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# Patient Preferred Fixed Treatment Modalities For One Or Two Missing Teeth - An Institution Based Retrospective Study

CHANDRAPOOJA[1], PADMA ARIGA[2]*, GANESH JEEVANANDAN[3]

[1]Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India
[2]Professor, Department Of Prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India
[3]Reader, Department of Pedodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India
*Corresponding Author
Email ID: 151501060.sdc@saveetha.com[1], padma@saveetha.com, ganesh.sdc@saveetha.com

**Abstract:** Replacement of missing teeth represents the largest category among patients in clinics who are looking for better esthetic and/or functional teeth. The fixed partial denture (FPD) is one of the most commonly preferred definitive treatment options for a single missing tooth.To assess the patient preference of type of fixed treatment modalities a retrospective study was carried out using case records of 1208 patients who reported to the Department of Prosthodontics from June 2019 to March 2020.The number of patients preferring fixed treatment modalities for one or two missing teeth were observed from the case records and tabulated on a spreadsheet. The collected data was analysed by computer software SPSS version 21 using Chi square test indicating the level of significance.Fixed partial denture was taken as a treatment of choice in 52.2% of the patient and implant was taken as treatment of choice in 47.8% of the patients. Both fixed partial denture and implant treatment were opted more among the male patients than female patients. Below the age of 30 years fixed partial denture was opted by 197(16.31%) of patients and implant by 163(13.49%) patients. Between the age of 31-60 years 369 patients(32.78%) opted fixed partial denture and 380 patients(31.46%) opted implants as treatment of choice. Above the age of 60 years, 37 patients(3.06%) and 35 patients(2.90%) had fixed partial denture and implant respectively with 31-60 years age group patients receiving maximum fixed treatments. Patient preferred treatment options with fixed prosthesis had no significant association with neither age(p value-0.50) nor gender(p value-0.20).

**Keywords:** Ceramic crowns; esthetics; fixed partial denture; metal; metal ceramic; implant; bridge; fixed prosthesis innovative technique.

## INTRODUCTION

Edentulism and missing teeth has a great effect on the quality of life of the patient(Fiske *et al.*, 1998). Dentofacial problems have well known effects on patients satisfaction with their dentition as they affect esthetics, performance and function(Venugopalan *et al.*, 2014). Fixed partial denture is a partial denture that is luted or otherwise securely retained to natural teeth, tooth roots and/or dental implant abutment that furnish the primary support to the prosthesis.Dental implant is any object or material such as an alloplastic substance or other tissues, which is partially or completely inserted or grafted into the body for therapeutic, diagnostic, prosthetic or experimental purposes.

Fixed partial denture have become the treatment of choice for replacement of missing teeth due to their advantage of being fixed in the mouth and being economical as compared to implants It is important to know whether patients that the treatment imparts value relative to comport, esthetics, economical condition and proper function and survival rate(Fiske *et al.*, 1998) (Ashok *et al.*, 2014).

All ceramic fixed partial dentures are used in the anteriors especially in the young age group because of their superior aesthetics in full mouth rehabilitations which is more affordable than dental implants(Motta, Pereira and da Cunha, 2007) (Ashok and Suvitha, 2016). Based on the survival rate, according to Olsson et, al[2003] all ceramic short span FPDS has a survival rate of 91% of 5 years survival rate and 83% of 10 years survival rat(Olsson *et al.*, 2003) (Vijayalakshmi and Ganapathy, 2016). According to Kalsson[1986] metal ceramic FPDS has 98% of 10 years survival rate(Karlsson, 1986) (Selvan and Ganapathy, 2016). Whereas implants have 82.94% of 16 years survival rate(Simonis and Dufour, 2010) (Jain and Dhanraj, 2016). The survival rate of a fixed treatment modality depends on proper impression making by choosing the right impression material and method

(Kannan and Venugopalan, 2018),the proper preparation of the teeth and the cement chosen for luting the crown(Ganapathy *et al.*, 2016) (Ganapathy *et al.*, 2016).

Dental implant is a treatment of choice for pubescent patients, if the conventional alternatives fail to alleviate the patient's concern both functionally and psychologically(Wang and Suzuki, 2015) (Subasree and Murthykumar, 2016) (Ganapathy, Kannan and Venugopalan, 2017). The use of dental implant provides support for replacement of missing teeth and has a long and multifaceted history(Elias, 2011) (Searson, Gough and Hemmings, 2005) (Di Giallorenzo, no date) (Sullivan, 2001) (Mijiritsky *et al.*, 2013) statistics provided by American Association of oral and Maxillofacial surgeons shows that 69% of adults of age 35 to 44 have lost at least one permanent tooth to an accident, gum disease, a failed root canal treatment or tooth decay. By the age of 74, 26% of adults have lost all of their permanent teeth. Therefore the use of dental implants are 1,00,000-3,00,000 per year, which is close to the number of artificial hip and knee joints placed per year (Ganapathy, Kannan and Venugopalan, 2017).Cement-retained restorations are the most common type of implant restoration because of numerous advantages for cement-retained prosthesis over screw-retained prosthesis such as passive casting, axial loading, accessibility, progressive loading(Ajay *et al.*, 2017) (Duraisamy *et al.*, 2019).

Though both implant and fixed partial denture tends to be a good treatment of choice, patient preference between these two treatment modalities differ based on their availability, missing tooth, damage to the neighbouring teeth, survival rate and patients economic condition which most importantly influence the decision highest satisfaction and aesthetics and function was seen in the implant group(Al-Quran, Al-Ghalayini and Al-Zu'bi, 2011) (Jain *et al.*, 2018). Hence, periodontal status is supposed to be assessed before choosing a fixed treatment modality.The initial periodontal assessment include plaque score(PLS), bleeding on probing(BOP),probing pocket depth(PPD),loss of attachment(LOA), furcation(Ranganathan, Ganapathy and Jain, 2017) (Jyothi *et al.*, 2017) (Basha, Ganapathy and Venugopalan, 2018).

Fixed treatment modalities are also based on patients growth pattern, individual status of existing dentition, the functional status of mastication,phoretics, esthetic aspects and emotional and psychological well being. Studies have shown that the fixed replacement options are better when compared to the removable dentures and patients should be made aware of all the treatment options available and should be explained about the advantages of getting a fixed replacement over a removable one .

Our department is passionate about research we have published numerous high quality articles in this domain over the past years (Abraham *et al.*, 2005; Devaki, Sathivel and BalajiRaghavendran, 2009; Neelakantan *et al.*, 2010, 2015; Arja *et al.*, 2013; Ramshankar *et al.*, 2014; Sumathi *et al.*, 2014; Surapaneni and Jainu, 2014; Surapaneni, Priya and Mallika, 2014; Ramamoorthi, Nivedhitha and Divyanand, 2015; Manivannan *et al.*, 2017; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; J *et al.*, 2018; Ravindiran and Praveenkumar, 2018; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Krishnaswamy *et al.*, 2020; Samuel, Acharya and Rao, 2020; Sathish and Karthick, 2020)

The aim of the study was to assess the patient preference of fixed treatment modality when one or two missing teeth were missing from the data available in the teaching institution.

## MATERIALS AND METHOD

**Study design:** In this retrospective study, data from patients records within the institution were revised and the data of patients who underwent fixed treatment modalities for one or two missing teeth were collected.After data extraction,all information was anonymized and tabulated onto a spreadsheet. The study was commenced after approval from the Institutional Review Board. (ethical approval number. SDC/SIHEC/2020/DIASDATA/0619-0320)

**Subjects and procedures:** Data were collected from June 2019 to March 2020 from 1208 patients who got fixed treatment for missing teeth . The data were retrieved from the dental records: patient age and gender. The total population was divided into three groups namely group 1( below 30 years), group 2(between 31 to 60 years) and group 3(above 60 years). The data was verified by 2 examiners. The dependent variables were age and gender and independent variables were the patient's willingness, socio economic status.

**Statistical Analysis:** The collected data were added in MS Excel. The statistical analysis was done using SPSS software version 21.0 (SPSS Inc., Chicago, IL, USA). Chi-square test was used to compare the study subject with age and gender.

## RESULTS AND DISCUSSION

A total of 1208 patients preferred fixed treatment modalities for their missing teeth oneithereither jaws with healthy abutments in the age group of 17-83 years. Fixed partial denture was taken as a treatment of choice in about 52.17% of patients and implant was taken as treatment of choice in about 47.85% of them (Figure 1).

The fixed treatment modalities opted for replacement of one or two missing teeth below the age of 30 years(group 1) were fixed partial dentures - 197(16.31%) and implants - 163(13.49%). Between the age of 31-60 years(group

2) 369 patients(32.78%) chose fixed partial dentures and 380 patients(31.46%) chose implants. Above the age group of 60 years(group 3), 37 patients(3.06%) and 35 patients(2.90%) had fixed partial dentures and implants respectively. Among the three groups, group 2(31-60 years) patients received a number of maximum fixed replacements. Figure 2 shows association of fixed replacement opted with age of the patient.Patients between the age group of 31-60 years have opted for more number of fixed replacements, this could be due to affordability and willingness to have better aesthetics. Aging in combination with intrinsic and extrinsic factors accelerates the decline in bone mass that predisposes to bone loss. Intrinsic factors include genetics, peak bone mass accrual in youth, alterations in cellular components, hormonal, biochemical and vasculature status. Extrinsic factors include nutrition, physical activity, comorbid medical conditions and drugs(Demontiero, Vidal and Duque, 2012).However patients from all the three study groups preferred fixed prostheses to implants.

The study results had similar results to Ioannidis et al, which says increased age of patients should not be considered a risk factor for fixed prosthesis. The majority of studies did not show any effect of age on survival of fixed prostheses (Ioannidis *et al.*, 2010). The study results were dissimilar to the results of Moy et al. who studied a relatively large group of patients who had been operated on by an experienced surgeon and found that advanced age increased the risk of implant failure; patients older than 60 years were twice as likely to have adverse outcomes (Moy *et al.*, 2005).

However our study shows no significant association between age and fixed replacement options according to Pearson's chi square test [ P value - 0.50].

Regarding the gender, 343 male patients(28.39%) opted for fixed partial dentures and 340 patients(28.15%)preferred implants. Among female patients, 286 patients(23.68%) opted for fixed partial denture and 238 patients(19.70%)preferred implants.

In our study group male patients have outnumbered females with respect to fixed replacements. This could be due to bone loss in women which has largely been associated with aging, menstruation, pregnancy, menopausal status .This can be due to estrogen, that protects bones in women, decreases sharply when women reach menopause, which causes bone loss. Hence the chances of developing osteoporosis increases as women reach menopause in their later ages around 60 to 70 years .The study results were dissimilar to Akarslan ZZ et al. which states female patients are often more dissatisfied and concerned with their teeth than males(Akarslan *et al.*, 2009).However, our study shows no significant association between gender and fixed prosthesis according to Pearson's chi square test [ P value - 0.20].

Advantages of fixed replacements include natural aesthetics, phonetics and mastication. Fixed prosthesis prevent tipping of adjacent teeth into edentulous areas and occlusal forces are distributed to the abutment teeth or to the surrounding bone as seen in implants. Limitations of the study include a small sample size and limited demographic area of coverage. Future scope of the study could include a multi centred study with different geographical areas and ethnicities with a wide range of population to ascertain better results and consider more number of clinical factors favouring fixed treatment options.

## CONCLUSION

Within the limitations of the study, it can be concluded that fixed partial dentures were preferred to implants in this study group. The number of male patients, choosing fixed partial denture treatment outnumbered female patients across all age groups especially in the middle age sector. Both age and gender had no significant association with choice of treatment. Socioeconomic conditions, awareness and literacy seemed to have influenced the treatment options.

## AUTHOR CONTRIBUTION

Author 1(J.Chandrapooja) carried out the retrospective study by collecting data and drafted manuscript performing the necessary statistical analysis. Author 2(Dr.Padma Ariga) aided in the conception of the topic, participated in the study design, statistical analysis and coordinated in developing the manuscript and author 3(Dr.Ganesh Jeevanandhan) aided in coordinating and developing the manuscript. All the authors have equally contributed in developing the manuscript.

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**Conflict of interest:** There is no conflict of interest.

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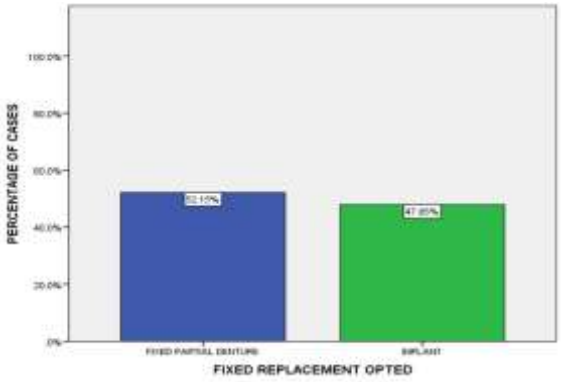


**Fig.1: Bar chart represents frequency distribution of fixed partial denture and implants. X-axis represents the type of fixed replacement and Y-axis represents the percentage of cases. Fixed partial dentures(blue colour - 52.15%) were preferred to implants(green colour).**

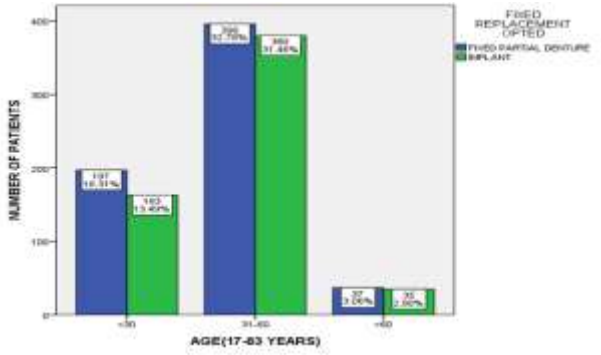


**Fig.2: Bar chart represents the correlation of age of the patient and fixed replacement for one or two missing teeth. X-axis represents the age and Y-axis represents the number of patients. Fixed partial denture(blue colour) was the most preferred fixed replacement in all three age groups when compared to implant(green colour). Association between age and fixed replacement options were analysed with Chi-square test and it was not significant(p value – 0.50).**

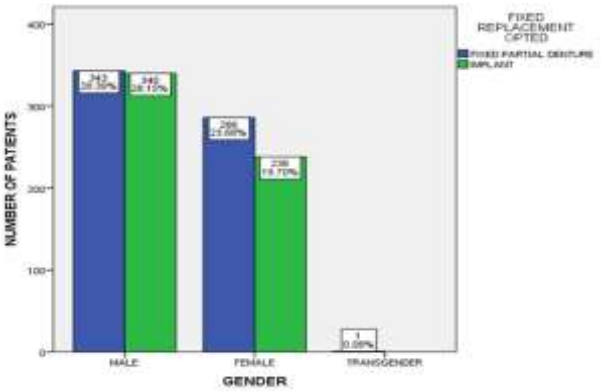


**Fig.3: Bar chart represents the correlation of gender of the patient and fixed replacement opted for one or two missing teeth. X-axis represents the gender and Y-axis represents the number of patients. Fixed partial denture(blue colour) was the most preferred treatment among male(28.39%), female(23.68%) patients and transgenders(0.08%) when compared to implant(green colour). Association between gender and fixed replacement preferred were analysed with Chi-square test and it was not significant( p value – 0.20 ).**