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Reliability of YouTube videos on the management of orthodontic emergencies during COVID-19 pandemic: A quantitative and qualitative analysis

Zaki Hakami, Satish Vishwanathaiah¹, Hussain Y. A. Marghalani², Ahmed M. Bokhari³, Mohammad Raji Alrwuili⁴, Abdulaziz Abdullah S. Barashid², Mohammad Sawadi and Prabhadevi C. Maganur¹

Department of Preventive Dental Sciences, Division of Orthodontics, College of Dentistry, Jazan University, Jizan, ¹Department of Preventive Dental Sciences, Division of Pediatric Dentistry, College of Dentistry, Jazan University, Jizan, ²Orthodontic Department, Faculty of Dentistry, King Abdulaziz University, Jeddah, ³Department of Preventive Dental Sciences, Division of Dental Public Health, College of Dentistry, Jazan University, Jizan, ⁴Orthodontic Department, Qurayyat Specialized Dental Center, Al-Qurayyat, Saudi Arabia

Address for correspondence:

Prof. Zaki Hakami, Department of Preventive Dental Sciences, Division of Orthodontics, College of Dentistry, Jazan University, Saudi Arabia. E-mail: zhakami@jazanu.edu.sa

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Abstract

OBJECTIVES: To assess the content of YouTube videos on the management of orthodontic emergencies during the COVID-19 pandemic.

MATERIALS AND METHODS: YouTube was systematically searched using the keywords “orthodontic emergency,” “orthodontic homecare,” “braces emergency,” and “braces homecare.” The first 100 videos for each keyword were assessed. The upload source, number of views, likes and dislikes, duration, and global quality score were extracted. Home and clinical advice reliability was evaluated using the reliability score (DISCERN) according to the COVID-19 orthodontic emergencies protocol published by the British Orthodontic Society.

RESULTS: The majority of the videos were found to be poor quality. Home care advice showed higher reliability than clinical advice. Orthodontic emergency videos uploaded by healthcare professionals had higher reliability.

CONCLUSION: Many types of orthodontic emergencies have received little attention on YouTube, and more useful and reliable educational videos should be uploaded in the event of future pandemics.

Keywords:

Braces emergency, COVID-19, global quality score, orthodontic emergency, reliability, YouTube videos

Introduction

The city of Wuhan, China, reported the first Covid-19 outbreak in December 2019. The respiratory disease was due to a new strain of coronavirus (SARS-Cov-2), a strain that was not recorded among mankind until then. SARS-CoV-2 is one of those viruses from the zoonotic virus family that prevailed as the reason for causing respiratory diseases such as the severe acute respiratory syndrome and the Middle

East Respiratory Syndrome.^[1,2] As the virus strain spread rapidly worldwide, the WHO declared COVID-19 as a public emergency and marked it as an issue of international concern. Later, the disease was declared as a pandemic.^[3,4]

COVID-19 significantly impacted healthcare settings, including dental care settings, because it spread among individuals in close contact through aerosols and respiratory droplets. The bidirectional spread of infection in dental care settings was of great concern owing to the bio-aerosols generated

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during dental procedures.^[5-7] Given these concerns related to the spread of this infectious disease and considering the high risk of exposure for the patients and dental care professionals in dental care settings, all routine dental procedures were suspended in most countries across the world.^[8] As in other dental specialties, the imposition of guidelines for providing dental care only on an emergency basis significantly affected orthodontic care. Routine procedures such as bonding and debonding, which generate bioaerosols, were considered high-risk procedures in terms of disease transmission.^[9-11]

Orthodontic treatment, an ongoing process heavily depends on regular evaluation of active appliances throughout the treatment.^[12,13] Millions of patients who heavily depended on such orthodontic procedures were left unattended for a long period because of restrictions imposed on the treatment. The general observation that almost 85% of patients undergoing orthodontic correction experience some urgency during the treatment time.^[14] Some adverse incidents occurring because of orthodontic appliances constitute the need for an emergency appointment to ensure smooth continuity of the treatment and to reduce the suffering of the patient. An orthodontic patient might term a situation as an “emergency” based on their personal opinion on the type and severity of the incident—basically, both of their point of view differs on the same incident sometimes.^[15] Although these emergencies are not life-threatening, timely management would ease pain and distress. Because orthodontists were restricted from providing face-to-face conventional orthodontic care in the pandemic era, patients experiencing any emergencies with orthodontic appliances could not be properly addressed. These unresolved issues consequently prolonged the treatment time and led to lower patient motivation.^[15,16] The dependence on digital platforms, such as social media and websites such as YouTube, Instagram, Telegram, etc., for fetching health-related information increased tremendously under these stressful circumstances.^[17,18] YouTube is considered one of the major sources for attaining health-related information on social media platforms.^[19,20]

Hence, this study aimed to assess the quality of YouTube videos on the management of orthodontic emergencies during this pandemic period. The objective of the study was to evaluate the information of videos on orthodontic emergencies available on YouTube during the COVID-19 pandemic and lockdowns and the reliability of home and clinical advice for orthodontic emergencies.

Materials and Methods

Ethical approval

The research protocol was approved by the Ethical Committee of Scientific Research Unit, College of Dentistry, Jazan University CODJU-2211F.

Study design

This observational study was taken to evaluate videos containing pertinent information related to clinical orthodontic emergencies. Informed consent was not required as the data was obtained from publicly available platforms. The following search terms were used: “orthodontic emergency,” “braces emergency,” “orthodontic home care,” and “braces home care,”. Videos were searched on YouTube until August 2021. Using the information that 95% of YouTube viewers don’t watch beyond the first 60 videos available in the search result, the study included only the first 100 videos listed.^[21]

Selection of videos

Videos fulfilling the following criteria were included: (i) videos in the English language with acceptable audio-visual quality, (ii) videos depicting orthodontic emergencies. Moreover, these types of videos were included: (i) personal videos (from the patient’s point of view), (ii) conference or meeting presentation videos, and (iii) dental school lectures about orthodontic emergencies. The first 100 videos from each category (search word) within the last ten years were selected. The following videos were excluded: (i) irrelevant videos, (ii) advertisement videos, (iii) videos on animal studies, (iv) duplicated videos, (v) videos with no sound or heading, and (vi) non-English language videos.

Analysis of videos

Videos were analyzed independently by two senior orthodontic residents (M.R.A and A.A.S.B). Any doubts were conferred with a third examiner (Z.H.), and a consensus was attained. The following information was obtained from each video: upload date; duration; and number of views, likes, and dislikes. The upload sources were categorized as a) healthcare professionals, b) university or professional organizations, c) TV channels or news agencies, d) healthcare websites, or e) individual users.

Type of emergency

The videos were analyzed based on the COVID-19 orthodontic emergency protocol published by the British Orthodontic Society.^[22] Types of emergency included wires digging in, broken bonded retainers, lost retainers, gold chains, orthognathic post-op, aligner therapy, bracket off, elastic bands, band off, band off rapid maxillary expander, removable appliances, separators, lost module(s), temporary anchorage devices, headgear, lost spring, fractured or frayed power chain, and exposed end of wire tie. The parameters mentioned above were used to assess each video on a scale from 1 to 18. The details of each video were documented and scored as 0 (parameters not mentioned) or 1 (parameters mentioned).

Quality of videos

With the help of the global quality scale (GQS), the general quality of the videos was evaluated based on the following scoring system:^[23-25]

- 1 point: Video of poor quality, poor flow, lacking substantial information, hence unsuitable for patients.
- 2 points: Video is generally of poor quality, offering limited information with limited usefulness for patients.
- 3 points: Video of moderate quality, providing some essential information adequately, though with a balance of accurate and inaccurate content. However, they contain misleading details alongside valuable information.
- 4 points: Video of good quality and good flow. They offer useful content for patients, covering the most relevant and accurate information, but with minor shortcomings.
- 5 points: Video of excellent quality and excellent flow. These videos are highly beneficial to patients and offer entirely accurate information.

Depending on the benefits and suitability of the videos to the patients who might view it, different scores were adopted.^[26,27]

Reliability of information

Management of orthodontic emergencies was classified into either home care advice, where patients addressed the issue independently or with the assistance of other family members, or clinical care advice, where healthcare professionals treat patients at dental facilities. The reliability of the advice was compared to the COVID-19 orthodontic emergency protocol published by the British Orthodontic Society.^[22,23] A 5-point scale grading was used to categorize videos into scores between 1 and 5 as per their precision and trustworthiness. This scale was derived from the DISCERN tool, which is based on five questions used for the assessment of written health information.^[26,28]

Statistical analysis

Kappa statistic was conducted to measure intra-examiner and inter-examiner reliabilities for all parameters. The Shapiro–Wilk test was used to check the normality of the variables. Descriptive statistics were expressed in terms of frequency and percentage. The Kruskal–Wallis test was carried out to identify significant differences among the continuous variables. The Chi-squared proved helpful in assessing categorical variables and the Spearman Rho test was used to evaluate the correlations. The significance level was established at P value >0.05 .

Results

Intra-examiner reliability was excellent for the type of emergency and GQS, good for the reliability of clinical

care, and moderate for the reliability of home care. Inter-examiner reliability was excellent for the upload source, type of emergency, GQS, reliability of home care, and reliability of clinical care. In general, if the use of Kappa is set to a threshold of 0.60, all measurements showed adequate reliability.^[29] A total of 418 videos were reviewed, and the final analysis included 134 of them, after considering the inclusion and exclusion criteria. YouTube engagement factors were calculated using the total number of likes, dislikes, views, and duration. The videos had durations ranging up to 619 min, with a median length of 1.3 min. Total views spanned around 5 million, with a median of 242.

The majority (49.25%) of the YouTube videos were uploaded by healthcare professionals, whereas a minority (5.2%) were from healthcare websites. The most common types of orthodontic emergencies mentioned were digging in of wires (71.43%) and bracket off (57.14%), and the least common type reported in the videos was removable appliances (0.75%) according to Table 1.

Table 2, compares views, likes, dislikes, and video duration and GQS according to the uploaded source of the videos. Statistically significant difference was observed for the duration of videos uploaded by health care professionals. The videos uploaded by individual users had much longer video durations compared to other uploaded sources. The video sources showed considerable variation in the GQS scores. The highest-scoring videos were those uploaded by healthcare professionals, universities or professional organizations, and healthcare websites having median scores of (3, [2–3]). However, a lower GQS score was observed in any video uploaded by individual users, and this is shown in Table 2. A significant, weak, positive correlation was observed between the quality of videos and views, likes, dislikes, or the duration of the videos [Table 3].

Reliability of management of orthodontic emergencies during the COVID-19 pandemic

According to the COVID-19 orthodontic emergency protocol published by the British Orthodontic Society, analysis of the reliability scores revealed that most of the videos (78.95%) with home care advice achieved their aims. However, only 12.8% of clinical care advice videos achieved their aims, as shown in Table 1.

Table 4 compares reliability scores according to the source of the videos. Videos uploaded by healthcare professionals showed significant home care reliability and overall reliability compared to those uploaded by individual users. Videos uploaded by TV channels or news agencies showed less significant clinical

Table 1: Descriptive statistics of videos upload sources, type of orthodontic videos and emergency

<i>n</i> =134	Frequency (f)	(%)
Upload source		
Healthcare professional	66	49.25
University/professional organization	24	17.91
TV channel/news agency	29	21.64
Healthcare Website	7	5.22
Individual users	8	5.97
Type of emergency (out of 18)		
Wires digging in	95	71.43
Broken bonded retainers	3	2.26
Lost Retainers	3	2.26
Gold Chains	0	0
Orthognathic Post-Op	0	0
Aligner therapy	6	4.51
Bracket off	76	57.14
Elastic Bands	10	7.52
Band off	8	6.02
Band off RME	0	0
Removable appliances	1	0.75
Separators	6	4.51
Lost module(s)	20	15.04
Temporary anchorage Devices TADS	0	0
Headgear	2	1.50
Lost spring	4	3.01
Fractured/Frayed power chain	6	4.51
Exposed end of wire tie	52	39.10
Homecare reliability		
Are the aims clear and achieved?	105	78.95
Are reliable sources of information used?	93	69.92
Is the information presented balanced and unbiased?	91	68.42
Are additional sources of information listed for patient reference?	50	37.59
Are areas of uncertainty mentioned?	46	34.59
Clinic care reliability		
Are the aims clear and achieved?	17	12.88
Are reliable sources of information used?	17	12.78
Is the information presented balanced and unbiased?	17	12.78
Are additional sources of information listed for patient reference?	9	6.77
Are areas of uncertainty mentioned?	17	12.78

Table 2: Comparison of total views, likes, dislikes, video duration, and global quality score according to the group

	Total views	Likes	Dislikes	Video duration (min)	Global quality score
Type of upload sources	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)
Healthcare professional	842 (200-12054)	6 (1-93)	0 (0-7)	2.55 (1.35-5.3)*	3 (2-3)
University/professional organization	1187 (229-8297.5)	5 (2-70)	0 (0-6)	2.40 (1.52-4.21)	3 (2-3)
TV channel/news agency	1042 (213-12769)	4 (1-19)	0 (0-2)	1.54 (1.21-2.53)	2 (2-3)
Healthcare Web site	796 (242-5952)	3 (1-14)	0 (0-2)	1.09 (.5-1.48)	3 (2-3)
Individual users	7190 (2058-75062)	135.5 (27-1510)	4.5 (0-32.5)	7.83 (6.36-9.27)	2 (1.5-2)

*Kruskal-Wallis is significant at *P*<0.05

care reliability than those uploaded by healthcare professionals.

Table 5 summarizes the general evaluation of the videos according to the uploading source and type of emergency. Regardless of emergency type, the videos showing a reliability score of more than 3

out of 5 were more related to home than clinical care advice. The type of emergencies that showed high-reliability scores were wires digging in, bracket off, elastic bands, and lost module(s). Videos about broken bonded retainers, aligner therapy, band-off, and headgear only showed high-reliability scores for home care advice.

Discussion

Both social and economic life have witnessed debilitating impacts as a result of the COVID-19 pandemic and its consequences including complete lockdowns. Since then, healthcare settings have been under immense pressure and dental practice is no exception. A higher incidence of infections poses a greater risk to patients and dental practitioners, which has had a debilitating effect on healthcare, particularly dentistry, as a result of the pandemic. All dental clinics excluding those catering to emergency care were requested to either close down or minimize the procedures keeping them to a bare minimum.^[30]

Unlike other dental specialties, orthodontic therapy might take 12 to 18 months, or possibly longer, depending on the severity of the case. The closure of most dental clinics has also substantially impacted the delivery of orthodontic care. Many people undergoing orthodontic

treatment remain unnoticed for an extended period, creating various emergencies. An orthodontic emergency is a problem caused by an orthodontic appliance that necessitates an unscheduled appointment to resolve. Pain and discomfort were the common complaints presented by the patients. Moreover, prolongation of the treatment leads to decreased patient motivation and loss of confidence.^[31,32]

The digital era in which we live has altered the landscape of health information. Easy and fast accessibility, patients' desire for more information, and cost-effectiveness in obtaining professional healthcare consultation are the factors that have fueled internet usage for fetching data related to medicine in recent decades.^[23,33] It was discovered that 8 out of 10 internet users looked for healthcare information on YouTube.^[28]

During the COVID-19 pandemic, social media became a vital platform for rapidly disseminating health information.^[34] YouTube is presently the third most popular social networking site after Google and Facebook and has evolved into the most popular video-sharing site among professionals and laypeople.^[26,33,35] Irrespective of the authenticity and relevance of the videos available on YouTube, a staggering 65,000 scientific videos are

Table 3: Correlation between quality of videos and total views, likes, dislikes, and video duration

	Views	Likes	Dislikes	Video duration
Global quality score	0.184*	0.237*	0.206*	0.187*

*Spearman Rho test is significant at $P < 0.05$

Table 4: Comparison of Reliability Scores according to the upload source groups

<i>n</i> =134	Reliability homecare	Reliability clinical care	Overall
Type of upload sources	Median (IQR)	Median (IQR)	Median (IQR)
Healthcare professional	4 (2-4)*	0 (0-2)	4 (3-5)*
University/professional organization	4 (2-4)	0 (0-0)	4 (2.5-5)
TV channel/news agency	3 (1-4)	0 (0-0)	4 (1-4)
Healthcare Web site	2 (0-3)	0 (0-0)	2 (0-3)
Individual users	0.5 (0-2.5)	0 (0-0)	0.5 (0-2.5)

*Kruskal-Wallis is significant at $P < 0.05$

Table 5: Performance of Orthodontic videos according to quality and reliability scores

Title	Duration (min)	Global Quality (>3)	Reliability (High score)		
			Homecare (>3)	Clinical care (>3)	Total (>3) is this total of home care and clinical care
Wires digging in	938.58	49	68	12	80
Broken bonded retainers	13.05	2	3	0	3
Lost Retainers	16.89	1	3	2	5
Gold Chains	-	-	-	-	-
Orthognathic post-op	-	-	-	-	-
Aligner therapy	24.36	3	6	1	7
Bracket off	903.71	40	55	10	65
Elastic Bands	60.85	5	8	2	10
Band off	26.09	1	6	-	6
Band off RME	-	-	-	-	-
Removable appliances	7.14	1	1	1	2
Separators	27.17	3	3	1	4
Lost module(s)	75.54	11	15	2	17
Temporary anchorage Devices TADS	75.54	-	-	-	-
Headgear	4.3	-	2	-	2
Lost spring	9.18	-	3	1	4

uploaded and almost 100 million videos are viewed on a day-to-day basis.^[36]

Hence, this research intended to assess the quality of YouTube videos on the management of orthodontic emergencies during the COVID-19 pandemic. YouTube videos can be educational and entertaining. Because YouTube is a free-to-access video-sharing site, videos on diagnosing, treating, and preventing illness often attract viewers. However, there are no scientific peer review or a set of criteria for regulating the videos published.^[26] Since a detailed evaluation of the videos uploaded on YouTube is lacking, the chances for the propagation of misinformation are very high.^[26]

According to Knösel and Jung, there are a lot of videos containing information about orthodontics on YouTube, and most of these were uploaded by orthodontic patients.^[37] The quality and dependability of these videos are questionable due to the influence and sharing of personal viewpoints and experiences. Furthermore, neither the source nor the currency of the videos needs to be expressed by any YouTuber publishing them, and they aren't obliged to upload the videos regularly.^[37,38]

In our research, we included 134 YouTube videos depicting orthodontic emergencies and categorized them into 18 types. Most of the videos had contents related to two orthodontic emergency types: wires digging in and bracket off. Most of the orthodontic emergency videos were found to have generally poor quality, which was in agreement with the study conducted by Kılınc and Sayar,^[26] where orthodontic videos uploaded on YouTube generally had poor to moderate quality. According to the study conducted by Chan *et al.*,^[39] the videos published by non-profit or healthcare-related institutions constituted below a quarter of the total videos uploaded. These account for lower uploading rates compared to other uploading sources, following our study, which found that healthcare professionals uploaded most of the videos. Furthermore, videos from healthcare websites and healthcare professionals obtained less viewership compared to those published by private individuals and the results show similar views proving that healthcare organizations such as the World Health Organization and the JAMA network contributed toward less than 25% of the total uploads, being in same terms with the study. Although videos produced by individuals achieved the highest reliability and quality scores, there has been exponential growth in medical YouTubers in this era.^[40] Our study results were in line with the findings of Onder and Zengin, who found that YouTube videos uploaded by academic institutions or professional organizations had a higher reliability score.^[41] In our research, compared to videos from individual users, videos uploaded by healthcare

professionals, universities, or professional organizations showed significantly higher reliability scores. Videos containing information related to home care advice achieved better reliability than those related to clinical advice.

In our study, significantly higher GQS scores were observed for the videos uploaded by healthcare professionals, universities, and professional organizations, but the overall quality of the YouTube videos depicting orthodontic emergencies was poor. Similar findings were reported in the research conducted by Cakmak, where higher GQS scores were reported for the videos uploaded by doctors compared to nondoctors.^[27]

It has been reported in a few studies that videos uploaded by nondoctors were more liked by users, although they were misleading and of poor quality.^[42,43] The major reason for this disparity is the professional and scientific presentation of the content by the doctors, and the language used in the videos is difficult for the layman to comprehend.

Like other studies, inherent limitations apply to this research regarding the data collection period and the language-based selection of videos. Future studies on Arabic-language content would bring valuable contributions to the field of orthodontics in Arabic-speaking countries. As we all know, YouTube is a platform that changes instantly, and the website's content changes every second. Second, the public perspective on orthodontic emergencies was not taken into consideration, and assessment and evaluation were done solely by professionals. Within these limitations, we attempted to assess the reliability of YouTube videos regarding the management of orthodontic emergencies during the COVID-19 pandemic. Consequently, currently available patient education media may present different information.

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Conflicts of interest

There are no conflicts of interest.

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