



## DENTIST'S PERSPECTIVE FOR SELECTION OF SINGLE TOOTH REPLACEMENT IN NORTH BIHAR: A CROSS SECTIONAL SURVEY

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### Abstract

The study aimed to analyze the dentists of North Bihar region about different treatment modalities for replacement of a single missing tooth and the factors that would affect their choices. The study concluded that fixed partial denture is the most common procedure in patient's perspective to restore a single tooth gap. Dentist educational training, patient oral factors affect the decision-making process. Dentist of various age groups had difference in their preference from the prosthesis like esthetic and function. There was no significant difference between the preferred choice of males and females Fixed partial denture is the most common procedure in dentist perspective to restore a single tooth gap. There is a need to upgrade dentist with educational training regarding all the available options as well as their advantages and disadvantages, the final call should be made keeping all the factors in mind and whatever is best for the concerned patient.

**Keywords:** Dentist perspective , FPD, Implant, RPD, Single tooth replacement

### INTRODUCTION

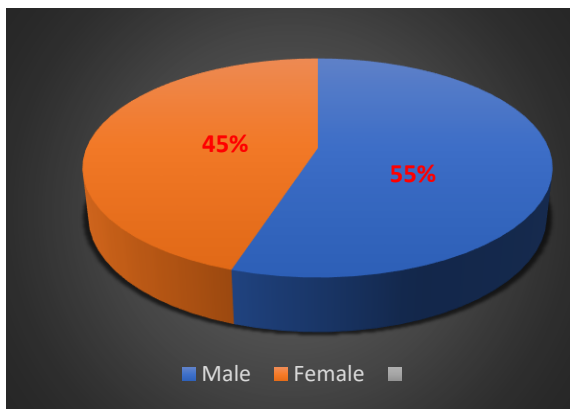
The term "esthetic" refers to something that is visually pleasing. Over the centuries, artists have developed principles of visual perception that enable them to create scenes of intense vitality, beauty, depth and realism on a 2D canvas. Similarly, dental restorations are subjected to the same perceptual process. Understanding perceptual principles can eliminate confusion in achieving the realm of beauty while maintaining functional and esthetic harmony<sup>1,2</sup>. A dentist who understands the principles of

visual perception can fabricate the restoration with confidence to meet the pleasing, functional and esthetic demands subtly and wisely without violating the principles of reality<sup>3-4</sup>.

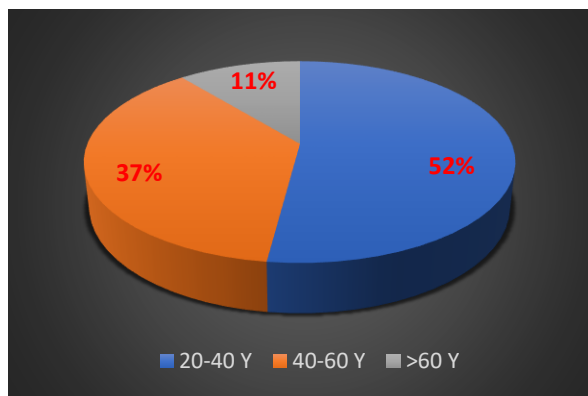
Dentists are routinely faced with the need to restore a single tooth that has been removed due to trauma, periodontal disease, root resorption or failed endodontic treatment<sup>5</sup>. Whether the tooth is removed surgically or lost due to trauma, the dentist should treat it with immediate means to satisfy the patient's cosmetic requirements while balancing the functional outcomes as well<sup>6</sup>. Various treatment options for restoration of a single tooth include fixed partial denture, a removable partial denture and a single tooth implant. Although fixed partial denture is the conventional treatment for a single edentulous case, since the early 1980s, the use of osseointegrated implants has become a well-established and predictable treatment. Rehabilitation using an acrylic removable denture is also an option but they are time-consuming and jeopardize the health of adjacent tissues. Because of the variety of treatment options for single-tooth replacement, there is limited literature covering all these treatments in a single survey. A few authors have reviewed data concerning multiple parts of the field of fixed prosthetics but most researchers focused on only one topic in every study<sup>7</sup>. Studies on single-tooth replacement with removable prostheses are well documented<sup>8</sup>. However, the comparison between the three most common prosthetic treatment choices of patients and the factors that dictate that choice are very limited. Often the bias of dentists plays a role rather than objective appraisal of the treatment options. This paper focuses on the study of the choice of dentists regarding three common single tooth replacement options and the associated factors while choosing these treatment options in the North Bihar region as obtained by a survey conducted on various dentists for patients with single tooth loss.

## **MATERIALS AND METHOD**

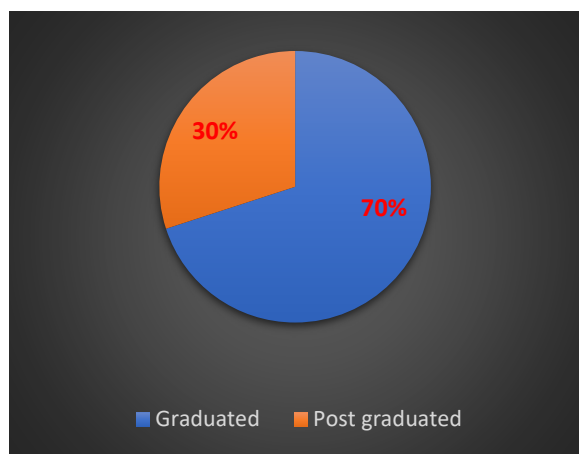
A cross-sectional online survey via e-mail was conducted consisting of 120 dentists practicing in different districts of North Bihar with a questionnaire. Out of 120 dentists, 66 (55%) were males and 54 (45%) were females (**Graph 1**). Growing patients (younger than 20 years) and multiple extractions were exclusion criteria. The dentists were divided into three groups according to age groups: Group A (20-40) 52%, Group B (40-60) 37% and Group C (>60) 10.8% (**Graph 2**). The patients were also grouped according to their higher education qualification (**Graph 3**). Study forms included the following reasons for tooth removal: caries, periodontitis, fracture, pre-prosthetic, impaction, orthodontic and other. Given the fact that tooth replacement may only be required when a tooth is lost because of caries, periodontitis or fracture, the analysis of the decision-making process was limited to these cases. For the same reason, wisdom teeth were not considered. Patients were informed by the dentists about the offered treatment options and their respective pros and cons. The questionnaire included various socio-demographic information, medical and dental history, smoking habits and also the preferred prosthetic rehabilitation following tooth loss, factors affecting the choice of treatments and the reasons for not selecting the other modalities including surgery, time, cost, phobia to new modality, lack of knowledge peer reviews etc were included along with their needs regarding prosthetic rehabilitation esthetically, functionally and speech efficiency. One of the following treatment options could be selected: (1) no treatment (2) removable partial denture (RPD) (3), fixed partial denture (FPD) (4) single implant treatment. The selected option was the actual decision made by the dentists at the time of survey according to their choice of treatment. Results were collected, tabulated and statistically analyzed using SPSS Version 22.



Graph 1 Distribution of subject as per gender



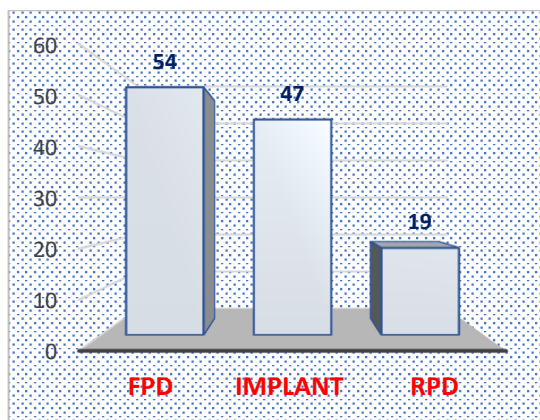
Graph.2 Distribution of subject as per age



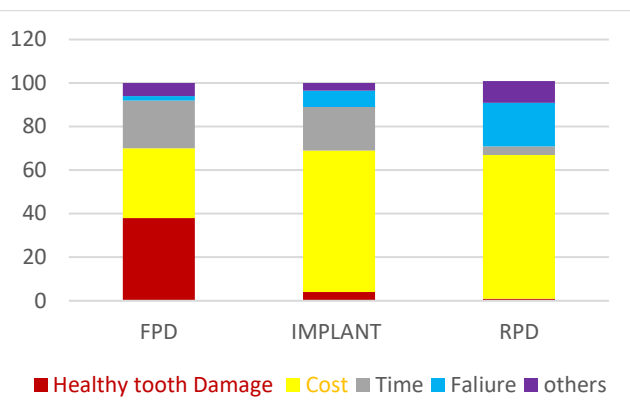
Graph 3. Distribution of subject as per educational qualification

**RESULTS**

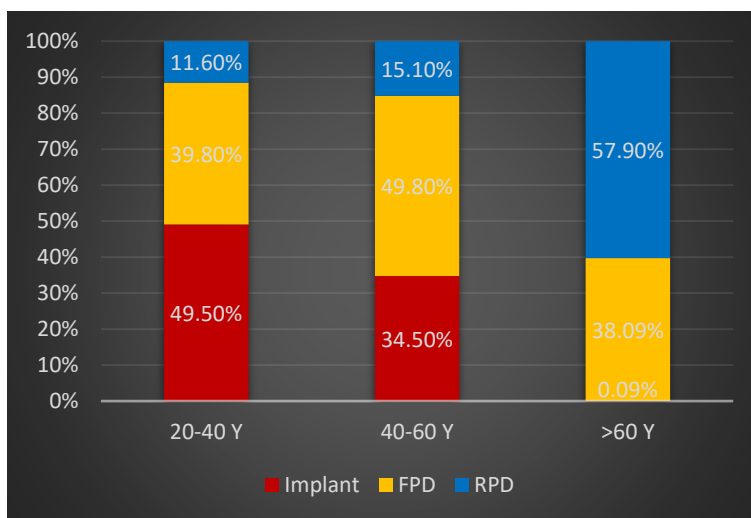
Tooth replacement was deemed necessary as per dentist’s option in the study out of 120 who were included in the survey, 44.58% chose fixed partial denture as their replacement option, second choice was single tooth dental implant which 39.16% people chose. 16.25% people selected removable partial denture as their favourable choice. FPD was mostly selected as the treatment of choice followed by single implant and then the RPD (**Graph 4**) which is in concordance with study conducted by Al-Shammari et al. (2005)<sup>8</sup>. The decision-making process was basically dependent on 6 major deciding norms, including Fear of surgery/procedure (19.5%) cost (26.25%) time (7.5%) Healthy tooth/tissue damage (27.9%) Failure risk (9.58%) and Others including peer reviews, knowledge about procedure etc.(9.16%). (**Graph 5**) For single implant treatment was compared with FPD and RPD and demonstrated a significant impact of three factors. The cost, time required for the treatment and restoration level of adjacent teeth was negatively associated with single implant treatment in this study, which makes sense as this is one of the main factors to be considered when choosing between FPD and implant treatment.<sup>9</sup> The reason for majority of dentist to choose fixed options including F.P.D. and implant may be because the majority of dentist’s that were included in the study were of the age group 20-40 years. In the subjects of younger age group A, 49% preferred implant as the mode of replacement. In Group B 49.5% preferred F.P.D. and as we progressed to Group C, advanced age, systemic factors, cost and time dictated choice and RPD was preferred by as much as 57.69% of the subjects. The selection was directly related to age and educational training with time and seems highly significant (p< 0.05). Hence, it is a definitive factor in the choice of treatment. (**Graph 6**)



Graph 4- Dentist choice for single tooth replacement selection



Graph 5- Norms for tooth replacement selection



Graph 6- Dentist's tooth replacement choice as per their age

**DISCUSSION**

**The deciding norms**

There are several factors that the patient considers while choosing a particular line of treatment. The information given by the clinician, the pros and cons of all the suggested procedures, peer reviews and personal factors like cost, time, fear and main reason for tooth replacement like function or esthetics<sup>10</sup>. In the following study there were 6 major deciding norms by which the subjects chose their replacement options for single tooth loss. These include:-

**1. Fear of Surgical intervention** - A lot of patients have dental fear or anxiety regarding the oncoming procedure. Some of this comes from past dental experiences, and some is just the fear of “not knowing.” Most of the subjects who chose FPD and RPD in this study had a fear of surgery during implant placement, a single implant placement is rather a contemporary procedure and hence there is a specific stigma attached to this line of treatment. However, a single implant doesn't take too long to place and the procedure is non-complicated.

**2. Cost-** This study is suggestive of cost was the second most selected norm which dictated the treatment option. As many patients of dentist who cannot pay for the fixed treatment options, and the lack of insurances to cover such dental treatments chose RPD. But as reviewed in various studies, the implant reconstruction demonstrated a more favorable cost/effectiveness ratio. Especially in clinical situations with either non- or minimally restored teeth or sufficient bone, the implant reconstruction is to be recommended from an economical point of view<sup>11</sup>.

**3. Time-** As per dentist point of view time was also a deciding factor. Acrylic removable partial denture placed after a single tooth extraction is an immediate solution but they are bulky, uncomfortable to patient and impede healing. Conventional FPD procedures require aggressive tooth reduction and high risk of pulp exposure. Implant supported restoration has a more conservative approach but poor patient acceptance owing to lack of motivation, higher cost or fear of surgery. However, these procedures do not satisfy immediate aesthetic and functional requirements of the patient.

**4. Healthy tooth/tissue damage-** A 3-unit F.P.D is within the training and experience of most restorative dentists. This form of restoration requires the reduction of the abutment teeth resulting in an increased incidence of endodontic therapy and root decay. If the abutment teeth have large restorations, they would benefit from abutment preparation. However, if the teeth have small restorations or if they are sound teeth, they would be damaged by abutment preparation and be placed at increased risk. In addition, cement loss or wash out under a retainer can lead to tooth loss. FPD bridges constitute a single restoration. Based on clinical experience, if one part of the bridge fails, the whole restoration fails, often with the loss of an abutment tooth. Despite these disadvantages, a 3-unit bridge is preferred because it is usually completed in a short time and esthetic control is fairly predictable<sup>10</sup>.

**5. Failure chances-**The literature search failed to identify any articles that directly compared survival or success of single implant-supported restorations with fixed partial dentures<sup>12</sup>. Following the search criteria, and independent analysis by reviewers, pooled success of single-implant restorations at 60 months was 95.1%, while fixed partial dentures of all designs exhibited an 84.0% success rate. As for removable partial dentures the success rates were 60.3% as with time the edentulous state of subject changes and RPD has to be changed and extended with time<sup>13</sup>.

**6. Educational Training :** Implants require training that is not sufficiently addressed in most undergraduate dental programs and, therefore, is not within the practice realm of all restorative dentists. An implant takes longer to complete than a 3-unit bridge, but costs about the same if grafting is not required. Insurance seldom helps with financial support for implants. In addition, implants can be more demanding if bone and soft tissues are inadequate. Areas of tissue deficiency should also be addressed with grafting in the pontic space for 3-unit bridges, but often these defects are ignored. The tremendous advantage of the single-tooth implant lies in the fact that the adjacent teeth are not prepared. These teeth are left in their current state of health and are not linked as part of a larger restoration. The adjacent teeth have a better prognosis, as they are not subject to a higher incidence of endodontic therapy and decay as a result of tooth preparation<sup>14</sup>.

**6. Others-**some of the deciding factors were peer reviews, no knowledge about new procedure, doubt on clinician's skill etc. Studies on single-tooth rehabilitation with different prostheses showed an important impact of patient's education, oral factors and clinician-related factors on the decision-making process. Conventional removable partial denture can replace a single tooth and with incremental tooth loss it can be modified to accommodate more acrylic teeth, it is more affordable than other alternatives of tooth replacement, it can be made in a single day and can be aesthetically pleasing covering the soft tissue defect if present post tooth loss. However, it is uncomfortable as it is much larger than natural tooth, covers the palate, reduces taste perception, needs replacing more frequently and requires specific cleaning procedure after removal. The single-tooth replacement with fixed partial dentures (FPDs) exposes the abutment teeth as well as the reconstruction to several biological and technical risks such as endodontic complications, secondary caries, difficult access for plaque control resulting in periodontal complications, loss of retention, fracture of teeth and/or the FPD<sup>15</sup>.

## CONCLUSION

According to a this survey conducted on dentists in North Bihar, fixed partial denture is the most common procedure for restoring a single tooth gap for their patients, followed by single crown on implant and RPD. Dentists of different age, higher education qualification and training is point to select the treatment options based on various factors that affect the decision-making process such as cost, time, damage to healthy tissue, fear of surgery, risk of failure etc. It is important to upgrade dentists time to time with education and training regarding all the recent available options for tooth replacement as well as their advantages and disadvantages. The final call should be made keeping all the factors in mind and whatever is best for the patient's dental health.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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