

# Are Informations of Subperiosteal Implant Procedure on YouTube Really Useful?

## SUMMARY

**Background/Aim:** Subperiosteal implant is a type of implant preferred in oral implantology in cases with severe bone deficiency where intraosseous implant application cannot be performed. We evaluated the accuracy of the information by examining YouTube videos containing information on this subject. **Material and Methods:** In the YouTube video search conducted with the keywords 'Subperiosteal dental implant', the first 200 videos were watched and evaluated. 118 videos that didn't meet the analysis criteria were excluded from evaluation and the remaining 82 videos were analyzed. The usefulness scores of all analyzed videos were determined as 'poor', 'moderate' and 'excellent' according to their information content. For statistical analysis, the Kruskal Wallis and Phi tests were used and the significance coefficient was determined as  $p < 0.05$ . **Results:** According to the information content of the videos, the usefulness scores were numbered as poor(0), moderate(1), excellent(2) and the average was found to be 0.51. When the usefulness scores of the videos and their demographic information were compared, it was found that there was a significant difference between the video duration ( $p=0.002$ ), the number of views ( $p=0.006$ ) and the number of likes ( $p=0.003$ ). There is a significant difference between the viewing rate of the videos ( $p=0.044$ ) according to their usefulness scores. It can be stated that video types differ depending on the target audience ( $p=0.003$ ). **Conclusions:** Among the YouTube videos examined, those uploaded by health professionals and health companies have a high educational quality and a high viewing rate. However, the number of such videos aimed at informing patients should be increased. **Key words:** Dental implant, subperiosteal implant, dental prosthesis, social media

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## Introduction

Dental implants are frequently used for oral rehabilitation in cases of partial or complete edentulism. A very comfortable treatment is provided, especially by eliminating the dissatisfaction of edentulous patients due to reasons such as retention and lack of stabilization in their total dentures, with dental implant-supported fixed dentures. However, some hindering factors may be encountered during most endosseous dental implant rehabilitation<sup>1</sup>. Subperiosteal implants are preferred when it is not possible to place a standard size endosseous

implant in severely atrophic jaws, partial or total edentulism, or in the presence of restrictive factors such as failure of endosseous implants or inability to perform augmentation procedures<sup>2</sup>.

Subperiosteal implants, which began to be used in the 1940s, consist of parts above and below the soft tissue. The substructure is the part above the bone that is responsible for the support of the prosthesis. This place can also be called a frame. Abutments emerge from the mucosa and serve as denture retainers<sup>3</sup>. The subperiosteal implantation process has been rethought over the years and changes have been made in the method. The design

of the new generation subperiosteal implant is made of titanium using personalized and 3D production techniques, on the bone model obtained from the patient's CBCT images in a virtual environment<sup>4</sup>.

Healthcare professionals and organizations have a responsibility to provide health-related information to patients. Looking at recent years, the use of the Internet for the purpose of obtaining medical and dental information has become very popular today, due to reasons such as the Internet's great place in our lives, ease of access, patients' preferences in obtaining information, and reduced costs compared to professional health consultancy. In addition to obtaining information, the internet is frequently used by patients to diagnose and treat their diseases<sup>5</sup>.

YouTube was founded in 2005 for free video sharing and is the 2nd most popular website of recent years, after the website called Google<sup>6</sup>. YouTube videos are used by many healthcare branches for patient education and health promotion<sup>7,8</sup>.

Since YouTube videos are often not objectively evaluated, viewers may encounter inaccurate or misleading information. Our aim in this study is to evaluate the accuracy and quality of the information in YouTube videos about the subperiosteal implant procedure, which is frequently preferred today.

## Material and Methods

### Reviewing YouTube™ videos

The keywords 'subperiosteal implant' were typed into the search button and YouTube videos were examined on March 27, 2024. It has been found that YouTube™ users review the first 60 to 200 videos, but the majority of users typically only browse the first 30 videos<sup>9</sup>. In this study, the first 200 videos after the scanning were watched and analyzed.

### Selection of the videos

In the analysis of the watched videos, videos and advertisements that were not in English, did not contain sound or titles, were repetitive, and had irrelevant content were not included in the evaluation (Figure 1).

### Analysis of videos

The number of views of each analyzed video, total video duration, number of comments made on the video, number of likes and dislikes, upload date, target audience and country of origin were recorded. Viewers' interaction was calculated according to the formulas interaction index ( $[\text{number of likes} - \text{number of dislikes}] / \text{total number of views} \times 100\%$ ) and viewing rate ( $\text{number of views} / \text{number of days after upload} \times 100\%$ )<sup>10</sup>.

Each video was classified as healthcare professional, healthcare company, information website, and individual user according to the upload source, and video types were also categorized as educational and patient experience. In the target audience category, the videos were evaluated in 3 different areas: for dentists, for patients, and for both dentists and patients. In addition, the video content was evaluated in terms of whether it included definition, indications, contraindications, advantages, surgical procedure content<sup>11-14</sup>, prosthetic procedure content, complications, prognosis-survival and cost indicators. Each content indicator was scored as 1 point and the total score was calculated out of 9. Videos with 0-2 points were evaluated as inadequate according to the usefulness score, videos with 3-5 points were evaluated as average according to the usefulness score, and videos with 6-9 points were evaluated as excellent according to the usefulness score. The usefulness score of all analyzed videos was determined in line with these markers; It was recorded as inadequate, average and excellent. Insufficient usefulness score; It was evaluated as "insufficient quality and the level of educational quality is low due to the fact that although some information is listed in the videos in the stream, most of the information is missing." Medium usefulness score; It was evaluated as "The educational level is at a medium level, as some important issues are discussed in the medium quality and streaming videos, while others are inadequately touched upon." The excellent usefulness score was evaluated as "Excellent quality and streaming videos contain sufficient and accurate information, thus their educational quality is at a high level"<sup>9</sup>.

### Statistical analysis

Descriptive statistics were used to describe continuous variables (mean (Mean), standard deviation (SD), minimum (Min.), median (Med.), maximum (Max)). Frequency (N) and percentage (%) values were used to define categorical variables. Comparison of continuous variables belonging to more than two groups that did not comply with normal distribution was made with the Kruskal Wallis test. Multiple comparison analysis for variables found to be significant was performed with the Mann-Whitney U test. Chi-Square Phi test statistics were used to examine the relationship between categorical variables. The statistical significance level was determined as 0.05. Statistical analyzes were performed in IBM SPSS Statistical Software (version 29; IBM, Armonk, NY).

## Results

The first 200 videos were evaluated for suitability according to the determined analysis criteria. 118 of these videos were not included in the analysis group

because they were outside the eligibility criteria (Figure 1). The remaining 82 videos were analyzed and classified according to their upload source. 51.2% (n=42) of these videos were posted by healthcare professionals (dentists, oral surgeons, prosthetists, prosthesis technicians, etc.),

and 48.8% (n=40) were uploaded by healthcare companies and information websites (dental clinics, dental uploaded by implant companies etc.). Additionally, according to the types of videos; 2.4% (n=2) were classified as patient experience and 97.6% (n=80) as educational videos.

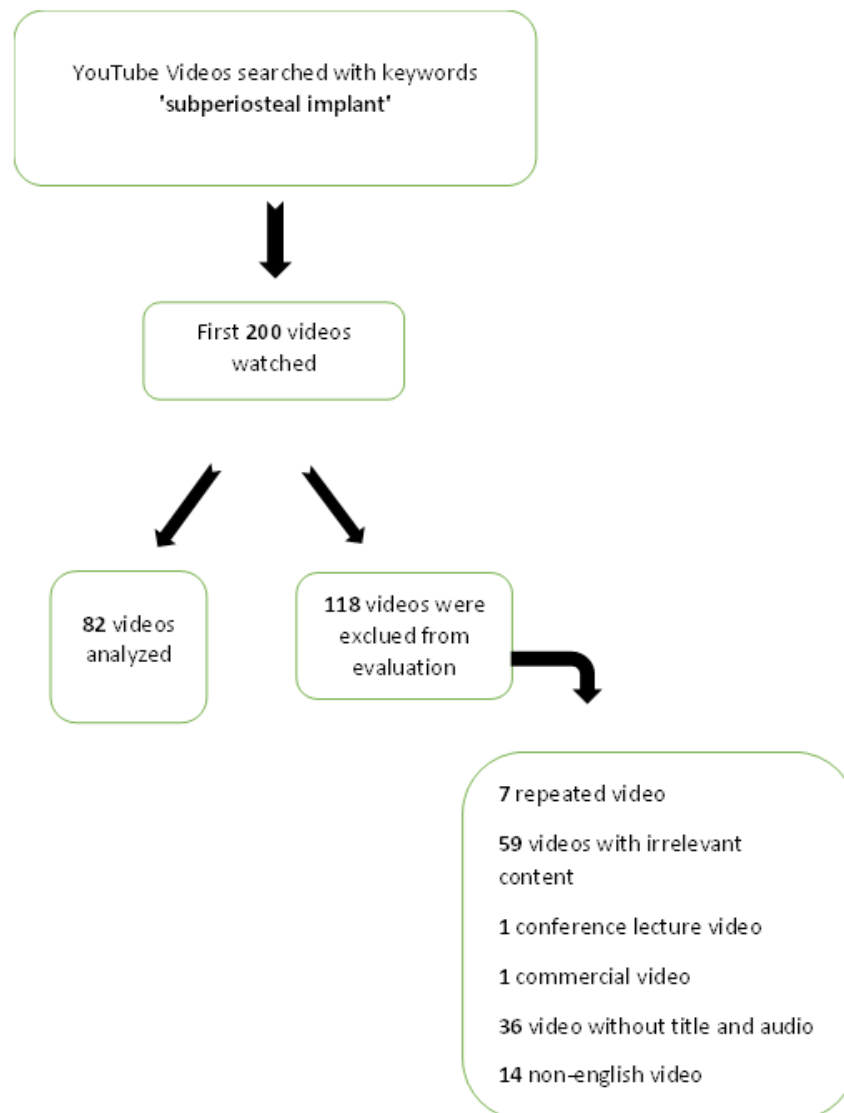


Figure 1. Selection of YouTube videos for analysis

The average duration of the videos is 11 minutes 59 seconds (minimum duration is 15 seconds, maximum duration is 77 minutes 39 seconds) and average number of views is 2534.85 (minimum number of views is 10, maximum number of views is 32663). The interaction of the audience is generally positive according to the average interaction index of 0.51 (minimum 0.00, maximum 2).

24.4% of the videos in the study were from India (n=20), 12.2% (n=10) from the United States, 7.3% (n=6) from Australia, 7.3% (n=6) from Portugal, 4.9% from 1 (n=4) originates from Italy, 2.4% (n=2) from Spain, 2.4% (n=2) from Switzerland, 2.4% (n=2) from Turkey, and 36.6% (n=30) country of origin is unclear.

Those evaluated as inadequate in the usefulness score were coded with the number '0', those evaluated as average with the number '1' and those evaluated as excellent with the number '2', and the average of these codes was found to be '0.51' according to the content indicators of the videos. Content indicators of analyzed videos; definition 19.8% (n=22), indications 17.1% (n=19), contraindications 1.8% (n=2), advantages 9.9% (n=11), surgical procedure content 27% (n=30), prosthetic procedure content It was calculated as 19.8% (n=22), complications as 1% (n=1), prognosis-survival as 3.6% (n=4) and cost as 0% (n=0) (Figure 2).

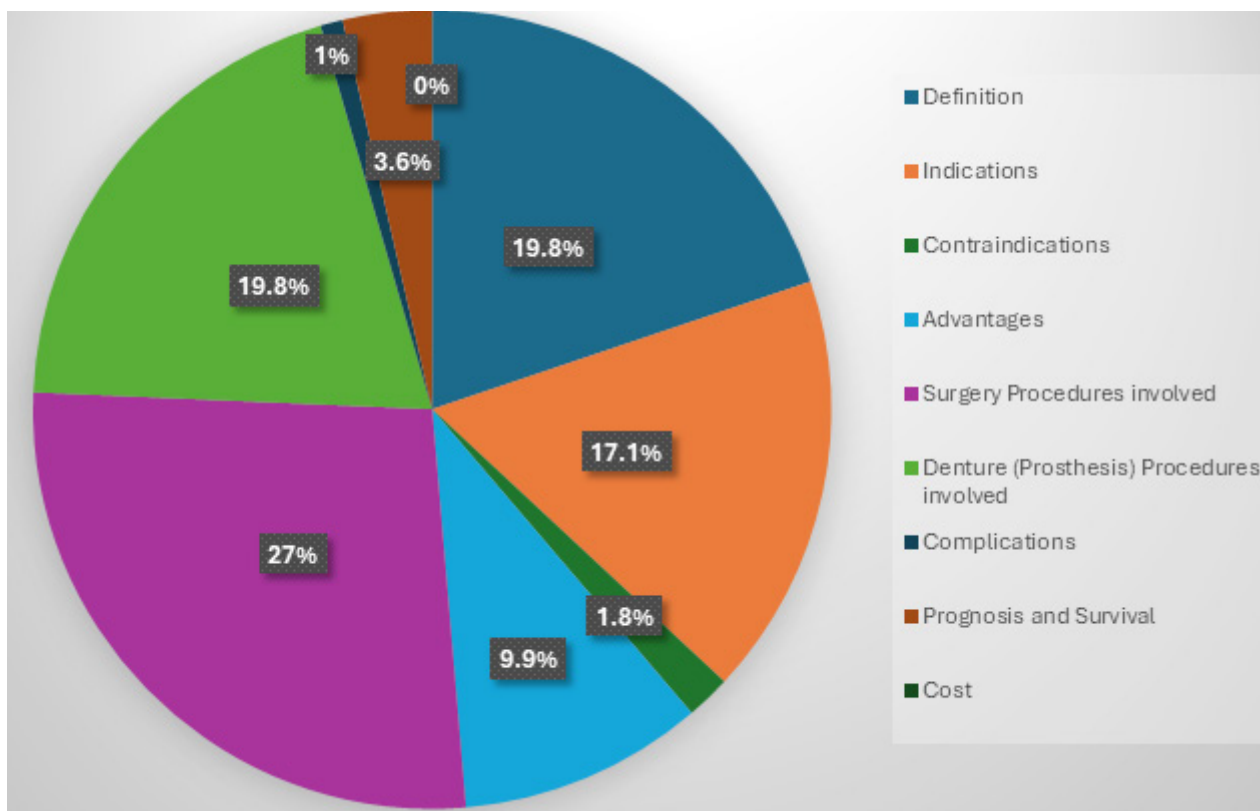


Figure 2. The ratio of markers contained in the analyzed videos

When the distribution of the demographic characteristics of the videos (video duration, number of views, number of likes, number of dislikes, number of comments) according to the usefulness scores of the analyzed videos are examined, the number of views ( $p = 0.006$ ), video duration ( $p < 0.001$ ) and likes according to the usefulness scores. It can be said that the distributions of the number of videos ( $p = 0.03$ ) are not at the same level (Kruskal Wallis Test), and the distributions of other demographic characteristics do not differ according

to the levels of video usefulness scores. According to these relationships, the number of views of poor usefulness videos was significantly higher than moderate and excellent usefulness videos. It was observed that excellent and moderate videos took significantly longer than poor videos. Additionally, Excellent usefulness videos received significantly more likes than other videos. There is no statistical relationship between the effect rate and other variables (Table 1).

Table 1. Comparison of videos' usefulness score and average demographic information

Mean+SD Med. (Min.-Max.)	Poor (n=48)	Moderate (n=26)	Excellent (n=8)	p- value
<b>Video Duration</b>	00:04:56±04:57:49 02:35:00 (00:00:15-00:16:13)	00:17:05±00:20:32 00:11:04 (00:01:25-01:15:41)	00:37:46±00:29:31 00:31:25 (00:10:34-01:17:39)	0.001*
<b>Number of Views</b>	3224,04±8652,023 404,5 (10-32663)	1297,31±1393,937 664,0 (42-4293)	2421,75±1353,342 2206,5 (956-4318)	0.006*
<b>Number of Likes</b>	49,92±133,92 4,0 (0-522)	20,69±23,153 6,0 (2-69)	33,75±21,678 34,5 (12-54)	0.003*
<b>Number of Dislikes</b>	1,29±4,016 0,0 (0-17)	0,0±0,0 0 (0-0)	0,0±0,0 0,0 (0-0)	0.104
<b>Number of Comments</b>	1,33±2,853 0,0 (0-11)	3,46±7,966 0 (0-29)	1,25±2,315 0,5 (0-4)	0.725

Kruskal Wallis Test \* $p < 0.05$

According to the usefulness scores of the videos, the interaction index (Kruskal Wallis  $p=0.276$ ) and upload source (Pearson Chi-Square  $p=0.097$ ) distributions were at the same level; It can be said that they show similar distribution in poor, moderate and excellent levels of usefulness.

There is a significant difference between the viewing rate of the videos according to their usefulness scores (Kruskal Wallis  $p=0.044$ ). Accordingly, excellent usefull videos have a higher viewing rate (Table 2).

It can be said that viewing rates (Kruskal Wallis  $p=0.373$ ) and interaction index distribution (Mann Whitney  $p=0.299$ ) are at the same level according to upload sources.

It can be stated that video types differ depending on the target audience (Phi  $p<0.003$ ). While 65% of the educational videos are videos only for dentists, 12.5% are videos only for patients, and 22.5% are videos for both dentists and patients (Table 3).

Table 2. Comparison of the relationships between usefulness scores and viewing rate

	Poor (n=48) Mean+SD	Moderate (n=26) Mean+SD	Excellent (n=8) Mean+SD	p-value
	Med. (Min.-Max.)	Med. (Min.-Max.)	Med. (Min.-Max.)	
Viewing Rate	342,58±930,43 34,776 (0,33-4165,33)	201,28±347,50 99,48 (6,96-1325,0)	437,24±553,74 154,23 (107,78-1332,72)	0.044*

Kruskal Wallis Test \* $p < 0.05$

Table 3. Comparison of relationships between video types and target audience

Type of Video	Patient Experience	For dentists (n=52)	For patients (n=12)	For both dentists and patients (n=18)	Chi-Square Test Statistics Value	p-value
		N (%)	N (%)	N (%)		
	Educational	52 (65)	10 (12,5)	18 (22,5)	11,958	0,003*

Chi-Square Phi Test \* $p < 0.05$

## Discussion

Subperiosteal implant is a treatment option that can be applied to atrophic jaws, such as zygoma implants and short implants, as an alternative to augmentation procedures consisting of metal frames and abutments positioned under the mucosa and on the bone. It is made of biocompatible mostly chromium cobalt or titanium alloys. Compared to root-shaped implants, masticatory forces are transferred and distributed over the large bone surface area rather than the bone mass<sup>3</sup>. Changes in the treatment stages, techniques used, implant design, implant material, and substances to be applied to the surface of the implant evolve over the years. Subperiosteal dental implants have undergone continuous evolution over 80 years of design changes regarding both supragingival and subgingival components. The evolution of these design changes has been determined by clinical successes and failures as reported by many authors<sup>15</sup>. However, subperiosteal implant treatment has become popular today in patients with severely atrophic jaws, partial or total edentulism, where standard size endosseous implant placement is not possible and in patients who do not accept augmentation procedures. Using the developing CAD-CAM technology, the subperiosteal implant treatment protocol has been

updated to be personalized and produced in the most ideal position. In addition, surface properties were improved in order to increase osseointegration. Thanks to such technological developments, the satisfaction of patients who can achieve partial function and aesthetics by placing implants and performing prosthetic treatment in a single appointment increases<sup>4</sup>.

Today, social media and video sharing websites have become frequently used tools to provide information to the public about health issues, thanks to the videos shared by site users<sup>16</sup>. YouTube is today's most popular social media video sharing site with videos on many different topics of health<sup>6</sup>. As in many studies, YouTube video content was evaluated in terms of different medical aspects, including oral health<sup>10,17,18</sup>.

In this study examining the subperiosteal dental implant system, the 82 videos analyzed had a total of 41,274 views and the average number of views for each video was 1,091.67, which may be a reason that explains the popularity of this treatment procedure.

With this new generation subperiosteal implant technology, which perfectly adapts to the patient's jawbone geometry, the time-consuming process of bending or changing the implant for correct adaptation during the surgical operation is avoided. In this way, the surgical

operation time is also shortened<sup>19</sup>. While the direct bone impression technique only provides a limited working area within its limits, the subperiosteal implant design we obtained with CT data can be designed to support the prosthesis design along the buccal, lingual/palatinal alveolar bone. In this way, the force is spread over a wider area and the forces can be distributed evenly. With less time required for production and virtual communication with the laboratory, the duration of the entire procedure and the possibility of complications are reduced. It means fewer procedures, less invasiveness, less pain and less stress for the patient<sup>4</sup>. Surgical procedures, which have an important place in the education of the new generation subperiosteal implant technology, are covered as subject content in 27% of the videos analyzed in our study, while prosthetic procedures are included as content in 19.8% of the videos.

In our study, as in the study by Lena et al.<sup>20</sup>, in the classification made according to the richness of the subject content, the duration of videos with excellent and moderate usefulness scores was longer than videos with poor usefulness scores. In addition, according to the results of our study, the viewing rate of videos in the excellent category is significantly higher than the videos in other groups. This result shows that videos with more information content are more interesting to viewers. When looking at the relationship between the target audience and the video type, the fact that there are more educational type videos for healthcare professionals than educational videos for patients shows that the education of healthcare professionals in this field is more important. However, with the widespread use of subperiosteal implant treatment in order to avoid advanced invasive surgical procedures in today's implant technology, we see that patients' need for information about this treatment is increasing day by day. For this reason, we think that the target audience of videos with high information quality should be increased towards patients.

There are some limitations in the study. The first of these is that different results can be obtained when the keywords typed into the search engine are changed. In addition, since YouTube has a dynamic that can change instantly, the video lists that will be created will result differently depending on the added or deleted videos and the time period searched. Additionally, the popularity of the subperiosteal dental implant procedure is increasing not only in English-speaking countries but also in non-native English speaking regions. However, by including videos in English, which is accepted as the common language in the world, in the analysis, we acknowledge that this is another limitation of our study.

## Conclusions

In this study, where information about the subperiosteal dental implant system was evaluated, it was determined that the YouTube videos were uploaded

by healthcare professionals and healthcare companies, and thus the educational level was significantly high and, accordingly, the viewing rate was high. However, in terms of the target audience of such videos with high educational quality, the number of those aimed at patients should also be increased.

**Conflict of interests:** Özge Özdal Zincir, Ali Zincir, and Umut Özdal declare that they have no competing interests.

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**Ethics approval and consent to participate:** Not applicable.

**Consent for publication:** This is an in vitro study and no patients were included in the conduct of this study.

**Availability of data and material:** Clinicians should know the subperiosteal implant system, which is preferred in bone deficiency in the field of implantology.

**Authors' contributions:** All authors read and approved the final manuscript. Ö.Ö.Z. read, collected data and wrote the manuscript, A.Z. analyzed statistically, U.Ö. revised, searched the additional data and corrected the entire article.

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