Original Article

Does YouTube provide adequate information about orthodontic pain?

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ABSTRACT

Objectives: To evaluate the content and quality of information about orthodontic pain on YouTube.

Materials and Methods: YouTube was searched using the keywords "orthodontic pain" and "brace pain." A total of 65 videos were chosen for the final analysis. Videos were classified into high- and low-content groups using an eight-point scoring system and reviewed according to selected orthodontic pain–related topics. Video quality was rated by the Video Information and Quality Index (VIQI) and Global Quality Scale (GQS). Statistical data analysis was performed using SPSS 28.0 software, Mann-Whitney *U*-tests, χ^2 tests, and Spearman correlation coefficients.

Results: Most YouTube videos related to orthodontic pain were low content (86.2%), and a few were high content (13.8%). Pharmacological pain relief was the most prevalent topic (50.8%), followed by duration of pain (32.3%) and influence of pain on patient quality of life (29.2%). The least-mentioned topic was possible location of pain (7.7%). Most of the videos were uploaded by laypeople (64.6%). Videos uploaded by dental professionals had significantly higher means of GQS scores ($P = .035$), flow of information ($P < .001$), information quality ($P = .008$), and total VIQI ($P < .001$). Compared with low-content, high-content videos had a higher mean of flow of information ($P = .037$). There was a weak correlation between total content and GQS scores and a strong correlation between GQS and VIQI scores ($r = 0.740$; $P < .01$).

Conclusions: Overall, YouTube was found to be an inadequate source of information on orthodontic pain. (*Angle Orthod.* 2023;93:403–408.)

KEY WORDS: Orthodontic pain; Brace pain; YouTube; Social media; Internet

INTRODUCTION

Orthodontic pain is one of the most common adverse effects of orthodontic treatment that, according to research, affects 90% of orthodontic patients. It can even be a reason for discontinuing treatment, with an estimated 30% of patients considering stopping treatment prematurely as a result of the pain experienced.[1] In addition, orthodontic pain is known to decrease patient health-related quality of life by impairing daily life activities such as mastication and speech.[2,3]

It is known that orthodontic tooth movements produce tension and compression zones in periodontal ligament space, which appears to be the main reason for pain.[4] Initial orthodontic pain begins 2–12 hours after the start of orthodontic treatment, peaks at 24 hours, and starts to decrease after 3–7 days, returning to baseline levels in 1 month.[3,5]

To relieve pain, the first thing a dentist may suggest is a pharmaceutical, such as acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs); a small number of studies also investigated the effect of local anesthetics and opioids (tramadol).[6] However, there is a widely discussed controversy relating to NSAIDs and their effect on tooth movement. It has been suggested that NSAIDs impair tooth movement by blocking prostaglandin synthesis.[7] Nevertheless, more research on this topic is needed.[8]

A range of nonpharmacological methods have also been proposed recently. These include low-level laser therapy, vibratory devices, chewing gum or bite wafers, brain wave music, cognitive behavioral therapy, and posttreatment communication in the form of a text message. However, these methods lack high-quality evidence to support their use for alleviating pain.[9]

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Regarding the location of pain during orthodontic treatment, most of the studies suggest that most significant pain occurs in the incisor area, particularly the lower incisors, both during the initial alignment and debond.[10] It is known that the perceived level of pain can vary and is influenced by a variety of factors, such as clinical, demographic, psychological, and genetic factors. However, there are still mixed opinions on which factors have the greatest impact.[11]

By reviewing various studies, it was concluded that elevated anxiety and fear levels, low motivation for treatment, and low activity temperament are associated with an increased level of pain.[12] It was also suggested that giving a patient a sense of control of a situation can make a positive influence on the sense of pain. It can be achieved not only by direct control of dentist's actions but also by providing information on treatment.

Social media is used widely among dental students,[13] practicing clinicians, and orthodontic patients.[14] In one survey, nearly 90% of students from health-related academic backgrounds stated that infographics on social media have a greater appeal compared with written articles because it is easier to navigate through complex science in a visual way.[15] YouTube, the second most used social media platform worldwide[16] with 122 million active daily users,[17] also allows access to a great variety of medical information, including orthodontics. However, because YouTube is a publicly open source and everyone can upload content, information can often be misleading or incorrect.[18] Therefore, it is wise to take a deeper look into what kind of information is being disseminated. In the literature, there is an increasing number of studies analyzing social media; however, no studies were found relating to the information about orthodontic pain on YouTube.

MATERIALS AND METHODS

This study was a cross-sectional evaluation of Internet-based video media and was exempted from the approval of the ethics committee as it used only public Internet data.

On the Google (Mountain View, Calif) Trends website (https://trends.google.com), a search was conducted on November 15, 2021, to find the most frequently used search term for "orthodontic pain" with the parameters "worldwide" and "past 5 years." Before searching, computer history and cookies were deleted to prevent any restrictions relating to user history. Keyword ideas were defined by using a related-queries table. It was determined that the most used search term for orthodontic pain was "orthodontic pain," followed by "bracket pain." The following two search terms were used to broaden the search results: (1) orthodontic pain and (2) bracket pain.

For the YouTube (https://www.youtube.com/; Google) video search, no filters or features were applied; videos were only sorted by relevance. "Incognito mode" was set to prevent previous search influence on new results. Search results were limited to the first 200 videos. Videos titles were reviewed manually, and those that were related to orthodontic pain were included in the further selection.

During the video screening, the following exclusion criteria were applied: (1) not related to orthodontic pain, (2) language not English, (3) advertisement, (4) longer than 15 minutes, (5) no audio, and (6) duplicate. After application of the exclusion criteria, 65 videos were included in the final qualitative and content analysis. The video playlist was created to be stored for later analysis.

The following data were extracted from videos: days since upload, duration (in minutes), number of likes, and number of views. The viewing rate was calculated according to the study by Hassona et al.[19]

The source of videos was categorized into the following two groups: dental professionals (dentists, specialists, hospitals, universities, and private offices were included in this group) and laypeople (bloggers and social media influencers). Video content was evaluated for the following topics: (1) duration of pain, (2) start and end of pain, (3) pharmacological pain relief (medication), (4) instructions for medications and adverse effects, (5) possible location of pain, (6) pain intensity, (7) possible factors influencing level of pain, and (8) quality of life. Coverage of each separate topic was scored as one point for a total of eight points. High-content videos were those that scored four or more points, and low-content videos were those that scored fewer than four points.

Audiovisual quality of videos was assessed using the Video Information and Quality Index (VIQI), a five-point Likert scale that uses the following four topics to examine videos and gives a score from one (poor quality) to five (high quality): (1) flow of information, (2) accuracy of information, (3) quality (one point each for use of still images, animation, interview with individuals in the community, video captions, and a report summary), and (4) precision (level of coherence between video title and content).

The Global Quality Scale (GQS) was used to assess the educational quality of videos (Table 1).[20]

Statistical Data Analysis

Statistical evaluations were performed with SPSS version 28.0.1.1 (IBM Corp., Armonk, N.Y.). To determine the normality of data distribution, the

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Table 1. Global Quality Scale

Score	Description
1	Poor quality, poor flow of the video, most information missing, not helpful for patients
2	Generally poor quality and poor flow, some information listed but many important topics with limited use to patients
3	Moderate quality, suboptimal flow, some important information is adequately discussed, but other information is poorly discussed, so somewhat useful for patients
4	Good quality, generally good flow, most relevant information is covered, is useful for patients
5	Excellent quality and flow, very useful for patients

Shapiro-Wilk test was used. For the number of views, days since upload, video duration, number of likes, and viewing rate, descriptive statistics were acquired. To analyze the differences between high- and low-content videos and different video uploader groups, Mann-Whitney *U*-tests were performed. Frequencies of ownership and contents were compared using χ^2 tests. Possible correlations of total content were estimated between GQS and VIQI scores and YouTube demographics, and Spearman correlation coefficients were calculated. The statistical significance level was set at $P \leq .05$.

RESULTS

The initial search using the terms "orthodontic pain" and "bracket pain" returned a total of 4540 videos. Titles of the first 200 videos were screened and, after implementing the specific exclusion criteria, 135 videos were removed (Figure 1). A total of 65 videos were analyzed in this study.

Descriptive statistics, containing the number of views, likes, duration, and days since upload, are displayed in Table 2. The most viewed and most liked video was derived from a patient source. Other video

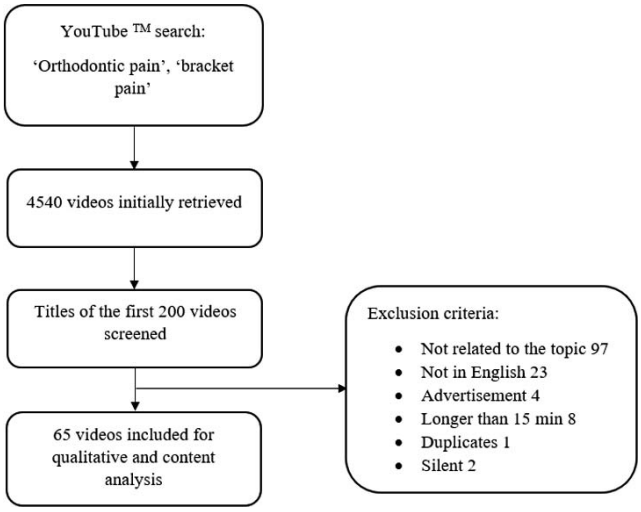

Figure 1. Flowchart. Initially, 4540 videos were obtained using the keywords "orthodontic pain" and "bracket pain." The first 200 video titles were reviewed and, after the application of certain exclusion criteria, 65 videos were chosen for final analysis.

demographics, including ownership and content, are reported in Table 3. The majority of videos were uploaded by laypeople (64.6%, n = 42), and the remaining videos were uploaded by dental professionals (35.4%, n = 23).

Comparing the number of mentioned topics, of 65 videos, only 9 (13.8%) were in the high-content group, and 56 (86.2%) were in the low-content group. The most covered topic was pharmacological pain relief (50.8%, n = 33), followed by duration of pain (32.3%, n = 21), quality of life (29.2%, n = 19), start and end of the pain (27.7%, n = 18), pain intensity (26.2%; n = 17), instructions for medications and adverse effects (15.4%, n = 10), and possible factors influencing the level of pain (9.2%, n = 6). The least covered topic was possible location of pain (7.7%, n = 5).

Table 2. Descriptive Analysis of the YouTube Videos[a]

Variable	Minimum	Maximum	Mean (SD)	Median	Total
Video characteristics					
No. of views	74.00	6,384,716.00	232,312.11 (816,373.62)	19,871.00	15,100,287
No. of likes	0.00	37,000.00	2647.45 (6048.88)	227.00	172,084
Duration, min	0.39	14.54	6.38 (3.52)	5.39	428.11
D since upload	186.00	4726.00	1372.65 (1097.60)	1139.00	95,397
Viewing rate	9.39	243,598.47	15,358.98 (36,528.36)	1914.86	955,979
Total content score	0.00	5.00	2.09 (1.36)	2.00	129
GQS	1.00	5.00	2.88 (0.80)	3.00	183
VIQI content assessment					
Flow	1.0	5.0	2.95 (1.05)	3.00	192
Information accuracy	2.0	5.0	4.11 (0.92)	4.00	267
Quality	0.0	4.0	1.74 (0.79)	2.00	113
Precision (coherence between title and content)	2.0	5.0	4.14 (0.92)	4.00	269
Total score	6.0	17.0	12.94 (2.26)	13.00	841

[a] GQS indicates Global Quality Scale; SD, standard deviation; and VIQI, Video Information and Quality Index.

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Table 3. Distribution of YouTube Video Uploaders and Contents in High-Content and Low-Content Video Groups

	High-Content Videos, n (%)	Low-Content Videos, n (%)	Total, N (%)
Ownership			
Dental professionals	3 (13.0)	20 (87.0)	23 (35.4)
Laypeople	6 (14.3)	36 (85.7)	42 (64.6)
Total	9 (13.8)	56 (86.2)	65 (100.0)
Content			
Duration of pain	5 (55.6)	16 (28.6)	21 (32.3)
Start and end of pain	6 (66.7)	12 (21.4)	18 (27.7)
Pharmacological pain relief	7 (77.8)	26 (46.4)	33 (50.8)
Instructions for medications, adverse effects	3 (33.3)	7 (12.5)	10 (15.4)
Possible location of pain	2 (22.2)	3 (5.4)	5 (7.7)
Quality of life	7 (77.8)	12 (21.4)	19 (29.2)
Possible factors influencing level of pain	2 (22.2)	4 (7.1)	6 (9.2)
Pain intensity	7 (77.8)	10 (17.9)	17 (26.2)

Comparing video uploader groups, the laypeople group had a significantly higher mean of video duration (8.23 minutes), whereas the dental professional group videos were shorter (3.25 minutes) ($P < .001$) (Table 4). In addition, there were differences in the GQS, flow of information, information quality, and total VIQI score ($P = .035$, $P < .001$, $P = .008$, and $P < .001$, respectively) between the groups. The dental professional group had the highest means, whereas the laypeople group scored the lowest. Comparing GQS, the mean score for the dental professional group was 3.13 (standard deviation [SD], 0.63), whereas the laypeople group scored 2.74 (SD, 0.86). The mean score of the flow of information in the dental professional group was 3.61 (SD, 0.78), whereas it was 2.59 (SD, 1.01) for the laypeople group. The mean of information quality in the dental professional group was 2.13 (SD, 0.92) and 1.52 (SD, 0.63) in the laypeople group. The mean total VIQI score in the dental professional group was 14.26 (SD, 1.68), whereas the laypeople group scored 12.21 (SD, 2.23).

Correlations between the total content score, GQS, VIQI score, and video demographics are shown in Table 5. Spearman correlation analysis showed a weak correlation between total content and GQS score ($r = 0.284$; $P = .022$). In addition, the Spearman correlation indicated a strong correlation between GQS and VIQI scores ($r = 0.740$; $P < .01$).

DISCUSSION

More patients are relying on social media for information because of its easy accessibility. Dentists could direct patients to get additional guidance from social media, but, before that, it is important to research whether the information given online is accurate. All 65 videos included in the study were viewed by a total of 15.1 million Internet users, which indicated that orthodontic pain is a topic of high interest.

The results of this study showed that YouTube is currently not an adequate source of information for orthodontic pain. This was consistent with other studies that found that videos on YouTube were not sufficient

Table 4. Comparison of Variables Between Different Video Uploader Groups[a]

	Dental Professionals				Laypeople				
Variables	Minimum	Maximum	Mean (SD)	Median	Minimum	Maximum	Mean (SD)	Median	*P* Value
Video characteristics									
No. of views	121	1,459,444	157,355.4 (330,585.8)	5941	74	6,384,716	273,359.9 (988,340.7)	31,846.5	.115
Likes	0	6900	1410.30 (2225.81)	78	1	37,000	3324.93 (7288.86)	375.5	.073
Duration, min	0.39	8.21	3.25 (2.10)	2.3	2.36	14.54	8.23 (3.27)	7.52	<.001*
D since upload	295	4726	1576.87 (1379.66)	984	186	4578	1260.81 (907.17)	1140.5	.826
Viewing rate	9.39	114,993	11,945.32 (24,857.97)	446.36	19.32	243,598.50	17,228.37 (41,727.21)	2004.66	.092
GQS	2	5	3.13 (0.63)	3	1	5	2.74 (0.86)	3	.035
Flow of information	2	5	3.61 (0.78)	4	1	5	2.59 (1.01)	2	<.001*
Information accuracy	2	5	4.09 (0.90)	4	2	5	4.12 (0.94)	4	.815
Information quality	1	4	2.13 (0.92)	2	0	3	1.52 (0.63)	1.5	.008*
Precision (level of coherence between video title and content)	3	5	4.44 (0.73)	5	2	5	3.98 (0.98)	4	.065
Total VIQI	12	17	14.26 (1.68)	14	6	17	12.21 (2.23)	12	<.001*

[a] GQS indicates Global Quality Scale; SD, standard deviation; and VIQI, Video Information and Quality Index.
* *P* value statistically significant if ≤.05.

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Table 5. Spearman Correlation Coefficient Scores Between Total Content Score, GQS, VIQI, and YouTube Demographics[a]

	Total Content		GQS		Total VIQI	
Variable	Correlation Coefficient	*P* Value	Correlation Coefficient	*P* Value	Correlation Coefficient	*P* Value
Total content	1.000	–	0.284	.022*	0.239	.056
GQS	0.284	.022*	1.000	–	0.740	<.001*
Total VIQI	0.239	.056	0.740	<.001*	1.000	–

[a] GQS indicates Global Quality Scale; and VIQI, Video Information and Quality Index.
* *P* value statistically significant if ≤.05.

information sources for various dental topics.[21–25] On the contrary, Wong et al.[26] found that there was high-quality content on YouTube regarding the topic of botulinum toxin A for wrinkles.

More videos (n = 42) were produced by laypeople, and fewer (n = 23) were produced by dental professionals. This could be explained by the fact that orthodontic pain is an experience by patients. That is why there may be more videos in which patients share their knowledge rather than dentists explaining the subject. However, some studies suggested that videos containing information about patient experiences can be misleading and less educational.[27,28] On the other hand, one study by Gaş et al. showed that the video source did not affect the quality of video content.[29] The current study found that dental professionals produced higher quality videos (had higher means of GQS [$P = .035$], flow of information [$P < .001$], information quality [$P = .008$], and total VIQI [$P < .001$]).

Regarding the duration, videos uploaded by individual users were significantly ($P < .001$) longer (mean, 8.23 minutes; median, 7.52 minutes) than those uploaded by dental professionals (mean, 3.25 minutes; median, 2.3 minutes). Other studies also reported similar results.[29] In addition, Lena et al. noted that longer videos may have higher content.[30] However, the current study did not find a significant relationship between high-content scores and video duration ($P = .842$). A previous study added that viewers might lose interest in videos that are excessively long; therefore, it is important to keep video length appropriate.[30]

None of the extracted videos covered all the predetermined topics. The most prevalent contents were pharmacological relief of pain, duration of pain, and possible effects on quality of life. The predominance of these topics may be explained by the high rate of laypeople as video uploaders because these topics are highly related to patient experiences.

The least mentioned topics were possible location of pain, possible factors influencing the level of pain, and instructions for medications and adverse effects. Because the location of orthodontic pain can differ from patient to patient and sometimes it is hard to localize the exact place of it, a lower number of videos mentioned this topic. Similar reasoning applies to possible factors influencing the level of pain due to the mixed opinions regarding this topic in the literature. In addition, the fact that NSAIDs can slow the rate of orthodontic movement is still a controversial topic; therefore, adverse effects were less often discussed in the videos. Currently, analgesics are widely used over-the-counter medications and are easily accessible for purchase, usually without a prescription from a health professional. Because it is a commonly used product and most of the patients have a general idea about its dosage, it may validate the fact that there is no need for explanation on how to use it. One survey showed that young adults are usually conscious about the instructions of pain relievers, although there is still a small proportion who report taking medication inappropriately.[31]

A weak correlation was found between total content and GQS score ($r = 0.284$; $P = .022$) as well as a strong correlation between GQS and VIQI scores ($r = 0.740$; $P < .001$). This can be explained by the fact that videos that contain higher amounts of accurate content and auditory and visual components have a higher educational value. Similar results were reported in the study by Sezici et al.[23]

This study investigated and compared metrics, trends, and quality of information about orthodontic pain on YouTube videos. These findings helped evaluate what kind of information reaches patients. However, analyzed videos were only in English, meaning that they reached only English-speaking people. Another limitation inherent to this study is that YouTube is an extremely dynamic search engine, and extracted data from videos may change quickly. Variables such as days since upload, likes, or viewing rates shift quickly, and the results can be ever-changing. Also, data were analyzed only by the GQS and VIQI, and including other assessment tools could give more insight into other aspects of the results and a more comprehensive analysis. It is also worth noting that no information about the audience was collected, and it is not known what kind of patients these videos reach. Thus, this could also be a potential area of investigation in future studies.

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CONCLUSIONS

- The pharmacological treatment of pain was the most common topic of YouTube videos regarding orthodontic pain, whereas the possible location of pain was a relatively rarely mentioned topic.
- The content of YouTube videos related to orthodontic pain was insufficient. Most of the videos lacked information about orthodontic pain characteristics.
- Dental professionals' videos concerning orthodontic pain had higher educational and audiovisual quality compared with those uploaded by laypeople.

DISCLOSURE

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