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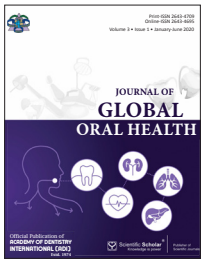

*Research Article*

# An analysis of YouTube videos on oral hygiene practices during coronavirus disease 2019 pandemic

Esra Oz[1], Zuhal Kırzıoglu[1]

[1]Department of Pediatric Dentistry, Suleyman Demirel University, Isparta, Turkey.

***Corresponding author:**
Esra Oz,
Department of Pediatric Dentistry, Suleyman Demirel University, Isparta, Turkey.

esrakaraagac@sdu.edu.tr

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## ABSTRACT

**Objectives:** The objectives of the study were to examine the usefulness and content of YouTube videos regarding additional oral hygiene practices that need to be taken during the coronavirus disease 2019 (COVID-19) pandemic.

**Materials and Methods:** A search of YouTube videos was performed using the terms "oral health," "dental hygiene," "oral health child" and "dental hygiene child" in combination with "COVID-19". When analyzing each video, the descriptive characteristics such as title, country of origin, date of upload, duration of the video, the number of views, comments, likes, and dislikes were recorded. The quality of the videos were assessed through indices: Video ınformation and quality ındex (VIQI), modified DISCERN, and global quality score (GQS). The content quality score of the videos was examined.

**Results:** The majority of the analyzed videos were uploaded by health-care professionals (67%). About 40% of the videos were slightly useful, and 6% were useful. There was no statistically significant correlation between the source of upload and GQS, VIQI, total content, or modified DISCERN scores ($P > 0.05$). Highly-watched videos appeared to have a higher total content, VIQI, Modified DISCERN, and GQI scores than poorly-watched videos, but this difference was not statistically significant ($P > 0.05$).

**Conclusion:** YouTube videos related to oral hygiene practices during COVID-19 pandemic were a limited source for children. Oral health-care professionals and organizations should play an active important role for providing educative oral hygiene-related information on YouTube videos.

**Keywords:** Coronavirus disease 2019, Dental hygiene, Oral health, Severe acute respiratory syndrome coronavirus-2, YouTube

## INTRODUCTION

In December 2019, rapidly spreading pneumonia cases with unknown etiology were observed in the city of Wuhan, in Hubei Province, China.[1] The disease, designated coronavirus disease 2019 (COVID-19), was identified as being caused by a novel coronavirus, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), and was declared to be an epidemic threatening international public health. The World Health Organization (WHO) designated COVID-19 a pandemic on March 11, 2020.[2]

The SARS-CoV-2 virus can be transmitted by droplet inhalation (coughing and sneezing) and surface contamination.[3] Given the transmission routes, hand hygiene is one of the primary

and simplest preventative measures. Since the oral cavity represents an entry portal for the virus into the body, oral hygiene, like hand hygiene, may help to reduce viral infection through the oral cavity.[4,5] Improved oral health by performing standard oral hygiene practices may also reduce the potential risk of complications.[6] Therefore, understanding the importance of oral healthcare during the pandemic is necessary.

During dental treatments, the patient and dentist are in close contact, generally with exposure to body fluids such as blood and saliva, and the tools used to create large amounts of aerosols that cause potentially high-risk factors for both patients and dentists. During the COVID-19 pandemic, decisions were made to postpone non-urgent dental treatments for all patients, and not to treat patients with a diagnosis of COVID-19 or with suspected COVID-19.[7,8] Therefore, providing oral hygiene measures to prevent dental problems that may affect quality of life or prevent the exacerbation of existing dental problems constitutes one of the major important steps required during the pandemic.

Health-care professionals have an important role in providing patients with healthcare-related information. However, using the internet to seek medical information has become popular by the public in the last decade. Health-care professionals and patients have turned to free-to-access video sharing sites like YouTube website to deliver and receive medical information.[9,10] 2018 Health Information National Trends Survey suggested that more than one-third of patients watch health-related videos on YouTube.[11]

In dentistry, studies showed that patients use YouTube videos related to various dental topics such as implants,[12,13] tooth whitening,[14] oral cancer,[9] impacted canines,[15] lingual orthodontics,[16]orthodontic retainers,[17] orthognathic surgery,[18] oral hygiene practices for children,[19] and dental avulsion injuries.[20] However, the videos are not subject to any peer view process or standardized methodology before uploading. This creates doubts about the reliability and accuracy of the content.[13] Inaccurate and misleading health-related information might negatively influence patients' viewpoints. Health-care professionals should be aware of the content to inform patients effectively during global public health emergencies.

To the best of our knowledge, this is the first study to evaluate the content and quality of YouTube videos on the importance of oral hygiene measures during the COVID-19 pandemic. The study aimed to examine the usefulness and content of YouTube videos regarding additional oral hygiene practices that need to be taken during the outbreak.

The hypotheses were as follows: (1) There would be few videos about oral health practices and the usefulness of the videos would be poor; and (2) the content of videos uploaded by health-care professionals would be better than that of videos uploaded by others.

## MATERIALS AND METHODS

As this cross-sectional study required analysis of publicly accessible data, ethics committee approval was not required.

### YouTube search

The online video hosting resource YouTube was searched using the search terms "oral health," "dental hygiene," "oral health child" and "dental hygiene child" in combination with "COVID-19" for the study material on August 30, 2020. In similar previous studies, researchers have analyzed 60–200 videos because they have observed that the majority of users researching a topic on YouTube watched only the first 60 videos.[21] Therefore, for each research terms, the first 90 videos were evaluated. Inclusion criteria for videos were: (1) English language; (2) related to oral hygiene instructions during COVID-19 pandemic; and (3) good audio-visual quality. Exclusion criteria for videos were; (1) irrelevant; (2) duplicate; (3) non-English language; (4) with no sound; (5) the advertisements; and (6) songs. These videos were examined in accordance with the stages in Figure 1.

### Video sources

The remaining videos were reviewed by a pediatric dentist (E.O). When analyzing each video, the descriptive characteristics such as title, country of origin, date of upload, duration of the video, the number of views, comments, likes, and dislikes were recorded. Data were collected and classified in three groups according to the number of views, as follows: <100, 100–500, >500.

All sources were categorized as the source of upload; general dentists, dental specialists, dental hygienists, private dental health centers, hospitals/universities, news/TV channels, International health agencies, and other individual users.

### Analysis of videos

The quality of the videos was assessed through indices: Video ınformation and quality ındex (VIQI), modified DISCERN, and global quality score (GQS).

The content quality score of the videos was examined according to the criteria shown in [Table 1].[22] Each criteria was given as 1 point, for a total of possible 14 points, which was considered as the "total content score." The total content score was classified as; Score 0=not useful; Scores 1–3=slightly useful; Scores 4–7=moderately useful; Scores 8–11=useful, and Scores 12–14=very useful.

The VIQI was used to evaluate the general quality of each video. The VIQI scale ranging from 1 (poor quality)

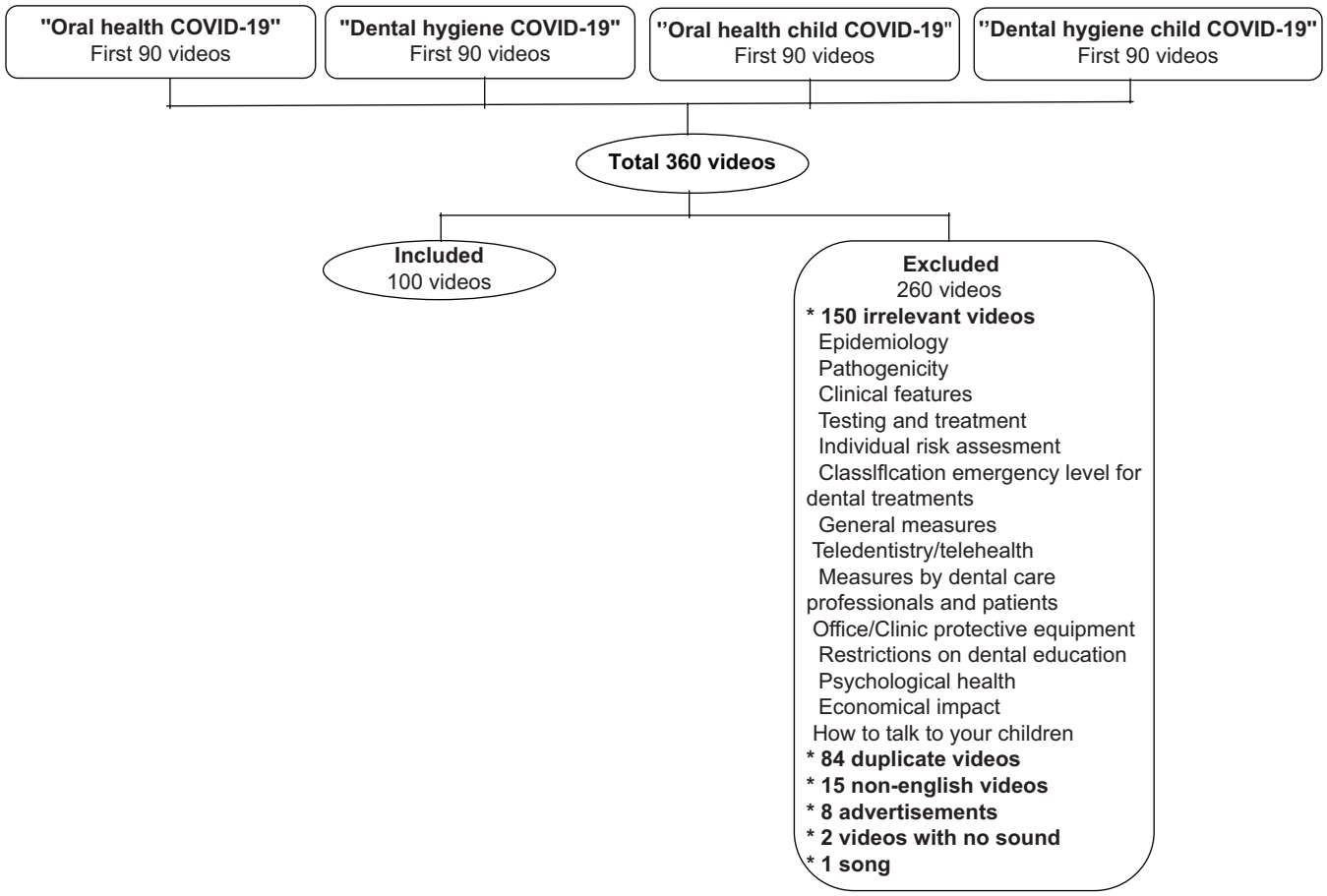


**Figure 1:** Detailed workflow diagram.

**Table 1:** The content quality of the videos.

| Classification | Scoring items | Score |
|---|---|---|
| Oral hygiene instructions | Brushing teeth with a toothpaste twice daily, for at least 2 minutes | 1 |
| | Tooth brushing techniques | 1 |
| | Change your toothbrush after 3 months or after you have been sick | 1 |
| | Never share your toothbrush | 1 |
| | After each use clean and disinfect the toothbrush | 1 |
| | Avoid placing tooth brushes of a family in a common toothbrush holder | 1 |
| | Brush/clean your tongue once daily | 1 |
| | Clean between your teeth everyday with interdental brushes or floss | 1 |
| | Use disposable interdental cleaning aids | 1 |
| | Use antiseptic mouthwashes | 1 |
| Having a well-balanced diet | Stay hydrated | 1 |
| | Avoid and limit sweets, snacking, and acidic foods | 1 |
| | Avoid sugary beverages including juice, soda, and energy drinks | 1 |
| | Try to consume vegetables, fruits, and nuts | 1 |
| Total Score | | 14 |

Score 0=Not useful, Scores 1–3=Slightly useful, Scores 4–7=Moderately useful, Scores 8–11=Useful, Scores 12–14=Very useful

to 5 (high quality) to assess each item of the video characteristics; (1) flow, (2) accuracy, (3) quality (one point each for use of images, animation, interview with individuals in the public, video headings, and a summary),

and (4) precision (level of consistency between video title and content).

The reliability of each video was evaluated by the Modified DISCERN criterion which was developed from a 16-question DISCERN instrument (Scoring: 0–5).[23] GQS was used to evaluate the quality of the videos.[24] Viewers' interactions were evaluated using the interaction index and the viewing rate which were calculated in previous studies.[9,13]

### Statistical analysis

Statistical analysis was performed using IBM SPSS Statistical Software V23. A Shapiro–Wilk normality test was performed to see if the data were distributed normally. The Kruskal–Wallis test was used for nonparametric data to compare quantitative variables in three and more groups, and one-way analysis of variance was used to compare normally-distributed data. The Chi-squared test was used to compare categorical data according to groups. $P$ <0.05 was considered statistically significant.

## RESULTS

For each research term, the first 90 videos related to oral hygiene measures during COVID-19 were screened. After the evaluation of 360 videos, 260 videos were excluded (15 non-English, 2 no-sound, 84 duplicate, 150 irrelevant videos, eight advertisements, and one song) and 100 videos were analyzed [Figure 1]. YouTube videos related to oral hygiene practices during COVID-19 pandemic were a limited source especially for children (only 18 videos for children).

According to the upload sources, videos were categorized as follows: The health-care professionals (67%) (general dentists 32%, dental specialists 22%, and dental hygienists 13%), private dental health centers (16%), hospitals/universities (2%), news and TV channels (5%), International health agencies (3%), and other individual users (7%). Most of videos (53%) were uploaded by users in United States of America and the others were uploaded from Britain (17%), India (15%), Australia (5%), Pakistan (2%), Spain (2%), New Zealand (1%), Turkey (1%), Kenya (1%), Korea (1%), Ireland (1%), and the Philippines (1%).

Analyzed videos contained information about oral hygiene instructions and diet according to the content quality criteria [Table 1]. "Brush teeth with a toothpaste twice daily" was the most commonly discussed criteria (94%) [Figure 2].

The mean number of comments was 3.17 ± 38.81. The mean number of views was 698.61 ± 2164.57. The mean duration of the videos was 6.27 ± 8.62 min. The mean numbers of likes and dislikes were 18.29 ± 56.23 and 0.5 ± 1.67, respectively. The mean interaction index score was 4.21 ± 5.89 (between 0.00 to 27.27); and the mean viewing rate was 6.14 ± 17.22%. The usefulness score ranged from 1 to 11. The mean VIQI score evaluating the quality of the videos was determined as 13.01 ± 3.65. The mean GQS was 2.9 ± 1.28 and the mean Modified DISCERN score was 2.7 ± 2 [Table 2].

More than three quarters of the YouTube videos prepared for children have been uploaded by dental health-care professionals (77.8%). The mean number of comments was 1.06 ± 2.67. The mean number of views was 121.9 ± 235.6. The mean duration of the videos was 6.77 ± 7.08 min. The mean numbers of likes and dislikes were 4.11 ± 6.57 and 0.11 ± 0.47, respectively. The mean interaction index score was 4.51 ± 6.61, and the mean viewing rate was 2.09% ±3.38%. The usefulness score (total content score) ranged from 2 to 8. The mean VIQI score evaluating the quality of

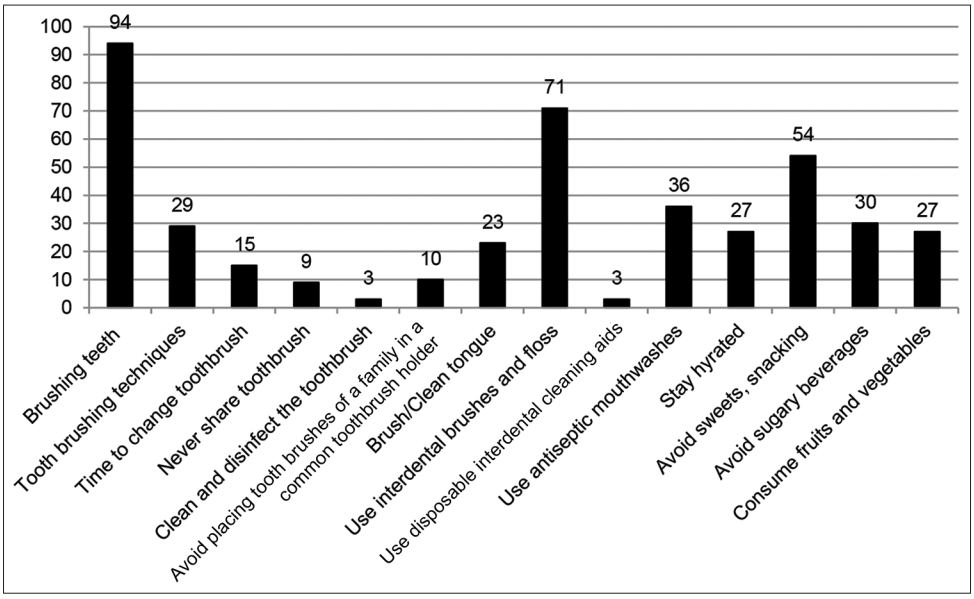


**Figure 2:** YouTube contents related to oral hygiene practices (%).

the videos was determined as 14.05 ± 4.04. The mean GQS was 3.22 ± 1.40 and the mean Modified DISCERN score was 3.11 ± 2.05.

There was no statistically significant correlation between the source of upload and GQS, VIQI, total content, or Modified DISCERN scores ($P > 0.05$). A statistically significant association was observed between mean total content scores depending on dental health professional group ($P = 0.021$). This difference is due to the fact that the average content score of the dental hygienist group was higher than the average of the general dentist group. Since the median of the dental specialist group was higher than the median of the general dentist group, a statistically significant relationship was found between the GQS scores ($P = 0.028$) [Table 3].

In the study, 40% of the videos were slightly useful, 54% were of moderate useful, and 6% were of useful. There were no videos mentioning scores 12–14 (very useful group) in the research content. [Table 4] shows the mean, median, standard deviation, and significant differences in the "usefulness score" between the different video characteristics. The usefulness scores were not significantly correlated with any of the videos' demographics including duration ($P = 0.05$), the number of days online ($P = 0.058$), views ($P = 0.556$), views/day ($P = 0.313$), likes ($P = 0.114$), likes/day ($P = 0.135$), likes/views ($P = 0.244$), dislikes ($P = 0.383$), comments ($P = 0.349$), interaction index ($P = 0.279$), and the viewing rate ($P = 0.307$). On the contrary, there was statistically significant differences between the usefulness scores and VIQI, Modified DISCERN, GQS, and total content scores ($P < 0.001$) [Table 4]. No significant differences were found between the usefulness scores and loading source ($P > 0.05$).

When the number of views (<100, 100–500, >500) was considered in terms of video characteristics, highly-watched videos (>500) appeared to have a higher total content, VIQI, Modified DISCERN, and GQI scores than poorly-watched videos (<100 and 100–500), but this difference was not statistically significant ($P > 0.05$) [Table 5]. There was no statistically significant difference between the viewing groups and the loading source ($P > 0.05$).

**Table 2:** Characteristics of the analyzed videos ($n$=100).

| Video characteristics | Median (min-max) | Mean ± SD | Total Number |
|---|---|---|---|
| Number of days since upload | 130 (14–181) | 120.12±38.81 | 12012 |
| Number of comments | 0 (0–85) | 3.17±12.07 | 317 |
| Number of views | 81.5 (2–13834) | 698.61±2164.57 | 69861 |
| Duration (min) | 3.21 (0.25–52.53) | 6.27±8.62 | 627.42 |
| Number of views/day | 0.67 (0.01–91.01) | 6.14±17.22 | 613.65 |
| Number of likes | 2 (0–374) | 18.29±56.23 | 1829 |
| Number of likes/day | 0,01 (0–3.19) | 0.21±0.56 | 20.47 |
| Number of likes/view | 0.02 (0–0.27) | 0.04±0.06 | 4.24 |
| Number of dislikes | 0 (0–11) | 0.5±1.67 | 50 |
| Interaction index | 2 (0–27.27) | 4.21±5.89 | 420.76 |
| Viewing rate | 0.67 (0.01–91.01) | 6.14±17.22 | 613.65 |
| Total content score | 0 (1–11) | 4.32±2 | 432 |
| Video information and quality index (VIQI) | 14 (5–20) | 13.01±3.65 | 1301 |
| Flow | 3 (1–5) | 3.37±1.08 | 337 |
| Accuracy | 4 (2–5) | 3.55±0.89 | 355 |
| Quality | 3 (1–5) | 2.83±0.97 | 283 |
| Precision | 3 (1–5) | 3.26±1.05 | 326 |
| Modified DISCERN score | 3 (0–5) | 2.7±2 | 270 |
| Global quality score (GQS) | 3 (1-5) | 2.9±1.28 | 290 |
| Source of upload total number (%) | | | |
| Dental health professionals | | | 67 (67) |
| General dentists | | | 32 (32) |
| Dental specialists | | | 22 (22) |
| Dental hygienists | | | 13 (13) |
| Private dental health centers | | | 16 (16) |
| Hospitals/universities | | | 2 (2) |
| News and TV channels | | | 5 (5) |
| International health agencies | | | 3 (3) |
| Other individual users | | | 7 (7) |

SD: Standard deviation, Min-Max: Minimum-Maximum, min: Minute

**Table 3:** VIQI, modified DISCERN score, GQS, and total content score categorized by source of upload.

| Source of upload | *n* (%) | Total content | | VIQI | | Modified DISCERN | | GQS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Median (min-max) | Mean±SD | Median (min-max) | Mean±SD | Median (min-max) | Mean±SD | Median (min-max) | Mean±SD |
| General dentists | 32 (32) | 3.5 (1–7) | 3.47±1.5 | 11.5 (6–19) | 12.19±3.64 | 1 (0–5) | 2.25±2.08 | 2 (1–5) | 2.47±1.24 |
| Dental specialists | 22 (22) | 4 (1–10) | 4.69±2.5 | 14 (8–20) | 14±3.92 | 5 (1–5) | 3.54±1.85 | 4 (2–5) | 3.54±1.27 |
| Dental hygienists | 13 (13) | 5 (1–8) | 4.77±1.77 | 14 (5–19) | 13.68±4.04 | 3 (0–5) | 3.09±1.82 | 3 (1–5) | 3.18±1.3 |
| Private dental health centers | 16 (16) | 4 (3–11) | 4.81±2.26 | 13.5 (8–19) | 13.06±3.32 | 3 (0–5) | 2.69±1.78 | 3 (1-5) | 2.94±1.18 |
| Hospitals/universities, News and TV channels, International health agencies | 10 (10) | 3.5 (2–7) | 4±1.89 | 11.5 (8–18) | 12.4±3.37 | 1 (0–5) | 2±2.31 | 2 (1-5) | 2.6±1.17 |
| Other individual users | 7 (7) | 6 (2–8) | 5.43±2.44 | 14 (10–19) | 13.57±3.21 | 3 (0–5) | 3±2.24 | 3 (1- 5) | 3.14±1.35 |
| *P*ˣ-value | | 0.087 | | 0.572 | | 0.271 | | 0.131 | |
| Dental health professionals | | 4 (1–10) | 4.13±1.9 | 14 (5–20) | 13.03±3.86 | 3 (0–5) | 2.78±2 | 3 (1–5) | 2.91±1.32 |
| General dentists | | 3.5 (1–7) | 3.47±1.5[a] | 11.5 (6–19) | 12.19±3.64 | 1 (0–5) | 2.25±2.08 | 2 (1–5)[a] | 2.47±1.24 |
| Dental specialists | | 4 (1–10) | 4.69±2.5[ab] | 14 (8–20) | 14±3.92 | 5 (1–5) | 3.54±1.85 | 4 (2–5)[b] | 3.54±1.27 |
| Dental hygienists | | 5 (1–8) | 4.77±1.77[b] | 14 (5–19) | 13.68±4.04 | 3 (0–5) | 3.09±1.82 | 3 (1–5)[ab] | 3.18±1.3 |
| *P*-value | | 0.021** | | 0.208* | | 0.088* | | 0.028* | |

*Kruskal–Wallis test, **One-way analysis of variance, [ab]: There is no difference between groups with the same letter. VIQI: Video information and quality index, GQS: Global quality score, SD: Standard deviation, min-max: Minimum-maximum

## DISCUSSION

During the COVID-19 pandemic, as in previous epidemics (Ebola, Zika, H1N1, West Nile), people frequently use YouTube videos to obtain health-related information.[25-30] Therefore, it is important to inform individuals accurately and effectively in this manner. This study provides an analysis of the content and usefulness of YouTube videos as a source of oral hygiene-related information during the COVID-19 pandemic.

SARS-CoV-2, transmitted by inhalation, has once again shown us how important hand-face-oral care is. If oral healthcare is not given enough attention, the mouth creates a suitable environment for many kinds of pathogens. For this reason, health-care professionals and organizations particularly recommend paying more attention to oral care during this period.[4] However, the COVID-19 pandemic has led to stress in many individuals and may have disrupted daily oral practices and diet, which negatively impact oral health. Maintaining a good daily home oral hygiene routine and having a well-balanced diet are both extremely important for keeping teeth and gums healthy, especially as regular visits to dental clinics are not possible during the pandemic.

Standard oral hygiene instructions consist of brushing teeth with a toothpaste twice daily, cleaning interdental areas and tongue daily.[31] The content of YouTube videos analyzed in our study mostly focused on issues of a home oral hygiene routine (brushing teeth [94%], using interdental brushes and floss [71%]). The toothbrush is the most common tool for cleaning teeth, but not disinfecting toothbrushes after use may recontaminate the mouth.[31] Although it is advisable to disinfect with an antiseptic mouthwash after each use,[32] it has been observed that this content is rarely mentioned in videos (3%). The use of antiseptic mouthwashes is an important oral care practice to reduce the viral load of saliva and the oropharyngeal cavity especially during the pandemic;[4] however, less than a third of the videos focused on this topic [Figure 2]. As individuals are always at home during the quarantine period, it may feel like a vacation: As a result, they may eat unhealthy snacks and sweets more frequently. Oral health and the immune system are linked, and a weakened immune system can allow viruses to enter the body through the nose and mouth more easily. However, in the study, only half of the YouTube videos emphasized that "avoid and limit sweets, snacking" is especially important [Figure 2].

The total number of views was 69,861, much lower than the total number of 15,589,902–364,080,193 views recorded for YouTube videos related to characteristics and preventative measures of COVID-19.[29,30,33-35] This result shows that internet users watch videos about the general characteristics and protection methods for COVID-19 more than those

**Table 4:** Comparison of the video characteristics between useful, moderately useful, and slightly useful videos.

| Video characteristics | Slightly Useful (n=40) | | Moderately Useful (n=54) | | Useful (n=6 ) | | *P-value |
|---|---|---|---|---|---|---|---|
| | Median (min-max) | Mean±SD | Median (min-max) | Mean±SD | Median (min-max) | Mean±SD | |
| Duration (min) | 2.79 (0.34–52.53) | 5.58±10.15 | 3.46 (0.25-28.22) | 6.13±6.38 | 6.48 (1.32–39.06) | 12.15±13.85 | 0.050 |
| Number of days online | 138 (21–165) | 123.15±40.69 | 130.5 (14–181) | 122.57±33.64 | 79.5 (15–137) | 77.83±51.33 | 0.058 |
| Number of views | 58.5 (2–11524) | 531.83±1909.06 | 98.5 (5–13834) | 870±2446.7 | 133.5 (8–942) | 268±354.07 | 0.556 |
| Number of views/day | 0.49 (0.01–71.14) | 3.73±11.75 | 0.71 (0.03–91.01) | 8.2±21.01 | 1.94 (0.15–9.4) | 3.63±3.89 | 0.313 |
| Number of likes | 1 (0–374) | 12.98±58.86 | 3.5 (0–341) | 22.72±57.3 | 7.5 (0–46) | 13.83±18.03 | 0.114 |
| Number of likes/day | 0.01 (0–2.31) | 0.11±0.38 | 0.03 (0–3.19) | 0.27±0.68 | 0.12 (0–0.87) | 0.24±0.33 | 0.135 |
| Number of likes/views | 0.01 (0–0.17) | 0.03±0.04 | 0.03 (0–0.27) | 0.05±0.07 | 0.05 (0–0.13) | 0.05±0.05 | 0.244 |
| Number of dislikes | 0 (0–8) | 0.33±1.33 | 0 (0–11) | 0.69±1.96 | 0 (0–0) | 0±0 | 0.383 |
| Number of comments | 0 (0–65) | 2.53±10.46 | 0 (0–85) | 3.67±13.76 | 1 (0–10) | 3±4.15 | 0.349 |
| Interaction index | 1.21 (0–17.46) | 2.96±4.33 | 2.59 (0–27.27) | 5±6.82 | 5.17 (0–12.57) | 5.36±5.3 | 0.279 |
| Viewing rate | 0.48 (0,01–71.14) | 3.72±11.75 | 0.71 (0.04–91.01) | 8.2±21.01 | 1.94 (0.15–9.4) | 3.63±3.89 | 0.307 |
| Total VIQI score | 10 (5–18)[a] | 10.58±2.93 | 14.5 (8–19)[b] | 14.24±3.02 | 19 (14–20)[b] | 18.17±2.14 | <0.001 |
| Flow | 2 (1–5)[a] | 2.65±0.92 | 4 (2–5)[b] | 3.74±0.87 | 5 (4–5)[b] | 4.83±0.41 | <0.001 |
| Accuracy | 3 (2–5)[a] | 3±0.75 | 4 (2–5)[b] | 3.83±0.77 | 5 (4–5)[b] | 4.67±0.52 | <0.001 |
| Quality | 2 (1–4)[a] | 2.3±0.79 | 3 (1–5)[b] | 3.09±0.9 | 4 (3–5)[b] | 4±0.89 | <0.001 |
| Precision | 2.5 (1–5)[a] | 2.63±0.9 | 4 (2–5)[b] | 3.57±0.88 | 5 (3–5)[b] | 4.67±0.82 | <0.001 |
| Modified DISCERN score | 0 (0–5)[a] | 1.1±1.61 | 4 (0–5)[b] | 3.67±1.47 | 5 (3–5)[b] | 4.67±0.82 | <0.001 |
| GQS | 2 (1–4)[a] | 1.93±0.89 | 3 (2–5)[b] | 3.43±1.02 | 5 (3–5)[b] | 4.67±0.82 | <0.001 |
| Total content score | 3 (1–3)[a] | 2.45±0.75 | 5 (4–7)[b] | 5.2±1.09 | 8 (8–11)[c] | 8.83±1.33 | <0.001 |

*Kruskal–Wallis test, [a,b,c]: There is no difference between groups with the same letter. SD: Standard deviation, min-max: Minimum–maximum, min: Minute, GQS; Global quality score, VIQI; Video information and quality index

about dental care in the pandemic. The mean number of comments was determined as 3.17 ± 12.07.

In YouTube videos related to other dental topics such as lingual orthodontics, impacted canines, teeth whitening, and dental implants, the mean number of comments was also higher than in the videos in our study.[12,14-16] This showed that many users do share their experiences to help individuals in this medium.

Everyone, from dental health professionals to laypeople, can upload videos to YouTube. In our study, the majority of those who uploaded videos were dental health-care professionals (67%), as providing information to and educating patients is the main role of dental hygienists and dentists. There were no videos on oral hygiene practices during pandemic from institutions such as the WHO, or the United States Centers for Disease Control and Prevention (US CDC). This indicates a lack of interest by the professional health institutions on this topic. There was no statistically significant association between total content score, VIQI, Modified DISCERN, or GQS scores of the videos and the upload source in this study.

Assessing the usefulness of the information in the videos, this study determined that 40% of the videos were "slightly useful," only 6% of them were "useful" and none of them were "very useful." Overall, the number of videos with useful content was very limited. This suggests that YouTube is inadequate as a source of information for oral hygiene practices during the COVID-19 pandemic. According to content analysis, usefulness scores ranged from 1 to 11 with a mean of 4.32 ± 2. This correlates with studies evaluating YouTube videos on other dental topics, where the content

**Table 5:** Comparison of the number of view groups and video parameters (total content score, duration, VIQI, M.DISCERN, GQS, interaction index, and viewing rate).

| Variables | <100 (*n*=54) | | 100–500 (*n*=31) | | >500 (*n*=15) | | *P*-value* |
|---|---|---|---|---|---|---|---|
| | Median (min-max) | Mean±SD | Median (min-max) | Mean±SD | Median (min-max) | Mean±SD | |
| Duration (min) | 2.79 (0.27–38.34) | 5.34±7.52 | 3.48 (0.25–52.53) | 7.12±9.66 | 3.46 (0.34-39.06) | 7.89±10.18 | 0.232 |
| Interaction index | 0 (0–27.27)[a] | 3.87±6.34 | 3.8 (0–23.36)[b] | 5.4±5.72 | 2.03 (0–17.18)[ab] | 2.99±4.3 | 0.028 |
| Viewing rate | 0.31 (0.01–3)[a] | 0.39±0.55 | 1.62 (0.64–9.4)[b] | 2.35±1.98 | 22.91 (3.55–91.01)[c] | 34.64±32.53 | <0.001 |
| Total content score | 4 (1–11) | 4.11±1.93 | 4 (1–8) | 4.55±1.86 | 5 (1–10) | 4.6±2.56 | 0.423 |
| VIQI score | 12 (6–19) | 12.56±3.7 | 14 (8–19) | 13.45±3.14 | 14 (5–20) | 13.73±4.38 | 0.370 |
| Flow | 3 (1–5) | 3.26±1.12 | 4 (2–5) | 3.52±0.96 | 3 (1–5) | 3.47±1.19 | 0.507 |
| Accuracy | 3 (2–5) | 3.43±0.9 | 4 (2–5) | 3.68±0.79 | 4 (2–5) | 3.73±1.03 | 0.291 |
| Quality | 3 (1–5) | 2.65±0.91 | 3 (1–4) | 2.94±0.85 | 4 (1–5) | 3.27±1.28 | 0.070 |
| Precision | 3 (1–5) | 3.22±1.11 | 3 (2–5) | 3.32±0.91 | 3 (1–5) | 3.27±1.16 | 0.904 |
| Modified DISCERN score | 2 (0–5) | 2.43±2.02 | 3 (0–5) | 3.03±1.91 | 4 (0–5) | 3±2.07 | 0.391 |
| GQS | 2 (1–5) | 2.74±1.29 | 3 (1–5) | 3.06±1.21 | 3 (1–5) | 3.13±1.36 | 0.358 |

*Kruskal–Wallis test, [a,b,c]: There is no difference between groups with the same letter. SD: Standard deviation, min-max: Minimum–maximum, min: Minute, GQS: Global quality score, VIQI: Video information and quality index

was found to be generally poor ranging from 55.83% to 74.32%.[12,18] In past pandemics (Zika, H1N1, West Nile), the percentage of YouTube videos that contained inaccurate information was between 8.0% and 23.8%.[26-28]

The usefulness of the videos in this study was not statistically significantly correlated with any of the video characteristics including duration, the number of days online, views, views/day, likes, likes/day, likes/views, dislikes, comments, interaction index, and the viewing rate ($P > 0.05$). The number of views, likes, likes/day, likes/views, comments, and interaction index was all higher in the "useful" video group than in the "slightly useful" video group, but the relationship was not statistically significant ($P > 0.05$). These results suggested that recording a "like" for a video is a subjective criterion and indicated that the number of views or likes of a video is not a determinative factor for the usefulness.

In the literature, in contrast, researchers have suggested a link between duration and quality, with the mean duration of useful videos being found to be longer than slightly- and moderately-useful videos.[15] The mean duration (min) of useful videos (12.15 ± 13.85) was longer than slightly and moderately useful videos (5.58 ± 10.15 and 6.13 ± 6.38, respectively) in the study. The duration of these videos was long because many of the key practices of oral healthcare were mentioned. Similar to this finding, other studies have stated that useful content videos have a longer duration.[12,16] Some researchers did not observe any relationship between the usefulness scores and the mean video duration[9]—this can be attributed to the loss of interest of viewers in long-duration videos despite increased video content.

Significant differences were observed in the total VIQI score, Modified DISCERN score, GQS, and total content score between the three usefulness groups in the study. The reason for this result can be explained by flow and appropriate title assignments that lead to a higher number of views. On the contrary, no significant differences were observed between the usefulness score and loading source ($P > 0.05$). The result was consistent with the results of other studies on dental implants.[12,13]

Although the content and quality of YouTube videos about oral hygiene practices for children during the COVID-19 pandemic are very important, in this study very limited numbers of these videos were found. During this pandemic period, pediatric dentists and organizations should play an active important role for providing educative oral hygiene-related information on YouTube videos.

The limitations of this study included that videos can be removed or added by their uploaders. Therefore, the study results may vary according to the date and time. There are lots of possible YouTube search terms with information on oral hygiene practices during the pandemic. Study results may show variation according to the search terms used. Analyzing other video sharing platforms may change the results. Analysis of only English-language videos can hide useful videos made in other languages.

## CONCLUSION

The results of this study showed that nearly half of the analyzed videos have slightly or moderately useful information on oral hygiene practices. Oral health-care professionals and the government should emphasize the importance of maintaining oral health hygiene measures during the pandemic to reduce the viral load in the oral cavity and reduce the potential risk of complications in the general public.

### Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. World Health Organization. Pneumonia of Unknown Cause China. Available from: https://www.who.int/csr/don/05-january-2020-pneumonia-of-unkown-cause-china/en. [Last accessed on 2020 Apr 19].
2. World Health Organization. Coronavirus Disease 2019 (COVID-19). Situation Report, 52. Available from: https://www.apps.who.int/iris/handle/10665/331476. [Last accessed on 2020 Mar 12].
3. Guan WJ, Ni ZY, Hu Y, Liang W, Ou C, He J, *et al*. Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med 2020;382:1708-20.
4. Bains VK, Bains R. Is oral hygiene as important as hand hygiene during COVID-19 pandemic? Asian J Oral Health Allied Sci 2020;10:1-5.
5. Herrera D, Serrano J, Roldán S, Sanz M. Is the oral cavity relevant in SARS-CoV-2 pandemic? Clin Oral Investig 2020;24:2925-30.
6. Azarpazhooh A, Leake JL. Systematic review of the association between respiratory diseases and oral health. J Periodontol 2006;77:1465-82.
7. ADA. Interim Guidance for Minimizing Risk of COVID-19 Transmission; 2020. Available from: https://www.ada.org/~/media/CPS/Files/COVID/ADA_COVID_Int_Guidance_Treat_Pts.pdf. [Last accessed on 2020 Apr 04].
8. CDC Guidance for Providing Dental Care During COVID-19. Available from: https://www.cdc.gov/oralhealth/infectioncontrol/statement-COVID.html. [Last accessed on 2020 Apr 08].
9. Hassona Y, Taimeh D, Marahleh A, Scully C. YouTube as a source of information on mouth (oral) cancer. Oral Dis 2016;22:202-8.
10. Bezner SK, Hodgman EI, Diesen DL, Clayton JT, Minkes RK, Langer JC, *et al*. Pediatric surgery on YouTube™: İs the truth out there? J Pediatr Surg 2014;49:586-9.
11. Langford A, Loeb S. Perceived patient-provider communication quality and sociodemographic factors associated with watching health-related videos on YouTube: A cross-sectional analysis. J Med Internet Res 2019;21:e13512.
12. Menziletoglu D, Guler AY, Isik BK. Are YouTube videos related to dental implant useful for patient education? J Stomatol Oral Maxillofac Surg 2020;121:661-4.
13. Abukaraky A, Hamdan AA, Ameera MN, Nasief M, Hassona Y. Quality of YouTube™ videos on dental implants. Med Oral Patol Oral Cir Bucal 2018;23:463-8.
14. Simsek H, Buyuk SK, Cetinkaya E, Tural M, Koseoglu MS. "How I whiten my teeth": YouTube™ as a patient information resource for teeth whitening. BMC Oral Health 2020;20:183.
15. Pasaoglu Bozkurt A, Gaş S, Özdal Zincir Ö. YouTube video analysis as a source of information for patients on impacted canine. Int Orthod 2019;17:769-75.
16. Lena Y, Dindaroğlu F. Lingual orthodontic treatment: A YouTube™ video analysis. Angle Orthod 2018;88:208-14.
17. Meade MJ, Sooriakumaran P, Dreyer CW. Orthodontic retention and retainers: Quality of information provided by dental professionals on YouTube. Am J Orthod Dentofacial Orthop 2020;158:229-36.
18. Hegarty E, Campbell C, Grammatopoulos E, DiBiase AT, Sherriff M, Cobourne MT. YouTube™ as an information resource for orthognathic surgery. J Orthod 2017;44:90-6.
19. Duman C. YouTube™ quality as a source for parent education about the oral hygiene of children. Int J Dent Hyg 2020;18:261-7.
20. Hutchison CMD, Cave V, Walshaw EG, Burns B, Park C. YouTube™ as a source for patient education about the management of dental avulsion injuries. Dent Traumatol 2020;36:207-11.
21. Desai T, Shariff A, Dhingra V, Minhas D, Eure M, Kats M. Is content really king? An objective analysis of the public's response to medical videos on YouTube. PLoS One 2013;8:e82469.
22. Bushell G. COVID-19: Our Guide to Looking after Yourselves and others through better Oral Hygiene; 2020. Available from: https://www.dentalhealth.org/blog/covid-19-our-guide-to-looking-after-yourselves-and-othersthrough-better-oral-hygiene. [Last accessed on 2020 Mar 23].
23. Singh AG, Singh S, Singh PP. YouTube for information on rheumatoid arthritis a wakeup call? J Rheumatol 2012;39:899-903.
24. Bernard A, Langille M, Hughes S, Rose C, Leddin D, van Zanten SV. A systematic review of patient inflammatory bowel disease information resources on the World Wide Web. Am J Gastroenterol 2007;102:2070-7.
25. Nagpal SJ, Karimianpour A, Mukhija D, Mohan D, Brateanu A. YouTube videos as a source of medical information during the Ebola hemorrhagic fever epidemic. Springerplus 2015;4:457.
26. Bora K, Das D, Barman B, Borah P. Are internet videos useful sources of information during global public health emergencies? A case study of YouTube videos during the 2015-16 Zika virus pandemic. Pathog Glob Health 2018;112:320-8.
27. Pandey A, Patni N, Singh M, Sood A, Singh G. YouTube as a source of information on the H1N1 influenza pandemic. Am J Prev Med 2010;38:e1-3.
28. Dubey D, Amritphale A, Sawhney A, Dubey D, Srivastav N. Analysis of YouTube as a source of information for West Nile Virus infection. Clin Med Res 2014;12:129-32.
29. Li HO, Bailey A, Huynh D, Chan J. YouTube as a source of information on COVID-19: A pandemic of misinformation? BMJ Glob Health 2020;5:e002604.
30. Dutta A, Beriwal N, Van Breugel LM, Sachdeva S, Barman B, Saikia H, *et al*. YouTube as a source of medical and epidemiological information during COVID-19 pandemic:

A Cross-sectional study of content across six languages around the Globe. Cureus 2020;12:e8622.
31. Naik R, Ahmed Mujib BR, Telagi N, Anil BS, Spoorthi BR. Contaminated tooth brushes-potential threat to oral and general health. J Family Med Prim Care 2015;4:444-8.
32. Frazelle MR, Munro CL. Toothbrush contamination: A review of the literature. Nurs Res Pract 2012;2012:420630.
33. Basch CH, Hillyer GC, Meleo-Erwin ZC, Jaime C, Mohlman J, Basch CE. Preventive behaviors conveyed on YouTube to mitigate transmission of COVID-19: Cross-sectional study. JMIR Public Health Surveill 2020;6:e19601.
34. Hernández-García I, Giménez-Júlvez T. Characteristics of YouTube videos in Spanish on how to prevent COVID-19. Int J Environ Res Public Health 2020;17:4671.
35. Khatri P, Singh SR, Belani NK, Yeong YL, Lohan R, Lim YW, *et al*. YouTube as source of information on 2019 novel coronavirus outbreak: A cross sectional study of English and Mandarin content. Travel Med Infect Dis 2020;35:101636.

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