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Esthetics in Removable Partial Denture Patients Visiting University Dental Hospital

Amanthi Ganapathi
Saveetha Dental college & Hospitals
Saveetha Institute of medical and Technical science,
Saveetha University,
chennai,India
Email-151501058.sdc@saveetha.com

Dhanraj Ganapathy
Professor and Head,
Department of Prosthodontics
Saveetha Dental college & Hospitals
Saveetha Institute of medical and Technical science,
Saveetha University,
chennai,India
Email-dhanraj@saveetha.com

M.Jeevitha
Senior lecturer,Department of Periodontics
Saveetha Dental college & Hospitals
Saveetha Institute of medical and Technical science,
Saveetha University,
chennai,India
Email-jeevitham.sdc@saveetha.com

Corresponding author
Dhanaraj Ganapathy
Professor and Head,
Department of Prosthodontics,
Saveetha Dental college & Hospitals
Saveetha Institute of medical and Technical science,
Saveetha University,
162,PH Road,chennai 600077,
Tamil Nadu,India
Contact Number-+91-9841504523
Email-dhanraj@saveetha.com

ABSTRACT
Removable cast partial dentures are considered a definite removable prosthesis but the location of the clasp may affect the aesthetic.A well-constructed removable partial denture can be an excellent treatment alternative for replacement thearpy .Yet, these patients deserve the best esthetic and functional results possible.The aim of this study is to evaluate the esthetic outcome of removable partial denture.In this retrospective study, the data was collected from case sheet records of 86,000 patients were postoperative removable partial denture insertion images were analyzed and score was given.The obtained data were analysed. Total of 1195 patients out of which female patients accounts for 42.19% and male patients accounts for 57.8%.Poor esthetics accounts for 26.1%,moderate esthetics accounts for 46%,and partial denture with good esthetics accounts for 27.6%.With the limitations of

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our study we would conclude that more number of patients receive removable partial denture with a fair amount of aesthetics. There are esthetics concerns that are still to be addressed in patients with removable partial denture.

Keywords -Removable partial denture, aesthetics, satisfaction.

INTRODUCTION

Denture esthetics is defined by the glossary of prosthodontics in terms produced via dental processes that affect the beauty and attractiveness of the person(Academy of Prosthodontics, 1994; Jyothi *et al.*, 2017; Jain *et al.*, 2018).It is very unfortunate for patients to lose their teeth at a very young age. The reason for loss of the tooth may vary from person to person, implant has become the treatment of choice for the dentist for their patient over removable partial processes but, the various other factors such as anatomical , physiological, psychological, medical and financial consideration of the patient begin the reason for deciding. It is a cost effective and best treatment option for partial edentulism(Shah and Aras, 2013; Selvan and Ganapathy, 2016; Duraisamy *et al.*, 2019). But, patients are concerned about the metal exposure in cast partial denture and hence worried about the esthetic appearance(Cowan *et al.*, 1991; Donovan *et al.*, 2001; Ganapathy *et al.*, 2016; Subasree, Murthykumar and Dhanraj, 2016).

Removable cast partial dentures are considered a definite removable prosthesis but the location of the clasp may affect the aesthetic. Hence, when the patient is more concerned about the aesthetic and appearance flexible partial denture which are aesthetically superior to flippers and cost partial denture. However for the success of flexible RPD proper diagnosis, treatment planning and insertion technique of the processes it's very important. Which may not be accepted by the patient due to the cost. Dissatisfaction of the denture was related mainly to age, health, prior experience with the prosthetics and type of opposing dentition and aesthetics(Frank *et al.*, 1998; Kokich, Kiyak and Shapiro, 1999; Vijayalakshmi and Ganapathy, 2016; Ranganathan, Ganapathy and Jain, 2017). Denture has proven to be an improvement over conventional complete prostheses with respect to chewing efficiency, patient comfort level, and esthetics satisfaction .(Cune, de Putter and Hoogstraten, 1994a, 1994b; Burns *et al.*, 1995; Mericske-Stern, 1998).The context for increasing the life spans and evidence from various national dental health surveys in industrialized countries indicate that the proportion of edentulous people will continue to decline and that more people will retain more teeth into old age(Na, 2000)

A well-constructed removable partial denture can be an excellent treatment alternative for replacement thearpy (Bergman, Olsson and Hugoson, 1971; Rissin *et al.*, 1985; Kapur, 1987, 1991b).Yet, these patients deserve the best esthetic and functional results possible. In these cases, a limited number of strategically placed dental implants in conjunction with the remaining natural teeth can establish a favorable removable partial denture design by significantly reducing the effect of the reciprocal arm and improving the fulcrum line position. When an implant or a limited number of implants is used to support the removable partial denture, additional retention is achieved, and the need for anesthetic buccal retentive arm clasps are avoided in the esthetic zone(Budtz-Jorgensen and Bochet, 1998; Carvalho *et al.*, 2001).The concepts of need and demand are central in studies on dentistry. Need has been defined as "the quantity of dental health care which expert opinion judges ought to be consumed over a relevant time period, in order to remain or become as dentally healthy as is permitted by existing knowledge.(Chee, 2005)However, such a definition gives little attention to the individual's personal comfort and quality of life. Need, however defined, does not always lead to demand for treatment,('Oral health in America: a report of the Surgeon General', 2000) depending on factors such as individual preferences, cost, cultural

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differences, psychosocial considerations, comfort, age, and accessibility of services. In most industrialized countries, the demand for prosthodontic treatment is influenced more by esthetic demands rather than by a few missing teeth in the posterior regions.(Kayser and Witter, 1985; Oosterhaven, Westert and Schaub, 1989) Therefore, so-called sociodental factors, social and cultural background, socioeconomic aspects, oral comfort, and appearance must be included and evaluated when dealing with need and demand for prosthodontic treatment. The professional attitude toward need must be that there is no true objective or subjective need. Need is established only in communication with mutual respect between the professional and the patient. (Kronstrom *et al.*, 2000). Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Subramanyam *et al.*, 2018)('Fluoride, fluoridated toothpaste efficacy and its safety in children - review', 2018; Ezhilarasan, 2018; Felicita, 2018; Kavarthapu and Thamaraiselvan, 2018; Krishnan *et al.*, 2018; Marimuthu *et al.*, 2018; Nair *et al.*, 2018; Padavala and Sukumaran, 2018; Pandian, Krishnan and Kumar, 2018; Rajeshkumar *et al.*, 2018; Rao and Kumar, 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Abhinav *et al.*, 2019; Ke *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Ponnulakshmi *et al.*, 2019; Ramesh *et al.*, 2019; Sridharan *et al.*, 2019; Sweta, Abhinav and Ramesh, 2019; Wu *et al.*, 2019; Palati *et al.*, 2020; Paramasivam, Vijayashree Priyadharsini and Raghunandhakumar, 2020).

The aim of this study is to evaluate the esthetic outcome in patients wearing removable partial denture .

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MATERIALS AND METHOD

Study design on study setting

Retrospective study where 86,000 patients case sheets were analysed.The postoperative images of removable partial denture insertion were graded and scoring was given.

Participants

All the patients who receive removable partial denture Saveetha dental college and hospital from June 2019-March 2020

Inclusion criteria

- Patients with partial edentulism
- Removable denture wearers within one year period of time
- Patients aged between 20 years old and above

Exclusion criteria

- Removable denture wearer for more than one year
- Patients with major physical disabilities
- Syndromic patients

Study size

The sample size was 1159 Patients.

Ethical approval

The ethical approval for the research(SDC/SIHEC/2020/DIASDATA/0619-0320) was obtained from the ethical committee of Saveetha Dental college ,Saveetha Institute of medical and Technical science,Saveetha University,Chennai

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Data Analysis

The data was collected from patient reports in hospitals,The obtained data was entered in microsoft excel 2012 .Then exported to statistical package for social science for windows (version 20.0.SPSS Inc.,Chicago III,USA)and all subjected to statistical analysis.

RESULTS

In our present study there are total of 1195 patients out of which 42.19% account for female patients and male patients accounts for 57.8%.So,male population is higher than the female population(Figure-1).In Figure 2 its shows the age of the patients involved in the study.20 years old and below patients accounts for 4.9%,21-30 years old patients accounts for 6.9%,31-40 years old patients accounts for 13.8%,41-50 years old patients accounts for 26.2%, 51 years old and above accounts for about 48%.This is it clearly depicted that patients with the age range of 51 years old and above were found more in our study.Figure 3 represents the main idea of the study the esthetic status of the removable partial denture.Grading was given to the removable partial denture depending on poor,moderate and good.Poor esthetics accounts for 26.1%,moderate esthetics accounts for 46%,f partial denture with good esthetics accounts for 27.6%.In Figure 4 association of gender and removable partial denture esthetics status was done where in female patients with removable partial denture with poor esthetics accounts for 10.5%,moderate esthetics accounts for 19.6%,good esthetics accounts for 12%.Among male population patients with poor removable partial denture esthetics accounts for 15.5%,moderate esthetics removable partial denture accounts for 26.5%,patients with good removable partial denture esthetics accounts for 15.6%.In both male and female population moderate esthetics in removable partial denture seems to be higher when compared to the others.However,no statistically significant differences between both the groups were observed.(Pearson Chi square test; P= 0.718 ,P>0.05).

In Figure 5 association of age and esthetic status of removable partial denture was done.In patients aged between 20 years old and below patients with poor esthetics stand for 0.9%,moderate esthetics stand for 2.7%,good esthetics stand for 1.2%.In patients aged between 21-30 years old poor esthetics stand for 1.3%,moderate esthetics stand for 3.3%,good esthetics stand for 2.1%.In patients aged between 31-40 years old poor esthetics stand for 4.1%,moderate esthetics stand for 6.9%,good esthetics stand for 2.7%.In patients aged between 41-50 years old poor esthetics stand for 6.7%,moderate esthetics stand for 11.6%,good esthetics stand for 7.8%.In patients aged between 51 years old and above poor esthetics stand for 12.9%,moderate esthetics stand for 21.4%,good esthetics stand for 13.6%.However,no statistically significant differences between the groups were observed.(Pearson Chi square test; P= 0.235 ,P>0.05.

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DISCUSSION

Dental treatment of partially edentulous patients is becoming more important because people are saving more teeth, and the complete edentulous population diminishes(Na, 2000; Douglass and Watson, 2002; Wostmann *et al.,* 2006).Almost all partially edentulous patients desire the benefits of implant restorations; but, unfortunately, many of them cannot or will not meet all the criteria to have fixed implant supported restorations because of anatomical, medical, financial, or personal reasons. In situations when financial, systemic, or local conditions preclude the use of a fixed partial denture, a well-constructed removable partial denture can be a valid treatment alternative(Rissin *et al.,* 1985; Kapur, 1991a, 1991b; Bergman, Hugoson and Olsson, 1995).In this context, it must be clearly recognized that

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practical problems with removable partial dentures (lack of stability and retention, unesthetic retentive clasping, and discomfort upon loading) are common and may be the reason why so many patients stop wearing their removable partial dentures. Yet, these patients deserve the best esthetic and functional results possible. In these cases, a limited number of strategically placed dental implants in conjunction with the remaining natural teeth can establish a favorable removable partial denture design by significantly reducing the effect of a reciprocal arm and improving the fulcrum line position. When an implant or a limited number of implants are used to support the removable partial denture, additional retention is achieved, and the need for anesthetic buccal retentive arm clasps is avoided at the esthetic zone(Brudvik, 1999; Mijiritsky *et al.*, 2005).

Our study there were a total of 1159 patients out of which 489 were female patients and 670 where male patients. 303 patients received removable partial denture with poor aesthetics, 535 had their removal partial denture with fair amount of aesthetics and 321 patients had received their removable partial denture with good aesthetics.

Agerberg and Carlson reported that cosmetic and aesthetic were the primary reason for prosthodontics treatment expressed by their patients, which involves mastication being the second most common reason(Agerberg and Carlsson, 1981). God has to be taken during designing the symmetry of the class assembling to both the maxillary and mandibular arch is crucial for their reasons(9).Numerous patients fail to wear removable partial dentures as they find the display of the clasp assembly is aesthetically unacceptable(Fitton *et al.*, 1994; Beaumont, 2002; Ashok and Suvitha, 2016; Ganapathy, Kannan and Venugopalan, 2017). Clasp are used as direct retainers for removable partial denture. The flexible clasp engages the undercut of the abutment to provide retention for the removal of partial denture(Frank *et al.*, 1998; Owen, 2000; Sato and Hosokawa, 2000; Ashok *et al.*, 2014).A prototype nonmetal class denture should be fabricated using CAD CAM technology(Venugopalan *et al.*, 2014; Takahashi, Hamanaka and Isshi, 2017). The CAD CAM clasp made by reporting a laser sintering on high speed milling can be used effectively as a removable partial denture component(Nakata, Shimpo and Ohkubo, 2017; Kannan and Venugopalan, 2018). Aesthetics constitute its major advantages as several two chairs are available for use anteriorly but long-term studies still need to be contacted to be used on a long scale(Davenport *et al.*, 2000; Ajay *et al.*, 2017; Basha, Ganapathy and Venugopalan, 2018). Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)

CONCLUSION

With the limitations of our study we conclude that more number of patients receive removable partial denture with a fair amount of esthetics. There are esthetics concerns that are still to be addressed in patients with removable partial denture.

AUTHORS CONTRIBUTION

Author1(Amanthi Ganapathi) Carried out the retrospective study by collecting the data and drafting the manuscript after performing the necessary statistical analysis.Author 2(Dr.Dhanraj.G) aided in the conception of the topic,participated in the study design,statistical analysis and supervised the preparation of the manuscript and helped in study design and has coordinated in developing the manuscript.All the authors have equally contributed in developing this manuscript.

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CONFLICT OF INTEREST
Nil

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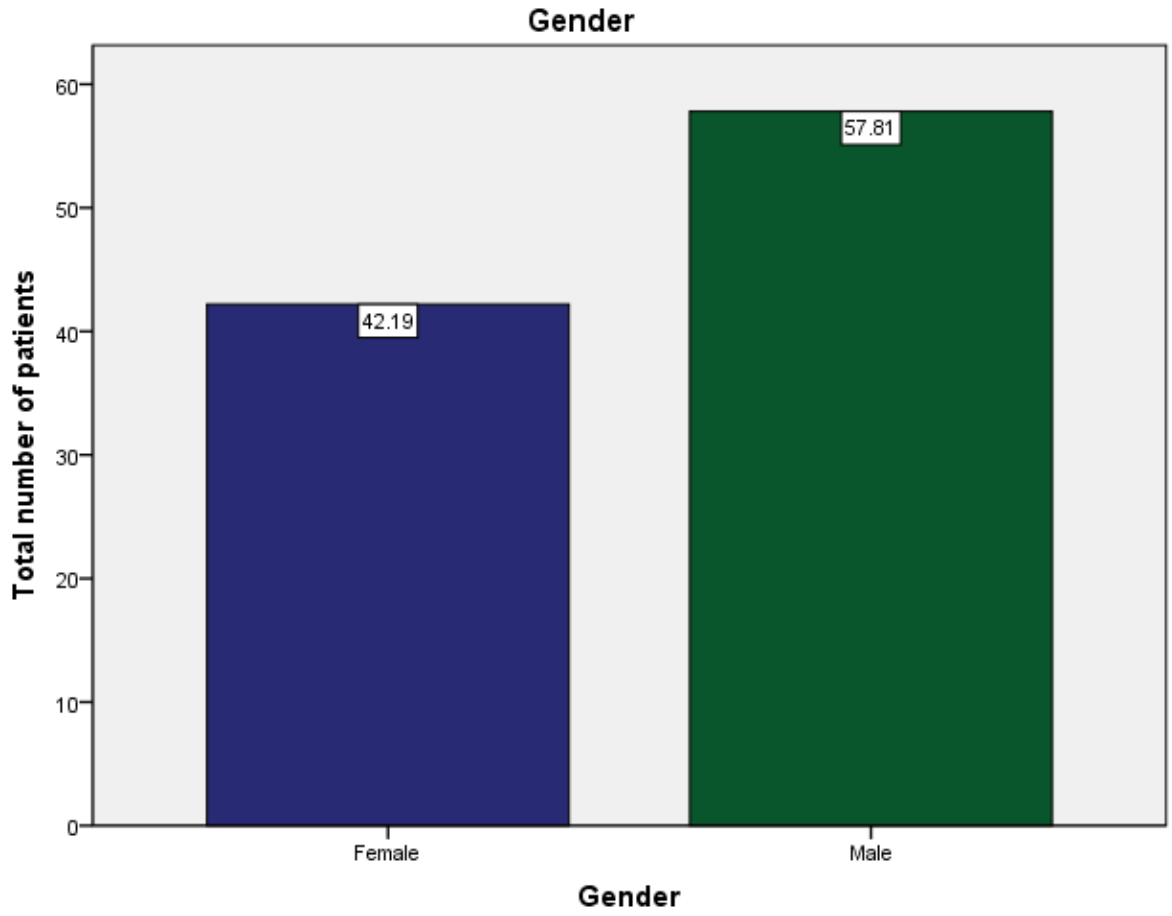

Figure 1 :Distribution of gender of the patients in our study.X axis denotes the Gender of the patients and Y-axis shows the total number of patients.Male patients(Green;57.81%) were more compared to female patients(Blue;42.19%).

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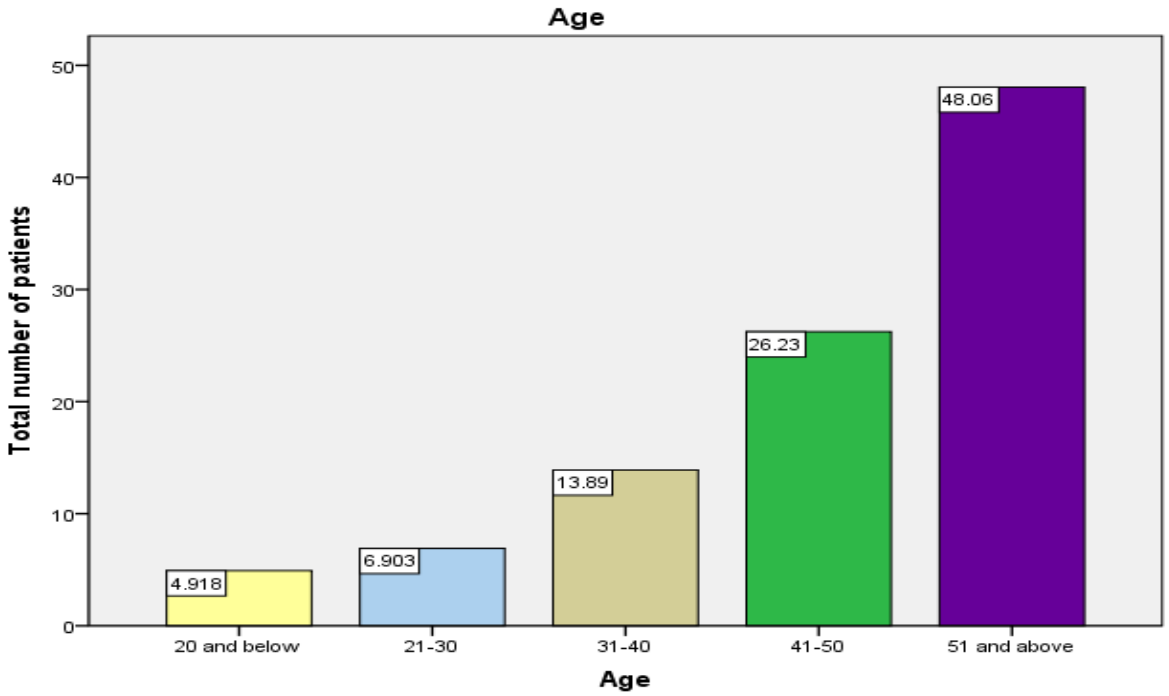

Figure 2 shows the distribution of age of patients involved in our study.X axis represents the age range of the patients,Y axis shows the total number of patients.It is shown that patients aged 51 years old and above (violet;48.06%) were found more when compared to other age groups.

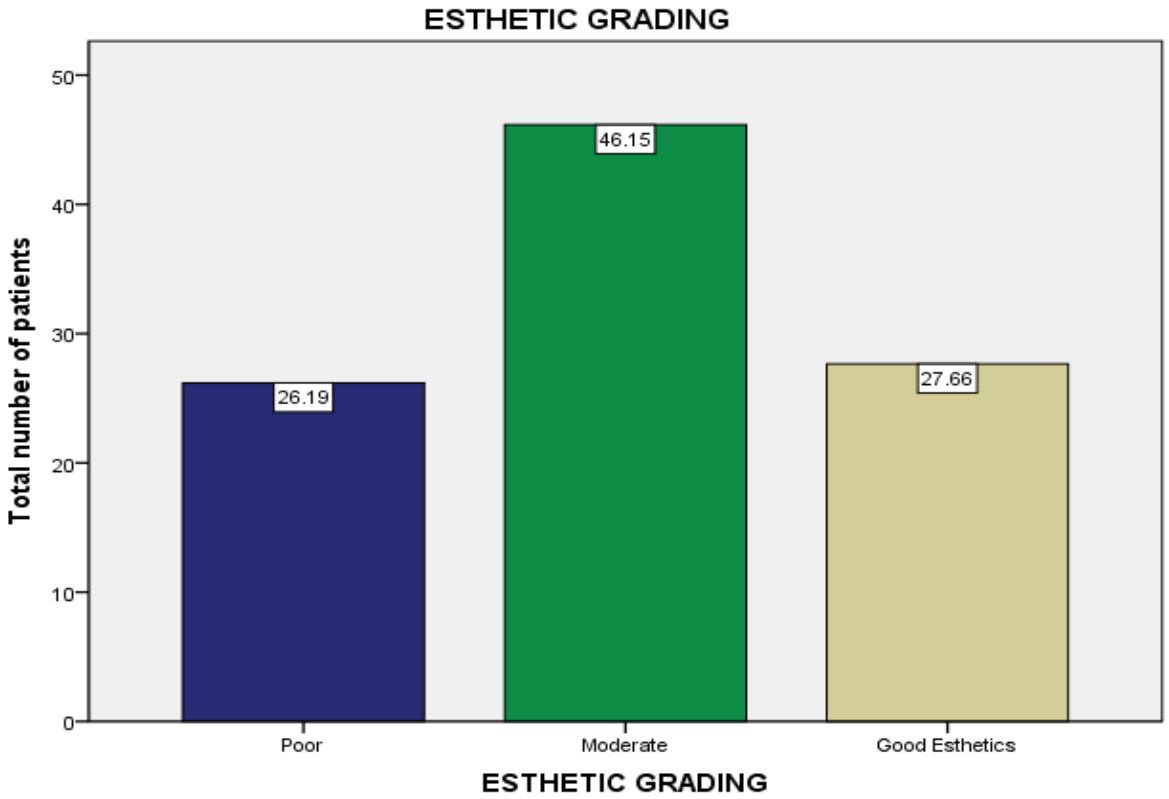

Figure 3 shows the esthetics status of the Removable Partial Denture.X axis shows the esthetic grading and Y axis shows the number of patients in percentage .Poor esthetics(Blue)

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accounts for 26.19%,Moderate esthetics(Green) accounts for 46.16% and patients with Good esthetics (Beige)

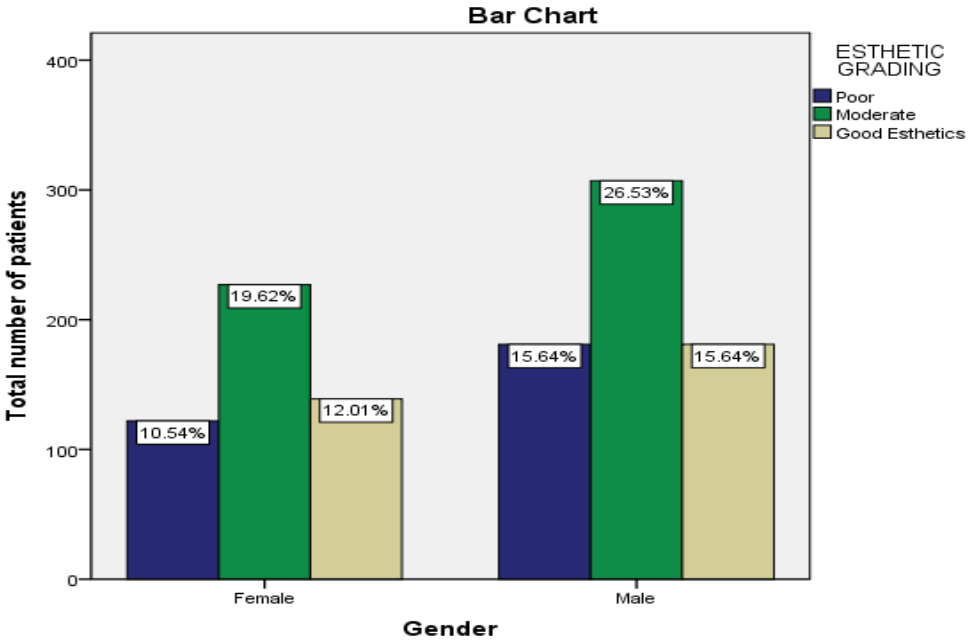

Figure 4 shows the association between gender and esthetics grading.X axis shows the gender and the esthetic grading of the patients Y axis shows the total number of patients.In both female and male patients moderate esthetics for fixed partial denture accounts for 19.62% and 26.53% respectively.However,no statistically significant differences between both the groups were observed.(Pearson Chi square test; P= 0.718 ,P>0.05).

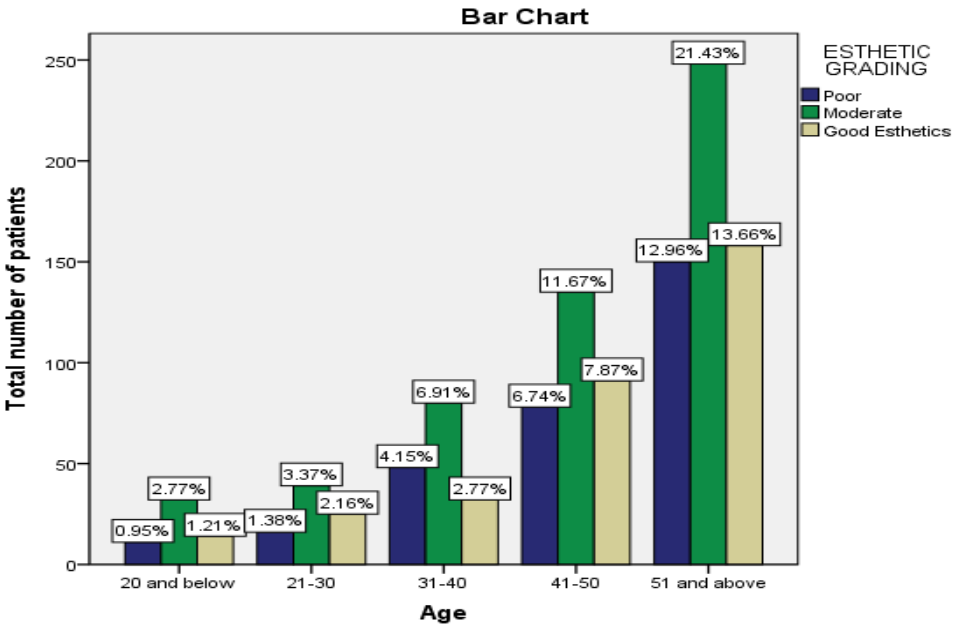

Figure 5 shows the association between age of the patients and esthetic status of fixed partial denture.In 51 years old and above patients they have received fixed partial denture with moderate esthetics (21.43%).However,no statistically significant differences between the groups were observed.(Pearson Chi square test; P= 0.235 ,P>0.05).