

Youtube as a Source of Patient Information for Gummy Smile

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Abstract

Purpose: To evaluate the content and quality of videos on Youtube about the gummy smile.

Materials and Methods: The keyword “gummy smile” was searched on Youtube. Videos were categorized as useful, misleading or personal experience based on their content. Videos were analysed to evaluate the quality and scientific reliability of the information using Global Quality Scale (GQS) and DISCERN criteria; and the understandability of this information using a tailor-made custom comprehensiveness index (CI). The source and user interaction information for each video were recorded.

Results: A total of 98 videos were included for analysis. The videos of 64 (65.3%) were considered as useful, 18 (18.4%) provided by misleading information, and 16 (16.3%) described personal experiences. The source of the videos was 66 (67.3%) of dentists/specialist, 8 (8.2%) of clinics/hospitals, 8 (8.2%) of TV channel/news agencies and 16 (16.3%) of were other. The GQS was <4 in most of the videos (92.9%). Based on 0–2 CI scores, 36, 51 and 11 videos had a score of 0, 1 and 2, respectively. 87 (88.8%) and 71 (72.4%) videos showed clear aims and reliable sources of information according to DISCERN criteria, respectively. The mean GQS and CI were significantly higher in useful video content compared to misleading and personal experience videos ($p < 0.001$). The mean GQS and CI in dentist-sourced videos were significantly higher than in TV and other-sourced videos ($p < 0.001$).

Conclusions: Although most of the videos were uploaded by dentists and contain accurate information, the content and quality of the information were insufficient. This study demonstrated that Youtube could still not be considered as a fully reliable source of information for patients on gummy smile.

Key words: Gummy smile; Patient information; Video analysis; Youtube

Introduction

The excessive gingival display also known as “gummy smile” is defined as non-pathological condition causing esthetic disorder, in which more than 3–4 mm of gingival tissue is exposed when smiling.¹ The etiology involved in a gummy smile is mostly multifactorial, there are many potential causes such as; altered passive eruption, gingival hyperplasia, short lip length, short clinical crown, hypermobile / hyperactive lip activity, and vertical maxillary excess.² Treatments for these patients vary depending on etiology and there are many treatment options such as gingivectomy, crown lengthening, lip repositioning surgery, lip augmentation, Botulinum Toxin A injections (Botox), orthodontics and orthognathic surgery.³ Excessive gingival display during smiling is seen as an aesthetic problem for patients. It is important to understand the cause of this problem and find a solution.

Healthcare professionals play a major role in providing information to patients about their conditions, including diagnosis and treatments. However, recently this role has been changing with the

rising use of the internet to search for healthcare related information. The worldwide prevalence and free accessibility of the internet increases patients' desire for self-information rather than face-to-face professional interview.^{4,5} An increasing number of consumers use social media to obtain information and promote health-related topics. The internet is a powerful communication tool and offers new technology to inform professionals about continuing education. Internet-based continuing education programs have been shown to be as effective as traditional methods in transferring knowledge.⁶ At the same time, the fact that this type of communication is more advantageous than traditional approaches in terms of time and cost. However, there is no peer review or control mechanism to check the quality and accuracy of the knowledge about health on the internet. These concerns are more important for social media networks and websites that provide information without any filtering system.

Youtube is a popular video-sharing website with an increasingly prolific amount of health-related information content. However, YouTube videos are not subject to peer review, which may result in users encountering inaccurate and potentially misleading content

when accessing healthcare information. YouTube contents have been evaluated from various medical and dental perspectives in several studies, and the quality of the information has shown considerable heterogeneity.^{4,7-9} To our knowledge, no previous study has investigated YouTube contents about gummy smile. The aim of this study was to assess the content and quality of Youtube videos about gummy smile.

Material and Methods

Search Strategy

A video selection strategy was used to determine the videos to be analyzed on YouTube. Search parameters were restricted to the last 5 years and 'Worldwide' settings, and the term gummy smile was used to search on YouTube, that is the most frequently used search term for excessive gingival display in the Google Trends application. The search was conducted on August, 2023. This study did not require the approval of an Ethical Committee, because it contains on the the publicly available Internet data. The only search filter applied was "sort by relevance", that is the default filter for a typical YouTube search. New youtube user account was created, search history and cookies were deleted. The results of search were listed by the relevance of the videos.

Inclusion and Exclusion Criteria

YouTube videos with titles and audio in English were included in this study. Advertisements, conferences or lectures, duplicate videos, non-English videos, and videos without audio or titles were not included in the study. Previous research has shown that most YouTube users browse the first 3 pages a few times a day, while more than 90% do not pay attention to other pages.¹⁰ Therefore according to these criteria, this study was restricted to the first 250 YouTube videos as a result of gummy smile search terms.

Content Analysis

Videos were evaluated by a single periodontist (M.C). Each video was assessed by the following features: title, date of upload, duration, source, number of views, dislikes and comments. Additionally, video's viewing rate (number of views/number of days since upload x 100) and interaction index (likes-dislikes/total number of views x 100) were calculated.⁷ (Video view rate is described as follows; Video view rate = (Video view count) / (Video impressions) * 100).

Videos were classified into four categories according to their source: 1- dentist/specialist, 2- clinic/hospital/university, 3- TV channels or news agencies, 4- other.

Video content was classified as; (a) Useful: the video included scientifically reliable information for the gummy smile; (b) misleading, including scientifically unproven information for gummy smile; (c) personal experience of recounted by a patient.

The quality of information in the videos was evaluated with the Global Quality Scale (GQS), which indicates the quality of the video, the availability of the information, and its usefulness to the patient.¹¹ The five-point Likert-type GQS scores as follows: (1) Poor quality, poor flow of the video, most information missing, not at all useful for patients, (2) Generally poor quality and flow, some information listed but many important topics missing, of very limited use to patients, (3) Moderate quality, suboptimal flow, some important information adequately discussed but others poorly discussed, somewhat useful for patients, (4) Good quality and generally good flow. Most of the relevant information is listed but some topics are not listed. useful for patients, (5) Excellent quality and flow, very useful for patients.

Additionally, a personalized comprehensiveness index (CI) was

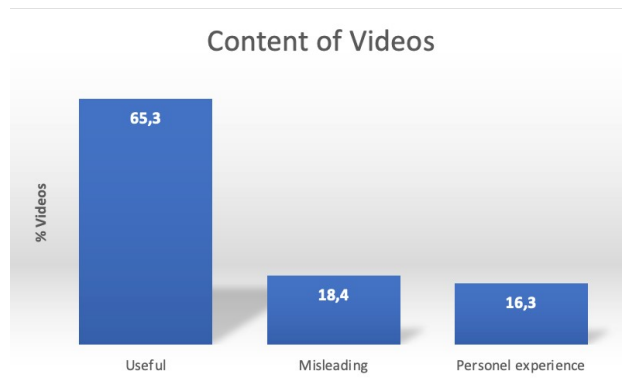


Figure 1. The % distributions of videos according to contents.

designed to evaluate the understandability of the videos based on their content in terms of etiological factors and treatment options. The following scores were used: score (0) - if the videos did not define any etiological factors or treatment options; score (1) - if the videos defined an etiological factor and did not explain treatment options; score (2) - for videos defining at least two etiological factors and at least one treatment option.

The reliability of each video was assessed by using the DISCERN tool that is a five-item questionnaire based on a standardised set of criteria to evaluate the reliability and quality of health information.¹² (scoring: 1 point for every yes and 0 point for every no). The items were as follows: (1) Are the aims clear and does it achieve? (2) Are reliable sources of information used? (3) Is the information presented both balanced and unbiased? (4) Are additional sources of information listed for patient reference? (5) Are areas of uncertainty mentioned?

Statistical Analysis

Statistical analysis was performed using in the SPSS 24.0 version (SPSS Inc., Chicago, IL, USA). Descriptive statistics were formed for each variable. For categorical variables, the percentages were calculated. Data normality was determined using Kolmogorov-Smirnov and Shapiro-Wilk test. Kruskal-Wallis and Mann-Whitney U test were performed for comparison of more than two non-normally distributed groups. The statistical significance was set at $p < 0.05$.

Results

250 videos were analysed for the "gummy smile" keyword and 126 duplicates were excluded. Of the remaining 124 videos, 26 were excluded based on the before mentioned exclusion criteria. A total of 98 videos were selected for analysis. The mean number of views for the included videos was 37141 views (range from 5 to 961498). The mean length of the videos was 4:39 minutes (range from 35 seconds to 23:21 minutes). The viewing rate of the videos was quite high, the mean viewing rate was 295.94 % (range from 0.01% to 23217%). Viewers' interaction with the videos was limited but generally positive, with mean interaction index of 0.0087 % (range from -1.600% to 0.2547%) (Table 1).

Content of the 98 total videos, 64 (65.3%) were considered as useful, 18 (18.4%) provided by misleading information, and 16 (16.3%) described patients' personal experiences (Figure 1). When the videos were analyzed according to their source, it was found that 66 (67.3%) of dentists/specialist, 8 (8.2%) of clinics/hospitals, 8 (8.2%) of TV channel/news agencies and 16 (16.3%) of were other sources (Figure 2). Additionally, 60 of the 66 (90.9%) videos provided by dentists/specialist contained useful content.

The mean GQS and CI levels were significantly higher in useful

Table 1. Videos Demographics

	Mean	Standart Deviation	Minimum	Maximum
Video length (min)	04:39	04:13	00:35	23:21
Days since upload	1047.84	1140.88	157	4547
Number of views	3714.135	111102.30	5	961498
Number of likes	452.05	1961.88	0	19000
Number of dislikes	12.95	40.057	0	340
Number of comments	36.32	82.042	0	575
Viewing rate (%)	295.94	2357.44	0.01	23217
Interaction index	0.0087	0.1682	-1.6000	0.2547
GQS, Global Quality Scale	2.07	0.888	1	5
CI, Comprehensiveness index	0.74	0.647	0	2

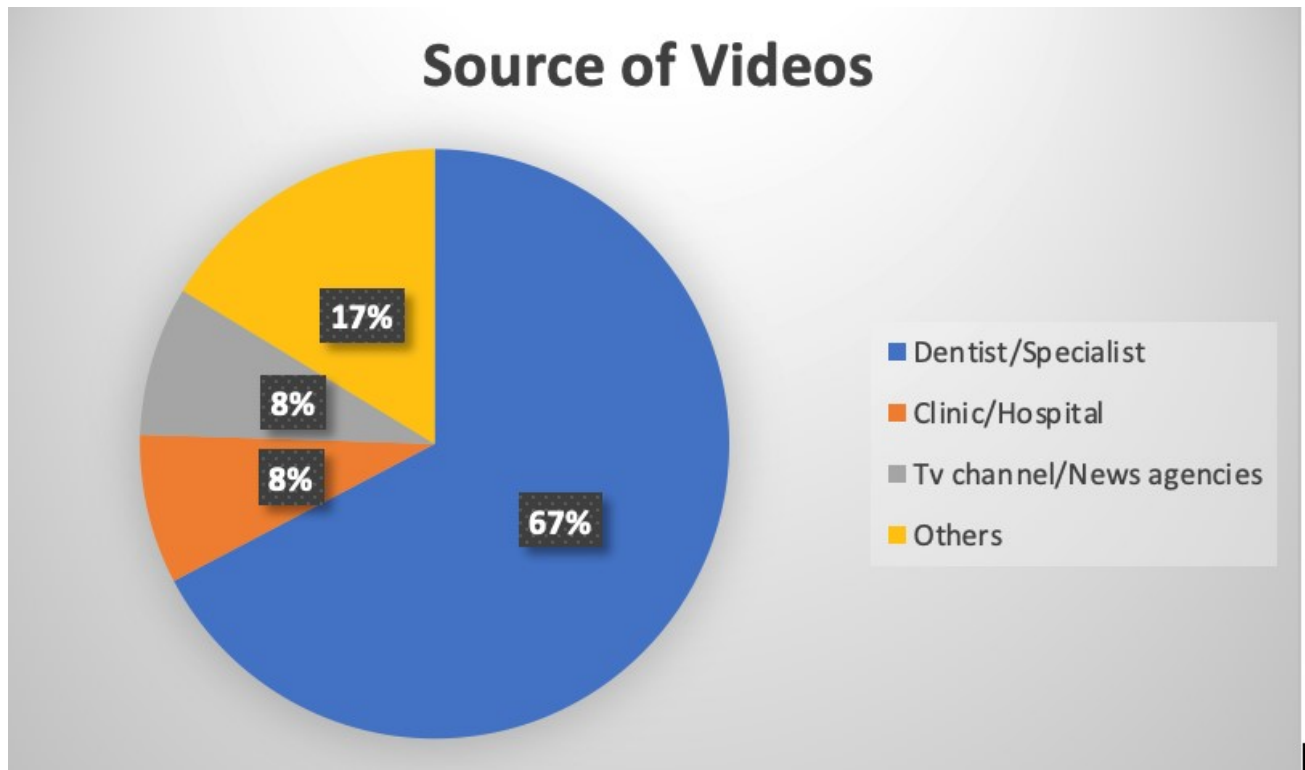


Figure 2. The % distributions of videos according to sources.

video content compared to misleading group and personal experience videos ($p < 0.001$), whereas there was no significant difference between the other two groups ($p > 0.05$). The duration of the videos was significantly longer in patient views group compared with useful content ($p < 0.05$) whereas, there was no significant difference between patient view and misleading group ($p > 0.05$). The video length was found more shorter in useful content compared to personal experience videos ($p < 0.05$). There was no significant differences between groups in terms of days since upload, number of views, likes, dislikes and comments, viewing rate and interaction index (Table 2)

It was also found that GQS and CI values in dentist-sourced videos were significantly higher compared to TV and other-sourced videos ($p < 0.001$). There was no significant difference between source of clinic, TV and others ($p > 0.05$) for GQS and CI (Table 3).

For the overall quality of the videos was evaluated using GQS and the mean score was 2.07, with the majority of included videos ($n = 7$; six for score 4 and one for score 5) had a score < 4 (Table 4). For the CI score, it was designed to objectively assess the comprehensiveness of the videos according to their content in terms of etiological factors and treatment options. The 11 videos had a CI score of 2; 51 videos had a CI score of 1; and 36 videos had a CI score of 0.

Short clinical crown was the most frequently mentioned etiological factor of gummy smile ($n = 25$) followed by vertical maxillary

excess ($n = 19$) and short lip length ($n = 16$). Altered passive eruption, gingival hyperplasia and hyperactive lip activity were mentioned in 11, 5 and 3 videos, respectively. Botox was the most frequently mentioned management options of gummy smile in videos ($n = 59$). Other management or treatment options shown mentioned gingivectomy ($n = 42$) and crown lengthening (20). Orthognathic surgery, ortodontics, lip reposition surgery and lip augmentation were mentioned in 9, 8, 8 and 7 videos, respectively. (Table 5)

Assessing the reliability of the information provided using DISCERN criteria, 87 videos had clear aims that were achieved, 71 videos used reliable sources of information, 29 videos presented balanced and unbiased information, 1 video provided additional sources of information and there were no videos addressing areas of uncertainty. 65 of the 87 videos and 61 of 71 videos were found to mention clarity of purpose (item 1) and source reliability (item 2), respectively was useful content (Table 6).

Discussion

The content of YouTube videos associated with various medical problems was assessed in the literature.^{11,13} Several studies related to oral health and dentistry such as endodontics treatment orthognathic surgery have been assessed on YouTube^{14,15} As far as

Table 2. Comparison for attributes of videos classified as “Useful,” “Misleading,” or “Personal experience.”

	Useful n=64 Median IQR	Misleading n=18 Median IQR	Personal experience n=16 Median IQR	p*(Kruskal– Wallis)
Video length (min)	03:57 (00:44–14:03)a	04:24 (00:35–2321)	07:37 (00:57–15:52)b	0.007
Days since upload	937.648 (157–4547)	1538.94 (291–3364)	936.81 (171–4547)	0.014
Number of views	25294 (101–301944)	125763 (16–961948)	20247 (48–105667)	0.86
Number of likes	197.18 (0–2000)	1401.16 (0–19000)	403.75 (0–1800)	0.172
Number of dislikes	5.92(0–64)	38.33 (0–340)	12.5 (0–55)	0.059
Number of comments	26.42(0–285)	65.44 (0–575)	44.75 (0–209)	0.276
Viewing rate (%)	379.09 (0.01–23217)	236.59 (0.03–2714)	30.09 (0.15–114.15)	0.131
Interaction index	–0.0005 (–1.600–0.2540)	0.011(0.0000–0.0270)	0.043 (0.000–0.1580)	0.046
GQS,Global Quality Scale	2.37(1–4)a	1.61 (1–3)b	1.37 (1–2)b	<0.001
CI,Comprehensiveness index	1.03 (0–2)a	0.27 (0–1)b	0.12 (0–1)b	<0.001

IQR interquartile range a,bComparison Mann–Whitney U test.

Table 3. Comparison for Global quality and Comprehensiveness in relation to video source—dentist/specialist, clinic/hospital, TV channel/news agencies or other source

	Dentist/Specialist n=66 Median IQR	Clinic/Hospital n=8 Median IQR	Tv channel/News agencies n=8 Median IQR	Others n=16	p*(Kruskal– Wallis)
GQS,Global Quality Scale	2.30 (1–4)a	1.75 (1–3)	1.5 (1–2)b	1.56 (1–2)b	0.019
CI,Comprehensiveness index	0.96 (0–2)a	0.62 (0–1)	0 (0–0)b	0.25 (0–1)b	<0.001

IQR interquartile range a,bComparison Mann–Whitney U test

Table 4. Global Quality Scale (GQS) of YouTube videos on gummy smile

Score	Definition	Number of videos (%)
1	Poor quality, poor flow of the video, most information missing, not at all useful for patients	26 (26.5%)
2	Generally poor quality and flow, some information listed but many important topics missing, of very limited use to patients	47 (48%)
3	Moderate quality, suboptimal flow, some important information adequately discussed but others poorly discussed, somewhat useful for patients	18 (18.4%)
4	Good quality and generally good flow. Most of the relevant information is listed but some topics are not listed. useful for patients	6 (6.1%)
5	Excellent quality and flow, very useful for patients	1 (1%)

Table 5. Topic domains discussed in YouTube videos on gummy smile

Etiological factors		Management options	
Topic	Frequency	Topic	Frequency
Short clinical crown	25 (31.6%)	Botox	59 (38.5%)
Vertical maxillary excess	19 (24.3%)	Gingivectomy	42 (27.4%)
Short lip length	16 (20.2%)	Crown lengthening	20 (13.4%)
Altered passive eruption	11 (13.9%)	Orthognathic surgery	9 (5.8%)
Gingival hyperplasia	5 (6.3%)	Orthodontics	8 (5.2%)
Hyperactive lip activity	3 (3.7%)	Lip reposition surgery	8 (5.2%)
		Lip augmentation	7 (4.5%)

Table 6. Assessment of YouTube videos on gummy smile using DISCERN criteria

DISCERN criteria	Number of videos (%)
Are the aims clear and achieved?	87 (88.8%)
Are reliable sources of information used	71 (72.4%)
Is the information presented balanced and unbiased?	29 (29.6%)
Are additional sources of information listed for patient reference	1 (1.2%)
Are areas of uncertainty mentioned	0 (0%)

we know, this is the first study to assess the content and quality of YouTube videos on excessive gingival display, namely gummy smile.

With the rising popularity of the internet and social media in recent years, it can be assumed that YouTube has become the first consultation platform for patients wondering about the cause and treatment of gummy smile. YouTube contains more interesting visual content compared to other social media platforms. For this reason, a major portion of patients will first look for informations about the gummy smile by using YouTube. The validity of the information on YouTube is questionable due to the simplicity of video sharing and the non-standardized video content.¹⁶ Therefore, we aimed to assess the quality and content of gummy smile videos on YouTube. The results of this study reported that YouTube videos included some useful information regarding the etiology and treatment of the gummy smile (more specifically, etiology), but only a few videos were comprehensive and provided information on all aspects of the gummy smile.

Social media is often a more accessible communication network, making it easier for patients to access information. However, the fact that information sources do not share objective opinions also carries some risks. It may cause patients to attempt to access treatment or encounter incorrect information that may prevent them from being directed to alternative treatment sources. The content quality of medical videos is inadequate as YouTube does not impose any restrictions or content controls on medical videos.¹⁷ Additionally, patients may have difficulties applying the information in the videos. Even if the information provided in the videos is accurate, clinicians should take into account that patients may not always interpret it correctly.

The method we used to categorize videos and evaluate their content is similar to other studies in the healthcare field.^{15,18,19} This study found that the content of gummy smile videos varied from highly specialized information to personal experiences of the disease. Videos classified as useful were also found to higher global quality scores and comprehensiveness index ($p < 0.001$). When video sources were analyzed, a similar result was found for information provided by dentists and specialist ($p < 0.001$). We also found that the content of the majority of videos provided by dentists/specialist was useful. Similar to our study, Leong et al. (2017), indicated that all videos provided by dentists and specialist contain scientifically solid information and were useful.¹⁸ Nevertheless, when we examined it in terms of GQS, most of the gummy smile video scores were < 4 (the most common score was 2). Therefore, some information is listed in the gummy smile videos on YouTube, it may suggest that many topics are missing and have limited use for patients.

The etiology of gummy smile is mostly multifactorial, and many factors such as; gingival hyperplasia, short clinical crown, altered passive eruption, short lip length, hypermobile / hyperactive lip activity and vertical maxillary excess have been reported.² There are many treatment options such as; gingivectomy, crown lengthening, Botox, lip repositioning surgery, lip augmentation, orthodontic treatment and orthognathic surgery which vary depending on these etiological factors.³ When examined in terms of CI, the scores of the majority of the videos were 0 or 1.

Accordingly, most of the videos did not contain any treatment management information regarding the gummy smile and were missing content for etiological factors. Botox and gingivectomy were the most frequently mentioned treatment options for the gummy smile on YouTube videos included in this study. Yağız et al. (2022), analyzed YouTube videos on Botox treatment of gummy smile and reported that the quality of the videos was generally low and that they were insufficient to access quality information.²⁰ Meseli et al. (2023), showed that information about the surgical treatment of gummy smile on Youtube videos were not reliable and there was difficulty in accessing accurate information.²¹ These results, reported about the most mentioned treatment options in our study, confirm that the quality of information provided by YouTube

videos of gummy smile is insufficient.

When the reliability of the information provided in the videos was evaluated with DISCERN, it was found that the videos classified as useful had more reliable information. The same videos also pointed out clarity of purpose and source reliability in the related with gummy smile. It can be thought that useful videos about gummy smile on YouTube use clear and reliable information sources. However, the fact that most of the information presented is not impartial and that additional sources are not provided may make YouTube inadequate as a reliable source of information about the gummy smile.

Study Limitations

The content of the YouTube video platform has a variable structure due to video results that are uploaded or deleted every day or change according to subjective search criteria (keyword selection, area of interest, video viewing times, etc.). As in similar studies, the instantaneous nature of the data collection method also affects the results of the current study. The results of the study will vary as new videos are uploaded to the YouTube video platform or added videos are deleted. Additionally, the categorization of videos as useful or misleading was necessarily subjective.

Conclusion

YouTube is a source of information about gummy smile for patients. Most gummy smile videos on YouTube are useful video that contain accurate information provided by a dentist or specialist. Although the videos uploaded by dentists contain relatively higher quality, they are missing many important issues and are insufficient in terms of content. Most of the information presented is not impartial, additional sources are not provided, and YouTube has a variable structure in its video results suggested that YouTube could be inadequate as a reliable source of information of gummy smile for patients. Further research needs to explore the quality of information about gummy smile on various social platforms.

Author Contributions

Concept: E.T., M.C., Design: E.T., Data Collection or Processing: M.C., Analysis or Interpretation: E.T. M.Y., Literature Search: E.T., M.Y., Writing: E.T., M.C.

Conflict of Interest

No conflict of interest was declared by the authors.

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