparison of indices according to some parameters ($N = 57$).

Variables	n	GQS	DISCERN	CCC
		Mean (SD)	Mean (SD)	Mean (SD)
Video type				
Informative	33	4.09 (0.67)	3.81 (0.95)	8.15 (1.22)
Misleading	24	2.12 (0.74)	2.41 (0.77)	3.91 (1.61)
z/p		**−6.194/0.000***	**−4.736/0.000***	**−6.481/0.000***
Country of origin of the videos				
USA	24	3.33 (1.34)	3.37 (1.20)	6.50 (2.73)
England	4	4.00 (0.81)	3.25 (0.95)	8.00 (1.41)
India	6	2.66 (1.21)	2.83 (1.47)	5.33 (2.73)
Canada	5	2.80 (1.30)	2.80 (1.09)	5.20 (3.19)
Ireland	3	3.33 (0.57)	3.33 (0.57)	6.33 (1.52)
Others	15	3.33 (1.11)	3.26 (1.03)	6.53 (2.26)
χ^2/p		3.649/0.601	1.458/0.918	3.685/0.596
Source of release				
Ministry/academic/hospital/physician channel	17	3.76 (0.90)	4.00 (0.86)	7.35 (2.02)
News-publisher channel	8	2.37 (1.18)	2.75 (1.03)	4.37 (2.26)
Educational channel	14	3.64 (1.00)	3.28 (0.91)	6.85 (2.14)
Entertainment/individual channel	18	2.88 (1.32)	2.66 (1.13)	5.94 (2.87)
χ^2/p		9.578/0.088	**14.792/0.011***	9.675/0.085
			a = b = c = d = e = f**	
Who took part in the videos				
Animation-cartoon-puppet	36	3.50 (1.08)	3.41 (1.07)	6.83 (2.27)
Physician	5	3.60 (1.14)	3.60 (0.54)	7.40 (2.30)
Others (teacher, parents, children, announcer)	16	2.62 (1.31)	2.68 (1.19)	5.00 (2.73)
χ^2/p		5.389/0.068	6.002/0.050	5.795/0.055

*$p < .05$, **p value obtained after Bonferroni correction $p > .003$, z: Mann Whitney U test, χ^2: Kruskal Wallis test.

Table 5
Correlation analysis of the data ($N = 57$).

		Video length	Views	Likes	Dislikes	Comments	No of days in YouTube	GQS	DISCERN	CCC
Video length	r_s	–	–	–	–	–	–	–	–	–
	p									
Views	r_s	0.002	–	–	–	–	–	–	–	–
	p	0.986								
Likes	r_s	0.094	**0.938**	–	–	–	–	–	–	–
	p	0.487	**0.000***							
Dislikes	r_s	0.072	**0.960**	**0.941**	–	–	–	–	–	–
	p	0.593	**0.000***	**0.000***						
Comments	r_s	−0.070	0.053	0.196	0.062	–	–	–	–	–
	p	0.603	0.695	0.144	0.648					
No of days in YouTube	r_s	−0.040	0.060	0.012	0.132	−0.023	–	–	–	–
	p	0.769	0.659	0.927	0.328	0.863				
GQS	r_s	0.204	0.057	0.040	0.004	−0.019	−0.103	–	–	–
	p	0.128	0.673	0.770	0.770	0.889	0.445			
DISCERN	r_s	0.065	0.144	0.088	0.091	−0.181	−0.168	**0.792**	–	–
	p	0.629	0.285	0.515	0.499	0.177	0.213	**0.000***		
CCC	r_s	0.259	0.007	0.021	−0.044	0.072	−0.071	**0.937**	**0.701**	–
	p	0.052	0.958	0.880	0.747	0.595	0.601	**0.000***	**0.000***	

*$p < .01$, r_s: Spearman Corrselation Analysis.

Table 6
Inter-rater Reliability of the GQS, DISCERN and CCC Scores.

GQS₁		GQS₂		r_s/p	ICC
Mean ± SD	Median (IQR*)	Mean ± SD	Median (IQR*)		
3.26 ± 1.20	3.00 (2.00)	3.24 ± 1.18	3.00 (2.00)	0.954/0.000*	0.978
DISCERN₁		DISCERN₂			
Mean ± SD	Median (IQR*)	Mean ± SD	Median (IQR*)		
3.22 ± 1.11	3.00 (1.50)	3.17 ± 1.22	3.00 (2.00)	0.961/0.000*	0.977
CCC₁		CCC₂			
Mean ± SD	Median (IQR*)	Mean ± SD	Median (IQR*)		
6.36 ± 2.52	7.00 (4.00)	6.31 ± 2.45	6.00 (4.00)	0.958/0.000*	0.982

*$p < .01$, rs: Spearman Correlation Analysis, ICC: Intraclass Correlation.
GQS₁, DISCERN₁ and CCC₁ were evaluated by MA.
GQS₂, DISCERN₂ and CCC₂ were evaluated by KŞ.

children to the information viewed by the parents and children on a dominant media platform.

In the planning of this study, the search terms that are most likely to be used by parents who are seeking to tell their children about COVID-19 were taken into consideration. Searching was conducted more than 1 year after the COVID-19 pandemic announcement by WHO (2020), so that more videos representing explaining COVID-19 for children could be included. In some studies, the search order of videos to be included in the analysis has been limited (Li et al., 2020; Ramírez et al., 2020), but most individuals searching YouTube do not take the time to look at search limitations. Therefore, limiting videos will not be an accurate representation of what people watch (Ozden-Yuce et al., 2021). In this study, we obtained the videos by searching the keywords from a new user registration without any limitation in the order of the videos. In addition to the videos that provide general information about COVID-19 to children included in this study, there are videos about how the COVID-19 test is performed, what happens or what to do when getting COVID-19, why schools are closed.

Although social media platforms are fast, and easily accessible sources of information on health, appropriate content may not always be accessible from these platforms. Gupta et al. (2020) revealed that social media channels are the most important source of misinformation about COVID-19. On YouTube, a popular social media platform, besides accurate and useful information, there are also videos created with misleading, poor quality, and unreliable sources (Ozdede & Peker, 2020). When the content of the videos analyzed in this research is examined, 56.1% was determined as informative and 43.9% as misleading. It was found that DISCERN, GQS, and CCC mean scores of videos grouped as informative were significantly higher than videos grouped as misleading. Onder and Zengin (2021) analyzed YouTube videos about gout in their study and, similar to this study, reported that the DISCERN and GQS scores of videos grouped as useful were significantly higher. Yuksel and Cakmak (2020) analyzed YouTube videos about COVID-19 and pregnancy, and similar to this study, most of the videos were categorized as informative. However, unlike this research, they found the DISCERN scores of the videos to be low. In this research, 31.6% of the published videos were created by Entertainment/individual channel and 29.8% by Ministry/academic/hospital/physician channel. Yuksel and Cakmak (2020) reported that most of the videos in Turkish analyzed on COVID-19 and pregnancy on YouTube were uploaded by physicians, similar to this research. Demir et al. (2021) reported that videos related to COVID-19 and andrology were mostly created by healthcare professionals, and Onder and Zengin (2021) reported that videos about gout were mostly uploaded by physicians. Similar to previous studies, it was determined in this study that the health videos uploaded were not reliable and of high quality, except for reliable authorities. Rice, 2006 showed that 25% of individuals seeking health information always check the source of the videos, 25% sometimes checked and 50% never checked. In addition, YouTube videos explaining COVID-19 to children do not contain information about which age group the videos appeal to children. This can lead to the problem of that younger age groups can access YouTube videos created for older children.

In this study, it was found that the mean DISCERN score of ministry/academic/hospital/physician channel videos was higher than the mean score of entertainment/individual channel videos. Similar to this study, Onder and Zengin (2021) reported that YouTube videos uploaded by academic institutions/professional organizations have a higher reliability score. Although there was no significant difference between the groups in terms of DISCERN score in the study of Demir et al. (2021), Culha et al. (2021) evaluated YouTube videos about pelvic floor muscle exercises, it was seen that quality and reliable information was shared by health professionals (nurses, physicians, physiotherapists) regardless of the branch, and it was reported that the "DISCERN" scores of the videos uploaded by health professionals were high. Similar to this study, in the study of Demir et al. (2021), no significant difference was found between the groups in GQS scores.

Practice implications

This study can provide children with access to more reliable and quality resources, protecting them from COVID-19 and reducing hospitalization rates. With the decrease in pediatric patients with COVID-19, it is expected that the care burden of nurses will decrease in parallel.

Limitations

This is a cross-sectional study at the one-time point. Since YouTube is a dynamic video-sharing platform with daily renewed content, the results of this study offer time-sensitive information, like similar studies about YouTube. In this study, it was analyzed English language videos on YouTube, as English is the universal language adopted by many countries around the world. Also, the demographic characteristics of the video viewers were not known. Since we cannot reach the age of the children viewing the videos, it could not be determined which age

group children view the videos. Because the COVID-19 outbreak is a new situation, there was no other study investigating explaining COVID-19 to children. Therefore, we could not compare our results with similar studies.

Conclusion

In this descriptive design study, YouTube videos, which are a source of information about COVID-19 for children, were analyzed and evaluated in terms of matter, credibility and quality. YouTube videos are an important source of information about COVID-19 for children that are easily accessible and catch children's and parents' attention. This study has shown that videos explaining COVID-19 to children have high viewing rates, but also videos that are low in terms of quality and reliability. Videos on YouTube need improvement, monitoring, and more standardization before they can be considered an effective and appropriate source of information in explaining COVID-19 to children. It is recommended that children watch YouTube videos under adult supervision, such as a parent or teacher. If the quality and sources of information of the published videos can be controlled by parents, then parents and children in a gap in health literacy will be able to access the right information in this easily accessible medical knowledge pool. YouTube should consider blocking misleading videos using validity scales (e.g. modified DISCERN, GQS, etc.). In future studies, it is recommended to evaluate the quality of the videos published on other platforms used to explain COVID-19 to children. In addition, internet literacy should be developed in the parents and children.

Declaration of Competing Interest

There is no conflict of interest between the authors of the article.

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