



March 2022

Can YouTube Videos be Helpful in Promoting Self-Performed Denture Hygiene?

Kubra Degirmenci

University of Bolu Abant Izzet Baysal, Bolu, dtkubradegirmenci@outlook.com

Serkan Saridag

University of Okan Istanbul, Istanbul, ssaridag@hotmail.com

Follow this and additional works at: <https://nsuworks.nova.edu/ijahsp>



Part of the [Dental Hygiene Commons](#), [Dental Public Health and Education Commons](#), and the [Prosthodontics and Prosthodontology Commons](#)

Recommended Citation

Degirmenci K, Saridag S. Can YouTube Videos be Helpful in Promoting Self-Performed Denture Hygiene?. The Internet Journal of Allied Health Sciences and Practice. 2022 Mar 31;20(2), Article 4.

This Manuscript is brought to you for free and open access by the College of Health Care Sciences at NSUWorks. It has been accepted for inclusion in Internet Journal of Allied Health Sciences and Practice by an authorized editor of NSUWorks. For more information, please contact nsuworks@nova.edu.

Can YouTube Videos be Helpful in Promoting Self-Performed Denture Hygiene?

Abstract

Purpose: The longevity and success of dentures depend on clinical factors and the appropriate application of various techniques as well as on patients' denture hygiene. Recently, the Internet has become an attractive information source for individuals searching for answers to their questions on health-related subjects. The aim of this study was to evaluate the information provided by YouTube videos on denture hygiene and analyze their content in terms of scientific validity. **Method:** Various key words related to denture cleaning, hygiene, and care were used to search for videos on YouTube. Based on their scientific content, the included videos were classified as useful, misleading, or as a user experience video. The content of each video was qualitatively evaluated by two researchers. **Results:** Ninety-six videos were selected for analysis. Sixty-one (63.6%) videos were defined as useful, 20 (20.8%) were defined as misleading, and 15 (15.6%) were assigned to the user experience category. Although significant differences were not observed among the interaction index and viewing rate variables ($p>0.05$), the scores for overall quality were higher for the videos in the useful group than for the videos in the other two groups (p Conclusion: YouTube is a dynamic source of both useful and misleading information. Therefore, it is essential that dentists provide proper denture hygiene instructions to their patients during patient visits.

Author Bio(s)

Kubra Degirmenci, DDS, is an assistant professor of Prosthodontics department in the University of Bolu Abant Izzet Baysal.

Serkan Saridag DDS,Phd is an associate professor of Prosthodontics department in Istanbul Okan University.



The Internet Journal of Allied Health Sciences and Practice

Dedicated to allied health professional practice and education

Vol. 20 No. 2 ISSN 1540-580X

Can YouTube Videos be Helpful in Promoting Self-Performed Denture Hygiene?

Kubra Degirmenci
Serkan Saridag

1. Bolu Abant Izzet Baysal University
2. University of Okan Istanbul

Turkey

ABSTRACT

Purpose: The longevity and success of dentures depend on clinical factors and the appropriate application of various techniques as well as on patients' denture hygiene. Recently, the Internet has become an attractive information source for individuals searching for answers to their questions on health-related subjects. The aim of this study was to evaluate the information provided by YouTube videos on denture hygiene and analyze their content in terms of scientific validity. **Method:** Various key words related to denture cleaning, hygiene, and care were used to search for videos on YouTube. Based on their scientific content, the included videos were classified as useful, misleading, or as a user experience video. The content of each video was qualitatively evaluated by two researchers. **Results:** Ninety-six videos were selected for analysis. Sixty-one (63.6%) videos were defined as useful, 20 (20.8%) were defined as misleading, and 15 (15.6%) were assigned to the user experience category. Although significant differences were not observed among the interaction index and viewing rate variables ($p>0.05$), the scores for overall quality were higher for the videos in the useful group than for the videos in the other two groups ($p<0.001$). **Conclusion:** YouTube is a dynamic source of both useful and misleading information. Therefore, it is essential that dentists provide proper denture hygiene instructions to their patients during patient visits.

Keywords: denture hygiene, patient information, quality assessment, videos, YouTube.

INTRODUCTION

Dental prosthetic treatment is a personal treatment administered to meet a patient's individual oral health requirements. Dentures can be classified into categories such as removable dentures, implant-retained dentures, implant-supported fixed partial dentures, and tooth-supported dentures, and the success of dentures varies from one patient to another. Prosthetic treatment differs from other dental treatments in that after denture placement, another vital stage begins, where the dentures must be maintained, and this is managed by the patients themselves and depends on their denture-care knowledge. Therefore, placement cannot be defined as a final stage for prosthetic treatment.¹ Although various technical and clinical factors are important, the patient's denture care attitude is also an important factor to consider in terms of the longevity of dentures.² Indeed, the patient's communication with the dentist, attendance at appointments, and adherence to hygiene instructions affects the prognosis of dentures.³

Denture hygiene is important because ideal hygiene conditions can help decrease the incidence of pathogenic microorganisms. The association between denture stomatitis and poor denture hygiene habits has been reported in previous studies.^{4,5} It was reported that patients' oral hygiene attitudes are important in terms of preventing peri-implant diseases.⁶ In addition, hygiene is a prominent factor in the longevity of implant-supported dentures.

One of the reasons patients cannot provide adequate denture hygiene may be that they have not received adequate instructions regarding denture hygiene.⁷ A previous study reported that providing proper denture hygiene information was an essential responsibility of dental professionals.⁸

Recently, various denture cleaning products that provide mechanical and chemical cleaning have been introduced to facilitate a hygiene routine for patients with dentures.^{9,10} In the best-case scenario, dentists should provide sufficient information to patients about denture hygiene and establish an ideal hygiene routine with proper denture cleaning products based on the type of denture. However, elderly individuals with dentures can forget or become confused about denture hygiene instructions.¹¹ If patients are unable or hesitant to communicate with their dentists, they may seek information from other sources. In a previous study, it was concluded that patients investigated information sources about denture hygiene and care.¹²

The Internet stands out as a dynamic source of information that can be easily accessed by everyone. Topics related to health, especially, are frequently searched by Internet users. Approximately 70% of adults in the United States are estimated to research health information on the Internet, while around 46% of European adults searched health-related topics on the Internet.^{11,13} Searching on the Internet can have an impact on the health-related attitudes of individuals.¹⁴

Recently, YouTube videos have become popular as sources of information on the Internet. YouTube has been reported as the most visited website after Google and Facebook.¹⁵ Anyone can easily share and access videos on YouTube. However, assessing the scientific value of this gray literature is difficult. Individuals might be presented with misleading information or information lacking scientific validity. Previously, researchers have analyzed YouTube videos about various subjects, such as orthodontics, dental implants, removable dentures, oral hygiene for children, and the oral care of patients with diabetes and divided them into categories of useful and misleading information.¹⁶⁻²¹ Although studies have evaluated web-based health information on denture hygiene and YouTube videos on oral hygiene instruction, a scientific evaluation of patient focused YouTube videos presenting information regarding different denture type hygiene and care has not been performed.^{11,22} Therefore, this study aimed to evaluate the scientific quality of English-language YouTube videos on different denture type hygiene and care.

The first null hypothesis was that no differences would be found among the quality scores according to video uploader groups. The second null hypothesis was that no differences would be found among the quality scores according to scientific content groups.

METHODS

Ethics committee approval was not required for this study because publicly available videos were evaluated. YouTube videos that can be easily accessed by everyone were examined. The evaluation was performed by two prosthodontists between May 1st and May 17th, 2021. Disagreements were resolved by reassessment and discussion. A mixed method was used for selection and evaluation of the videos in the study. The selection of videos was performed with quantitative method while, the content of the videos was evaluated with qualitative methods. The keywords *denture hygiene*, *denture care*, *denture cleaning*, *dental prosthesis hygiene*, *dental prosthesis care*, *dental prosthesis cleaning*, *dental implant hygiene*, *dental implant care*, and *dental implant cleaning* were selected, and a YouTube search was performed. In total, 5,372 videos were found. The first 60 videos for every key word were included in the analysis. Videos that were not in English, did not provide information about self-performed denture hygiene, or were repetitive were excluded from the study. Educational videos prepared for caregivers and dentists were not included in the study.

A total of 96 videos were selected for further analysis. The date they were uploaded, their duration, and the number of likes, dislikes, and comments for each video were recorded. The interaction index (likes–dislikes / number of views × 100) and viewing rate (number of views × 100/number of days since upload) values of the videos were calculated. The uploaders of the videos were divided into different categories, including educational institutions, healthcare professionals/private dental clinics, denture hygiene product manufacturers, and individuals with dentures. The content of the videos was evaluated according to scientific information. The videos were classified as useful were those presenting scientifically based, helpful content. The videos that presented false or scientifically unproven information were classified as misleading. The videos in which prosthesis users shared their own experiences were classified as user experience videos. In addition, the global quality scale (GQS) and modified DISCERN instrument were used to assess the quality of the videos. The GQS score for each video was determined based on a defined degree of quality from 1 to 5, as shown in Table 1. The modified DISCERN instrument (MDI) includes five questions, shown in Table 1. For each question, a “yes” answer received one point and a “no” answer received 0 points. On this basis, a total MDI score was calculated for each video.

Table 1. Global Quality Scale (GQS) and Modified DISCERN Statement Scores

Global Quality Scale (GQS)	Modified DISCERN Instrument (MDI)
1. Poor quality; poor flow of the video; most information missing; not at all useful for patients. (GQS 1)	1. Are the aims clear and achieved? Yes (1), No(0)
2. Generally poor quality and poor flow; some information listed, but many important topics missing; of very limited use to patients. (GQS 2)	2. Are reliable sources of information used (i.e., publication cited, speaker is specialist in dentistry or dental hygieneist)? Yes (1), No(0)
3. Moderate quality; suboptimal flow; some important information adequately discussed, but other information poorlydiscussed; somewhat useful for patients. (GQS 3)	3. Is the information presented both balanced and unbiased? Yes (1), No(0)
4. Good quality and generally good flow; most of the relevant information listed, but some topics not covered; useful for patients. (GQS 4)	4. Are additional sources of information listed for patient reference? Yes (1), No(0)
5. Excellent quality and flow; very useful for patients. (GQS 5)	5. Are areas of uncertainty mentioned? Yes (1), No(0)

The normality distribution of variable of the videos was evaluated according to the Kolmogorov-Smirnov test, and it was observed that the data were not normally distributed ($p < 0.05$). A comparative analysis of variables according to video uploader groups and video classification groups was conducted using the Kruskal–Wallis test, and Dunn’s post hoc test was used for pairwise comparison.

RESULTS

In this study, a total of 96 videos on denture hygiene were reviewed. The mean duration of the analyzed videos was 4.43 ± 3.14 minutes. The distribution of the examined videos based on the types of dentures featured was as follows: 31 videos featured implant-supported fixed partial dentures (32.4%), 52 featured complete and removable partial dentures (54.2%), six featured implant retained removable dentures (6.3%), and seven featured two different types of dentures (7.3%) (Figure 1a). Sixty-one videos (63.6%) were classified as useful, 20 (20.8%) videos were classified as misleading, and 15 (15.6%) were classified as user experience videos (Figure 1b). The videos were also classified by the type of uploader as follows: six (6.3%) videos were uploaded by educational institutions, 57 (59.4%) videos were uploaded by healthcare professionals/private dental clinics, 13 (13.5%) videos were uploaded by denture product hygiene companies as advertisements for their product, and 20 (20.8%) videos were uploaded by individuals with dentures (Figure 1c).

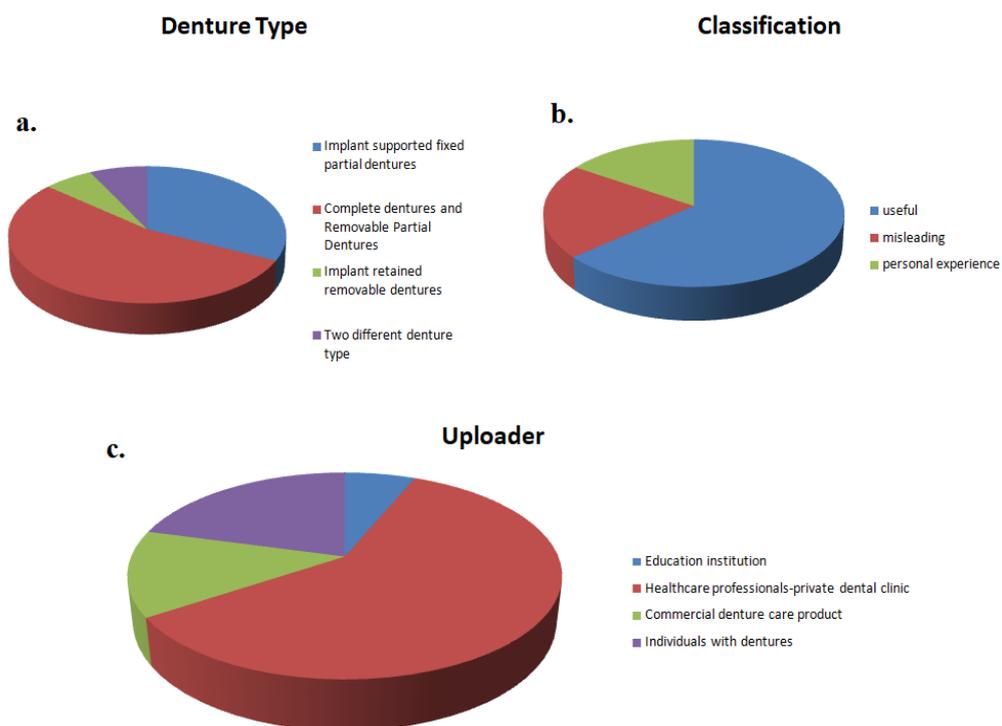


Figure 1. a. Distribution of videos according to the types of dentures. b. Distribution of videos according to scientific classification. c. Distribution of videos according to uploader.

The year the videos were uploaded was also noted. The videos were uploaded between 2008 and 2021, with most videos being uploaded in 2020. Although the number of videos uploaded in the each year between 2008 and 2021 fluctuated, more videos were uploaded in recent years (Figure 2). The countries the videos were uploaded was recorded. 75 (78.1%) videos were uploaded from United States, 9 (9.4%) videos were uploaded from England, 6 (6.3%) videos were uploaded from unknown location, 3 (3.1%) videos were uploaded from Spain, 2 (2.1%) videos were uploaded from Australia, and 1 (1%) video was uploaded from Mexico.

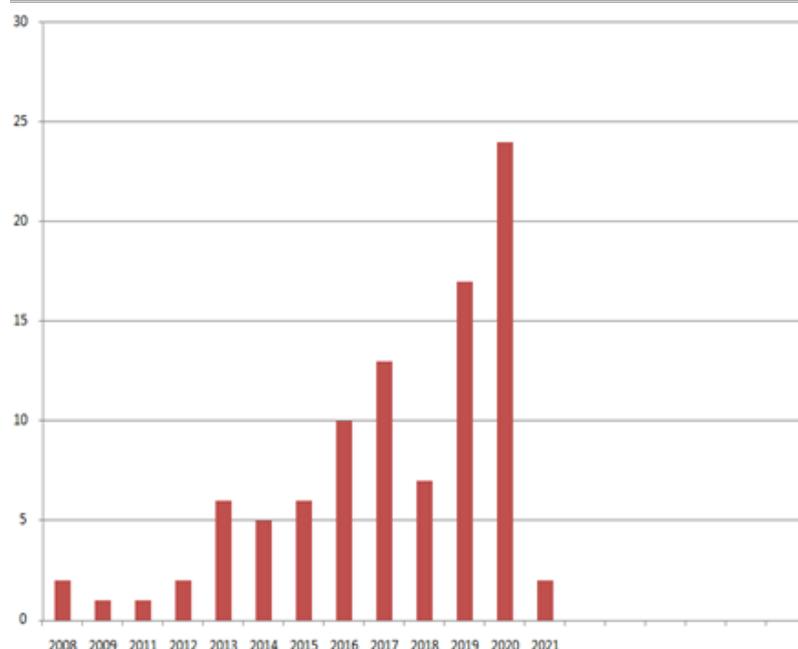


Figure 2. The Number of Uploaded Videos According to Years

The interaction index and the viewing rates of the selected videos were calculated. The interaction index values of the videos examined in the study varied between 0 and 7.32, while the viewing rates of the videos varied between 1.11 and 39.809.80.

The mean and standard deviations of the variables of the videos evaluated in the study according to the groups are shown in Table 2. Denture hygiene instructions were presented to the audience by different means, such as verbal narration and demonstration of the application. The quality of the content/scientific validity of the videos was evaluated with the GQS and MDI scores.

Comparisons among video uploader groups were made in terms of number of likes, dislikes, and comments as well as the interaction index, viewing rate, and GQS and MDI scores (Table 3). The number of likes, dislikes, and comments were significantly higher for videos in the "individual with denture" group than for the videos in the other uploader groups ($p < 0.001$). There were no significant differences in the interaction indexes of all the uploader groups ($p > 0.05$), but the viewing rate for the "individual with denture group" was significantly higher than that of other uploader groups ($p < 0.001$).

Comparing the GQS scores of the uploader groups, no significant difference was found between the videos in the "individual with denture" group and those in the "denture hygiene product commercial" group ($p > 0.05$). The GQS scores of the videos in the "healthcare professional/private dental clinic" group were significantly higher from those of the videos in the "individual with denture" group and the "prosthetic hygiene product commercial" groups ($p < 0.001$). There were no significant differences between the GQS scores for the videos in the "healthcare professional/private dental clinic" group and the scores of the videos in the "educational institution" group ($p > 0.05$).

Considering the MDI scores of the uploader groups, there were no significant differences in the scores of the videos in the "educational institutions" group and the videos in the "healthcare professional/private clinic" group. However, the scores of the videos in the "healthcare professional/private clinic" group were significantly different from those of the videos in the "individual with denture" group and the "prosthetic hygiene product commercial" group ($p < 0.001$). There were no significant differences between the MDI scores of the videos in the "individual with denture" group and those in the "denture hygiene product commercial" group ($p > 0.05$).

Comparisons were made of the number of likes, dislikes, and comments as well as the interaction index, viewing rate, GQS, and MDI scores of the different video classification groups (Table 4). There were no significant differences among the classification groups for likes, dislikes, comments, interaction index, and viewing rate variables ($p > 0.05$). For the comment variable, there were no significant differences between the videos classified as misleading and those classified as useful. Contrary to the foregoing, significant differences were found between the videos classified as useful and those classified as user experience videos ($p < 0.001$). The GQS and MDI scores of the classification groups presented significant differences ($p < 0.001$). Both GQS and MDI scores were significantly higher for the useful group than for the misleading and user experience groups ($p < 0.001$). However, there were no significant differences between the GQS and MDI scores of the videos classified as misleading and those classified as user experience videos ($p > 0.05$).

Table 2. Mean and Standart Deviations of Variables According to the Groups

		Likes	Dislikes	Comments	Interaction index	Viewing Rate	GQS	MDI Score
Uploader Groups	Education Instution	71.16±63.36	5.33±5.33	1.66±1.11	0.26±0.09	1586.91±41.81	3.16±1.32	2.33±1.96
	Healthcare professionals/ Private Clinic	80.45±25.03	7.12±2.32	4.82±1.42	0.88±0.19	1113.24±210.05	3.21±0.14	2.87±1.19
	Prosthetic hygiene Product commercial	17.30±8.16	1.30±0.75	0.84±0.84	0.58±0.21	330.92±155.49	2.15±0.89	1.61±0.96
	Individuals with denture	536.80±247.31	49.15±21.91	138±69.82	1.12±0.25	4513.48±2032.6	2±0.64	1.3±0.8
Classification Groups	Useful	90.27±24.92	8.19±2.53	5.52±1.79	0.85±1.37	1308.33±245.39	3.36±0.93	3 ±1.11
	Misleading	84.30±25.80	12±5.3	16.95±6.22	0.69±0.82	855.48±215.11	1.60±0.59	1.10±0.85
	User Experience	585.4±332.6	46.53±29.14	158.66±93.35	1.07±1.29	4708.6±2726.5	2.2±0.67	1.33±0.72

Table 3. Median (Minimum- Maximum) Kruskal-Wallis Test and Dunn's Post Hoc Test

	Education Institutions	Healthcare professionals/ Private Clinic	Prosthetic Hygiene Product Commercial	Individuals with Denture	p-value
Likes	4 (0-387) ^a	23(0-1301) ^a	4(0-106) ^a	175(0-3797) ^b	<0.001
Dislikes	0(0-32) ^a	2(0-123) ^a	0(0-10) ^a	12(0-422) ^b	0.001
Comments	0.5(0-7) ^a	1(0-69) ^a	0(0-11) ^a	25(0-1226) ^b	<0.001
Interaction index	0.29 (0- 0.55)	0.448 (0-7.32)	0.331(0-2.88)	0.546 (0-4.10)	0.189
Viewing Rate	41.81 (1.11-7181.57) ^a	440.45 (4.36-6825.70) ^a	128.30(9.77-2064.50) ^a	1992.68 (284.28-39809.80) ^b	<0.001
GQS	3 (2-5) ^{ab}	3 (1-5) ^a	2(1-4) ^b	2(1-3) ^b	<0.001
MDI Score	2(0-5) ^{ab}	3(0-5) ^a	1(0-3) ^b	1(0-3) ^b	<0.001

Different letters (a,b) indicate values that are significantly differences (p<0.05).

Table 4: Median (Minimum- Maximum) Kruskal-Wallis Test and Dunn's Post Hoc Test

	Useful	Misleading	User Experience	p-value
Likes	23(0-1301)	43(0-404)	47(0-3797)	0.440
Dislikes	1(0-123)	2.5 (0-105)	4(0-422)	0.524
Comments	1(0-76) ^a	6.5 (0-103) ^{ab}	11(0-1226) ^b	0.03
Interaction index	0.44 (0-7.32)	0.47 (0-2.76)	0.43 (0-4.10)	0.957
Viewing Rate	487.61 (1.11- 7360.68)	341.41 (23.2-3187.54)	986.42 (4.36-39809.80)	0.56
GQS	3 (2-5) ^a	2 (1-3) ^b	2(1-3) ^b	<0.001
MDI	3(0-5) ^a	1(0-3) ^b	1(0-3) ^b	<0.001

DISCUSSION

The null hypotheses of the study were rejected because the GQS and MDI scores were significantly different according to video uploader groups and scientific content groups.

In this study, two researchers evaluated the quality of YouTube videos that present information on denture hygiene and care. The researchers considered and analyzed the first 60 videos for each searched term. This search strategy was determined based on previous studies that have shown that 90% of users searching on YouTube generally consider the first 60 videos and skip videos after the 60th video.²²⁻²⁵ This search was intended to be performed from a denture patient's point of view.

In the study, the type of dentures featured in the videos was taken into consideration. The number of videos on the hygiene and care of conventional, complete, and removable partial dentures was higher than the number of videos featuring other types of other dentures. The second most frequent denture type featured in the selected videos was implant-supported fixed dentures. The hygiene of implant-supported fixed dentures is crucial to maintain the longevity of the dentures. Therefore, the patient's knowledge of hygiene should be sufficient to prevent plaque accumulation around these dentures.²⁵ Peri-implant diseases are major problems that are characterized by inflammation of peri-implant tissues. Inadequate oral hygiene has been reported as a common reason for peri-implant diseases.²⁶ However, no consensus has been reached on oral hygiene guidelines for implant-supported/retained dentures, and oral hygiene procedures for implant-supported/retained dentures have been rarely researched.^{6,27} Therefore, self-care hygiene protocols for implant-supported dentures can be based on information about preventing plaque in natural teeth.²⁸ The content of the selected videos was evaluated according to the guidelines for comprehensive denture care established by the American College of Prosthodontist and on scientific information provided by previous research on chemical and mechanical hygiene procedures.^{3,28,29}

Patients need be aware of the structural differences between natural teeth and implant-supported dentures. In particular, interdental brushes and subgingival irrigators can be more effective in removing plaque from the proximal surfaces of implant-supported dentures than using only dental floss.³⁰ Generally, the videos uploaded by dental professionals or educational institutions presented useful information regarding mechanical and chemical hygiene for implant-retained dentures.

Some of the selected videos were prepared to present information about the cleaning of two different types of dentures. These videos might be helpful for viewers as they provide a comparison, but they might also be confusing as they may not provide precise answers to the viewers' questions.

The videos were classified as useful, misleading, or user experience video based on their content. Since hygiene protocols vary according to the type of dentures, two evaluation scales were used in the study. The scores obtained from the GQS and MDI scales have been used for evaluation of YouTube videos related to health in previous scientific studies.^{20,31,32} Although the GQS and MDI scores of the videos classified as useful were significantly higher than the scores of the videos in the other groups, the likes, dislikes, comments, interaction index, and viewing rate variables of the useful videos were no higher than those of the other groups. Thus, the concerns of the audience were not compatible with the scientific classification of the videos. This finding agrees with that of a previous study that searched the quality of YouTube videos related to oral hygiene instructions.²²

Useful videos present to viewers scientific information on denture hygiene, and these videos can be reliable sources of information. Although the number of useful videos was higher than the number of misleading and user experience videos, the number of useful videos assigned 5 points was low. Therefore, patients need to watch more than one useful video to access complete and accurate denture cleaning instructions. However, watching useful videos cannot replace denture maintenance appointments and dentists' demonstration to patients in person on how to clean their dentures efficiently.³ Moreover, misleading and user experience videos might present little or no scientific information, which could result in patients carrying out harmful denture hygiene procedures.

In a misleading video, viewers were advised to break a denture cleanser tablet in their mouth to rapidly clean the entire denture. On the contrary, according to the manufacturer's instructions, denture cleanser tablets should be applied to dentures in a container outside the mouth. Swallowing or drinking cleanser tablets can be harmful to the digestive and respiratory systems and to the oral tissues of patients.^{33,34} Another misleading video recommended soaking dentures overnight in a mixture of vinegar and carbonate. The effect of this combination on the surface and mechanical features of denture material has not been researched. Other confusing information provided by one of the videos regards the use of sodium hypochlorite. Although the effects of sodium hypochlorite on microorganisms have been researched in previous studies, exposure time and the proper cleaning of chemical remnants from denture surfaces are important factors in preventing damage to the denture and oral tissues.³⁵⁻³⁸ Generally, such instructions were presented in videos uploaded by individuals with dentures. The number of comments by viewers on user experience videos was significantly higher than the number of comments on videos uploaded by other groups. The high interest of viewers can be explained by the fact that these videos do not employ elevated or

academic language and that viewers might have felt that “only the wearer knows where the shoe pinches.” However, the information provided by individuals with dentures can be confusing and misleading for patients who have not been appropriately instructed on denture care by a dentist. In addition, the use of these chemical products should be advised by the dentist based on denture materials and the oral health condition of individual patients. Also, there is no scientific information on the videos that takes into consideration particular denture types such as precious attachments and different denture materials such as CAD/CAM–based acrylic materials.

Limitations

This study aimed to present a current view of denture hygiene as presented by YouTube videos. The study has some limitations. First, the Internet search included only English videos uploaded to YouTube; in fact, many videos in other languages are available on YouTube, and these were not evaluated. Second, other video sources such as Vimeo and Dailymotion were not searched. Thirdly, this study evaluated videos that were available in May 2021, whereas YouTube is a dynamic video source onto which new videos are uploaded everyday.

CONCLUSION

The Internet is a tremendous source of information on a great variety of subjects, including health, and individuals will continue to use the Internet to find answers to their questions. Since anyone can upload videos easily on this platform, and new videos are being uploaded every day, oversight of their content is impossible. Patients who have lost their teeth need to be able to provide adequate oral hygiene as well as hygiene for the dentures that replace their missing teeth. This responsibility might lead them to search videos on YouTube. However, patients should receive detailed instructions regarding the care of their dentures from their dentists. In our study, the number of videos that provided useful information was high among the videos reviewed, but there was also great interest among viewers in videos that featured user experience. Dentists should be aware that both useful and misleading information can be found on YouTube, and they should properly instruct their patients on denture hygiene. Thus, patients will be more critical when they search the Internet for information on denture hygiene.

1. REFERENCES

1. Namrata M, Ganapathy D. Awareness about denture hygiene: A survey among patients wearing complete dentures and removable partial dentures. *Int J Orofac Biol.* 2017;1:59-65.
2. Nirale RM, Thombre R, Kubasad G. Comparative evaluation of sodium hypochlorite and microwave disinfection on dimensional stability of denture bases. *J Adv Prosthodont.* 2012;4:24-29.
3. Felton D, Cooper L, Duqum I, Minsley G, Guckes A, Haug S, Meredith P, Solie C, Avery D, Deal Chandler N; American College of Prosthodontists. Evidence based guidelines for the care and maintenance of complete dentures: a publication of the American College of Prosthodontists. *J Prosthodont.* 2011;20:1-12.
4. Dikbas I, Koksal T, Calikkocaoglu S. Investigation of the cleanliness of dentures in a university hospital. *Int J Prosthodont.* 2006;19:294-298.
5. Sadig W. The denture hygiene, denture stomatitis and role of dental hygienist. *Int J Dent Hyg.* 2010;8:227-231.
6. Cheung MC, Hopcraft MS, Darby IB Patient-reported oral hygiene and implant outcomes in general dental practice. *Aust Dent J.* 2021;66:49-60.
7. Peracini A, de Andrade IM, Paranhos Hde F, da Silva CH, de Souza RF. Behaviors and hygiene habits of complete denture wearers. *Braz Dent J.* 2010;21:247-252.
8. Kulak-Ozkan Y, Kazazoglu Y, Arikan A. Oral hygiene habits, denture cleanliness, presence of yeast and stomatitis in elderly people. *J Oral Rehabil.* 2002;29:300-304.
8. Baba Y, Sato Y, Owada G, Minakuchi S. Effectiveness of a combination denture-cleaning method versus a mechanical method: comparison of denture cleanliness, patient satisfaction, and oral health-related quality of life. *J Prosthodont Res.* 2018;62:353-358.
9. Bianchi S, Fantozzi G, Bernardi S, Antonouli S, Continenza MA, Macchiarelli G. Commercial oral hygiene products and implant collar surfaces: Scanning electron microscopy observations. *Can J Dent Hyg.* 2020;54:26-31.
10. Alhadj MN, Mashyakhly M, Ariffin Z, Ab-Ghani Z, Johari Y, Salim NS. Quality and readability of web-based Arabic health information on denture hygiene: An infodemiology study. *J Contemp Dent Pract.* 2020;21:956-960.
11. Chestnutt IG, Reynolds K. Perceptions of how the internet has impacted on dentistry. *Br Dent J.* 2006;200:161-165.
12. Andreassen HK, Bujnowska-Fedak MM, Chronaki CE, Dumitru RC, Pudule I, Santana S, et al. European citizens' use of E-health services: a study of seven countries. *BMC Public Health.* 2007;53:1-7.
13. Yigzaw KY, Wynn R, Marco-Ruiz L, et al. The Association Between Health Information Seeking on the Internet and Physician Visits (The Seventh Tromsø Study - Part 4): Population-Based Questionnaire Study. *J Med Internet Res.* 2020;22:1-18.
14. Bezner SK, Hodgman EI, Diesen DL, Clayton JT, Minkes RK, Langer JC, Chen LE. Pediatric surgery on YouTube TM: is the truth out there? *J Pediatr Surg.* 2014;49:586-589.
15. Kiliç DD, Sayar G. Assessment of reliability of YouTube videos on orthodontics. *Turk J Orthod.* 2019;32:145-150.

16. Menziletoglu D, Guler AY, Isik BK. Are YouTube videos related to dental implant useful for patient education? *J Stomatol Oral Maxillofac Surg.* 2020;121:661-664.
17. Yagci F. Evaluation of YouTube as an information source for denture care [published online ahead of print, 2021 Aug 3]. *J Prosthet Dent.* 2021;S0022-3913(21)00364-4.
18. Duman C. YouTube™ quality as a source for parent education about the oral hygiene of children. *Int J Dent Hyg.* 2020;18:261-267.
19. Pons-Fuster E, Ruiz Roca J, Tvarijonavičiute A, López-Jornet P. YouTube information about diabetes and oral healthcare. *Odontology.* 2020;108:84-90.
20. Abukaraky A, Hamdan AA, Ameer MN, Nasief M, Hassona Y. Quality of YouTube TM videos on dental implants. *Med Oral Patol Oral Cir Bucal.* 2018;23:463-468.
21. Smyth RSD, Amlani M, Fulton A, Sharif MO. The availability and characteristics of patient-focused YouTube videos related to oral hygiene instruction. *Br Dent J.* 2020; 228:773-781.
22. Desai T, Shariff A, Dhingra V, Minhas D, Eure M, Kats M. Is contentreal lyking? An objective analysis of the public's response to medical videos on YouTube. *PLoS One.* 2013;8:1-6.
23. Strychowsky JE, Nayan S, Farrokhyar F, MacLean J. YouTube: a good source of information on pediatric tonsillectomy? *Int J Pediatr Otorhinolaryngol.* 2013;77:972-975.
24. Kim HY, Shin SW, Lee JY. Standardizing the evaluation criteria on treatment outcomes of mandibular implant overdentures: a systematic review. *J Adv Prosthodont.* 2014;6:325-332.
25. Vandekerckhove B, Quirynen M, Warren PR, Strate J, van Steenberghe D. The safety and efficacy of a powered tooth brush on soft tissues in patients with implant-supported fixed prostheses. *Clin Oral Investig.* 2004;8:206-210.
26. Riben-Grundstrom C, Norderyd O, André U, Renvert S. Treatment of peri-implant mucositis using a glycine powder air-polishing or ultrasonic device: a randomized clinical trial. *J Clin Periodontol.* 2015;42:462-469.
27. Louropoulou A, Slot DE, Van der Weijden F. Mechanical self-performed oral hygiene of implant supported restorations: a systematic review. *J Evid Based Dent Pract.* 2014;14:60-69.
28. Felice P, Bertacci A, Bonifazi L, Karaban M, Canullo L, Pistilli R, Sammartino P, Gasparro R, Barausse C. A proposed protocol for ordinary and extraordinary hygienic maintenance in different implant prosthetic scenarios. *Appl Sci.* 2021;11:1-9.
29. Geisinger ML, Ogdon D, Kaur M, Valiquette G, Geurs NC, Reddy MS. Toss the floss? Evidence-based oral hygiene recommendations for the periodontal patient in the age of "Flossgate". *Clin Adv Periodontics.* 2019;9:83-90.
30. Işık G, Özden Yüce M. Are YouTube Videos in Turkish Useful as an Information Source for Dental Treatment During the COVID-19 Pandemic? *Internet Journal of Allied Health Sciences and Practice,* 2021 Jan01;19(2),Article 18.
31. Goyal R, Mercado AE, Ring D, Crijns TJ. Most YouTube Videos about carpal tunnel syndrome have the potential to reinforce misconceptions. [published online ahead of print, 2021 Apr 11]. *Clin Orthop Relat Res.* 2021;10.1097/CORR.0000000000001773. doi:10.1097/CORR.0000000000001773.
32. Ochi N, Yamane H, Honda Y, Takigawa N. Accidental aspiration of denture cleanser tablets caused severe mucosal edema in upper airway. *Clin Respir J.* 2018;12:291-294.
33. Laidlaw S. Accidental ingestion of Steradent tablets in a patient with cognitive impairment. *Scot Med J.* 2007;52:53.
34. de Sousa Porta SR, de Lucena-Ferreira SC, da Silva WJ, Del Bel Cury AA. Evaluation of sodium hypochlorite as a denture cleanser: a clinical study. *Gerodontology.* 2015;32:260-266.
35. Salles MM, Oliveira Vde C, Souza RF, Silva CH, Paranhos Hde F. Antimicrobial action of sodium hypochlorite and castor oil solutions for denture cleaning - in vitro evaluation. *Braz Oral Res.* 2015;29:1-6.
36. Kurt A, Erköse-Genc G, Uzun M, Sari T, Isik-Ozkol G. The effect of cleaning solutions on a denture base material: elimination of candida albicans and alteration of physical properties. *J Prosthodont.* 2018;27:577-583.
37. Procópio ALF, Da Silva RA, Maciel JG, Sugio CYC, Soares S, Urban VM, Neppelenbroek KH. Antimicrobial and cytotoxic effects of denture base acrylic resin impregnated with cleaning agents after long-term immersion. *Toxicol In Vitro.* 2018;52:8-13.