

## Quantitative and qualitative analyses of orthodontic-related videos on YouTube

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### ABSTRACT

**Objectives:** To investigate content of orthodontic-related videos on YouTube to improve the understanding of orthodontic patients' perceptions and treatment experiences.

**Materials and Methods:** A systematic search was conducted on YouTube on March 20, 2018, and updated on August 4, 2019, to identify all relevant videos using search terms "orthodontic," "orthodontics," "braces," and "orthodontic braces." The data set was captured from YouTube Data API (Application Programming Interface) and stored in an Excel database using a query function written in Python. All videos captured were viewed and categorized by three independent dental investigators using thematic analysis. The top 100 videos (by view count) related to patients' treatment experience were further analyzed using discourse analysis.

**Results:** A total of 600 orthodontic videos were screened, and 546 were included in the study. Six main themes were identified: (1) individual review of orthodontic treatment (45.8%, n = 250), (2) entertainment (19.8%, n = 108), (3) education (18.3%, n = 100), (4) advertisements (6.6%, n = 36), (5) time lapse of orthodontic treatment (5.3%, n = 29), and (6) do-it-yourself orthodontics (4.2%, n = 23). Of the top 100 videos related to patient's individual review of treatment, patients' main focuses were on pain (24%), problems with chewing and swallowing (12%), and adhesive removal (10%).

**Conclusions:** Orthodontic-related YouTube videos are diverse in nature. The most common video category was video providing an individual review of orthodontic treatment experience. Other popular video categories included entertainment, education, and advertisements. A range of do-it-yourself YouTube videos were also identified. YouTube may provide an opportunity for orthodontic professionals to disseminate health information. (*Angle Orthod.* 2020;90:411–418.)

**KEY WORDS:** YouTube; Orthodontics; Web 2.0

### INTRODUCTION

YouTube is a video-sharing website on which people worldwide can view and create content on a range of

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topics, including orthodontics. The growing popularity of YouTube means its role in influencing the public's perceptions about orthodontics is becoming more significant. Approximately 51.2 % of the world's population uses the Internet; this translates to more than 3.9 billion people.<sup>1</sup> By navigating the Internet, users have information, a method to communicate, and entertainment at their fingertips. The web is no longer a static notice board but instead an interactive information platform on which users can consume, unite, and create. It is said to have evolved into a new phase: Web 2.0.<sup>2,3</sup> One of the key concepts underlying Web 2.0 is "individual production and user generated content"—and an idea or opinion can now be shared globally in an instant.<sup>2</sup> Web 2.0 applications such as RSS feeds, podcasts, blogs, wikis, online social networks, and social media have been proposed as innovative tools for educating and updating clinicians and medical and dental students, as they allow clinicians and students to distribute, share, and

comment using such media as photos, videos, slides, or notes.<sup>2,4,5</sup>

YouTube (<http://www.youtube.com>, San Bruno, Calif) is a global phenomenon that can be used in 76 different languages via customized versions offered in more than 88 countries. With billions of users and hundreds of millions of hours of YouTube videos consumed every day, YouTube has established itself as an undeniably dominant site on the Internet. With the user capacity mentioned and the immense spectrum of videos available, YouTube can now be used as a readily accessible health database. Health-affiliated videos on the site deliver advice on prevention, diagnosis, treatment, and pathogenesis for a variety of conditions.<sup>2</sup>

Dentistry is one of the health care fields where these technologies have been successfully applied.<sup>6,7</sup> Information distributed by YouTube videos, whether evidence based or opinion based, now explore a range of disciplines, including orthodontics. However, a study on orthodontic-related videos found that content was weak and questionable and, as a discipline, orthodontics was not adequately represented.<sup>8</sup> Many of these videos are provided by nonauthorized and nonprofessional parties. This results in a high likelihood of YouTube users encountering inaccurate and, ultimately unsafe, information.<sup>9</sup>

The aim of this study was to investigate the content of orthodontic-related YouTube videos in order to improve understanding of orthodontic patients' perceptions and treatment experiences.

## MATERIALS AND METHODS

Searches were carried out on YouTube using the words "orthodontic," "orthodontics," "braces," and "orthodontic braces" on March 20, 2018, and updated on August 4, 2019. The data set was captured from YouTube Data API (Application Programming Interface) and stored in an Excel database using a query function written in Python. Video links, video view counts, time of upload, and number of "thumbs up" and "thumbs down" ratings were all recorded in the Excel database.

All videos captured were subsequently viewed and categorized simultaneously by three independent researchers (X.Y., S.L. and J.W.) using thematic analysis. Videos were excluded if it (1) was not in English, (2) was not related to dentistry/orthodontics, (3) had poor image and/or sound quality, or (4) was deleted/private and therefore inaccessible.

The top 100 videos (by view count) that were related to patients' treatment experience were then selected and assessed further. The sample size was based on a previous study.<sup>8</sup> The videos were viewed by the three

independent researchers and interpreted using discourse analysis.

## RESULTS

### Categorization of the YouTube Videos

The top 600 relevant videos were screened for eligibility (Figure 1). Of those, 54 videos (9%) were excluded from further analysis, while the 546 remaining videos were categorized by their content. The largest proportion of the videos were individual review videos (45.8%,  $n = 250$ ) (Figure 1). About one fifth each were about entertainment (19.8%,  $n = 108$ ) and education (18.3%,  $n = 100$ ). The other types of the videos included advertisements (6.6%,  $n = 36$ ), time lapse of orthodontic treatment (5.3%,  $n = 29$ ), and do-it-yourself (DIY) videos (4.2%,  $n = 23$ ).

Within the educational category (Figure 1), the majority of the videos (98%,  $n = 98$ ) were targeted at laypersons; only 2% of the educational videos were for dental professionals. Most of the educational videos for laypersons were about orthodontic treatment procedures (56.1%,  $n = 55$ ), such as demonstrations of braces being placed on patients (69.0%,  $n = 38$ ) and braces being taken off patients (25.5%,  $n = 14$ ). About one third of these videos contained general information about orthodontics (27.6%,  $n = 27$ ); and 16.3% ( $n = 16$ ) were about the general maintenance of braces.

Within the advertisements category (Figure 1), the majority of the videos were related to orthodontic products (66.7%,  $n = 24$ ), while the others were related to clinics (33.3%,  $n = 12$ ).

Within the DIY category (Figure 1), more than half of the videos (69.6%,  $n = 16$ ) were about the creation of fake braces. The other DIY videos included self-treatment with rubber bands for diastema closure (13%,  $n = 3$ ), self-removal of braces (8.7%,  $n = 2$ ), and self-treatment with at-home commercial products (8.7%,  $n = 2$ ).

### Discourse Analysis on the Individual Review Videos

Since the majority of the videos (45.8%,  $n = 250$ ) were individual reviews on orthodontic treatment (eg, patients' treatment experience), the top 100 videos (by view count) were further analyzed in detail (Table 1; Figures 2 and 3). About half of the users exhibited a positive attitude toward orthodontic treatment (47%), while 39% of the users had a negative attitude and 14% were neutral. The majority of the videos were uploaded by adolescents (47%), followed by adults (30%) and children (14%). Most of the videos (80%) were uploaded by females and 20% by males (Table 1).

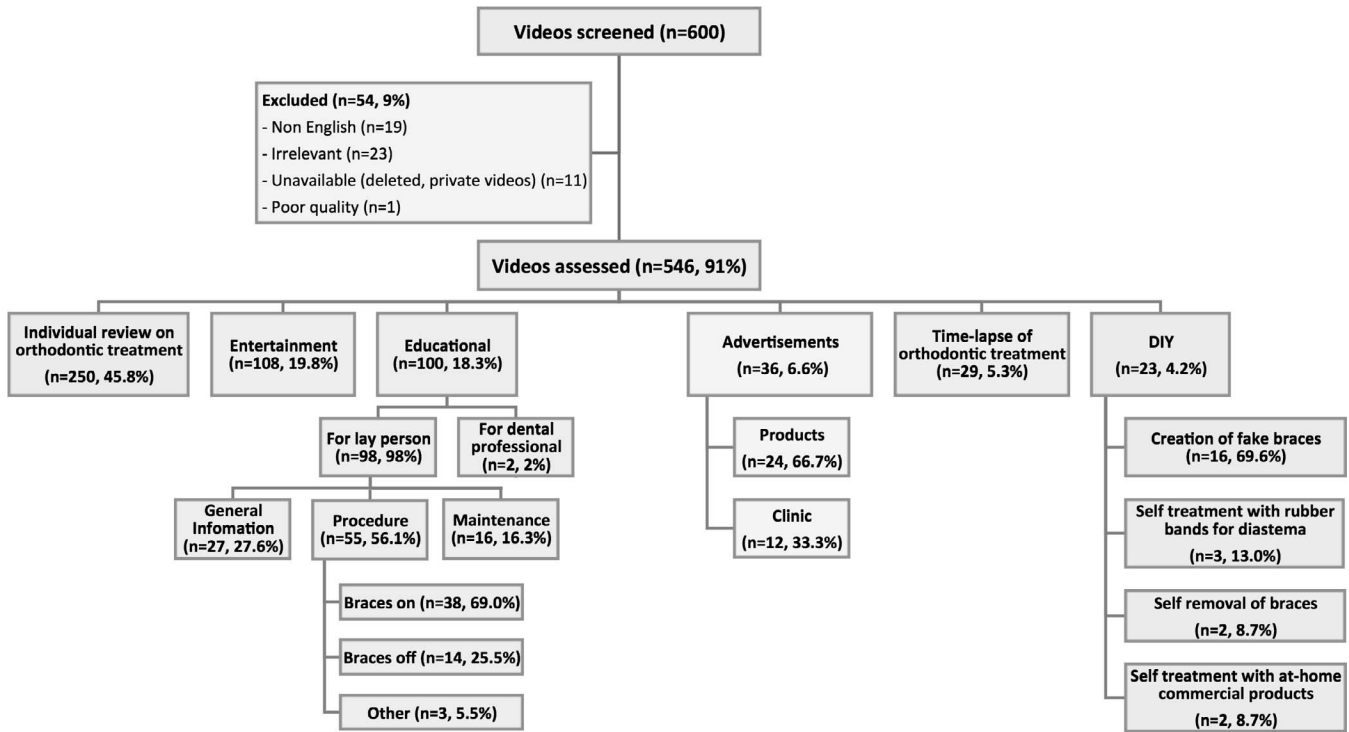


Figure 1. Categorization of the YouTube videos.

Four main areas of discussion were identified using discourse analysis: patient concerns, orthodontic procedures, orthodontic maintenance, and motivation for orthodontic treatment (Figure 2). Of the YouTube users, 24% and 12% were concerned about pain and with chewing and swallowing problems, respectively. Examples of these types of posts were “[it] really hurt in [the] beginning... [I] recommend taking ibuprofen”; “whole mouth ached”; “first couple of days was the most painful”; “really frustrated at first because [I] couldn’t eat”; and “always get food stuck in between.” Other interesting results included appearance, speech, and elastics (7%, 6%, and 5%, respectively).

Table 1. Demographic Characteristics of YouTube Users Who Uploaded Individual Reviews on Orthodontic Treatment

User Characteristics (n = 100)	Frequency
Gender	
Male	20%
Female	80%
Age group	
Child (<12 y)	14%
Teenager (12–18 y)	47%
Adult (>18 y)	39%
Attitude toward orthodontic treatment	
Positive	47%
Neutral	14%
Negative	39%

A few issues concerned with orthodontic procedures were raised by YouTube uploaders. They were related to the process of adhesive removal (10%), use of cheek retractors (7%), process of taking impressions (5%), bracket removal (4%), application of molar bands (2%), gingivectomy (2%), and application of spacers (1%). Issues around orthodontics maintenance and motivation were 12% and 3%, respectively. Examples of these kinds of posts were: “wearing retainer is very, very important in the first few weeks”; “cannot talk properly with it”; “I brush my teeth twice a day; I don’t do it three times”; “make sure to floss”; and “before I never smiled with my mouth open.”

A full list of quotes by YouTube users are summarized in Table 2. These quotes were used to generate a word cloud (Figure 3) highlighting the main themes discussed by users.

DISCUSSION

With the rising popularity of online information-sharing websites, there is a large community of Internet users who search for and/or upload information related to orthodontics. A notable and popular website is YouTube, a video-sharing platform that allows users to freely upload video content online. A previous study assessed the informational value and bias of YouTube orthodontic-related videos and found that most of them

**Table 2.** Quotes by YouTube Users in Individual Reviews of Orthodontic Treatment

Orthodontic Treatment Procedure	Quotes
Impression (6%)	#90 "It feels like you are being suffocated" #105 "You're sitting there gagging" #32 "I really hated it; it tasted like nasty bubblegum" #9 "No one likes the mold part but have to survive it" #18 "It is so gross and horrible" #257 "The mold really bothered me"
Cheek retraction (10%)	#2 "Smile maker really made my mouth dry" #105 "They stretch out your mouth so your lips get supper chapped" #155 "Apply chapstick before and then religiously after" #35 "The cheek retractor was really hurting me" #3 "it's really uncomfortable"; "she finally took me out of this prison, and i was so happy"; "It really made my mouth dry" #248 "Cheek prop makes your lip really dry" #253 "It hurts, and my lips were all chapped" #255 "One of my main tips is just to bring some chapstick" #267 "If you have dry lips that doesn't feel very good" #289 "That was really uncomfortable"
Adhesive removal (14%)	#105 "It sounds like a blender and smells like something burning" #143 "It hurts so bad, and the drilling noise like hurt my ears" #32 "It hurts really bad; I almost cried 'cause how bad it hurt" #43 "It was really painful during the polishing" #44 "The worst part was to grind down all the excess glue" #57 "Smells horrible when grinding glue off" #5 "It is my least favorite part; it is just a weird feeling" #9 "I was really scared for that part" #189 "It's uncomfortable" #246 "Scraping the glue off really got to me; like it hurts really bad" #259 "It is the worst part"; "it doesn't hurt; it's just so uncomfortable" #264 "It smelled really bad" #270 "It hurts really bad; I was crying" #279 "When they were. Like. scraping off the glue, there was just sensitivity"
Bracket removal (5%)	#90 "It sounds like she's breaking your teeth off" #185 "Hate the sound when taking off brackets" #257 "A lot of pressure on your mouth" #264 "I felt like my teeth were breaking with it"; "it felt really weird"; "it didn't hurt" #279 "When they were taking off the brackets it was just kind of like pressure"
Spacer application (1%)	#2 "Hurt the first day but not right now"

**Table 2.** Continued

Orthodontic Treatment Procedure	Quotes
Molar band (3%)	#90 "It hurts so bad because there was so much pressure" (removal) #92 "Getting them on is the most painful part" #265 "When they were taking off the bands in the back, it felt like they were pulling out my teeth, and it hurt so bad"
Gingivectomy (2%)	#105 "I could feel it burning; it hurt so bad" (lasering gums) #185 "It didn't hurt like I expected it to"
Patient Concerns	
Pain (26%)	#105 "Braces are fine for a while but then they really hurt" #126 "With braces are very sensitive" #128 "My teeth were so sensitive; it was painful" #133 "Take it (Advil) before you get braces" #143 "Take Advil" #155 "Eeally hurt in beginning... recommend taking ibuprofen"; "whole mouth ached" #159 "Take pain killers before appointment; the day after was the worst" #161 "First couple of days was the most painful; getting wires changed is painful and uncomfortable" #22 "Teeth still sore" #41 "Really hurt at first" #19 "Hurts first couple of days"; "eat soft foods because teeth are really sore" #181 "Hurts with rubber band; tightening hurts as well" #184 "Elastics are sore" #192 "Hurts so bad when eating" #215 "Hurts so bad" #221 "First night was the worst; really painful to eat; pain starts to wear off on third day" #222 "Hurts after tightening" #246 "Rubber band hurts so bad" #248 "H urts about 2-3 days after adjustment" #264 "Teeth sore for a few days after getting braces" #265 "Hurt so bad; [taking off bands] felt like they were pulling out my teeth" #269 "My teeth are so sore right now" #270 "Hurt really bad; I was crying getting braces off"; "the experience was very painful for me" #272 "Hurts like a really bad bruise" #289 "Its my actual teeth that hurt" #308 "Feel lots of pain and pressure couple of hours later"
Appearance (10%)	#85 "They're making me really self-conscious and weird" #155 "Looks bad at first"; "I was really self-conscious, and I wouldn't smile at first" #176 "Awkward" #180 "Clear elastics gets yellow fast" #184 "Stay away from clear elastics; they stain" #192 "Looks weird" #254 "Makes your teeth yellow" #257 "Throughout the 2 years of having braces, I never once smiled with my mouth open"



**Table 2.** Continued

Orthodontic Treatment Procedure	Quotes
Speech (10%)	270 "They look so big"; "i can't stop smiling"
	#61 "Feel more confident without my braces"; "felt self-conscious with them"
	#117 "Slight lisp"
	#85 "I don't know how to talk"
	#128 "Hard to speak at first"
	#165 "Can't talk"
	#178 "Talks funny when wearing them"
	#201 "Cannot talk properly with retainer"
	#214 "Lisp when talking"
	#240 "Lisp" (Invisalign)
Eating (13%)	#257 "Braces gave me lisp, so I avoided talking"
	#272 "Bad lisp, to the point where i whistle"
	#94 "I don't like eating; I don't like chewing anymore"; "can't bite at all"
	#128 "Hard for me to eat"
	#133 "Hard to eat with them the first day"
	#155 "Food gets stuck in them"
	#22 "I'm just gonna tell you the stuff that ilm really disappointed in"
	#41 "Really frustrated at first because couldn't eat"; "always get food stuck in between my teeth"
	#174 "Food trap"
	#181 "Sad not being able to eat something"
Elastics (10%)	#184 "Cannot eat my favorite food"
	#231 "Cannot eat for the first week"
	#272 "There are foods that [I] can't eat now that I have braces"
	#289 "Can't eat when [I] first got braces; painful on biting even soft foods like french fries"
	#307 "I couldn't eat anything"; "food stuck in my teeth"
	#155 "I'm getting them off early, and that is for one simple reason: I wore my rubber bands"
	#43 "Rubber bands suck"
	#57 "I know rubber bands suck, but it will pay off at the end"; "when you first get them on it hurt...in the end it's so worth it 'cause you're gonna have straight teeth"
	#81 "Always wear your rubber bands"
	#181 "It hurts with rubber band, hurts like poop"
Retainer (9%)	#184 "Hard to wear elastic all the time, and it is sore"
	#257 "I never wore my elastics"; "I don't recommend doing this; you will have braces on for longer than you should have them"
	#264 "Make sure to wear [rubber bands]; I didn't at first, and then I had to, like, keep my braces on for an extra 3 months or so"
	#267 "It actually kind of hurt putting on a few of the rubber bands"
	#296 "I do not like the powerchains; they make it really difficult to get food out ...food just gets trapped in there more easily"
	Maintenace
	#32 'I was drooling in it when I first got it; I hated it so much"
	#201 "Wearing [the] retainer is very, very important in the first few weeks"; "cannot talk properly with it"
	#248 "Going to wear [the] retainer for the rest of my life"; "soft bristle tooth brush"

**Table 2.** Continued

Orthodontic Treatment Procedure	Quotes
Oral hygiene practices (10%)	#257 "I did wear mine every single day"
	#90 "Annoying; gave me a speech impediment; cut up my tongue"
	#44 "It is really sore when wearing at night. I don't like them"
	#57 "I hate them"; "they suck and give you a lisp"
	#264 "I really recommend getting a water flosser"; "it's uncomfortable at first, but then you get use to it"
	#270 "My retainer kind of hurts; it's like shredding my tongue up"
	#125 "I'm not the best toothbrusher in the world"; "to be honest I haven't really been using [water pick] lately"; "I don't really brush my teeth after I eat"; "I don't really have food stuck in my mouth"; "If it's like really something stuck...then I usually do "This has been a lifesaver for me" (gum scraper tool, Dentech professional oral care kit)
	#143 "For me I would only brush my teeth twice a day, sometimes three times"; "definitely mouthwash is a great way to keep your teeth clean"; "personally I didn't really follow them; for example. I did chew gum" (in reference to foods not allowed to eat)
	#159 "I brush my teeth twice a day; I don't do it three times"; "make sure to floss"
	#81 "I recommend a water pick"; "oral hygiene is really important!"
Self consiousness (6%)	#180 "flossing is hard, hate it; until start to use water pick"; "like using interdental brushes"; "I don't like superfloss; it threads when going through braces"
	#181 "Likes interdental brushes"
	#184 "Make sure you clean it properly; its super important"
	#222 "Flossing is not gonna happen" she recommend water pick and interdental brush
	#242 "Need to floss your teeth every single day"
	#246 "I got [a] problem with flossing; it hurts, and it is gross"
	Motivation for orthodontics
	#85 "I've, like, always been so self-conscious of, like, my mouth"
	#128 "I really don't like my teeth at all"
	#33 "I never smiled a whole lot for the camera"; "look how crooked those were"; "they were crooked and horrible"
#204 "I hate my teeth"; "before I never smiled with my mouth open"	
#255 "They're kind of ugly" (teeth before braces)	
#172 "My teeth were so messed up before"	

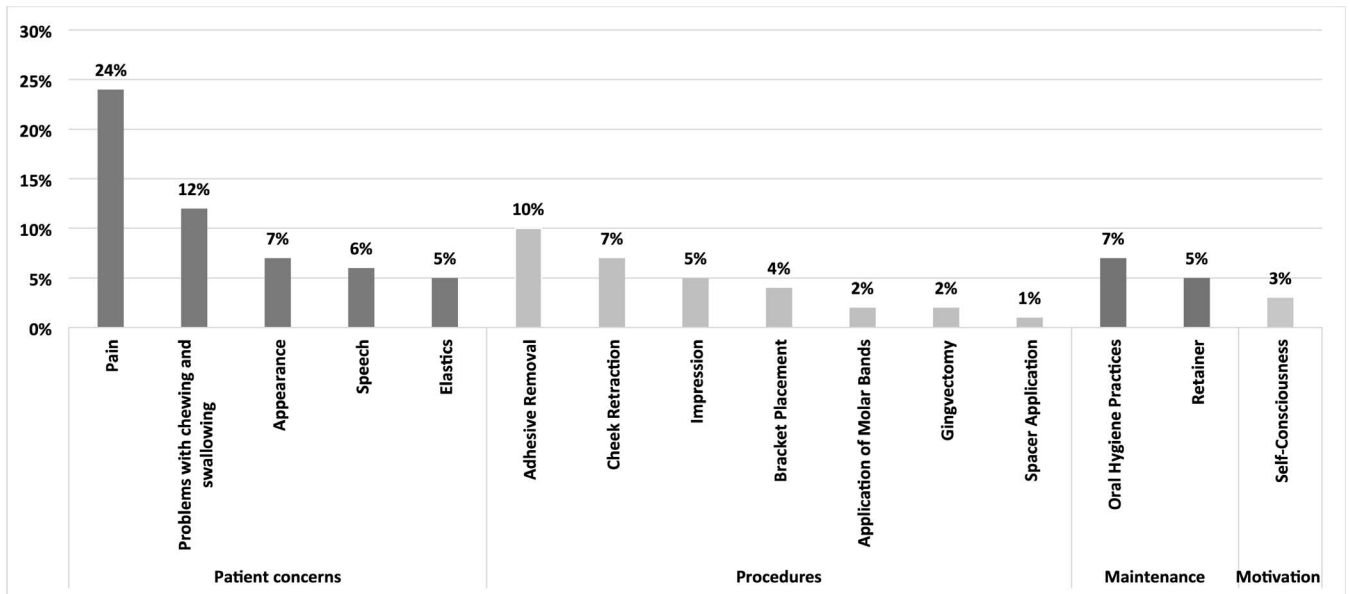


Figure 2. The top 100 (by view count) of the individual review videos on orthodontic treatment.

were generally a poor representation of the orthodontic specialty, and the majority of orthodontists' contributions to YouTube constituted advertising.<sup>8</sup> The current study quantitatively and qualitatively analyzed orthodontic-related videos uploaded in YouTube before August 4, 2019. Videos were classified into six main categories, including individual review, entertainment, education, advertisements, time lapse of orthodontic treatment, and DIY. In addition, the top 100 videos (by view count) related to the patient treatment experience were analyzed using discourse analysis. Females and older children were more likely to upload individual

review videos of orthodontics to YouTube. Most of their comments were positive. These findings were similar to those of studies on orthodontic treatment attitudes, suggesting that females and older children had higher esthetic demands.<sup>10,11</sup>

A number of YouTube videos were identified to be orthodontic-related, such as patient treatment experiences, entertainment, advertisements, educational videos, time-lapse depictions, and DIY with braces. Sharing and using this visual and auditory information on YouTube is convenient for patients and dental professionals and could potentially improve public perception of orthodontics. YouTube has potential benefits as an audiovisual information source for orthodontic patients. One study showed that YouTube videos could improve patient knowledge compared with the information provided by leaflets or verbal communication.<sup>12</sup> Patients can watch YouTube any time on any YouTube-accessible device, such as a smartphone or tablet. These potential benefits are currently underutilized, as the majority of videos were based on personal experience or entertainment rather than scientific evidence. The information related to dentistry was generally poor.<sup>7</sup>

About half of the videos were concerned with pain and discomfort during orthodontic treatment, due to the high magnitude of mechanical forces and the debonding procedure, which was in agreement with previous studies.<sup>13,14</sup> Surprisingly, only 7% of patients were concerned about esthetics, which was less compared with previous studies.<sup>13,15</sup> Orthodontic treatment is known to cause difficulty with eating.<sup>16</sup> Therefore, it



Figure 3. Word cloud created from the original quotes collected from the top 100 individual review videos (<http://www.wordclouds.com/>). Font size correlates with the greater frequency of the word used in quotes related to orthodontics.

was not surprising that 12% of the videos were about problems with chewing and swallowing.

An interesting finding was the popularity of DIY orthodontic videos on YouTube. Although the number of videos in this category was relatively low compared with other categories, the view count of these videos was relatively high, indicating that this might be a highly sought-after search trend.

Content involving DIY orthodontics appears to be increasingly more prevalent online. A simple search on YouTube offers a large quantity of DIY orthodontic material. DIY orthodontic videos, such as those about taking impressions at home, using factory-fabricated invisible aligners, and using elastic bands to try to close midline diastemas, are potentially dangerous without professional examination and supervision. Terms used in these videos were commonly incorrect, and procedures were poorly understood and explained. Several studies have demonstrated the potential damage of DIY orthodontics, such as hard and soft tissue damage.<sup>17–19</sup> Unfortunately, people were often unaware of the serious consequences and believed they could safely straighten their own teeth without any professional oversight.<sup>18</sup> The American Association of Orthodontists has issued a series of public service announcements that the diagnosis, prevention, and correction of malpositioned teeth should be managed by orthodontists.<sup>20,21</sup>

Orthodontic treatment is a highly precise and unique individualized treatment that takes into account a person's biological features and treatment needs. The placement of orthodontic appliances involves precise measurement and planning. Without that care, treatment could be compromised. Excessively simplified orthodontic treatment shown on YouTube could lead to significant side effects and complications. Therefore, one suggestion is for authoritative bodies and professionals to consider producing targeted, audience-appropriate YouTube videos to provide the public with accurate, well-explained, and evidence-based orthodontic information in order to increase patient safety.

## CONCLUSIONS

- Orthodontic-related YouTube videos are diverse in nature.
- The most common video category identified were videos providing an individual review of an orthodontic treatment experience. Other popular video categories included entertainment, education, and advertisements. A range of DIY YouTube videos were also identified.
- YouTube may provide an opportunity for orthodontic professionals to disseminate health information.

## REFERENCES

1. International Telecommunication Union. *World Telecommunication/ICT Indicators Database*. 23rd ed. Geneva, Switzerland: International Telecommunication Union; 2019
2. Cain J, Fox BI. Web 2.0 and pharmacy education. *Am J Pharm Educ*. 2009;73:120
3. Anderson P. What is Web 2.0? Ideas, technologies and implications for education. *JISC Technol Standards Watch*. 2017:1–64.
4. Santoro E, Quintaliani G. Using web 2.0 technologies and social media for the nephrologist. *G Ital Nefrol*. 2013;30:1–15.
5. Boulos MN, Maramba I, Wheeler S. Wikis, blogs and podcasts: a new generation of Web-based tools for virtual collaborative clinical practice and education. *BMC Med Educ*. 2006;6:41.
6. Mattheos N, Stefanovic N, Apse P, et al. Potential of information technology in dental education. *Eur J Dent Educ*. 2008;12(suppl 1):85–92.
7. Knosel M, Jung K, Bleckmann A. YouTube, dentistry, and dental education. *J Dent Educ*. 2011;75:1558–1568.
8. Knosel M, Jung K. Informational value and bias of videos related to orthodontics screened on a video-sharing Web site. *Angle Orthod*. 2011;81:532–539.
9. Madathil KC, Rivera-Rodriguez AJ, Greenstein JS, Gramopadhye AK. Healthcare information on YouTube: a systematic review. *Health Inform J*. 2015;21:173–194.
10. Deli R, Macri LA, Radico P, et al. Orthodontic treatment attitude versus orthodontic treatment need: differences by gender, age, socioeconomical status and geographical context. *Community Dent Oral Epidemiol*. 2012;40(suppl 1):71–76.
11. Salih FN, Lindsten R, Bagesund M. Perception of orthodontic treatment need among Swedish children, adolescents and young adults. *Acta Odontol Scand*. 2017;75:407–412.
12. Al-Silwadi FM, Gill DS, Petrie A, Cunningham SJ. Effect of social media in improving knowledge among patients having fixed appliance orthodontic treatment: a single-center randomized controlled trial. *Am J Orthod Dentofacial Orthop*. 2015;148:231–237.
13. Kazancı F, Aydoğan C, Alkan Ö. Patients' and parents' concerns and decisions about orthodontic treatment. *Korean J Orthod*. 2016;46:20–26.
14. Abu Alhaja ES, Aldaikki A, Al-Omairi MK, Al-Khateeb SN. The relationship between personality traits, pain perception and attitude toward orthodontic treatment. *Angle Orthod*. 2010;80:1141–1149.
15. Laothong W, Cheng H-C. Comparison of factors affecting orthodontic treatment motivation of Taiwanese and Thai patients in two hospitals. *J Dent Sci*. 2017;12:396–404.
16. Carter LA, Geldenhuys M, Moynihan PJ, Slater DR, Exley CE, Rolland SL. The impact of orthodontic appliances on eating— young people's views and experiences. *J Orthod*. 2015;42:114–122.
17. Dianiskova S, Calzolari C, Migliorati M, et al. Tooth loss caused by displaced elastic during simple preprosthetic orthodontic treatment. *World J Clin Cases*. 2016;4(9):285–9.
18. Kravitz ND, Burris B, Butler D, Dabney CW. Teledentistry, do-it-yourself orthodontics, and remote treatment monitoring. *J Clin Orthod*. 2016;50:718–726.
19. Konstantonis D, Brenner R, Karamolegkou M, Vasileiou D. Torturous path of an elastic gap band: interdisciplinary approach to orthodontic treatment for a young patient who lost both maxillary central incisors after do-it-yourself

- treatment. *Am J Orthod Dentofacial Orthop.* 2018;154:835–847.
20. Dianiskova S, Calzolari C, Migliorati M, et al. Tooth loss caused by displaced elastic during simple preprosthetic orthodontic treatment. *World J Clin Cases.* 2016;4:285–299.
21. American Association of Orthodontists. Missouri: Consumer alert: Risks involved with “do it yourself” teeth straightening products. Available at: <https://www.aaoinfo.org/news/2015/10/media-coverage-do-it-yourself-orthodontics-continues>. Accessed: June 2019.