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Youtube As Sources of Information About Fiber-Reinforcement Composite Resin Bridge: Accuracy and Reliability Assessment

Fiber Destekli Kompozit Rezin Köprü Hakkında Bilgi Kaynağı Olarak Youtube: Doğruluk ve Güvenilirlik Değerlendirmesi

ABSTRACT

Objectives

The aim of current study was to examine the accuracy and reliability of YouTube videos regarding fiber-reinforced composite resin bridges.

Material and Methods

The keyword '*fiber-reinforced composite resin bridge*' was searched in English on YouTube and 100 videos were included in the study. The videos were evaluated in terms of video demographics. Video contents were examined in 2 different categories and video sources were examined in 5 different categories. The videos were assessed by two researchers utilizing the JAMA (Journal of the American Medical Association) and m-DISCERN (modified DISCERN) scales.

Results

When evaluated in terms of source, there was a significant difference in both m-DISCERN and JAMA criteria (respectively, $p = 0.032$; $p = 0.037$). In terms of content, there was a significant difference in both video duration and m-DISCERN score (respectively, $p = 0.003$; $p = 0.004$). There was a significant difference between m-DISCERN and video duration ($p = 0.04$). A significant difference was found between the company and the dentist in terms of m-DISCERN ($p = 0.01$). According to JAMA, a significant difference was found between the dental company-dentist and the dental company-specialist ($p = 0.014$).

Conclusion

YouTube videos about fiber-reinforced composite resin bridges have the potential to serve as valuable tools for both public health awareness and dental education. However, there is a need for dental professionals to enhance the quality and accuracy of the content being shared on this topic.

Key Words

Fiber-reinforced composite resin bridge, Journal of American Medical Association, Modified-DISCERN, YouTube

ÖZ

Amaç

Mevcut çalışmanın amacı, fiber destekli kompozit köprüler ile ilgili YouTube videolarının doğruluğunu ve güvenilirliğini incelemektir.

Gereç ve Yöntemler

YouTube'da 'fiber destekli kompozit rezin köprü' anahtar kelimesi İngilizce olarak arandı ve çalışmaya 100 video dahil edildi. Videolar video demografisi açısından değerlendirildi. Video içerikleri 2 farklı kategoride, video kaynakları ise 5 farklı kategoride incelendi. Videolar, JAMA (Amerikan Tıp Derneği Dergisi) ve m-DISCERN (Modifiye DISCERN) ölçeklerini kullanan iki araştırmacı tarafından değerlendirildi.

Bulgular

Kaynak açısından değerlendirildiğinde, hem m-DISCERN hem de JAMA kriterlerinde anlamlı bir fark vardı (sırasıyla, $p = 0.032$; $p = 0.037$). İçerik açısından hem video süresinde hem de m-DISCERN puanında anlamlı bir fark vardı (sırasıyla, $p = 0.003$; $p = 0.004$). m-DISCERN ile video süresi arasında anlamlı bir fark vardı ($p = 0.04$). Şirket ile diş hekimi arasında m-DISCERN açısından anlamlı bir fark bulundu ($p = 0.01$). JAMA'ya göre, diş hekimliği şirketi-diş hekimi ile diş hekimliği şirketi-uzmanı arasında anlamlı bir fark bulundu ($p = 0.014$).

Sonuç

Fiberle güçlendirilmiş kompozit rezin köprüler hakkındaki YouTube videoları hem halk sağlığı bilinci hem de diş hekimliği eğitimi için değerli araçlardan birisi olma potansiyeline sahiptir. Ancak, diş hekimliği profesyonellerinin bu konuda paylaşılan içeriğin kalitesini ve doğruluğunu artırımları gerekmektedir.

Anahtar Sözcükler

Fiber destekli kompozit rezin köprü, JAMA, M-DISCERN, YouTube

INTRODUCTION

Tooth loss is a prevalent issue in contemporary times, primarily caused by factors such as tooth decay, periodontal diseases, accidents, and congenital disorders. Various treatment options exist for replacing teeth with tooth loss. In recent years, there has been a growing demand for efficient and rapid solutions that can meet the escalating aesthetic expectations of patients. As technology advances, research into creating restorations using more aesthetically pleasing and long-lasting materials that minimize the loss of tooth tissue is becoming increasingly popular.

Fiber-reinforced composite resin bridges (FRCRB) offer a treatment alternative to three-unit fixed prostheses, metal-substructure adhesive bridges, and single crowns on implants for single-tooth deficiencies. It is deemed preferable due to its capacity to confer aesthetic restoration in a single appointment, while also representing a more cost-effective treatment option when compared to other alternatives. By necessitating minimal intervention upon the tooth, FRCRB afford patients the potential for a subsequent treatment opportunity should a different treatment request arise in the future (1). Other advantages of FRCRBs are ease of attachment, repairability, ease of fabrication and relatively long life (2). In addition to these advantages, there is no risk of metal allergy that can occur with traditional bridges. Despite these advantages, problems such as over bulking, insufficient bonding, poor aesthetic results and unsatisfactory usage properties due to the physical and chemical properties of the material continue (3).

Initially, fiber-reinforced technology was employed as a splint material for teeth affected by periodontal disease and for the stabilization of avulsed teeth. Currently, it is utilized for the replacement of both anterior and posterior teeth (4). The selection criteria for FRCRB are dependent on the specific location within the oral cavity and the magnitude of occlusal forces. Before initiating treatment, researchers advised assessing the condition of abutment teeth, checking for periodontal disease, and identifying any parafunctional habits. Prior to selecting this treatment option, it is essential to evaluate additional criteria, including any uncontrolled medical conditions that adversely affect oral health, such as diabetes. Furthermore, consideration must be given to the length of the edentulous space, the load on the pontic tooth, the type and form of fiber presentation, as well as the technique employed (5, 6). Additionally, it is contraindicated in traumatic occlusal relationships and in the presence of an abutment that prevents proper bonding (7).

YouTube, a prominent video-sharing platform, ranks as the second most visited website globally and serves as a frequently accessed resource for individuals seeking health-related information (8). YouTube, established in June 2005, is recognized as a comprehensive online platform for user-generated content (9). A significant number

of studies in dentistry and medical education have revealed that YouTube is the most widely used electronic resource among students interested in pursuing a career in healthcare (10,11). It is widely accepted as a means of gaining practical knowledge in various specialties (12). However, the information available on this platform is not peer-reviewed and may often be of poor quality, which may jeopardize the patient's health, affect the patient's expectations and negatively affect the patient-physician relationship (13).

The current research aims to evaluate the content regarding FRCRBs on YouTube and assess the accuracy and reliability of this published information. The purpose of current study was to evaluate the information on "*fiber-reinforced composite resin bridges*" videos shared on YouTube. We hypothesized that the YouTube videos on FRCRB may contain incomplete or misleading information.

MATERIAL and METHODS

The current research did not undergo an ethical review because it solely analyzed publicly accessible videos and did not collect any personal data. Over the course of two days, the process of selecting appropriate videos was conducted, taking into account both the video content and the swiftly advancing style of social media platforms. On March 19-20, 2024, a search was conducted on YouTube for videos about fiber-reinforced composite resin bridges using the keyword "*fiber-reinforced composite resin bridge*" and applying the default filter to "*sort by relevance*." Searches were conducted using a YouTube account that had not previously been searched. The purpose of this approach is for the YouTube algorithm to take user interactions into account when recommending content (14). Videos in languages other than English, duplicated videos, videos without audio, shorts, irrelevant videos, and videos without video demographic data were not included in our study.

The principles for selecting videos were as monitors: educational training videos in English uploaded to YouTube related to FRCRB. Additionally the investigators besides evaluated videos that recorded the practices carried out on patients. Videos' information (number of views & likes & dislikes & comments, date of upload, video duration, viewing rate, interaction index, Video Power Index) were recorded. Videos were uploaded by 5 different sources (dental company, dentist, expert, YouTube channel and other) and examined in 2 different content categories (educational and technical). Parameters such as VPI, II and view rate were calculated using formulas in the literature (15).

Various assessment tools were used to evaluate the adequacy of the information related to FRCRB. These comprised the JAMA Benchmark Criteria and the m-DISCERN Questionnaire. The performance of the videos was evaluated based on these criteria to assess the appropriateness of the information given. Both authors conducted independent reviews of the videos using the m-DISCERN and JAMA criteria for this assessment.

The JAMA Criterion is a four-point scale commonly used to rate the accuracy of videos and other sources. It examines materials across four main areas: authorship, attribution, description, and timeliness. Reviewers assign a score for each of these criteria, leading to a entire score between 0 and 4 points. A grade of one or two on this criterion generally indicates low accuracy, a grade of three indicates moderate accuracy, and a grade of four indicates high source accuracy (11).

The m-DISCERN is a 5 question scale that rates source credibility with yes/no answers. It scores from zero to five points, with higher scores indicating greater reliability. Scores exceeding 3 indicate good reliability, scores of 3 suggest moderate reliability, and scores below 3 denote low reliability (16). Statistical analyses were conducted using SPSS version 26 on Windows. The Shapiro-Wilk test was initially performed to assess the normality of the data. To examine differences across the various source categories the Kruskal-Wallis test was used. For the content categories, we opted for the Mann-Whitney U test. Upon finding statistically significant differences, we performed a post hoc Dunnett's test to identify the specific group contributing to the effect. Finally, to see if there was any relationship between accuracy and reliability scores, we calculated the Spearman correlation coefficient. We considered any findings statistically significant if the p-value was less than 0.05.

RESULTS

After applying eligibility criteria during the initial screening process, 18 out of 100 videos were selected for inclusion in the study (Fig. 1). Upon examining the video data, it was found that a total of 11.625 sec. were reviewed, with the videos having an average length of 645.83 sec. In addition, the videos accumulated a total of 39.781 likes, averaging 2.210.06 likes for each video. Despite this, the average number of likes per video was 102.5 while the number of dislikes was recorded as 1845. We found very high inter-rater reliability between the authors. Cohen's Kappa value was found to be 0.935 for JAMA and 0.899 for the m-DISCERN.

In the evaluation results according to the sources that uploaded the videos, YouTube channels and dental companies had the largest rate among all categories with a rate of 61.11% ($n = 11$). The comparison of evaluation scores according to sources is shown in Tab. 1.

Significant differences for source categories were found only in JAMA and m-DISCERN criteria ($p = 0.037$, $p = 0.032$, respectively). Accordance to the JAMA criteria, and while it was determined that the highest mean value was in dental company with 3.33, lowest mean values were dentist and specialist with 2.00. Moreover, accordance to the m-DISCERN criteria, and while it was determined that the highest mean value was in dental company with 4.67, lowest mean value was dentist with 1.00. In

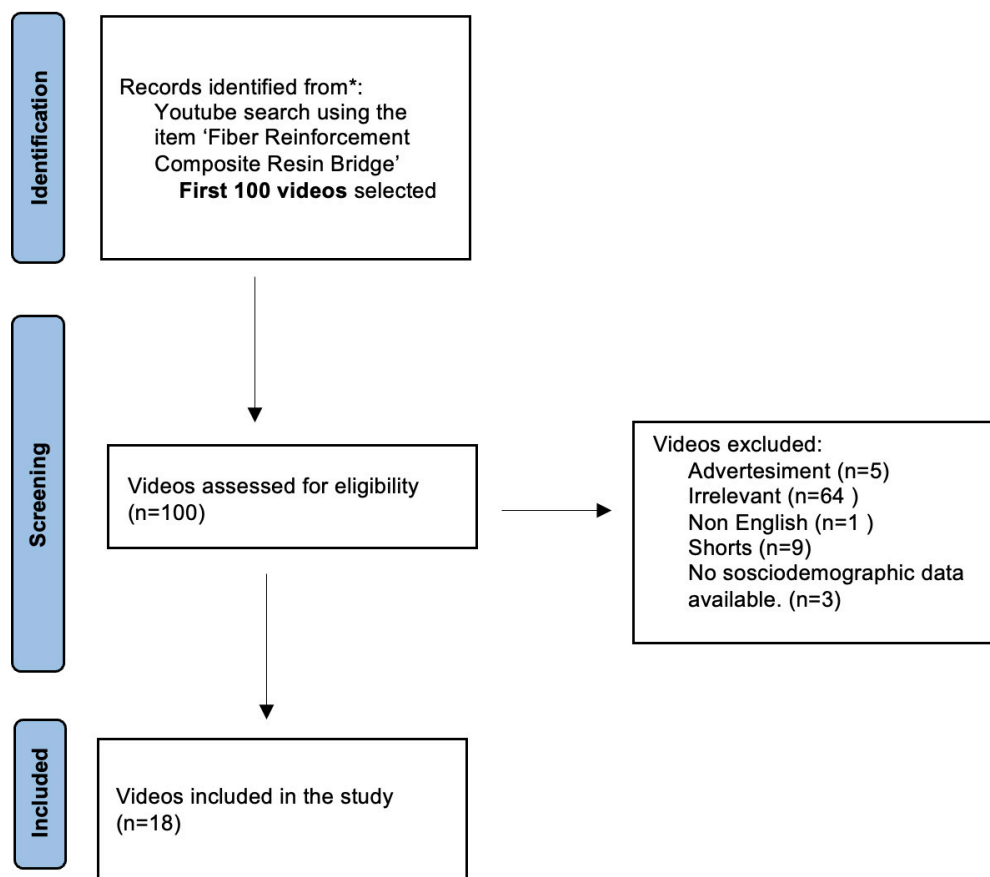


Figure 1. Flow chart of the video selections

Table 1. Comparison of assessment scores based on sources

Variable	Dentist (n=3)	Specialist (n=2)	Dental Company (n=6)	YouTube Channel (n=5)	Other (n=2)	p value
Number of views	4,816 (599-1,199,337)	27,931(20,603-35,259)	6,230.5 (429-967990)	163.601 (22.313-8,323,363)	507,142 (2,288-1,011,996)	0.492
Number of likes	29 (11-6,374)	176 (161-191)	19 (4-4815)	880 (127-19,692)	2,905 (9-5,801)	0.550
Number of dislikes	0 (0-596)	7.5 (4-11)	2 (0-366)	19 (1-258)	227.5 (0-455)	0.887
Number of comments	1(0-279)	16 (10-22)	0 (0-130)	16 (3-1336)	55.5 (0-111)	0.407
Video duration (sec)	60 (38-101)	632 (75-1,189)	380.5 (248-1358)	343 (23-3,118)	251 (42-460)	0.335
Days since upload	2,247 (1,816-3,111)	1,114(908-1,320)	3,292 (661-5321)	713 (469-3,193)	2,531 (537-4,525)	0.282
Interaction index (II)	0.6 (0.48-1.84)	0.66 (0.45-0.87)	0.38 (0.23-1.4)	0.53 (0.23-0.59)	0.46 (0.39-0.53)	0.583
Viewing rate	265.2(26.66-38,551.49)	2,721.99(1,560.83-3,883.15)	188.61 (33.32-20,902.4)	10,493.97 (3,794.73-1,167,372.09)	11,395.31 (426.07-22,364.55)	0.258
VPI	2.65 (0.27-352.55)	263,250 (14.76-37.89)	1.735 (0.33-194.26)	102.72 (37.36-11,522.75)	105.82 (4.26-207.38)	0.258
JAMA	2 (2-2) ^a	2 (2-2) ^a	3 (3-4) ^b	3 (2-4) ^{ab}	3 (3-3) ^{ab}	0.037
Modified DISCERN	1(1-1) ^a	3 (2-4) ^{ab}	5 (3-5) ^b	4 (2-5) ^{ab}	3.5 (2-5) ^{ab}	0.032

JAMA, although highest value was in dental company, it was similar to both YouTube channel and other categories but differing from dentist and specialist. In m-DISCERN, although highest value was in dental company, it was similar to all categories, except dentist category. The distribution of the videos accordance the JAMA and m-DISCERN is shown in Table 2.

Table 2. The distribution of the videos accordance the JAMA and m-DISCERN

Parameter	Value (n=18)
JAMA Score (0-4 points)	
Low Level Accuracy (1 point)	0 (0%)
Partially Medium Accuracy (2-3 points)	15 (83.33%)
High Level Accuracy (4 points)	3 (16.67%)
m-DISCERN Score (0-5 points)	
Poor Reliability (<3 points)	7 (38.88%)
Moderate Reliability (3 points)	1 (5.55%)
Good Reliability (>3 points)	10 (55.55%)

The most videos had partially medium accuracy (score of 2-3) (83.33%, $n = 15$) and good reliability (score 4-5) (55.5%, $n = 10$).

Table 3 presents the valuation of the videos based on their content. When comparing educational and technical video content, significant differences were observed solely in m-DISCERN ($p = 0.004$) and video length ($p = 0.001$). In regard to m-DISCERN, while the median value of educational videos was 4.85, mean value of teaching technique videos was 2.55. Likewise, while the mean value of educational videos video duration was 1.242 sec. mean value of teaching technique videos was 266.45 sec.

Table 3. Values of videos according to content

Variable	Teaching Technique (n=11)	Educational (n=7)	p value
m-DISCERN	2 (1-5) ^A	5 (4-5) ^B	0.004
JAMA	3 (2-4)	4 (1-4)	0.768
Video duration(sec)	101 (23-1358) ^A	467(353-3,118) ^B	0.001

Correlations between the variables and scores was shown in Table 4. Our results demonstrate a strong positive correlation between video duration and m-DISCERN scores ($r = 0.784$; $P < 0.001$). Although no significant difference was found, a weak positive correlation has been demonstrated between JAMA and m-DISCERN ($r = 0.286$, $P > 0.05$).

Table 4. Correlations between quantitative variables and scores

Variable	JAMA	m-DISCERN
Number of views	$r = 0.155$	$r = 0.023$
Number of likes	$r = 0.064$	$r = -0.071$
Number of dislikes	$r = 0.140$	$r = 0.086$
Number of comments	$r = -0.014$	$r = -0.081$
Video duration (sec)	$r = -0.045$	$r = 0.784$ $p < 0.001$
Days since upload	$r = 0.435$	$r = 0.060$
Interaction index (II)	$r = -0.321$	$r = -0.203$
Viewing rate	$r = 0.047$	$r = 0.012$
VPI	$r = 0.012$	$r = 0.047$
JAMA	-	$r = 0.286$
m-DISCERN	$r = 0.286$	-

Table 5 was demonstrated data on video metric data for m-DISCERN. No statistically significant difference ($P > 0.05$) was found in the JAMA criteria when evaluated across low, medium, and high accuracy levels for video metrics. There was a statistically significant difference between m-DISCERN levels and video duration ($p = 0.004$). In terms of video duration, videos with poor reliability lasted 97.43 sec. those with moderate reliability averaged 353 sec. and videos with good reliability had an average duration of 1.059 sec. Consequently, the longer videos had good reliability.

Table 5. Modified DISCERN

Variable	Poor (n= 7)	Moderate (n= 1)	Good (n= 10)	p value
Number of views	35,259 (599–1199337)	7,171 (7,171–7,171)	36,358 (429–8,323,363)	0.866
Number of likes	161 (9–6374)	18 (18–18)	170.5 (4–19,692)	0.686
Number of dislikes	4 (0–596)	0 (0–0)	7.5 (0–455)	0.448
Number of comments	16 (0–279)	0 (0–0)	8.5 (0–1,336)	0.497
Video duration (sec)	60 (23–343) ^a	353(353–353) ^a	463.5 (248–3,118) ^b	0.004
Days since upload	1,816 (537–3,193)	3,699 (3,699–3,699)	2,102.5 (469–5,321)	0.558
Interaction index (II)	0.53 (0.39–1.84)	0.25 (0.25–0.25)	0.495 (0.23–1.41)	0.338
Viewing rate	3,883.1500 (26.66–38,551,49)	193.86 (193.86–193.86)	2,942.53 (33.32–1,167,372.09)	0.681
VPI	37,8900 (0.27–352.55)	1.94 (1.94–1.94)	28.435 (0.33–11,522.75)	0.681
JAMA	2 (2–4)	4 (4–4)	3 (2–4)	0.223

DISCUSSION

As far as we are aware, this study is the first to explore the precision, dependability, and content of online audio/visual information concerning the FRCRB. For each video, details such as duration, source, likes, number of views, comments, dislikes, etc. were documented. By means of the JAMA and m-DISCERN criteria, we then performed a content-based classification of the videos. Additionally, the data related to FRCRB provided by these internet videos was evaluated based on these classifications.

YouTube's search algorithm prioritizes factors like popularity, relevance, and users' viewing history over the quality of content. This poses a challenge for informal or self-directed learners, who are increasingly encountering unverified and somewhat misleading information that could encourage unhealthy behaviors and activities (17). For instance, a recent study revealed that over 25% of the most popular YouTube videos about COVID-19 contained misleading information, reaching millions globally (18). To fully realize YouTube's educational potential, especially in medicine, we need a curated, peer-reviewed video library and a consistent strategy for developing online learning materials (19,20).

In this study, a source-based analysis revealed a surprising finding: videos shared by dentists showed low credibility and accuracy, whereas those posted by dental companies demonstrated high credibility and accuracy. We believe these results stem from the fact that the videos related to FRCRB are outdated, having been uploaded on average 2.281.5 days ago. This suggests that healthcare professionals, particularly dentists, may focus primarily on showcas-

ing restoration outcomes for promotional purposes, rather than basing their evaluations of restoration success and failure on current literature. Similar to our study, a previous study found that specialists and dentists received low ratings for their uploaded videos, likely because they did not focus on the video's etiology and prognosis (21). In the another study, content integrity was not found in the videos prepared by health professionals and it was stated that this was attributed to an old topic review (22). Similarly, studies have shown that video content originating from academic sources does not inherently offer information of superior quality when compared to that from informal sources (23). This advises that similar videos from sources considered reliable may not exactly reflect recent data. In contrast to these studies, in a study about Sjögren syndrome, videos provided by universities and the state were found to be the most reliable source of information (24). In support videos uploaded by healthcare experts received higher ratings for usefulness, quality, and exhaustiveness compared to those uploaded by laypeople (25).

According to this study, educational videos were more reliable than technical videos. This conclusion was thought to be due to the longer length of educational videos and the sharing of more information during the processing of the videos. In contrast to our study, educational videos on anterior approach ptosis surgery and upper eyelid blepharoplasty did not have high content quality (26,27). Supporting our study, the videos in the bariatric surgery study were mostly reliable (28). These discrepancies may be due to the diversity of video sharers, the informative backgrounds of the raters, and the fact that YouTube serves as a public platform that allows anyone to share videos.

Another result of our study showed that there is a strong positive correlation between video duration and reliability. Studies (29,30) on YouTube related to insulin resistance and tachycardia further support our research. On the other hand, the study on insulin injection in children found no relationship between video length and reliability (31).

Based on these findings, the initial hypothesis was not supported. As a result, it is recommended that healthcare professionals and organizations prioritize creating social media content that is evidence-based, accessible, and engaging. They are also encouraged to produce and share more educational videos. Incorporating personal experiences and patient stories into content can help foster deeper audience engagement and broaden outreach. Additionally, the use of animations may enhance user interest and understanding, particularly among general audiences with limited medical knowledge.

This study has certain limitations. Firstly, although limiting the selection to English-language videos might introduce bias, this approach is justified by the global dominance of English as the foremost language for authoritative health-related video content. Second, the study initially evaluated only YouTube videos and did not examine the experiences of actual dental students, graduate students, research assistants, or professionals with FRCRB, nor was it conducted with patients. Another limitation of the study was that only videos from YouTube were evaluated, not videos from other social media platforms such as Instagram, Facebook, etc. Another limitation was that only videos from YouTube were evaluated, and other parameters were not considered. One limitation of the current study was that it was conducted over a two-day period. Therefore, our study did not conduct a longitudinal evaluation and only presented a snapshot of the information available on YouTube. However, YouTube content changed daily over time. This may have introduced bias into the study. Moreover, only first 100 videos were assessed in the study, which also can create bias. It is a well-established fact that the majority of individuals do not recite beyond one or two pages of search outcomes they encounter on the internet (32). It is very important to know that the likes, dislikes and views of videos are constantly changing and this is due to the dynamics of YouTube. There is no agreement on a standard method for evaluating health-related videos, but JAMA, m-DISCERN, and DISCERN scales are used in studies. As a result, complete assessment of videos remains personal and at the pleasure of the individual researcher. In addition, only two researchers evaluated the videos in this study, and it is recommended that researchers have more videos in future studies. Despite the aforementioned limitations, YouTube videos provide instant comprehensions into recent improvements at the FRCRB. Equally, coming research may include these aspects when evaluating the effectiveness of FRCRB.

CONCLUSION

In this study, we found that the quantity and depth of content shared by dentists and specialists were limited compared to those produced by dental companies. Much of the available content lacked information on restoration prognosis and technical procedures, with many videos appearing to serve primarily as personal promotional material. To ensure the accuracy and reliability of such content, it is essential that creators adhere to internationally recognized guidelines. This alignment supports the delivery of relevant and trustworthy information to the public.

There remains a clear need for more comprehensive and evidence-based content on this emerging topic. We recommend that healthcare institutions and dental faculties develop standardized guidelines for content creation and consider integrating courses on “*public health promotion through social media*” into dental education programs. While YouTube holds significant potential as a tool for public education, its effectiveness depends on the consistent production and dissemination of high-quality, informative videos.

Ethics Committee Approval

The study was approved by the relevant institution administration.

Author contribution statement

Concept: M.A., Z.M.O.; Design: M.A., Z.M.O.; Supervision: M.A., Z.M.O.; Resources: M.A., Z.M.O.; Materials: M.A., Z.M.O.; Data Collection and/or Processing: M.A., Z.M.O.; Analysis and/ or Interpretation: M.A., Z.M.O.; Literature Search: M.A., Z.M.O.; Writing Manuscript: M.A., Z.M.O.; Critical Review: M.A., Z.M.O.;

Informed Consent

Written informed consent was obtained from participants who participated in this study.

Conflict of Interest

The author declare that they have no conflict of interest.

Financial Disclosure

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