

# Clinical Performances of Fixed Bridges and Crowns amongst Patients Visiting a Private Dental College in Tamil Nadu.

**V.Sutharshana,**

*BDS Final Year Student, Department of Prosthodontics,  
Saveetha Dental College and Hospital, Chennai.*

**Dr. Revathy Gounder,**

*MDS, Senior Lecturer, Department of Prosthodontics,  
Saveetha Dental College and Hospital, Chennai.*

## INTRODUCTION:

Fixed dental prosthesis is referred to as indirect restorations which include crowns, bridges, inlays, onlays, veneers. Fixed prosthesis can be used to restore single or multiple teeth, to restore its function such as mastication, speech, and aesthetic purpose. In general, the main advantages of fixed prosthodontics when compared to direct restorations is the superior strength when used in large restorations, and the ability to create an aesthetic looking tooth. As with any dental restoration, principles used to determine the appropriate restoration involves consideration of the materials to be used, extent of tooth destruction, orientation and location of tooth, and condition of neighboring teeth. Fixed prosthesis maybe made up of different materials which include all metal, all ceramic, metal ceramic, ceramic facing crowns, gold, etc. Each of this varies with rate, appearance, strength, resistance and compatibility.

Complications of indirect restorations or fixed prosthesis include pain, discomfort, occlusal wear of opposing teeth, periodontal diseases, aesthetically compromised, gingival bleeding, loosening or fracture of the prosthesis, shade mismatch, over hanging restorations. Each type of fixed prosthesis varies with different complication based on material.

It is important to evaluate the success and survival rate of the fixed prosthesis as well as its type of complications plus failures associated with these prosthesis. On assessment, the factors found will improve the clinicians ability to plan and provide the best treatments to patients with expectations and plan a maintenance record for the patients with fixed prosthesis.

## MATERIALS AND METHODS:

This study was conducted to assess the clinical performances of fixed bridges and crowns amongst patients visiting a private dental colleges in Chennai. A sample size of 100 subjects was selected. The population selected for the study was randomly spread across the different age groups and gender. The patients were screened and if patient had a fixed crown or bridge, it was evaluated with a format. The research was conducted under the approval of the scientific research board, saveetha dental college. Each subject was informed prior to the study and was questioned further only if the subject was willing to participate.

The inclusion criteria for this study included patients wearing crown for more than 4 months, patients of age group above 20, single crowns or bridges used to replace missing tooth or root canal treated tooth, all ceramic, metal ceramic and all metal crowns.

The exclusion criteria for this study included patients below the age of 20, crowns or bridges luted within 4 months of time.

The final questionnaire consisted of two parts:

The first part included Socio-demographic variables such as age and sex, and their oral hygiene habits of the patients and intra oral examination which evaluated tooth number, type of crown (all ceramic, metal ceramic, all metal), number of crown or bridges, and time elapsed since luting the crown or bridges.

The second part included the aesthetic, mechanical, and biological value

The aesthetic value of the crown, was further evaluated considering the shade matching, gingival colour change, gingival contour of the fixed prosthesis.

The mechanical value of the crown/bridge was further evaluated considering loss of retention, tooth fracture, prosthesis fracture, marginal gap, discolouration, and recementation.

The biological value of the crown was further evaluated considering the periodontal status such as loss of attachment, bleeding on probing, pocket, mobility, food impaction, pain, bad odour.

The filled formats were taken for analysis.

## EVALUATION FORMAT:

### Clinical performances of fixed bridges and crowns amongst patients visiting private dental colleges in tamilnadu.

1) Age/gender:  
Oral hygiene habits:

### 2) INTRA ORAL EXAMINATION:

Tooth number:

Type of crown: all ceramic / all metal / metal ceramic / porcelain

Number of crowns/bridges:

Bridges: short / long

Time elapsed since luting the prosthesis:

### 3) AESTHETIC VALUE:

Shade matching: poor/good/excellent

Gingival recession: present/absent

Gingival colour change: present/absent

<b>4)MECHANICAL VALUE:</b>
<u>Loss of Retention:</u> present /absent
<u>Tooth fracture/ chipping of canine:</u> present/absent
<u>Prosthesis fracture:</u> present/absent
<u>Marginal gap:</u> present/absent
<u>Recementation:</u> yes/no
<u>Discoloration:</u> present/absent
<b>5)BIOLOGICAL VALUE:</b>
<u>Periodontal status:</u>
<u>Loss of attachment-</u> present/absent
<u>Bleeding-</u> present/absent
<u>Pockets-</u> present/absent
<u>Mobility-</u> present/absent
<u>Food impaction-</u> present/absent
<u>Bad odour-</u> present/absent
<u>Pain-</u> present/absent

**RESULTS:**

The study participants had a mean age of 34.8 years.

	N	Minimum	Maximum	Mean	Standard deviation
<b>Age</b>	100	20	56	34.83	10.063
<b>Valid n (listwise)</b>	100				

**Table 1: represents the age group included in the data.**

Three main factors were considered and using these factors the results were evaluated for three types of fixed prosthetic crowns.

The three factors mainly included was the aesthetic value, biological value, and mechanical value to all ceramic, all metal and metal ceramic crowns or bridges.

The sample size consisted of 30 % all ceramic crowns, 35% metal ceramic crowns, 35% all metal crowns.

1)Comparing the aesthetic value for all ceramic, all metal and metal ceramic crowns with their shade matching, gingival recession, gingival colour change.

Shade matching with excellent score in all ceramic, metal ceramic and all metal crowns are 23.3 % ( N=7), 14.3 % ( N=5), and 0 % ( N=0) respectively.

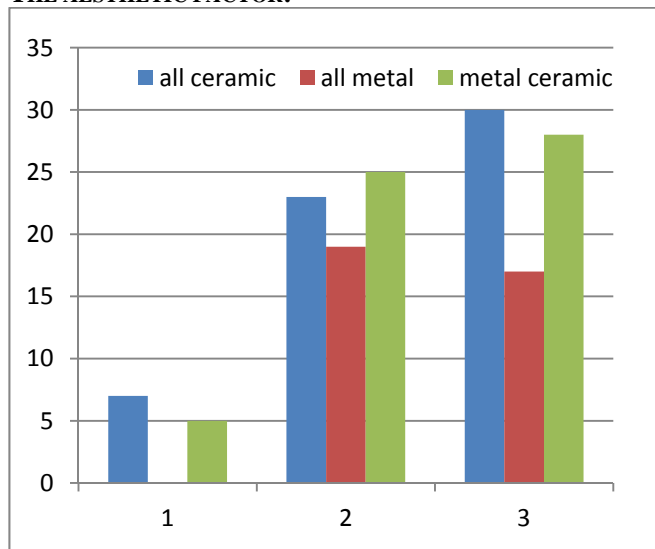
Gingival recession was absent in all ceramic, metal ceramic and all metal crowns with 76.7 % ( N=23), 71.4 % ( N=25) and 54.3 % ( N=19) respectively.

Gingival colour change was absent in all ceramic, metal ceramic and all metal crown with 100 % ( N=30), 80 % ( N=28) and 48.6 % ( N=17) respectively.

Aesthetic value	All ceramic	Metal ceramic	All metal
	<b>excellent</b>	<b>absent</b>	<b>absent</b>
Shade matching	23.3%	14.3%	0%
Gingival recession	76.7%	71.4%	54.3%
Gingival colour change	100%	80%	48.6%

**Table2: represents the aesthetic value evaluation.**

**THE AESTHETIC FACTOR:**



**Tab 3: 1 represents the shade matching, 2 represent the gingival recession, and 3 represent the gingival colour change.**

2)On comparing the mechanical value of all ceramic, all metal and metal ceramic crowns with their loss of retention, tooth fracture, prosthesis fracture, marginal gap, recementation, and discoloration was considered for evaluation.

Loss of retention was absent in all ceramic, metal ceramic and all metal crowns with 96.7 % ( N=29), 100 % ( N=35) and 100 % ( N=35) respectively.

Tooth fracture was absent in all ceramic, metal ceramic and all metal crowns with 100 % ( N=30), 82.9 % ( N=29) and 100 % ( N=35) respectively.

Prosthesis fracture was absent in all ceramic, metal ceramic and all metal crowns with 100 % ( N=30), 91.4 % ( N=32) and 100 % ( N=35) respectively.

Marginal gap was absent in all ceramic, metal ceramic and all metal crowns with 70 % ( N=21), 68.6 % ( N=24) and 40 % ( N=14) respectively.

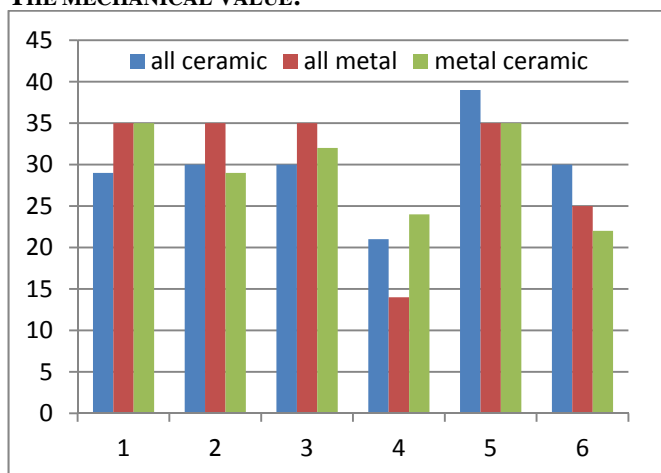
Recementation was absent in all ceramic, metal ceramic and all metal crowns with 96.7 % ( N=29), 100 % ( N=35) and 100 % ( N=35) respectively.

Discoloration was absent in all ceramic, metal ceramic, and all metal crowns with 100 % ( N=30), 62.9 % ( N=22) and 100 % ( N=35) respectively.

Mechanical value	All ceramic	Metal ceramic	All metal
Grade	absent	absent	absent
Loss of retention	96.7%	100%	100%
Tooth fracture	100%	82.9%	82.9%
Prosthesis fracture	100%	91.4%	91.4%
Marginal gap	70%	68.6%	68.6%
Recementation	96.7%	100%	100%
discolouration	100%	62.9%	62.9%

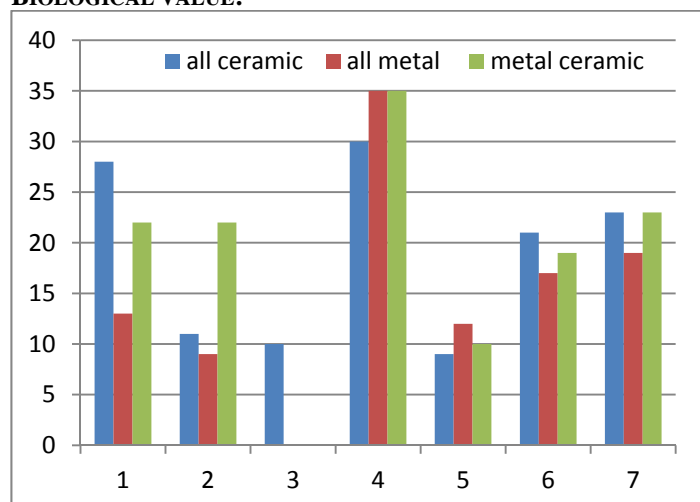
**Table 4 represent mechanical value evaluations**

**THE MECHANICAL VALUE:**



**Tab 5 :** 1 represents the loss of retention, 2 represents tooth fracture, 3 represents prosthesis fracture, 4 represents marginal gap, 5 represents recementation, 6 represents discolouration.

**BIOLOGICAL VALUE:**



**Tab 7 :** 1 represents the loss of attachment, 2 represents the bleeding, 3 represents the pockets, 4 represents the mobility, 5 represents food impaction, 6 represents bad odour, 7 represents pain.

3) On comparing the biological value of all ceramic, all metal and metal ceramic with their loss of attachment, bleeding, pockets, mobility, food impaction, bad odour, pain.

Loss of attachment was absent in all ceramic, metal ceramic and all metal crowns with 93.3 % (N=28), 62.9 % (N=22) and 37.1 % (N=13) respectively.

Bleeding was absent in all ceramic, metal ceramic and all metal crowns with 36.7 % (N=11), 62.9 % (N=22) and 25.7 % (N=9) respectively.

Pockets was absent in all ceramic, metal ceramic and all metal crowns with 33.3 % (N=10), 0 % (N=0) and 0 % (N=0) respectively.

Mobility was absent in all ceramic, metal ceramic and all metal crowns with 100 % (N=30), 100 % (N=35) and 100 % (N=35) respectively.

Food impaction was absent in all ceramic, metal ceramic and all metal crowns with 30 % (N=9), 29 % (N=10) and 34.3 % (N=12) respectively.

Bad odour was absent in all ceramic, metal ceramic and all metal crowns with 70 % (N=21), 54.3 % (N=19) and 48.6 % (N=17) respectively.

Pain was absent in all ceramic, metal ceramic and all metal crowns with 76.7 % (N=23), 65.7 % (N=23) and 54.3 % (N=19) respectively.

**DISCUSSION:**

In spite of the possibilities of implantology, conventional bridge prosthesis are still needed in prosthodontics.

At the institute of dentistry it is possible to gather the needed study material. The patients who were examined for fixed prosthetic crown/bridge that was previously luted at the minimum time interval before four months.

The longevity of these reconstructions has been evaluated in many studies, but especially the homogeneity of the study materials has been problematic.

In meta-analysis attempts have been made to combine the survival rates of multiple studies in order to diminish the variations. Using meta-analytical procedures, it was calculated the survival rate to be 74% after 15 years [1], and in other study the survival rate was 92% after 10 years and 75% after 15 years [2].

Survival seems to decrease more sharply after 10 years [3], which could technically be partly explained by fatigue of material used, such as metal alloys, porcelain, and cement [1].

Retainer loosening and recurrent caries probably also decrease the survival rate after 10 years [2]. Caries has been a major reason for failure of bridge prosthesis. It has been concluded in a study that loss of retention is the common reason form of failure [3], but it was often combined with caries.

In the present study the participants had a mean age of 34.8 years and, it was found that the age of the patient does not influence the failure rate. This was also concluded by Few studies [3, 4] while in the other study the failure rate was higher among the elderly with posts and cores [5]. It has been also stated that non-vital teeth, especially when they are used as abutments for extension bridges, increased number of failures is seen [6].

Marginal discoloration or occurrence of marginal gaps was evaluated in five of the nine studies. The estimated annual complication rate ranged between 0 and 10. The highest rate of marginal discoloration was found in a study on

Biological value	All ceramic	Metal ceramic	All metal
grade	absent	absent	Absent
Loss of attachment	93.3%	62.9%	37.1%
Bleeding	36.7%	62.9%	25.7%
Pockets	33.3%	0%	0%
mobility	100%	100%	100%
food impaction	30%	29%	34.3%
Bad odour	70%	54.3%	48.6%
pain	76.7%	65.7%	54.3%

**Table 6** represents the biological value evaluation.

zirconia FDPs. The authors reported on difficulties with the accuracy of the frameworks [7]. Owing to this out-layer study, the estimated 5-year rate of ceramic FDPs exhibiting marginal gaps or discoloration was as high as 15.3% (95% CI: 4–48.9%) obtained with a random-effects Poisson model analysis.

In this study, On comparing the aesthetic values, the gingival colour change was predominantly absent with nearly 0% in all ceramic prosthesis than that of the metal ceramic and all metal prosthesis with 80% and 48.6% respectively.

Five of the nine studies on all-ceramic FDPs addressed the issue of loss of retention (fracture of the luting cement). In two studies [8, 9] utilizing conventional cementation, FDPs became loose. In another study one adhesively cemented reconstruction lost retention [7]. In one study, using conventional [10] and in another one using adhesive cementation [11], no loss of retention was found. In summary, the standard Poisson model analysis gave an estimated rate of loss of retention of ceramic FDPs after 5 years of 2.3% (95% CI: 1.2–4.6%). The estimated rate of loss of retention for conventional metal–ceramic FDPs after 5 years was comparable with 3.3% (95% CI: 2–5.3%) [12]. In this study, the loss of retention and recementation changes were predominantly absent with nearly 0% in metal ceramic and all metal prosthesis and 96.7% in all ceramic prosthesis.

Nine studies on all-ceramic FDPs provided information on reconstructions lost due to recurrent periodontal disease during the observation period. In none of the studies were FDPs lost due to periodontitis. Hence, the failure rate was 0%.

The estimated rate of conventional metal ceramic FDPs that were reported to be lost due to recurrent periodontitis was comparably low with 0.4% (95% CI: 0.2–0.7%) after 5 years [12].

In this study, on comparing the biological values mobility was most predominantly absent with nearly 0% in all ceramic, metal ceramic, and all metal prosthesis, periodontitis was found to be absent at a high rate with 93.3% in all ceramic prosthesis.

Other reasons for failure include root fracture, endodontic complications and tooth fracture. Complications could be assumed to accumulate in extensive bridges.

#### CONCLUSION:

Clinical performances of fixed bridges and crowns that was previously luted with minimum time interval of four months was evaluated and assessed with their aesthetic, biological and mechanical values, and it was found that the all ceramic fixed prosthesis commonly had high success rate with aesthetic, mechanical and biological values.

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