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TREATMENT COMPLETION OF PATIENTS UNDERGOING PERIODONTAL FLAP SURGERY

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ABSTRACT

The aim of the present study was to evaluate the treatment completion rate among patients undergoing periodontal flap surgery. The purpose of the study was to determine the treatment completion rate among patients undergoing periodontal flap surgery in Saveetha Dental College and Hospital. A hospital based cross-sectional study was conducted for 373 patients undergoing periodontal flap surgery attending Saveetha Dental College and Hospital from June 2019 to March 2020. The data were gathered through semi-closed ended questionnaires and clinical examinations. Treatment completion rate among patients undergoing periodontal flap surgery was assessed by student's independent t-test or one way analysis of variance. Results showed that 71% of patients in the 31-50 year old age group, 54% patients in the 18-30 year old age group and 55% of the patients in the 51-80 years old age group completed their periodontal flap surgery treatment. Data analysis was done using a chi-square test to compare between the association of age with the treatment completion of patients undergoing periodontal flap surgery, Chi-square-20.292;df-1;p-0.000; the results were statistically significant (P=0.000). Within the limitations of the present study, it was encountered that the majority of the patients aged 31- 50 years old completed periodontal flap surgery treatment.

Keywords: Completion, Flap Surgery, Periodontitis, Treatment

INTRODUCTION

Periodontal diseases are one of the most common diseases affecting up to ninety percent of the population of the world. That accounts to about 6.3 billion people [1, 2]. The mildest form of periodontal disease is known as gingivitis and is caused by dental plaque that accumulates on teeth adjacent to the gingiva. However, gingivitis does not affect the underlying supporting structures of the teeth and is reversible. Periodontitis causes a loss of connective tissue and alveolar bone support. It is the leading cause of tooth loss in adults [3, 4].

Periodontal manifestation can be seen in genetic, dermatological, haematological, granulomatous, immunosuppressive, and neoplastic disorders [5]. Periodontal diseases are usually caused by biofilm containing pathogenic microorganisms as well as familial and environmental factors such as tobacco use which is the main leading cause of periodontitis. Periodontal surgery is a surgical procedure designed to reshape, restore and regenerate normal form and function to lost and damaged periodontal structures which support the teeth [6, 7].

Chronic periodontitis is a disease of the oral cavity characterized by inflammation that spreads from the gingiva into the periodontal tissue, resulting in periodontal pocket

formation, destruction and absorption of alveolar bone, loss of the attached gingiva, gingival recession, and increased tooth mobility [8, 9]. It is easily neglected in the gingivitis stage or during early periodontitis because very few subjective symptoms are present. Thus, treatment usually begins after progression to a later stage, which is more difficult to cure due to the development of alveolar bone destruction [10, 11]. As with most chronic diseases, such as diabetes and hypertension, constant maintenance and management are required.

Periodontitis is a multifactorial inflammatory disease caused by microorganisms leading to irreparable periodontal tissue damage progressing to tooth loss and impaired masticatory function. The current diagnosis of periodontitis is mainly based on clinical examination and alveolar bone changes which are visible radiographically only after an evident amount of bone loss and tissue destruction [12, 13]. It causes relative edentulism which affects the mastication and compromised esthetics causing functional, psychological disturbances which, in turn, distress the general health and quality of life. The consensus of European Workshop on Periodontal Education 2010 said that “preservation of periodontal health disease is

a key component of oral health and overall health and is a fundamental human right”[14].

Compliance is the extent to which persons' behavior coincides with medical or other health-related advice [15, 16]. The success of nonsurgical, surgical, and supportive periodontal therapy is associated with patient compliance. The prognosis of patients is critically dependent on patients' attitude, desire to retain natural teeth, willingness, and ability to maintain good oral hygiene [17]. Unlike endodontic lesions, periodontal lesions are primarily painless [18, 19]. Thus, painless nature of disease along with the lack of awareness and knowledge leads to the perceived unimportance of periodontal therapy which may hinder the patient compliance. A study by Miyamoto *et al.* in 505 patients over 15–53 years demonstrated that there is a reduction in bleeding on probing and plaque index in complete compliant patients as compared to erratically compliant patients [20]. Another study stressed the importance of compliance to periodontal therapy by relating it to improve dental prognosis and reduction in tooth loss [21]. A recent systematic review by Lee *et al.* said that patients who attend their follow up reviews regularly had less risk of tooth loss as compared to erratically compliant patients

[22]. According to Costa *et al.*, regular compliance patients presented a lower progression of periodontitis and tooth loss compared to erratic compliance patients [23]. Thus, these studies highlight the importance of patient compliance on the success of periodontal therapy. Patient compliance can be improved by providing more information about the development and consequences of periodontal diseases and by institution of a recall system supported by electronic data processing as described by Anneken *et al* [24].

Once periodontal treatment is completed, supportive periodontal treatment (SPT) should be continued to maintain the outcomes of treatment and to progressively assess the patient's prognosis. The American Academy of Periodontology has emphasized the importance of SPT, defining it as treatment to prevent or minimize the recurrence and progression of periodontal disease in patients with gingivitis, periodontitis, and peri-implantitis. Furthermore, SPT helps to reduce tooth loss through periodic examinations of natural teeth and periodontal tissues, which help to identify other oral diseases or conditions that may require immediate treatment [8, 10, 25]. There is surprisingly little information on the correlation between flap surgeries with

patients completion rate in India. This is to observe the understanding of the patients in adhering to appointment dates as well as their understanding of the seriousness of periodontal diseases. This initiated our present study to determine the patients that are able and willing to complete their treatment in cases which requires periodontal surgery upon visiting a private dental institute.

MATERIALS AND METHODS

This study was carried out by collecting data from record management software at the private dental institute from June 2019 till April 2020. A project was evaluated and approved by the committee of the private dental institute. Ethical approval for this study was obtained from the institutional ethical committee (ethical approval number: SDC/SIHEC/2020/DIASDATA/ 0619-0320). Informed consent was obtained from the study participants. The present study was conducted among 373 patients who underwent periodontal flap surgery.

The upside of the study was the presence of enormous data. The downside of the study is the geographic restriction as the study was only conducted in one specific area/ region that is in and around Chennai, India. The data to be obtained was passed through the

institutional ethics committee at the Saveetha Dental College and Hospital.

There were 2 reviewers involved in the study with data taken from patients visiting the Saveetha Dental College and Hospital from June 2019 to March 2020. Cross checking of data was done by random verification. Patients with incomplete follow ups were called on the telephone. Random verification was done for 10% of the patient samples.

The internal validity is done by creating a study design followed by complete data collection and validation of data. The external validity is done by creating a study design followed by forming a clinical setup.

Data collection was done by entering the data into Microsoft Excel and then transferred into Statistical Package for Social Sciences (SPSS) software for statistical results. The independent variables were treatment completion of flap surgery while dependent variables present were age and gender. The analysis used for data collection is the chi-square test. The statistical SPSS software used was one- way ANOVA within the SPSS software. The steps for data analysis are as follows, data tabulations were done with data entered into excel sheets followed by tabulation of data into specific subgroups. Data analysis was done using a chi- square test to compare between the association of

age with the treatment completion of patients undergoing periodontal flap surgery, Chi-square-20.292;df-1;p-0.000; the results were statistically significant (P=0.000).

RESULTS AND DISCUSSIONS

A total of 373 patients belonging to the age group of 18 to 73 years of age with a mean age of 38.92 years. The data plotted as a histogram with a normal curve shows a near normal distribution of cases (**Figure 1**).

This final study sample shows 230 (61.66%) patients completed their periodontal flap surgery treatment with 143 (38.34%) patients not completing their periodontal flap surgery. There is a higher prevalence of patients who completed their treatment compared to those who did not (**Figure 2**).

In a stacked bar graph involving gender and age group of the patients who completed their periodontal flap surgery. It is revealed that 142 (71%) patients in the 31-50 year old age group completed their treatment out of a total 201. 58 (54%) patients in the 18-30 year old age group completed their treatment with 47 not completing their treatment. For patients aged between 51-80 years old, only 33 (55%) out of a total of 60 patients completed their periodontal flap surgery treatment by adhering to follow up appointments. There is a higher prevalence of treatment completion among males in the 31-

50 age group compared to other groups (**Figure 3**).

The final study sample size included a total of 373 patients with 221 males and 152 females of which 62 (28%) males were among the 18-30 age group, 120 (54%) patients in the 31-50 year old group and 39 (18%) patients in the 51-80 age group for males. With regard to females, there were 40 (26%) patients in the 18-30, 91 (60%) females in the 31-50 year old age group and 21 (14%) patients who were between 51-80 years old. On a chi square analysis between the association of age with the treatment completion of patients undergoing periodontal flap surgery, Chi-square-20.292;df-1;p-0.000; the results were statistically significant (P=0.000) which implies there is an association between age groups and treatment completion of patients undergoing periodontal flap surgery. There was a higher prevalence of treatment completion in patients among the 31-50 age group (**Figure 4**).

Among patients who completed their treatments, there were 140 males out of 221 (63%) who completed their entire periodontal flap surgery with 85 out of 153 (56%) females completing their periodontal flap surgery treatments. On a chi square analysis between the association of gender with the

treatment completion of patients undergoing periodontal flap surgery, Chi-square-15.895;df-1;p-0.000; the results were statistically significant (P=0.000) which implies there is an association between gender and treatment completion of patients undergoing periodontal flap surgery. There was a higher prevalence of treatment completion among males compared to females in this study (**Figure 5**).

Periodontal diseases are chronic inflammatory diseases affecting the tissues around the tooth and primarily painless in nature. The primary goal of periodontal therapy is to reduce the infectious and inflammatory challenge and to halt the progressing tissue destruction. Removal of pathogenic biofilms and suppression of inflammation can discontinue the periodontal tissue degradation; however, only limited regain of lost tissues occurs, depending on the form of tissue defects, systemic health status, and age [26, 27]. In advanced cases, the active anti-infective treatment phase is often combined with surgery to eliminate residual pockets—with the aim of improving the ecology at periodontal sites—or sometimes with adjunctive systemic antimicrobials to reduce pathogen burden. In smokers, however, the treatment outcome is compromised, which makes smoking

cessation an essential part of their periodontal therapy [28-30]. The beneficial influence of quitting may partly be due to decreased pathogen numbers and increased abundance of health-associated commensals in subgingival biofilms [31, 32]. Although anti-infective treatment reduces total bacterial counts, proportions of periodontal pathogens, as well as the number of sites colonized with pathogens, many of the species return with time [33, 34]. Therefore, daily oral hygiene of the patient and continuing professional supportive periodontal therapy are necessary to maintain the outcome and strengthen the long-term success of the treatment [33, 35].

Initial signs and symptoms of periodontitis are not distressing enough to be considered alarming by patients. For a successful treatment plan, the continuous and active cooperation of the patient is indispensable. After completion of stipulated periodontal therapy, the patient is subjected to the maintenance phase. The definition and classification of compliance has been described by various authors and greatly varies. Most commonly, the patients are classified as regularly compliant patients, erratically compliant patients, and non-compliant patients [36]. In the study by Delatola *et al.*, it was observed that the

compliance of patients to nonsurgical and supportive periodontal therapy was generally low. Furthermore, smoking and periodontal disease act as modest modifiers of patient compliance.[37] Another literature review identified psychological factors associated with patient compliance includes personality traits and emotional stressors. However, there are very limited studies to assess the factors affecting patient compliance.

In our study, the patient compliance role between gender showed that males were 63.64% more likely to complete their treatment compared to 55.92% of females. This is an accordance with the results of previous study conducted by Heft *et al* in 2007, that stated males were more likely to complete their treatment as they engage in more social activities and interpersonal relationships than females, and are therefore more cognisant of the importance and necessity of dental treatments as well as women experience more pain associated with dental treatments than men. Greater fear may also be the cause of lower patient compliance in periodontal therapy [38]. Studies carried out by Mendoza *et al* [33] and Novaes *et al* reported that the gender did not affect patient compliance but Demiel *et al* [38], reported that female patients had a higher compliance

rate and a higher tendency to revisit which is not in accordance with our study.

The relation of age range against treatment completion shows that, patients in the 31-50 year old age group had a higher rate of treatment completion with 60.87% against 26.09% and 13.04% from the 18-30 and 51-80 age group respectively. This may be due to the fact that patients in the 31-50 years old age group are more financially stable and care more about their aesthetics. Guy Huyunh B, 2009 stated that there is a more effective outcome in patients undergoing periodontal therapy having a higher survival rate in younger males [39].

The limitations found in the study are geographic restrictions as the patients are from around the same region. Besides, there was only a single ethnicity as the group of people are from the same region geographically.

The future scope of exploration with regards to patient compliance of treatment completion among patients undergoing periodontal flap surgery is by providing awareness towards patients to create a borderline on treatment completion among patients attending review sessions and by improving the methods in treating patients.

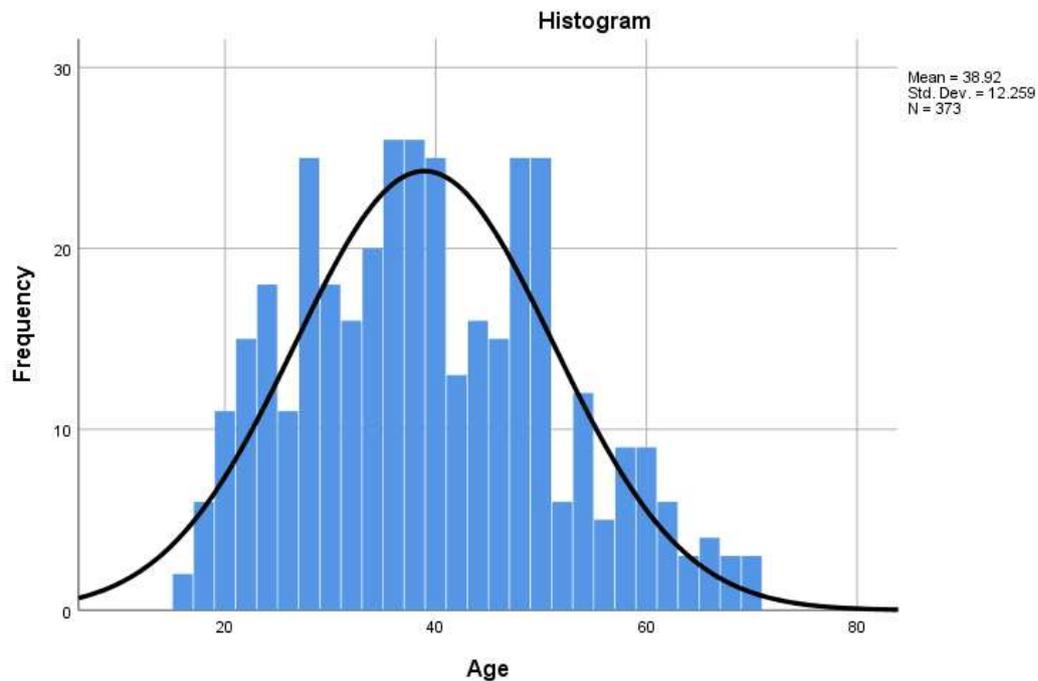


Figure 1: The histogram depicts the age distribution of the patients who underwent flap surgery. X- axis shows the age of the patient and Y- axis shows the frequency. The mean age was 38.92 years.

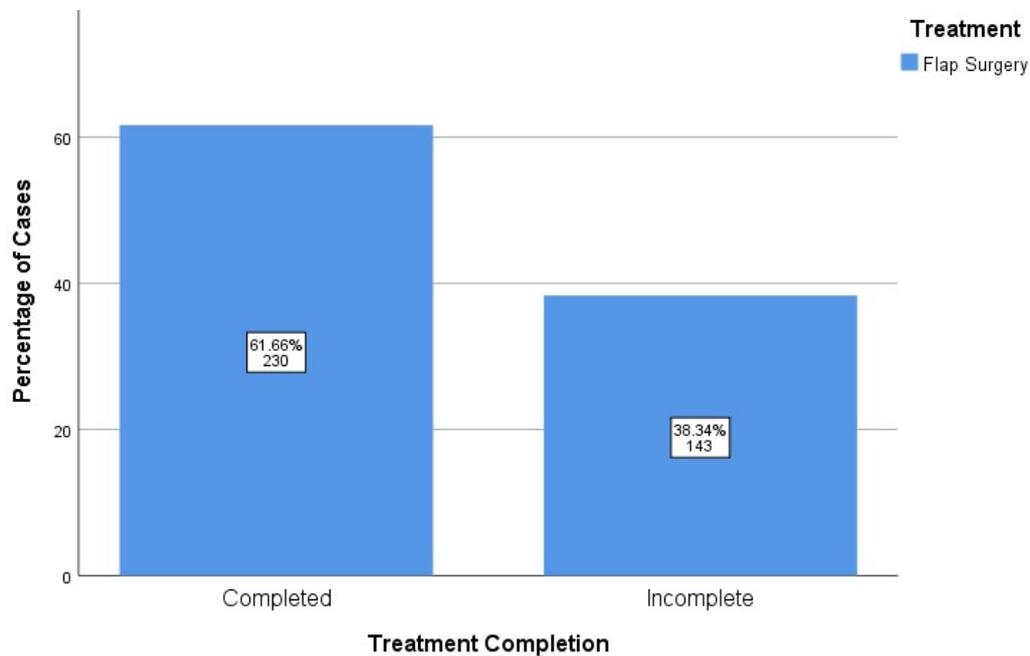


Figure 2: The graph bar shows the gender distribution of patients who underwent periodontal flap surgery. X- axis shows completion of treatment and Y-axis shows the percentages of patients with diabetes and hypertension who underwent periodontal flap surgery. This graph shows 230 (61.66%) patients completed their periodontal flap surgery treatment with 143 (38.34%) patients not completing their periodontal flap surgery. There is a higher prevalence of patients who completed their treatment compared to those who did not.

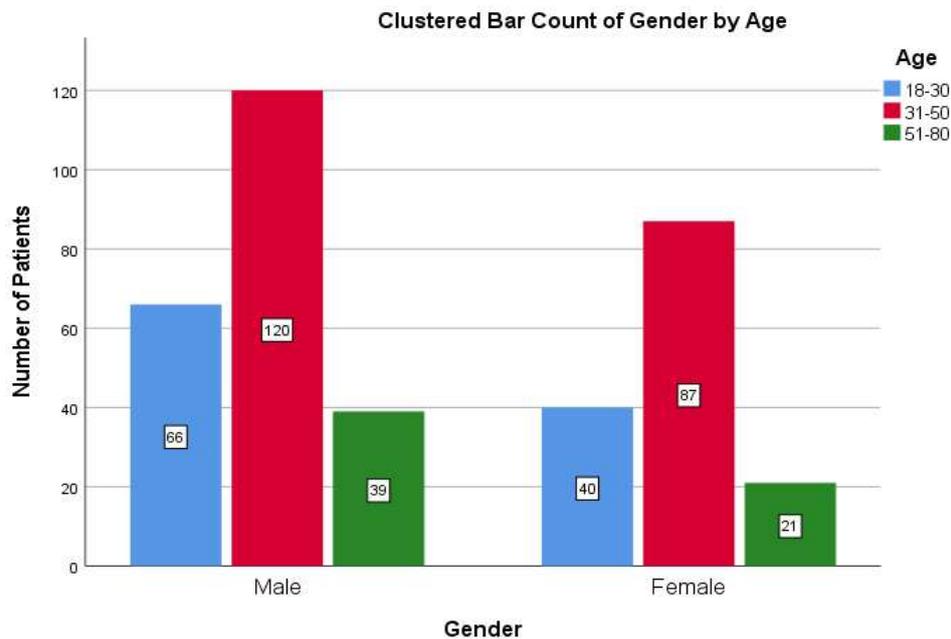


Figure 3: The graph bar shows age distribution among gender in patients who underwent periodontal flap surgery. (X-axis: Gender; Y-axis: Number of patients completing periodontal flap surgery treatment; Blue: 18-30 age group; Red: 31-50 age group; Green: 51-80 age group).. 71% of patients in the 31-50 year old age group, 54% patients in the 18-30 year old age group and 55% of the patients in the 51-80 years old age group completed their periodontal flap surgery treatment. There is a higher prevalence of treatment completion among males in the 31-50 age group compared to other groups.

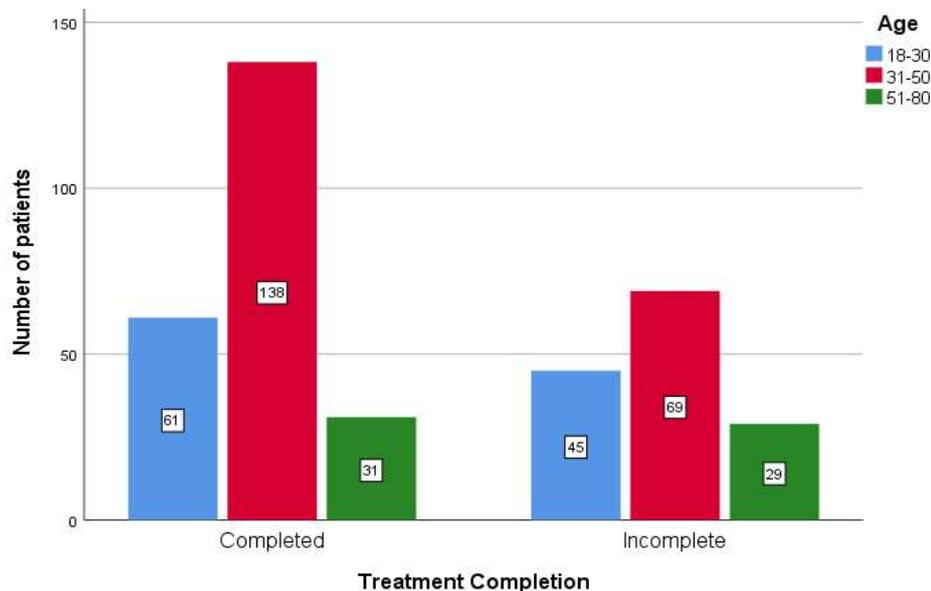


Figure 4: Bar graph showing the association between treatment completion of patients who underwent periodontal flap surgery among age groups. (X-axis: treatment completion rate; and Y-axis: Number of patients completing periodontal flap surgery treatment; Blue: 18-30 age group; Red: 31-50 age group; Green: 51-80 age group). Chi square test done with a chi-square value-20.292;df-1;p-0.000; ($P < 0.05$) which implies the results were statistically significant. There is an association between age groups and treatment completion of patients undergoing periodontal flap surgery. There was a higher prevalence of treatment completion in patients among the 31-50 age group.

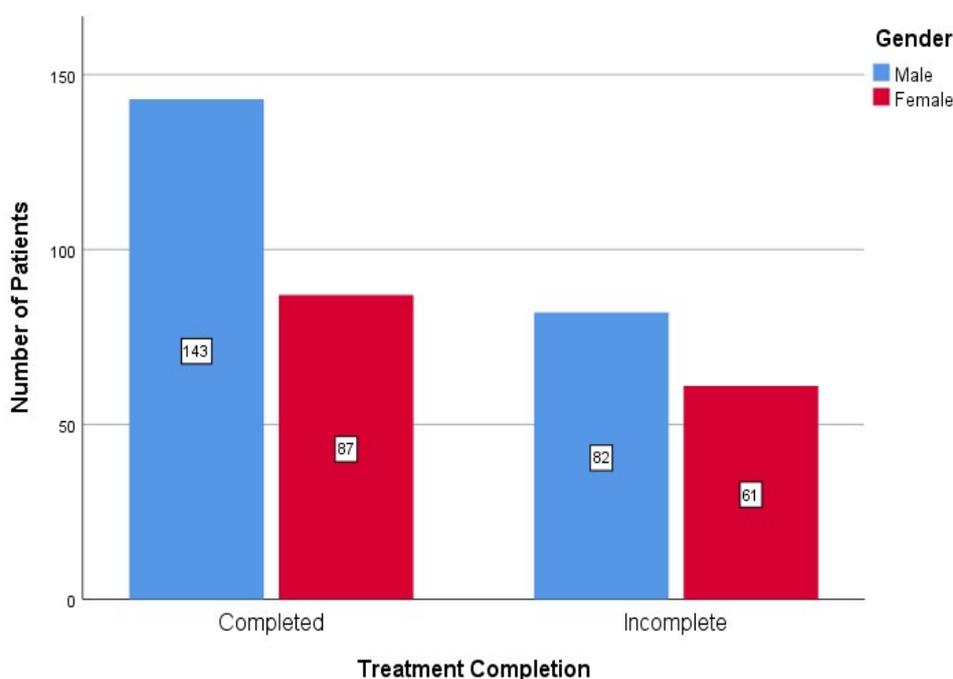


Figure 5: Bar graph showing the association between treatment completion of patients who underwent periodontal flap surgery among gender. (X-axis: treatment completion rate; Y-axis: Number of patients completing periodontal flap surgery treatment; Blue: Males; Red: Females). It reveals that 63% of the males and 56% of females completed their flap surgery treatment. A chi-square test was done with a chi-square value- 15.895, df-1, $p=0.000$; ($P<0.05$) which implies the results were statistically significant. There is an association between gender and treatment completion rate with both males and females completing their periodontal flap surgery.

CONCLUSION

Within the limitations of the present study, it was encountered that the majority of the male patients from the 31-50 age group completed treatment of periodontal flap surgery. This could be due to the financial stability and being able to attend the appointments regularly by the 31-50 age group who are more settled in life.

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AUTHORS CONTRIBUTION

Sivesh Sangar contributed to the study design, data collection, data analysis, preparation of the manuscript.

Nashra Kareem contributed to the study design, data collection, and preparation of the manuscript.

Visalakshmi Ramanathan contributed to the study design, preparation of the manuscript and proofreading.

CONFLICT OF INTEREST

This research project is self funded. There is no conflict of interest.

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