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Evaluation of YouTube as an Information Source for Use of Laser in Root Canal Treatment

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Abstract

Objective: At the present time patients in developed countries widely use online resources to access medical information. YouTube is a widely used website to get knowledge. In the past, medical and dental data were accessed only by doctor and dentist examinations. This research was aimed to assess the quality and quantity of the knowledge content in popular YouTube™ videos about laser root canal treatment (LRCT).

Method: Google Trends showed that "laser root canal treatment" was the most searched keyword on the topic. Included videos were assessed as the video's name, universal resource locators, the number of video display, time of adding in website, total numbers of likes, dislikes and comments and total video time. Each video was classed into the 3 groups according to their information source as dentist, commercial, dental clinic. This video was classified according to the quality of information content as ‘good’, ‘poor’, or ‘bad’. In the evaluation of the data, the distribution of variables was examined with the Shapiro-Wilk normality test, the intergroup comparison of variables that did not show a normal distribution was examined with the Kruskal Wallis test. Comparison of subgroups was examined with Dunn's multiple comparison test and comparison of qualitative data was analyzed with Chi-square test. The results were evaluated at the significance level of $p < 0.05$.

Results: Most of the YouTube™ videos on LRCT were uploaded by the dental clinic (44.0%). The advantage of LRCT was the most commonly covered topic (64.0%). No statistically significant difference was observed between the number of views, the number of comments, values of the bad, poor, and good situation groups. A statistically significant difference was observed between the number of likes of the bad, poor, and good situation groups ($p=0.048$). The liking values of the good group were found to be statistically significantly higher than the bad group ($p=0.034$).

Conclusion: YouTube™ is a social media platform where comprises subjective comments, and some videos that can be easily accessed can give wrong knowledge sometimes. The content is active; therefore, the search results change continually, because the areas of interest and video number of views vary over time. YouTube platform has a large quantity of social media data that is hard to analyze and uncontrollable.

Keyword: Laser; root canal treatment, social media, YouTube

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INTRODUCTION

Patients to usage online resources to reach medical knowledge is common with used internet in developed countries; but medical and dental data has been reached by only through examination with doctor and dentist in the past. It has been reported that one third of patients utility the internet as a source of medical information (1), with 11% of patients researching their symptoms before form the doctor's consultation (2). It is clear that 75% of people use the internet for medical information. However, it is important to note that the tendency to search the internet for this information varies by age, habit and place (3). It's clear from the numbers that a lot of people are looking for information on dental procedures (4), However, the analysis and documentation of internet-sourced information has been limited to medical disciplines (5). YouTube™ is the second most popular website in the world, beaten only by Google. It is the most commonly visited video site (6) by patients looking to access medical information because of users can easily accessible with computer , smartphone and television, an average user spends an average of 17 minute 42 second on YouTube™ a day (7). As is common on the internet, the uploaded videos is not expert-reviewed, can be uploaded from a lot of sources and is probably to be of variable quality. YouTube™ subscribers who by the use of 'search terms', can accessed videos, can use as an information source (8).

YouTube™ is becoming increasingly popular for learning about medical procedures. YouTube™ has been recognised by medical and dental professionals as a fund of data for patients, there are lots of studies researching the quality and quantity of data getable on this site (9).

Laser-activated irrigation is increasingly used in dental root canals as its effectiveness has been shown to be superior to conventional method (10). The laser method is based on laser-induced localized fluid vaporization and, after rapid bubble expansion and collapse, stimulation of microfluidic flow throughout the entire volume of the cavity (11). As a result of all these positive properties of the laser, it has become popular among dentists (12). Laser, a popular treatment; also attracted the attention of patients and prompted the laser to research. The

present study definitively assessed the quality and quantity of the knowledge content in popular YouTube™ videos about LRCT.

METHODS

Identification Criterias of YouTube Videos

Ethical approval is not required in this study, as research was conducted on the publicly accessible "http://www.youtube.com" using the google chrome web browser for data collection. We chose the 'laser root canal treatment' as our preferred option after searching for keywords on YouTube™ (https://www.youtube.com/) on 28 July 2020 between 8 am to 5 pm. Google Trends was the tool of choice for identifying the most commonly used search terms for LRCT. Sort by number of views" was used as the default filter for YouTubeTM searches. Previous searches and cookies and were removed. English language and acceptable sound and picture quality have been taken into account. The sample size was calculated using the G* Power software program (version 3.1.9.4; Axel Buchner, Universität Düsseldorf, Germany) and the total sample size required to identfy a moderate effect (0.60) with 80%power was found to be 19. In this study we included 50 YouTube™ videos.

Evaluation of You Tube Videos

We only included videos in this study that were in English, had acceptable visual and sound quality, and were not duplicates. The non-English language, lack of relevance to LRCT information, poor audio or visual quality, ironic videos and duplicates were all excluded from the selection process. Video's each characteristic was assessed as following;

- The video's name
- Universal Resource Locators (URLs)
- The number of video display
- Time of adding in website
- Total numbers of likes, dislikes, and comments
- Total video time

Each video was classed into the 3 groups according to their information source

- Dentist
- Commercial
- Dental clinic

One researcher (S.T.) evaluated the YouTube™ videos. Eight items with a total of 1 point were evaluated in videos (Table 1).

Table 1 The video information content

Scoring Items	Point
Describing	1
Material overview	1
Procedure of application	1
Advantages	1
Post-op experience	1
Educational	1
Commercial	1
Before-after	1
Total	8

Videos specified a total of 0–8 points; 0–2 points, which indicated bad video content with little information; 3–4 points, which indicated poor video content with useful information; 5–8 points, which indicated excellent and provided a great deal of valuable information. For each video; the number of views, the number of comments, likes and dislikes and video durations were recorded.

Statistical analysis

Statistical analyses were carried out on the data set applying the NCSS (Number Cruncher Statistical System) 2007 Statistical Software (Utah, USA) package program. The dissemination of variables was examined for descriptive statistical methods (mean, standard deviation, median, interquartile range) using the Shapiro-Wilk test for normality, the Kruskal-Wallis test to compare the variables between the groups, that did not have a normal distribution, Dunn's multiple comparison test for the comparison between subgroups, and for the comparison of qualitative data, the Chi-square test was performed. Our results were evaluated at $p<0.05$ significance level.

RESULTS

The descriptive statistics appraised of the 50 YouTube™ video demographics are submitted in Table 2.

The average total quantity of views of YouTube™ videos on LRCT was 1692.23 for dental clinic, 11518.56 for dentist and 6142.4 for commercial. The average quantity of comments was 5 for dental clinic, 5 for dentist and 1 for commercial. The total average quantity of 'likes' was 8.36 for dental clinic, 38.64 for dentist and 10.22 for commercial while the total average quantity of 'dislikes' was 1.78 for dental clinic, 9.6 for dentist and 4 for commercial. The majority of the videos were uploaded by dental clinics (44%), followed by dentists (36%), and the remaining videos were uploaded for commercial purposes. Significant difference was not observed in terms of the quantity of views, the quantity of comments, the quantity of likes, the quantity of dislikes, video duration and source status of the dental clinic, dentist and commercial resource groups.

Most YouTube™ videos about LRCT were uploaded by the dental clinic (44.0%). The benefits of LRCT were the most frequently discussed topic (64.0%), followed by an educational (62.0%), describing (48.0%), post-op experience and material overview (24.0%), and procedure of application (20.0%).

It is clear from the data that the difference between the descriptions is insignificant statistically ($p=0.647$), material overview ($p=0.688$), procedure of application ($p=0.204$), advantages ($p=0.661$), post-op experience ($p=0.508$), educations ($p=0.133$) and before-after ($p=0.149$) of the dental clinic, dentist, and commercial resource groups. Among the video demographics and description values, only a

significant difference was observed between the dental clinic, dentist and commercial groups in the commercial descriptive. No commercial description was observed in the dentist group (Table 3).

Table 2. Dental clinic, dentist and commercial information content statistics values

Source		Dental Clinic		Dentist		Commercial		P
The number of views	Ort±SS	1692.23±3814.32		11518.56±26046.64		6142.4±11543.58		0.245[α]
	Median (IQR)	300 (71.25-1498.25)		486.5 (97.75-13629)		2187.5 (208.75-5940.25)		
The number of comments	Closed comment	3	13.64%	4	22.22%	0	0.00%	0.316[β]
	No comment	14	63.64%	9	50.00%	9	90.00%	
	1-3	3	13.64%	1	5.56%	0	0.00%	
	>4	2	9.09%	4	22.22%	1	10.00%	
Like	Ort±SS	8.36±9.9		38.64±50.82		10.22±17.2		0.256[α]
	Median (IQR)	3 (1.75-12.75)		8 (2-70)		4 (1.5-10)		
Dislike	Ort±SS	1.78±0.67		9.6±9.32		4±4.24		0.258[α]
	Median (IQR)	2 (1-2)		7 (1.5-19)		2.5 (1-8.5)		
Video duration (sn)	Ort±SS	187.36±151.79		184.28±139.72		233.3±221.3		0.887[α]
	Median (IQR)	131 (65.75-303)		124.5 (85-242.25)		122 (67.75-446.5)		
Situation	Bad	13	59.09%	6	33.33%	5	50.00%	0.530[β]
	Poor	7	31.82%	8	44.44%	4	40.00%	
	Good	2	9.09%	4	22.22%	1	10.00%	

[α] Results of Kruskal-Wallis H test; [β] Results of Pearson chi-square test

Table 3. Dental clinic, dentist and commercial; Youtube video demographics and descriptive statistics values

		Dental Clinic		Dentist		Commercial		
		n:	%:	n:	%:	n:	%	P
Describing	No	13	59.09%	8	44.44%	5	50.00%	0.647[α]
	Yes	9	40.91%	10	55.56%	5	50.00%	
Material overview	No	18	81.82%	13	72.22%	7	70.00%	0.688[α]
	Yes	4	18.18%	5	27.78%	3	30.00%	
Procedure of application	No	19	86.36%	15	83.33%	6	60.00%	0.204[α]
	Yes	3	13.64%	3	16.67%	4	40.00%	
Advantages	No	9	40.91%	5	27.78%	4	40.00%	0.661[α]
	Yes	13	59.09%	13	72.22%	6	60.00%	
Post-op experience	No	18	81.82%	12	66.67%	8	80.00%	0.508
	Yes	4	18.18%	6	33.33%	2	20.00%	
Educational	No	9	40.91%	4	22.22%	6	60.00%	0.133[α]
	Yes	13	59.09%	14	77.78%	4	40.00%	
Commercial	No	20	90.91%	18	100.00%	6	60.00%	**0.007**[α]
	Yes	2	9.09%	0	0.00%	4	40.00%	
Before-After	No	22	100.00%	15	83.33%	9	90.00%	0.149[α]
	Yes	0	0.00%	3	16.67%	1	10.00%	
Total Score	Mean (SD)	2,18±1,56		2,94±1,89		2,9±1,97		0.294[β]
	Median (IQR)	2 (1-3)		3 (1-4,25)		2,5 (1,75-4)		

[α] Results of Pearson chi-square test; [β] Results of Kruskal-Wallis H test

It is clear from the data that the difference between the descriptions is insignificant statistically: the quantitiy of views (p=0.214), the quantitiy of comments (p=0.788) values of

the bad, poor, and good situation groups. We can state with confidence that there was a statistically significant difference between the quantitiy of likes of the bad, poor, and good situation groups (p=0.048). The results clearly show a statistically significant difference between the values of the following parameters: dislike quantity of the bad, poor, and good situation groups (p = 0.026) (Table 4).

The good group scored significantly higher than the bad group on the liking scale (p=0.034). The other two groups on the liking scale were not found to be statistically significant. The dislike scores of the good group were found to be statistically significantly higher than bad and poor groups scores (p=0.008, p=0.049), and the results were not statistically significant between the bad and poor groups (p=0.556). The video duration values of the good group were found to be statistically significantly higher than those of the bad group (p=0.001), and between the other groups, no statistically significant difference was observed (p>0.05) (Table 5).

Table 4. Bad, poor and good information content statistics values

Situation		Bad		Poor		Good		P
The number of views	**Mean (SD)**	3050.79±7796.35		8713.11±25076.47		9602.71±11820.28		0.214 α
	Median (IQR)	300 (63.75-1546)		365 (103-5383)		4884 (463-16731)		
The number of comments	**No comment**	16	66.67%	12	63.16%	4	57.14%	0.788 β
	Closed comment	2	8.33%	3	15.79%	2	28.57%	
	1-3	3	12.50%	1	5.26%	0	0.00%	
	>4	3	12.50%	3	15.79%	1	14.29%	
Like	**Mean (SD)**	9.63±16.64		13.9±16.9		62.4±65.35		**0.048** α
	Median (IQR)	2 (1-11)		7 (3.5-19)		62 (4.5-120.5)		
Dislike	**Ort±SS**	1.8±0.92		3.4±3.78		15±8		**0.026** α
	Median (IQR)	2 (1-2)		2 (1-6.5)		15 (7-23)		
Video duration (sn)	**Mean (SD)**	131.79±112.47		227.26±195.12		327.29±100.1		**0.003** α
	Median (IQR)	92.5 (59.5-181.75)		122 (95-352)		330 (230-409)		
Source	**Dental Clinic**	13	54.17%	7	36.84%	2	28.57%	0.530β
	Dentist	6	25.00%	8	42.11%	4	57.14%	
	Commercial	5	20.83%	4	21.05%	1	14.29%	

α Results of Kruskal-Wallis H test; β Results of Pearson chi-square test

Table 5. Dunn's multiple comparison test

	Like	Dislike	Video duration (sn)
Bad / Poor	0.138	0.556	0.061
Bad / Good	**0.034**	**0.008**	**0.001**
Poor / Good	0.159	**0.049**	0.078

It is clear that statistically significant differences exist between the describing and material overview of the bad, poor, and good situation groups (p=0.0001). The presence of describing and material comparison in the bad group was lower than the poor and good groups. A statistically significant difference was obtained the before-after and procedure of

application of between the bad, poor, and good situation groups (p=0.0001, p=0.001). The presence of before-after and procedure of application, in the good group was higher than in the poor and bad groups. It is statistically clear that there is a difference in the distribution of educational and advantage between the groups in each situation (p=0.0001, p=0.001). It has been definitively proven that those in the "bad" group have significantly lower levels of education and advantages than those in the "poor" and "good" groups. The post-op experience and commercial presence distributions of the bad, poor, and good situation groups showed statistically insignificant difference (p<0.05) (Table 6).

Table 6. Bad, poor and good; Youtube video demographics and descriptive statistics values

		Bad		Poor		Good		P
Describing	**No**	22	91.67%	4	21.05%	0	0.00%	**0.0001**[α]
	Yes	2	8.33%	15	78.95%	7	100.00%	
Material overview	**No**	23	95.83%	15	78.95%	0	0.00%	**0.0001** [α]
	Yes	1	4.17%	4	21.05%	7	100.00%	
Procedure of application	**No**	21	87.50%	17	89.47%	2	28.57%	**0.001** [α]
	Yes	3	12.50%	2	10.53%	5	71.43%	
Advantages	**No**	15	62.50%	2	10.53%	1	14.29%	**0.001** [α]
	Yes	9	37.50%	17	89.47%	6	85.71%	
Post-op experience	**No**	20	83.33%	13	68.42%	5	71.43%	0.501 [α]
	Yes	4	16.67%	6	31.58%	2	28.57%	
Educational	**No**	17	70.83%	2	10.53%	0	0.00%	**0.0001** [α]
	Yes	7	29.17%	17	89.47%	7	100.00%	
Commercial	**No**	23	95.83%	15	78.95%	6	85.71%	0.234 [α]
	Yes	1	4.17%	4	21.05%	1	14.29%	
Before-After	**No**	24	100.00%	19	100.00%	3	42.86%	**0.0001** [α]
	Yes	0	0,00%	0	0,00%	4	57,14%	
Total Score	**Mean (SD)**	1,08±0,83		3,42±0,51		5,57±0,79		**0,0001** [β]
	Median (IQR)	1 (0-2)		3 (3-4)		5 (5-6)		

[α] Results of Pearson chi-square test; [β] Results of Kruskal-Wallis H test

DISCUSSION

At the present, patients are more and more turning to search engine like Google and video-sharing web sites like YouTube to informed in healthcare (13). Delli at al. (8) reported the quality of this information is unverifiable and not useful in some cases. Despite this, Nason et al (14) found that 33 % of people believed that the health information on the most popular websites was accurate. A few topics connected to oral health and dentistry have been appraised on YouTube™ such as orthognathic surgery, early childhood caries and root canal treatment (15–17). This is the first study to analyze the content and quality of YouTube™ videos info about LRCT.

The internet and social media have become more prevalent in recent years, making

YouTube™ the first port of call for LRCT patients seeking advice. Prior studies have shown that videos on YouTube™ were not an adequate source of information, and therefore clinicians should suggest videos that provide accurate information (16,18,19).

Lena and Dindaroglu (20) reported that the videos with a high knowledge had a long videos in their study. Our study also found that the longest videos were in the 'good-information content' category. Good-information content videos are commonly uploaded by dentist while bad content videos are uploaded by dental clinic in our study. It was clear that videos uploaded by dentists included more information, which explains why they were longer. The data clearly shows that the longest videos and the most viewed and liked videos were in the 'good-information content' category. Our analysis revealed that the viewers' comment index was mostly in the bad-information content than good-information content. Therefore this may be because the less of information makes the situation open to interpretation.

In this study, videos usually had bad and poor-information quality, and ranking was not based on the informational content of the videos. This proves that the YouTube™ relevance rank is not an accurate reflection of the content of the videos. The majority of the videos have flimsy, limited information, which improves the risk of spreading. misinformation and may have a negative impact on patients' attitudes towards LRCT. Nason et al. (17) appraised YouTube™ videos about root canal in their research and they confidently declared that the majority of videos on YouTube™ had low information content. As a result, they firmly proposed that the site is not a suitable resource for information.

Nason et al. (17) appraised YouTube videos on root canal were researched and found to have low information content, YouTube is not an accurate source of information for this topic. On the other hand, Wong et al. (21) studies found the quality of the content to be high on Botox injections videos. YouTube is a useful resource for patients seeking information about this procedure, all the same, some of the uploaded YouTube videos for commercial may create source with incorrect and insufficient information.

CONCLUSION

YouTube™ is a social media platform where comprises subjective comments, and some videos that can be easily accessed can give wrong knowledge sometimes. The content is active; therefore, the search results change continually. The number of views varies over time, so it is not possible to make a reliable comparison between areas of interest and video views. YouTube manufacture a large quantity of social media data that is hard to analyze and uncontrollable. However, it should not be forgotten that YouTube™ variables can absolutely be manipulated. The clinicians must

take a more proactive approach and ensure that patients are directed to the most suitable platforms for accurate information.

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