

Assessment Of Oral Hygiene Index in Patients Undergoing Orthodontic Treatment

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Abstract

Background: Oral hygiene is an important factor controlled by the patient during orthodontic treatment, which can affect the quality and timing of the therapy. Previous studies have demonstrated a rapid decline in oral hygiene compliance after the initial bonding, and the appliance favors plaque accumulation and represents an obstruction to the hygiene procedures.

Aim:The aim of this study was to determine and assess the oral hygiene index in patients undergoing orthodontic treatment.

Materials & Methods: A total of 997 patients who were subjected to orthodontic treatment were taken from April 2020 to March 2021. The data was collected from the patient management system. The data was collected and the analysis was done using “Statistical Package for the Social Sciences” by IBM version 23.

Results: Out the 997 patients who underwent orthodontic treatment, 51.96% of the patients were males and 48.04% were females. 70.81% of the patients have got the fixed orthodontic appliance treatment and 29.19% of the patients underwent removable appliance treatment. 74.12% of the patients had “Good” OHIS interpretation, out of which 52.86% had fixed appliance and 21.26% had removable appliance.

Conclusion: Most of the patients who underwent orthodontic treatment had an oral hygiene index interpretation as “good” as the patients were given proper oral hygiene index instructions and the patients have followed them.

Keywords: Fixed appliance, Innovative technique, Oral hygiene index, Orthodontic treatment, Plaque accumulation , Removable appliance

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INTRODUCTION

Individuals typically seek orthodontic treatment to improve their dentofacial attractiveness. Fixed appliances are frequently used in orthodontic treatment to treat malocclusion and misalignment of the dental arches (1). Fixed orthodontic appliances, on the other hand, may make oral hygiene routines more difficult for patients. All individuals having orthodontic treatment must maintain a high degree of oral hygiene. Inadequate oral home care and dental hygiene habits can lead to plaque accumulation, increasing the risk of gingivitis, gingival recession, loss of gingival attachment and periodontal support, and dental caries in orthodontic patients(2), (3).

If oral hygiene routines are maintained during orthodontic treatment, traditional orthodontic treatment has minor effects on periodontal health (4). The amount of plaque present in the patients determines the severity of gingivitis, regardless of whether the teeth are crowded or not(5). It is therefore critical for clinicians to teach prospective orthodontic patients that the components of fixed appliances can facilitate plaque accumulation and retention in a low-motivated individual with poor oral hygiene, and that this, combined with an increase in oral microfloras during orthodontic treatment, can lead to oral and dental infections(6).

Greene and Vermillion's Oral Hygiene Index Simplified (OHI-S) has been found to be beneficial in assessing people's oral hygiene (7). The assessment of oral hygiene state in orthodontic patients undergoing active treatment will reveal their present oral health status and help plan suitable oral health care and dental services (8). It will also facilitate the determination of the need to further reinforce home care oral hygiene instructions and remedies for patients where appropriate with a view to prevent and reduce risk of complications of oral and dental infections during active orthodontic treatment (9).

The Invisalign system, a new generation of removable, clear semi elastic polyurethane aligners, was first introduced into orthodontics in 1999(10). It is made of a thin, transparent plastic that fits over the buccal, lingual/palatal, and occlusal surfaces of the teeth, which was previously a computer designed and could gradually move the teeth into an ideal position. It is based on a polymer composed of a chain of organic units joined with urethane links and is made from a thin, transparent plastic that fits over the buccal, lingual/palatal, and occlusal surfaces on the teeth, which was previously a It is not as firmly attached to teeth as regular braces are, and it can be readily removed for cleaning.

For a more simple adjustment experience, Invisalign aligners can simply be replaced at home. Most patients with mild to moderate biting or alignment issues may benefit from it. Many researchers now believe that invisalign aligners are better than traditional fixed appliances for maintaining periodontal health. The Invisalign method, on the other hand, often requires patients to wear the aligners for a minimum of 20 hours per day, removing them only for eating, drinking, tooth cleaning, and flossing. Because the surfaces of the teeth are fitted over, periodontal damage can occur as a result of incorrect oral cavity cleansing and the appliance's unsmooth edge(11). Our team has extensive knowledge and research experience that has translated into high quality publications.(12–24),(25–29) (30) (31). The aim of the present study is to assess the oral hygiene status in patients undergoing orthodontic treatment.

Materials And Methods

It is a single centered retrospective study conducted at Saveetha dental college and hospitals, Chennai. A total of 997 patients who underwent orthodontic treatment, predominantly South Indians, were included in the study. Ethical clearance was obtained from the International review board. The study was conducted from April 2020 to February 2021. Validation to the study was done by undergraduate, postgraduates and all faculty members of Saveetha dental college.

Data collection was done by using patient management software which has all patients records. It is a recording system of all patients of all data related to the medical and dental history of patients and treatment done in Saveetha dental college. The collected data was tabulated under the following parameters - name, age, gender, type of the orthodontic treatment and OHIS interpretation. The main variables included are the type of orthodontic treatment and OHIS interpretation. The data analysis was performed using SPSS software (version 23). The chi square test and pearson correlation was done. The chi square test was used to compare the data and checked for the distributions at 0.05 level of significance for effect of statistical significance.

Results And Discussion

The data collected from the digital archives was tabulated, imported to SPSS and descriptive statistics was performed. Out of 997 patients, the age of 58.48% of the population ranged from 21 to 30yrs age group, 28.39% from 10 to 20yrs, 10.23% from 31 to 40yrs, 1.60% from above 40yrs of age group and 1.30% from less than 10 yrs of age group (Figure 1). Out of the study population, 52% of the patients were males and 48% of them were females. Out of the 997 patients who underwent orthodontic treatment, 70.81% of the population had fixed appliance and 29.19% had removable appliance (Figure 2). The OHIS interpretation was categorized into three groups, namely good, fair and poor. 74.12% of the patients had an interpretation of "Good", 23.87% had "Fair" and 2.01% had "Poor" interpretation.

An association was done between age groups and type of orthodontic treatment. A statistical test named "Chi square" test has been done. Out of 70.81% of the patients with fixed appliance, 42.53% were from 21 to 30yrs age group, 20.36% from 10 to 20yrs, 7.02% from 31 to 40yrs, 0.70% from above 40yrs of age group and 0.20% from less than 10yrs of age group. Out of 29.19% of the patients with removable appliance, 15.95% of the patients were from the age group of 21 to 30yrs, 8.02% were from 10 to 20yrs, 3.21% from 31 to 40yrs, 1.10% were less than 10yrs and 0.90% were above 40yrs (Figure 3). When the Chi-square test was done, the p value was found to be 0.00 which is statistically significant.

The crosstabs were done between the type of orthodontic treatment and gender. The patients who underwent the treatment of fixed appliance were 70.81%, out of which 37.91% were males and 32.90% were females. 29.19% of the patients had removable appliance out of which, 15.15% were females and 14.04% were males (Figure 4). The p value was found to be 0.02 which is statistically significant. A study given by Farhad Atassi, Fatin Awartani, 2010, (32) shows the similar ethnicity as the present

study. Most of the male patients had fixed appliance and most of the females had removable appliance.

An association was made between the type of orthodontic treatment and OHIS interpretation. 74.12% of the patients had an OHIS interpretation as “Good”, out of which 52.86% were the patients with fixed appliance and 21.26% were with removable appliance. 23.87% of the patients had an OHIS interpretation as “Fair”, out of which 17.55% were with fixed appliance and 6.32% with removable appliance. 2% of the patients had an OHIS interpretation as “Poor”, out of which 1.60% had removable appliance and 0.40% with fixed appliance (Figure 5)). The p value was found to be 0.00 which is statistically significant.

A study given by Ajayi EO, Azodo CC,2014 (33), says that patients with a high level of dental awareness and a favourable attitude towards oral health are thus important contributory factors in obtaining effective oral hygiene. It's also worth noting that, while orthodontic patients are responsible for maintaining proper oral hygiene, orthodontists play a vital role in promoting oral hygiene during orthodontic treatment which will include choice of more hygienic orthodontic appliances, provision of oral health education and advice about methods of plaque control, dietary advice, fluoride therapy, motivation and monitoring to ensure effectiveness of the oral hygiene regime. This study shows similar ethnicity as the present study. A study given by NL Buthelezi; TK Madiba, 2021,(34), stated that there was a satisfactory oral hygiene status among patients at the institution with the majority of patients maintaining good oral hygiene practices. It also revealed that the high percentage of the patients in this study had “Good to Fair” OHIS interpretation, which is also an indication that patients took the oral hygiene instruction that was given to them seriously and practised them. This is evidenced by the fact that 90% of the patients admitted that they were shown how to clean their teeth after the brackets were bonded and the fact that the majority of the patients brushed their teeth twice a day.

A study given by Alessandra Impellizzeri, et.al, 2018,(35),states that the appropriate prescription of an oral hygiene protocol in orthodontic patients and the periodical reiteration of the message are positively correlated with an improvement of oral hygiene conditions, in spite of the sort of health facility and mainly related to the ability of the dental professionals. The presence of a fixed appliance strengthened the need for close control. It is a single centered study with limited sample size. This research would help as one of the guides for further research on the association between oral hygiene index and orthodontic treatment.

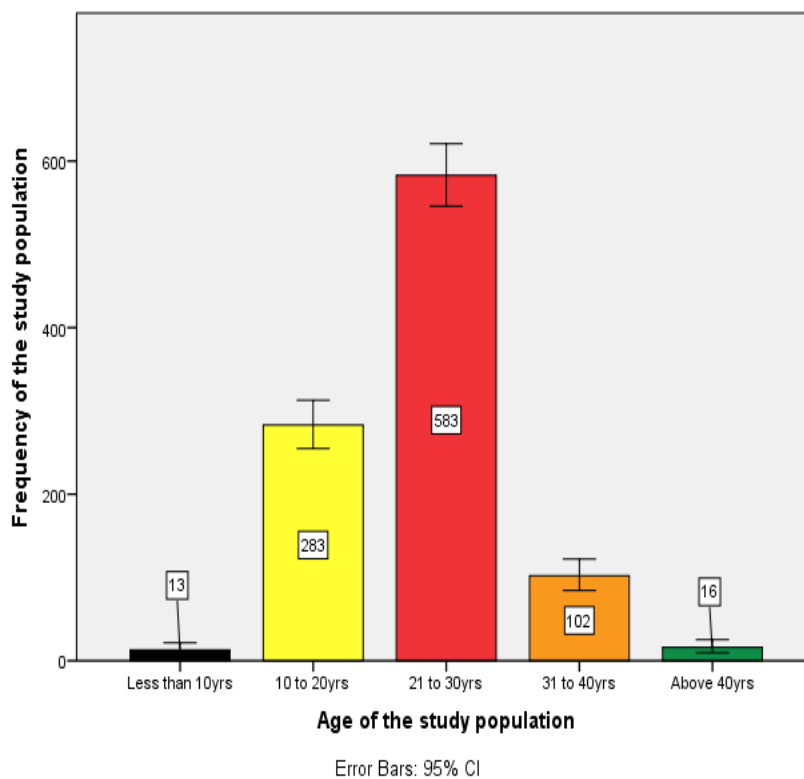


Figure 1: Bar graph depicting the age of the study population who underwent orthodontic treatment. Black colour denotes less than 10yrs, Yellow colour denotes 10 to 20yrs, Red colour denotes 21 to 30yrs, Orange colour denotes 31 to 40yrs and Green colour denotes age group above 40yrs. X axis represents the age of the study population and Y axis represents the percentage of the study population.

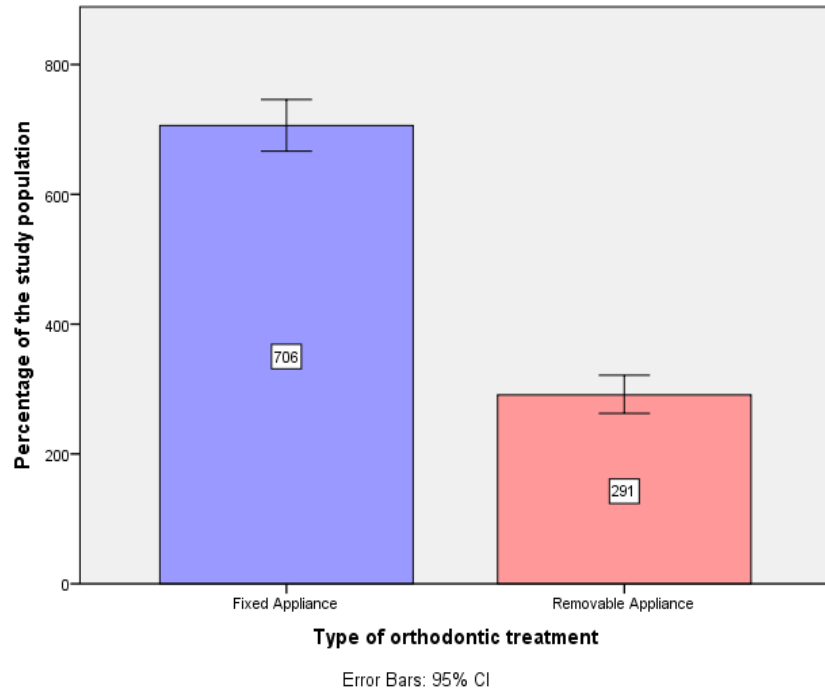


Figure 2: Bar graph depicting the type of orthodontic treatment of the study population who underwent orthodontic treatment. Purple colour denotes fixed appliance and Peach colour denotes removable appliance. X axis represents the type of the orthodontic treatment and Y axis represents the percentage of the study population.

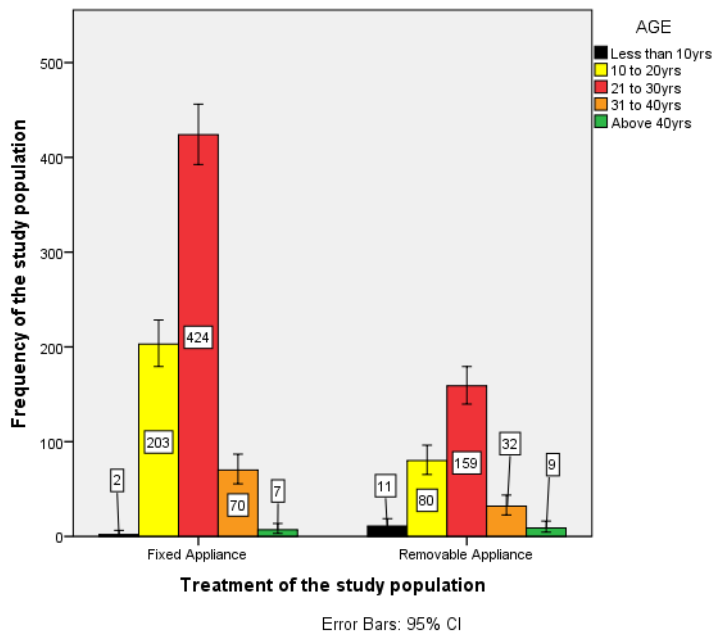


Figure 3: Bar graph depicting the association between age of the study population and the type of orthodontic treatment. Black colour denotes less than 10yrs, Yellow colour denotes 10 to 20yrs, Red colour denotes 21 to 30yrs, Orange colour denotes 31 to 40yrs and Green colour denotes age group above 40yrs. X axis represents the type of orthodontic treatment of the study population and Y axis represents the percentage of the study population.

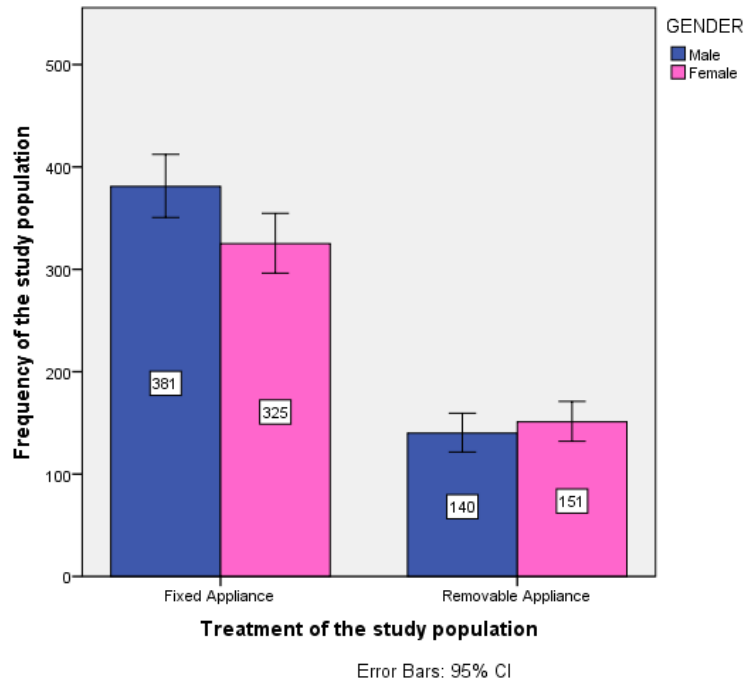


Figure 4

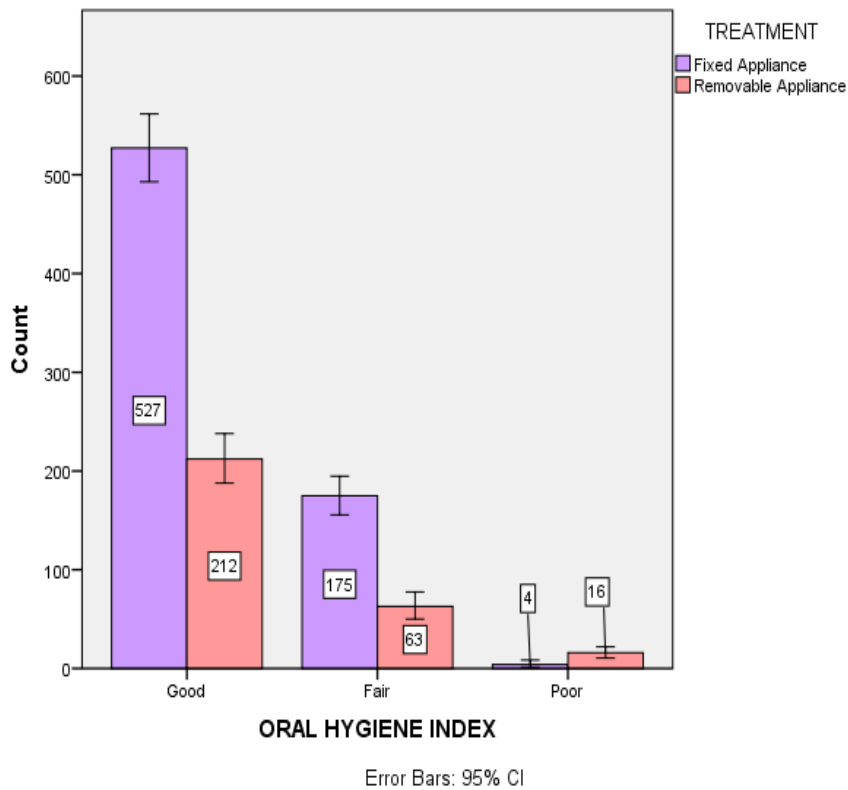


Figure 5: Bar graph depicting the association between OHIS interpretation of the study population and the type of orthodontic treatment. Purple colour denotes fixed appliance and Peach colour denotes removable appliance. X axis represents the OHIS interpretation of the study population and Y axis represents the percentage of the study population.

Conclusion

From the above article it can be concluded that this study showed a satisfactory oral hygiene status among the study population who underwent orthodontic treatment. There were statistically significant gender differences in the distribution of oral hygiene status among the subjects, although the younger subjects had a significantly highest proportion of good and fair oral hygiene status.

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Conflict Of Interest

None to declare

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