YouTube TM Videos as a Source of Information on Clear Retainers

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Abstract

Background: Internet is one of the most important information sources in dental field to obtain information regarding treatment procedures. The content and quality of information about clear retainers available on YouTube is not known. The aim of the study was to analyze the source and quality of information about clear retainers on YouTube.

Methods: The search keywords were "clear retainers". The first 100 results were arranged in decreasing order of "relevance" using default YouTube algorithm. Two orthodontists independently viewed and analyzed the videos for video content using customized 10-point Likert scale and video information and quality index (VIQI) to determine the quality of the videos.

Results: Out of 100 videos screened, 48 videos met the inclusion criteria. The inter investigator results were similar in evaluating video content and the findings was not significant except for comparison by investigator II (p=0.006). For VIQI, internal consistency showed good reliability of Cronbach's Alpha .855. Most of the videos were uploaded by layperson (64.6%) rather than dental professionals (29.2%). Instructions on retainer hygiene was the most commonly covered topic (64.6%), followed by handling the retainer (60.4%). The least mentioned content was the procedure of making the clear retainer (19.8%).

Conclusion: The results of the study sheds light on the inadequacies in the content of the YouTube videos on clear retainers and also points out the underrepresentation of videos uploaded by dental professionals and orthodontists. The study suggests that YouTube is currently not an appropriate source of information on clear retainers. Dental professionals and academic institutions hold a responsibility for improving the content of YouTube about clear retainers and directing the patients to professional online sites for reliable information.

Keywords: *YouTube; orthodontic retainers; social media; internet*

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Introduction

The esthetic paradigm shift in orthodontics has led to the evolution of orthodontic appliances to incorporate esthetics to the functional goals and requirements of orthodontics treatment.[1] Clear retainer is one of the most common types of retainer preferred by the patients due to its excellent esthetic characteristics, simplicity of use, superior formability, maintenance of good oral

hygiene, and lesser discomfort compared to the Hawley retainers.[2-4]

Healthcare information is usually provided by healthcare professionals.However, the Internet's ease and accessibility, privacy, the patient's willingness to be more knowledgeable and the reduced cost of consultation compared to traditional healthcare consultation have contributed to the rise of social media from being used for entertainment to being used for education and information.[5] YouTube, a free-to-access video sharing-site, is the third most frequently visited website after google and Facebook, with more than 1 billion unique viewers every month and approximately 360 hours of video being uploaded every 24 hours.[6-8] The relative ease of uploading, searching, watching and sharing videos through different media, such as smartphones, personal computers and televisions has been attributed to the popularity of YouTube. However, the nature of the content of the uploaded videos are not peer-reviewed, which raises concern about the reliability, accuracy and quality of information, particularly because of freedom of expression.[9,10]

YouTube has been evaluated to investigate the video content and quality of information on dental topics such as oral cancer,[11] dental education,[12] root canal treatment,[13] lingual orthodontics[14] and orthognathic surgery.[15] However, the content and quality of information on clear retainers available on YouTube is not known. The aim of the study was to analyze the source and quality of information on clear retainers on YouTube.

Materials and Methods

The study included publicly available YouTube videos and was deemed exempt from the institutional ethical committee. There has been no interaction or attempt to contact any YouTube users and their names have not been identified or disclosed.

YouTube video search strategy

YouTube website (http://www.youtube.com) was searched on 18th April, 2018 for videos related to clear orthodontic retainers. The search keywords used were "clear retainers" with the search filter as "sort by relevance" as the default YouTube algorithm. The first 100 videos were selected for the study based on the previous research which showed 95% of users clicked only on the initial 3 pages of output to obtain the intended information.[16] For the purpose of the study, a new YouTube account was created and a playlist of the identified videos was created. Retrieved video source locators (URLs) were saved.

The inclusion criteria were:

1) English language

2) Clear retainer as the primary content

3) Acceptable audio-visual quality

Multi part videos were considered as one for analysis

The exclusion criteria were:

1) No audio

2) Irrelevant material (videos about other types of retainers, parodies, comics)

3) Duplication

4) Duration more than 15 minutes

5) Non English.

Video analysis

Two orthodontists independently viewed and analyzed the videos. The following general parameters were extracted for each included videos: 1) title 2) number of views 3) likes 4) dislikes 5) number of comments 6) duration and 7) date of upload. The videos were categorized based on their ownership as dentist/ professional, commercial and layperson. The target population of each video was categorized as layperson, professional and layperson/professional.

The videos were assessed for video content using customized 10-point Likert scale and video information and quality index (VIQI) to determine the quality of the videos.

The video content scale was used to assess the following components of the information regarding clear retainers in the videos: 1) Definition of retainer 2) Procedure of fabricating clear retainer 3) Instructions on inserting and removing the retainer 4) Comparison with other retainers 5) Durability 6) Hygiene 7) Speech performance 8) Wear time 9) Psychological impact 10)

Pain/ discomfort.

The VIQI scale uses a 5-point Likert scale ranging from 1 (poor quality) to 5 (high quality) to evaluate the following video characteristics: flow of information, information accuracy, quality (one point each for use of still images, animation, interview with individuals in the community, video captions, and a report summary), and precision (level of coherence between video title and content).[17]

Viewers' interaction was calculated based on

$$\text{Interaction index} = \frac{\text{number of likes} - \text{number of dislikes}}{\text{total number of views}} \times 100$$

Statistical Analysis

Data was entered independently by two assessors on Microsoft excel spread sheet. Statistical analysis was performed using SPSS software program (IBM SPSS Statistics 20). Descriptive statistics was generated. For internal consistency reliability test was conducted. Chi square test was conducted to find the significance of evaluation done by the investigators. Correlations were determined by using Pearson's test. A p value of <0.05 was considered statistically significant.

Results

Screening of videos

Out of the initial 100 videos screened, 52 videos were eliminated as per the inclusion criteria. And the final sample size was 48. **(Table 1)**

Contents of videos

Two orthodontists independently viewed the Contents to determine the quality of the videos with 10 selected parameters. A customized 10 point Likert scale was used to evaluate the information content of the clear retainer videos. Result showed **(Graph 1)** instructions on cleaning the retainer was the most commonly covered topic (64.6%), followed by instructions on handling the retainer (60.4%), definition (52.1%), speech (45.8%), wear-time (41.7%), pain (31.3%), comparison with other types of retainer (30.2%) and psychological impact (29.2%). The least mentioned content was durability and the procedure of making the clear retainer (19.8%). Among the included videos 15 videos were considered high content videos (≥5 total content score) and 33 videos as low content videos (<5 total content score).

Results showed the evaluation done by both the investigators and the findings were not significant for the contents of the videos except for "comparison" by investigator II which showed significance at .01 level.

Ownership of videos

More than half of the videos were uploaded by layperson (64.6%) rather than dental professionals (29.2%). **(Graph 2)**

Viewership of videos

Majority of the viewers of the analyzed YouTube videos were laypersons (87.4%). **(Graph 3)**

The mean viewing rate was 3800.42 with (range: 1-446794 views). The overall mean number of 'likes' was 146 (range: 0-956) and mean number of dislikes was 15 (range: 0-234). The mean length of the videos on clear retainers was 4.8464 minutes (range:0.20-12.45 minutes). The mean of days since upload was 1167.17 (range: 4-3586). Each parameter was found significant at .01 level. **(Table 2)**

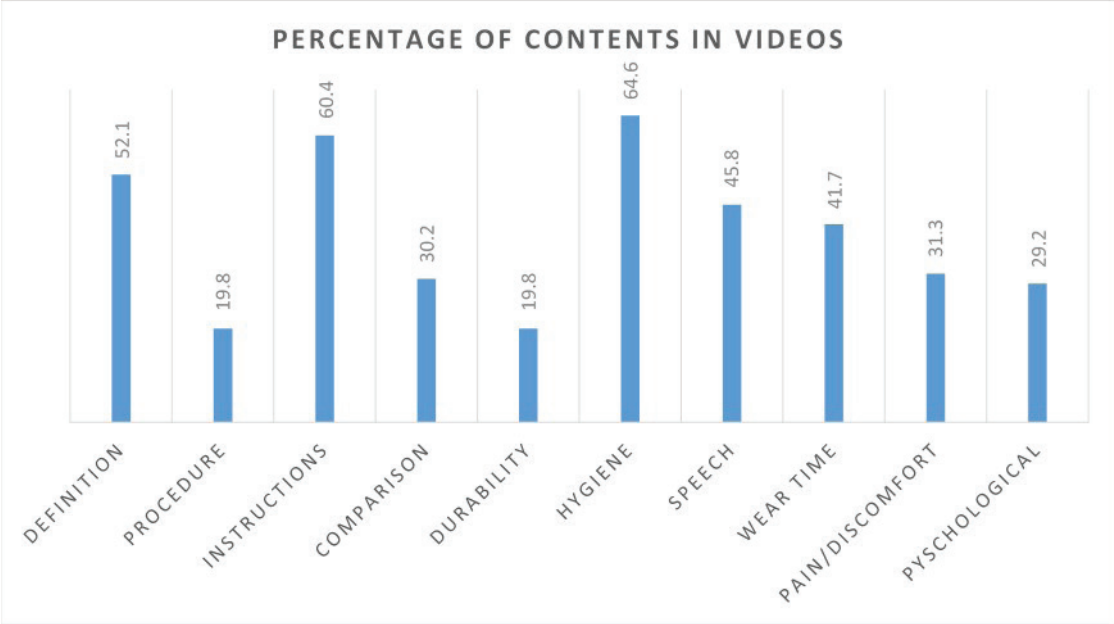
The mean interaction index was calculated using the formula and was found to be 10.57

The highest viewed YouTube video on clear retainer (44,6794 views) was uploaded by a layperson and had a total content score of 6 and total VIQI sore of 12. It was also the most disliked video with 234 dislikes. The most liked video (956 likes) was also uploaded by a layperson and had a total content score of 4 and total VIQI score of 8.

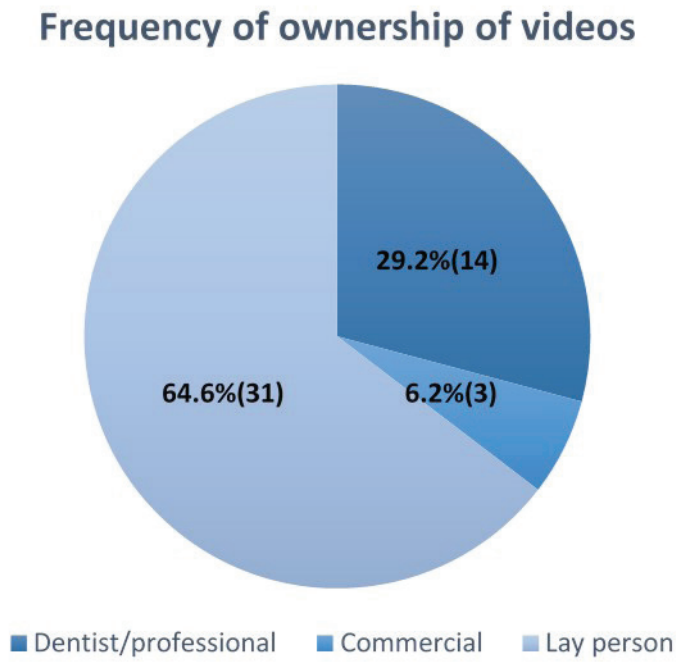
For VIQI, internal consistency was calculated and result showed good reliability with Cronbach's Alpha .855.

Pearson correlation **(Table 3)** between VIQI score and Total content score was highly significant at p=0.001 level. There was highly significant correlation between total content score and length of the video and number of dislikes at p=0.001. Correlation between total content score and number of views, number of likes, number of comments and interaction index was significant at

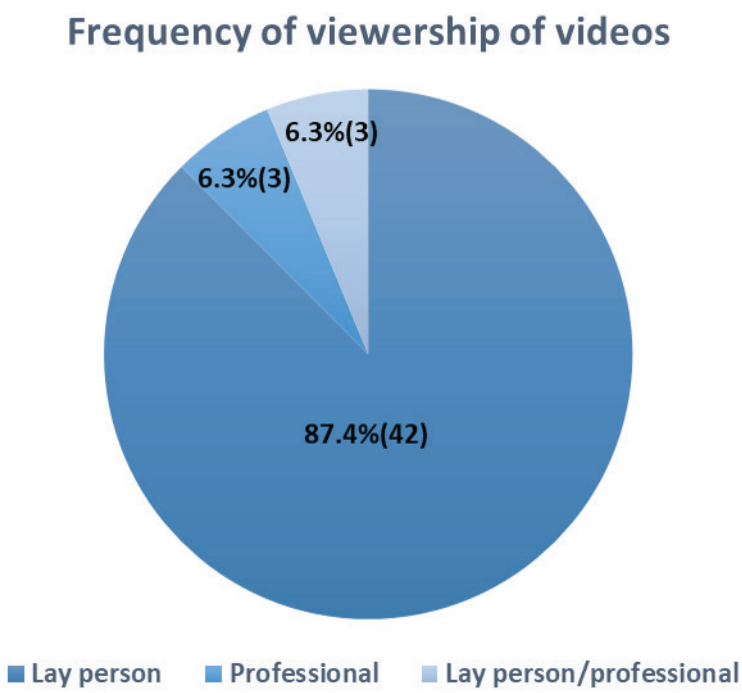
p=0.05 level.



Graph 1: Contents in videos



Graph 2: Ownership of videos



Graph 3: Viewership of videos

Table 1: Descriptive statistics of excluded videos

Sl. No.	Criteria	Frequency	Percentage
1	No audio	19	36.5%
2	Irrelevant	23	44.2%
3	Duplicate	5	9.6%
4	Duration more than 15 minutes	4	7.7%
5	Not English	1	1.9%
Total		52	100%

Table 2: Significance of each parameter of video content

Investigator 1						
Parameter		**Mean**	**SD**	**t**	**F**	**Sig. (p)**
1	Definition	1.75	.438	27.707	1.093	.362
2	Procedure	1.88	.334	38.868	1.049	.380
3	Instructions	1.50	.505	20.567	.416	.743
4	Comparison	1.77	.425	28.885	1.013	.396
5	Durability	1.79	.410	30.245	1.692	.183
6	Hygiene	1.38	.489	19.471	.531	.664

Cont... **Table 2: Significance of each parameter of video content**

7	Speech	1.60	.494	22.489	.840	.479
8	Wear-time	1.58	.498	22.018	.855	.471
9	Psychological	1.69	.468	24.959	1.237	.308
10	Pain/discomfort	1.71	.459	25.767	.144	.933
Investigator 2						
1	Definition	1.21	.410	20.398	.506	.680
2	Procedure	1.73	.449	26.676	.905	.446
3	Instructions	1.29	.459	19.482	.702	.556
4	Comparison	1.63	.489	23.012	1.515	.224
5	Durability	1.81	.394	31.836	4.748	.006**
6	Hygiene	1.33	.476	19.391	.594	.622
7	Speech	1.48	.505	20.299	.731	.539
8	Wear-time	1.58	.498	22.018	1.461	.238
9	Psychological	1.69	.468	24.959	.905	.446
10	Pain/discomfort	1.67	.519	22.243	.348	.790

**significant at .01 level.

Table 3: Descriptive statistics of YouTube video demographics

parameter	minimum	maximum	mean	SD	'p'
Views	1	446794	3800.42	75386.052	.001**
Likes	0	956	146	261.561	.001**
dislikes	0	234	15	38.592	.001**
No. of comments	0	394	46.81	92.620	.001**
Length (minutes)	0.20	12.45	4.8464	3.42346	.001**
Days uploaded	4	3586	1167.17	813.169	.001**

** significant at .01level

Discussion

The aim of our study was to provide a detailed analysis of the information available on YouTube about clear retainers. The use of social media to gather information has infiltrated every field including dentistry. In an effort to make informed dental care decisions, patients are increasingly turning to the Internet to better understand their conditions and treatments. The internet has become a linchpin of information in healthcare system. Patients prefer visual content in contrast to other scientific platforms to gain better information regarding their orthodontic treatment. YouTube is the third most visited website in the world, however the patient usage of YouTube video to gain health information is unknown. Several studies have analyzed the YouTube as source of information regarding dental issues such as oral cancer,[11] dental education,[12] root canal treatment,[13] lingual orthodontics[14] and orthognathic surgery.[15] No studies have analyzed the YouTube resources on clear retainers.

Previous studies have used different systems to evaluate the quality of information on YouTube website. Since there is no validated scoring system to evaluate videos on YouTube a subjective evaluation scoring system was used. The scoring system used in this study is simple and can be used to evaluate both the content and the quality of YouTube videos easily. It has been tested in a previous study analyzing YouTube video on Lingual orthodontic treatment.[14] Internal consistency showed good reliability between the investigators (Cronbach's Alpha .855), implying that the technique was valid.

According to previous studies the YouTube video database is dynamic and rapidly changes over a short period of time. This study evaluated only 100 videos generated by the search engine, which represents only a small proportion of videos related to clear retainers. However prior statistics suggests that the 90% of the viewers do not go beyond the first three pages of YouTube search results. Also the mean views of the evaluated videos were high (33689.62 views) suggestive of the videos routinely accessed by the viewers, making the results applicable in wider setting.

We observed that amongst the 100 top videos on Clear retainers only 48 videos were found to be eligible for inclusion in the study. Among the included videos only 15 videos were high content videos. When the video content was analyzed none of the videos mentioned all the contents on the content scoring scale. Most of the videos gave information on only one or two content which led to majority of low content videos. The procedure of making the clear retainer and the durability was the least covered topic. Instructions on cleaning the retainer was the most covered topic. This could be because majority of the videos were patient-uploaded videos conveying their experience with clear retainers. Layperson shared more videos compared to dental professions due to the ease of sharing the videos and lack of standardization of the uploaded videos on YouTube. The source of information of clear retainers from dental professionals, orthodontists and commercial sources were under represented. This correlated with systematic review conducted by Madathil KC et al that found patients were the main source of healthcare information on uploaded videos.[17] We believe that the dental academic institutions and dental professionals can provide reliable information on clear retainers, particularly orthodontists. Orthodontists should take initiative in delivering reliable and accurate and information on clear retainers for the benefit of patients via social media, such as YouTube

There was a positive correlation between total content score and the VIQI. The evolving technology enables YouTube users to produce high quality videos. There was highly significant correlation between total content score, length of the video and number of dislikes. The most viewed video was also the most disliked video with a high content score. However, the most liked video was a low content video. The videos were analyzed by experts in the field and it was felt that they would judge videos differently when compared to patients. One must also be aware that the evaluated YouTube variables can be manipulated. As YouTube Ranks its videos based on viewership scores, the high content videos may not be ranked in the beginning of search list and can be missed by the viewers.

This study possesses several limitations. First, this study used only one search term 'clear retainers'. The use of other related search term may yield variation in the searched results. The search term used in this study was decided by the investigating orthodontists, however a patient might use other search term and get different results. Secondly, the study was a cross sectional

study and represents 'snapshot' data collection. Since YouTube database is not static, several videos are being added or deleted over a short period of time, making the search results inevitable for change. Third, the videos assessed were only in English language. Further studies including videos with other languages can be performed to know the influence of cultural variables on patients and orthodontic treatment.

Considering the increasing number of patients using YouTube as the source of information on clear retainers, dental professionals should be aware of the quality of information available to them. It is important to recognize YouTube as a media of educating the patients on clear retainers. Dental professionals who are keen to create information videos on clear retainers should consider planning and defining the contents on clear retainers. The content scoring system used in this study is simple and easy which can be used by orthodontist to create and upload their videos.

Conclusion

The quality and content of information about clear retainers on YouTube is inadequate. The study suggests that YouTube is currently not an appropriate source of information on clear retainers.

Most of the videos were uploaded by Layperson rather than dental professionals.

Majority of the videos discuss the hygiene of the retainer, but only few videos mention about the durability and procedure of making clear retainers. Hence, high content videos are very less and dispersed in the search history, making it difficult for patients to find useful videos which are reliable and accurate.

Orthodontists should be aware of the source and content of information available to the patients through social media. Dental professionals and academic institutions should take an initiative in improving the content of YouTube about clear retainers and directing the patients to professional online sites for reliable information.

Ethical Clearance: The study included publicly available YouTube videos and was deemed exempt from the institutional ethical committee. There has been no interaction or attempt to contact any YouTube users and their names have not been identified or disclosed

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Conflict of Interest: Nil

References

1. Sarver DM, Ackerman JL. Orthodontics about face: the re- emergence of the esthetic paradigm. *Am J Orthod Dentofacial Orthop*. 2000; 117:575-576.
2. Melrose C, Millett D. Towards a perspective on orthodontic retention? *Am J Orthod Dentofacial Orthop* 1998; 113(5):507-514.
3. Mai W, He J, Meng H, Jiang Y, Huang C, Li M, et al. Comparison of vacuum-formed and Hawley retainers: a systematic review. Am J Orthod Dentofacial Orthop 2014; 145:720-727.
4. Rosvall MD, Fields HW, Ziuchkovski J, Rosenstiel SF, Johnston WM. Attractiveness, acceptability, and value of orthodontic appliances. *Am J Orthod Dentofacial Orthop* 2009; 135:276. e1-12.
5. de Boer MJ, Versteegen GJ, van Wijhe. Patients' use of the Internet for pain-related medical information. *Patient Educ Couns* 2007; 68:86–97.
6. YouTube Press Statistics. https://www.youtube.com/yt/press/statistics.html; 2017. (Accessed 15 January, 2017).
7. Alexa Traffic Rank for Youtube. http://www.alexa.com/siteinfo/youtube.com,2011. (Accessed, March 20, 2012).
8. USA Today: YouTube Serves Up 100 Million Videos a Day Online. Available from www.usatoday.com/tech/news/2006-07-16-youtube-views_x.htm,2006. (Accessed, March 20, 2012).
9. Lewis SP, Heath NL, Sornberger MJ, Arbuthnott AE. Helpful or harmful? An examination of viewers' responses to nonsuicidal self-injury videos on YouTube. *J Adolesc Health* 2012; 51:380–385.
10. Syed-Abdul S, Fernandez-Luque L, Jian W-S, Li Y-C, Crain S, Hsu M-H, Wang Y-C, Khandregzen D, Chuluunbaatar E, Nguyen PA, Liou D-M. Misleading health-related information promoted through video-based social media: anorexia on YouTube. *J Med Int Res* 2013;15: e30.

11. Y. Hassona, D. Taimeh, A. Marahleh, C. Scully. YouTube as a source of information on mouth (oral) cancer. *Oral Dis*2016; 22: 202-208
12. Knösel M, Jung K, Bleckmann A: YouTube, dentistry, and dental education. *J Dent Educ* 2011; 75:1558–1568.
13. Nason K, Donnelly A, Duncan HF. YouTube as a patient information source for root canal treatment. *Int Endod J* 2016; 49:1194–1200.
14. Yağmur Lena and Furkan Dindaroğlu. Lingual orthodontic treatment: A YouTube™ video analysis. *Angle Orthod* 2018; 88:208-214.
15. Emmett Hegarty, Ciara Campbell, Ektor Grammatopoulos, Andrew T. DiBiase, Martyn Sherriff & Martyn T. Cobourne. YouTube™ as an information resource for orthognathic surgery. *J Orthod* 2017;44: 90-96
16. Desai T, Shariff A, Dhingra V, Minhas D, Eure M, Kats M. Is content really king? An objective analysis of the public's response to medical videos on YouTube. *PLoS One* 2013; 8: e82469.
17. Madathil KC, Rivera-Rodriguez AJ, Greenstein JS, Gramopadhye AK. Healthcare information on YouTube: a systematic review. *Health Inform J* 2015; 21:173–194.