

## Role of 3-D Animation Videos in Periodontics - Depict, Deduce and Deliver!

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### Abstract

**Objectives:** The study compared 3D animation videos with narration and sketching and evaluated its effects on knowledge and motivation of the patient in regards with periodontitis.

**Materials and method:** A total of 40 patients were randomly divided into 2 groups, Group A- sketches and group B- 3D animation. 1. Subjects from both the groups received a questionnaire consisting of 10 multiple choice questions. 2. Both the groups were then subjected to their education mode (Sketches/3D animation). 3. Baseline gingival index, plaque index and probing depth were recorded. 4. Both the groups were made to fill the questionnaire again. 5. Post one month the gingival index, plaque index and probing depth were recorded.

**Results:** Group B subjects had a significantly higher difference in the knowledge post intervention and significant difference in reduction of gingival index and plaque index. Probing depth showed no statistically significant difference.

**Conclusion:** 3D animations were more successful in imparting knowledge and motivating patients regarding periodontitis.

**Keywords:** 3D-Animation videos; Periodontitis; Education and motivation

### Introduction

Patient education and awareness ought to be the primary goals of a Periodontist through which the correct causality of periodontitis, treatment plan and consequences of no treatment can be explained to the patients. Information and communication improve patient's involvement in the decision making process thereby improving treatment outcomes. Explaining is a fundamental aspect and an integral part of negotiating treatment options and health goals with patients [1].

The importance of 3D animation videos for patients remains unexplored in the Indian population.

Most respondents encounter language-related communication barriers. The most common alternative communication methods were diagrams and models. Periodontics provides the maximum challenge in communication [2].

Also, the literacy rate of some patients may not be very high, making it difficult for the patients to grasp the graveness of periodontal diseases.

The aim of this study was to compare 3D animation with narration and sketching and evaluate its effects on knowledge and motivation of the patient in regards with periodontitis.

### Materials and Methods

A total number of 40 patients were selected from the out-patient department of Department of Periodontology, Jaipur Dental College. Participants of the study had to meet the following criteria:

### Inclusion Criteria

- At least 1 pocket measuring 5mm or more.
- Ability to speak and understand Hindi/English
- Above the age of 40 years.

### Exclusion Criteria

- Patients with previous history of periodontal treatment
- Systemic conditions

### Study Design

The subjects were randomly divided into two groups via toss of coin method. The 3D animated videos used in this study were taken from the European Federation of Periodontology website (with a voice-over in the preferred language of the patient). The videos used were regarding:

1. Dental Hygiene
2. Progression of periodontal disease.
3. Periodontics
4. Dental implants.

### 1<sup>st</sup> day protocol

1. The patients of both the groups were made to fill a multiple choice questionnaire that provided the periodontist with the basic knowledge and awareness that the patient had regarding periodontitis. (The questionnaire had 10 multiple choice questions)
2. Sketches made with the help of 'paper and pen' were used to educate the patients of the Group 'A'.
3. The Group 'B' on the other hand was made to watch the 3D animated videos.
4. The probing depth, gingival index (Loe and Silness) and plaque index (Silness and Loe) were recorded for both the test and the control groups at baseline.
5. Both the groups were made to fill the same multiple choice questionnaire again in order to compare the knowledge grasped by the patients in each group.

### Post 1-month protocol

The probing depth, gingival index and plaque index were recorded post 1 month for both control and test group.

## Results and Discussion

A significant difference was seen in the knowledge of patients, probing depth, GI and PI scores in both the groups. However, the significant difference in the gingival and periodontal index scores was greater in the test group ( $p < 0.001$ ) as compared to the control group ( $p < 0.05$ ).

Patient education and motivation are important aspects in treatment and maintenance during periodontal therapy. Only instructing the patients to return for recalls without clearly explaining the importance of these visits may not be beneficial. Providing the patient with structured, simple information about the disease, treatment needs and maintenance allows the patient to be a part of treatment planning thereby increasing the success of the treatments.

This study researched the role of 3D animations on knowledge levels among periodontal patients.

Parameters for Measuring Oral Hygiene Status				
Group 'A'				
	At Base Line	At 1 Month	Change	P value
Probing Depth	6.0±0.31	5.2±0.28	0.8±0.03	<0.05
Gingival Index	1.75±0.46	0.4±0.23	1.35±0.23	<0.05*
Plaque Index	2.0±0.09	0.7±0.20	1.3±0.11	<0.05*

**Table 1:**Parameters for Measuring Oral Hygiene Status in Group A.

Parameters for Measuring Oral Hygiene Status				
Group 'B'				
	At Base Line	At 1 Month	Change	P value
Probing Depth	6.2±0.22	4.7±0.98	1.13±0.18	<0.001
Gingival Index	1.8±0.56	0.2±0.18	1.6±0.38	<0.001*
Plaque Index	2.1±0.14	0.4±0.85	1.7±0.55	<0.001*

**Table 2:**Parameters for Measuring Oral Hygiene Status In Group B.

40 subjects meeting the inclusion criteria were randomly divided in to 2 groups of 20 each. This observation was supported by clinical parameters assessed at 1 month between the groups with statistically significant reduction in GI and PI in group 'B' as compared to group 'A'. The PD did not show significant reduction.

Explanations in dentistry should be clear and direct for the patient to understand.

Hu., *et al.*[3]in their study concluded that more number of patients preferred 3D multimedia system over the conventional mode of communication between the dentist and the patient. Also an increase in the mutual understanding and patient satisfaction was noted in patients subjected to 3D animation.

Mladenovski A and Kieser JA found information regarding third molar extraction more effective via multimedia as compared to the pamphlet mode [4].

Philippott P concluded that behavioral education intervention showed better results than the traditional approach as the PI became normal in more number of patients subjected to the intervention also patients[5].

Hermann M[6]found that an aptly designed 3D representation of complex surgical procedures conveyed more information to the patients than conventional flyers.

Cleeren., *et al.*[7]have rightly pointed out that sketches maybe difficult to understand by the patient and the patient may not be able to link it to their prior knowledge. Whereas animated videos provide better graphics which makes it simpler for the patients to grasp the information.

However, it should be stressed that 3D animation videos can never replace the communication between patient and health professional.

**Conclusion**

3D animation videos were more successful in imparting knowledge and motivating patients regarding periodontitis and in achieving better gingival and periodontal status.

**Conflict of Interest**

No conflict of interest.

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