

Assessment of Etiological Factors Associated to Anterior Class Iv Restorations - A University Based Study

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ABSTRACT

INTRODUCTION

Physical appearance especially concerning the esthetics of the facial form shape and appearance has been of utmost importance since the development of civilizations. Many studies

are present researching the different types of composites, techniques and other modalities as such for anterior teeth restorations but the insights regarding the etiology and the studies regarding it are very few in number. This study aims to assess the factors and the etiology of class 4 restorations in patients visiting a private dental institution.

MATERIALS & METHODS

Dental patients who visited our institution from June 2019 - July 2021, 200 patients who had undergone class 4 restorations were included in the study and simple random sampling method was followed to prevent bias. Each patient's dental records, treatment reports and photographs were reviewed thoroughly. The data analysis was done using Statistical Package for Social Sciences for Windows, version 26.0 (SPSS Inc., Chicago, IL, USA) and results were obtained. P-value (< 0.05) was considered statistically significant.

RESULTS

The study population had an equal male and female gender ratio (50%). Majority of the study population were affected with trauma 34.50% followed by caries 33.50%. Majority of the female population (21.50%) had caries as their main etiological factor and the majority of the male population had trauma (20.50%). Trauma was the main etiological factor in 18-22 age group (18.50%), followed by caries which was the main etiological factor in 33-37 age group.

CONCLUSION

Caries and trauma were the most common etiological factors for patients to undergo class 4 restorations. Caries were mostly associated with Females & older age groups and Trauma was mostly associated with Males & younger age groups.

KEYWORDS: Anterior, Restoration, Aesthetic, Novel Study, Trauma

INTRODUCTION

Physical appearance especially concerning the esthetics of the facial form shape and appearance has been of utmost importance since the development of civilizations. The morphological features of the face has always been the reference of ideal beauty of which a person's smile is given the most importance when it comes to aesthetics.^{1,2} Smiling has been one of the most significant factors in developing one's self confidence and social relationships. Smile is defined as "a change of facial expression involving a brightening of the eyes, an upward curving of the corners of the mouth with no sound and less muscular distortion of the features than in a laugh that may express amusement, pleasure, tender affection, approval, restrained mirth, irony, derision or any of various other emotions." by Webster. Smile is said to develop when a sensation of happiness, pleasure, and humour is felt. Smiling often reveals the upper and lower anterior teeth.^{3,4}

Any loss of tooth structure, decay, discoloration of the anterior would bring down the aesthetic appearance of a person. In the earliest days Dentistry was predominantly focussed on saving or restoring the remaining or the lost tooth structure. However due to the increase in the

importance of facial features and esthetics when it comes to restoring the anterior teeth ,the techniques and materials have evolved to a greater extent. ⁵⁻⁷ For composite restorations involving the anterior teeth , right from the beginning of the treatment the satisfaction of the patient is the most important criteria and their involvement in the planning of the treatment is vital right from the selection of materials based on their and the other technicals aspects come into the practitioners hand such as the type of instruments used, the type of adhesive system,type of composite,the of light curing unit, has a chance of influencing the mechanical properties of the restoration and it may interfere with the clinical efficiency of a practitioner.In the commercial market, several different composites are available.⁸⁻¹¹ Though there are many options to restore the damaged tooth structure, it is evident that the root cause or the etiology must also be inspected to prevent the loss of tooth structure. ^{12,13} Many studies are present researching the different types of composites,techniques and other modalities as such but the insights regarding the etiology and the studies regarding it are very few in number. Hence with the prior extensive knowledge and research experience that has translated into high quality publications^{14-23 24-27 28-32 33}. This study aims to assess the factors and the etiology of class 4 restorations in patients visiting a private dental institution.

MATERIALS & METHODS

Study design and Study setting

The current study was done in a private university setting (Saveetha dental college and hospitals, Chennai, India). The data available is of the patients visiting as outpatients who had undergone class 4 restorations. Digital records of 200 patients who reported to the hospital were used in this retrospective study . Ethical clearance to conduct this study was obtained from the institutional review board.

Sampling

Data of 200 patients (100 females and 100 males) were verified and obtained. All incomplete or any missing data, and completely edentulous patients in the given time period were excluded from the study. Dental records, photographs and treatment records of all patients were examined thoroughly. Data was cross verified for errors with the aid of an additional reviewer and photographic records.

Data collection

A single calibrated examiner evaluated the digital case records of the patients who had visited the outpatient department from June 2019 to July 2021 for class 4 restoration. Demographic details such as age and gender were also recorded.

Statistical Analysis

The collected data was analyzed,tabulated and validated with Statistical Package for Social Sciences for Windows, version 26.0 (SPSS Inc., Chicago, IL, USA) and the results were obtained. Categorical variables were depicted using frequency and percentage. Chi-square test was used to test the association between categorical variables. P-value < 0.05 was considered statistically significant.

RESULTS

The study population had an equal male and female gender ratio (50%)[**Figure:1**]. Majority of the study population belonged to the 18-22 age group (32.00%) followed by 28-32 age group (21.00%) , 23-27 age group (19.50%) , 33 - 47 age group (16.50%) and lastly by 38-42 age group (11.00%)[**Figure:2**] . Majority of the study population were affected with trauma 34.50% followed by caries 33.50%, [**Figure:3**]. Majority of the female population (21.50%) had caries as their main etiological factor and the majority of the male population had trauma (20.50%) as their etiological factor [**Figure:4**]. With respect to age groups trauma was the main etiological factor in 18-22 age group (18.50%) , followed by caries which was the main etiological factor in 33-37 age group (13.50%), dislodgement of restoration was mostly associated with 23-27 age group (8.00%) and lastly 38-42 age group was also mainly associated with caries (6.00%) [**Figure:5**]

DISCUSSION

Our study had an equal gender distribution of male and females (50%). This was not accomplished in previous other studies. An equal distribution of both the genders would give an idea of etiological factors.³⁴

It is to be noted that the majority of the study population belonged to the 18-22 age group 32.00% , followed by 28-32 age group 21% , 23-27 age group 19.50% , 33 - 47 age group 16.50%(orange) and lastly by 38-42 age group 11.00% . This could be due to various factors that denote that the younger age group are more likely to get their anterior restoration done as facial aesthetics are important to them and less likely for the older age groups as they might not be giving much attention to the facial aesthetics as long as their functional requirements are met. This has been discussed in another studies done by Moles and Espeland and is in accordance with our study.³⁵⁻³⁸

Frequency distribution of the etiological factors showed majority of the study population were affected with trauma 34.50% Figure:3 ,this could be due to various factors such as roadside accidents, sporting accidents, domestic abuse and many factors as such followed by caries 33.50%, it is a well known fact that caries is a multifactorial disease such as salivary pH, pathogens, host immunity and many other factors which we discussed in prior studies.^{39,40}

The latter part of the etiological factors include dislodgement of the restoration and the discoloration of the restorations this could be due to various factors affecting the clinical proceedings of the practitioner such the quality of the materials used, the intensity and the quality of the light curing unit, the food habits of the patient and the lifestyle of the patients which are discussed in previous studies and could be few of the reason for it to be a etiological part of this study.^{41,42}

It is evident that the majority of the female population 21.50% had caries and the majority of the male population had trauma 20.50% has their respective etiological factor. There have been other studies denoting that the female gender are more prone to caries than the male gender due to their innate genetics, diets and lifestyle ^{43,44} . Trauma was mostly associated with males

and it is reported in other studies that male gender is mostly involved in roadside accidents, sporting accidents and other activities which may cause trauma to the anterior part of their face.⁴⁵⁻⁴⁷

Both male gender and female gender are of equal proportion in getting their dislodged restoration corrected, this could be due to factors such as social acceptance and to retain their social image as such.⁴⁸⁻⁵⁰

With respect to age groups it is evident that trauma was the main etiological factor in 18-22 age group 18.50%, followed by caries which was the main etiological factor in 33-37 age group 13.50%, dislodgement of restoration was mostly associated with 23-27 age group 8.00% and lastly 38-42 age group was also mainly associated with caries 6.00%. Young age groups are often involved in physical activities and are more prone to trauma, and people belonging to the older age group are prone to be inactive and are not well monitored regarding the oral hygiene and nutritional well being thus leading to dental caries.⁵¹⁻⁵³

There has been very few studies of this kind in the past. As the old saying goes “*prevention is better than cure*” it is best to prevent any loss of tooth structure to the anterior dental region as no matter how hard it is tried the natural teeth cannot be matched by any artificial measures with respect to aesthetics and functionality. Future studies with better sample size and variable can be done to provide more insight regarding it

CONCLUSION

Caries and trauma were the most common etiological factors for patients to undergo class 4 restorations. Caries was mostly associated with Females & older age groups and Trauma was mostly associated with Males & younger age groups.

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CONFLICT OF INTEREST: None

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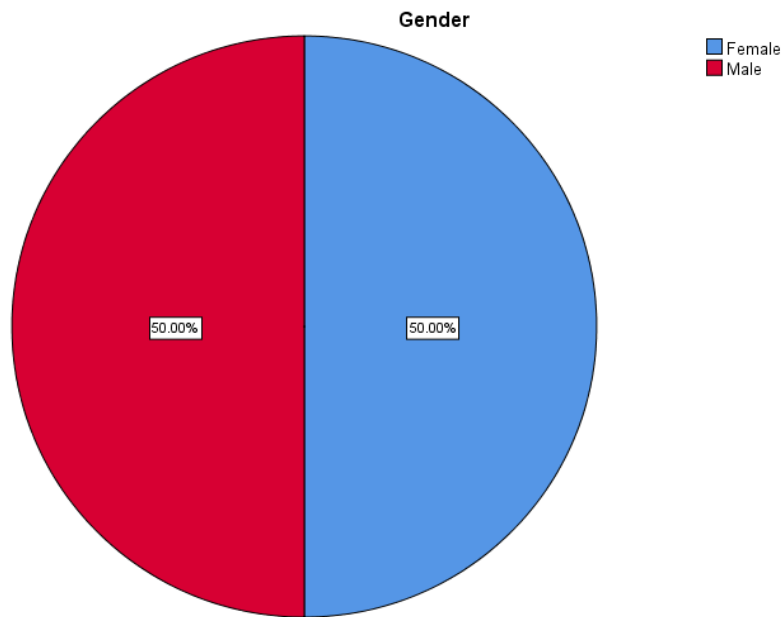


Figure 1: Pie chart shows the gender distribution of the study population. It is evident that Male and the Female gender were of equal distribution 50%.

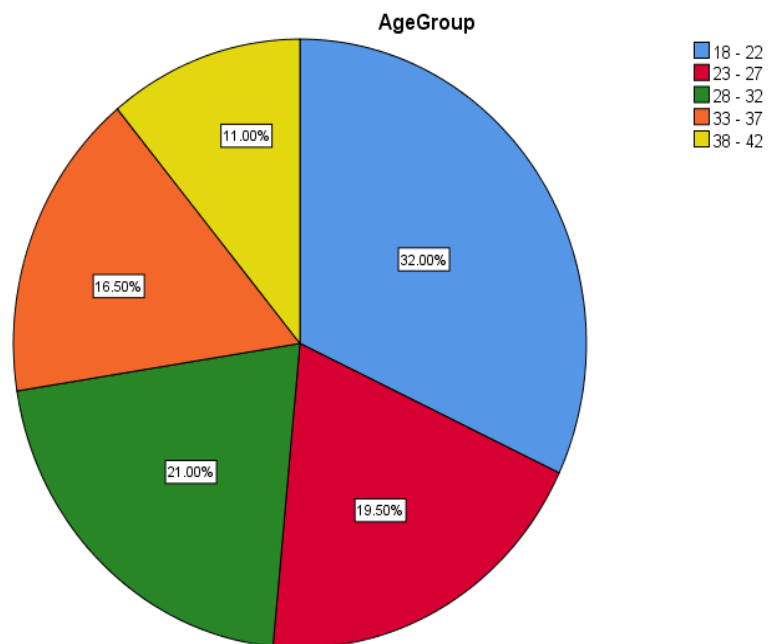


Figure 2: Pie chart shows the age distribution of the study population. It is evident that the majority of the study population belonged to the 18-22 age group 32.00% (blue), followed by 28-32 age group 21% (green), 23-27 age group 19.50% (red), 33 - 47 age group 16.50%(orange) and lastly by 38-42 age group 11.00% (yellow).

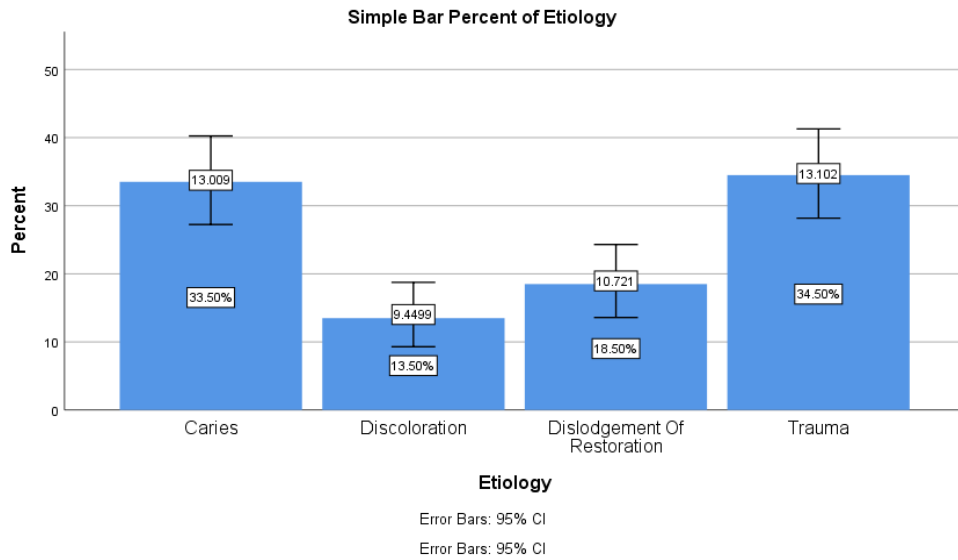


Figure 3: Pie chart shows the distribution of the etiology which leads the study population to get their anterior restoration done. It is evident that the majority of the study population were affected with trauma 34.50% followed by caries 33.50%, dislodgement of previous restoration 18.50% and lastly discoloration of previous restoration 13.50%.

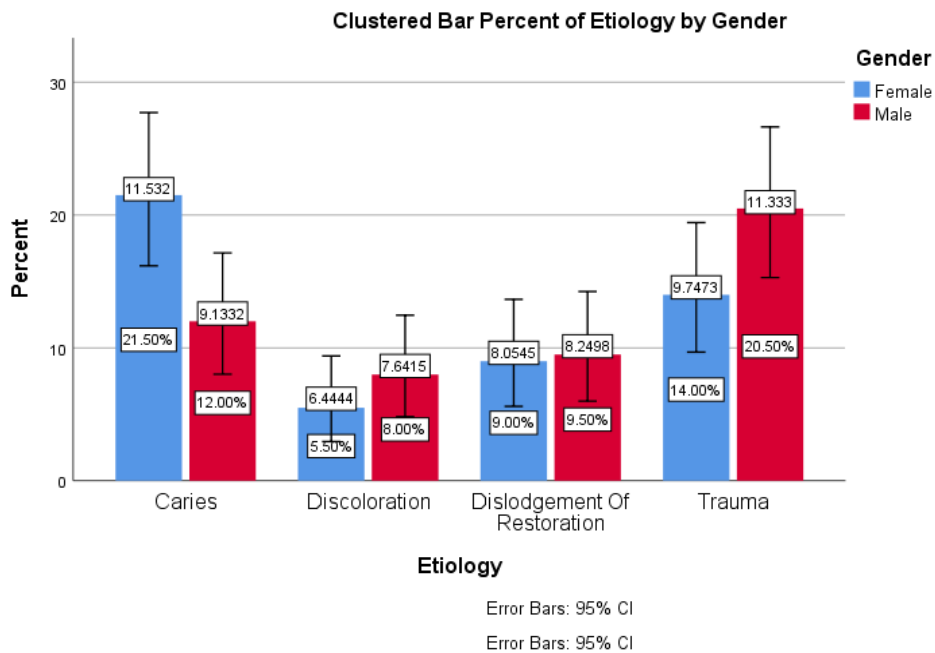


Figure 4: Bar chart shows the association of Etiology of restoration and the respective gender groups. X axis represents the etiology of restoration . Y axis represents the corresponding gender group. Chi- square analysis was done and the association was found to be statistically significant. Pearson chi-square value-8.790; DF-3, p-value <0.03. It is evident that the majority of the female population 21.50% had caries and the majority of the male population had trauma 20.50% has their respective etiological factor.

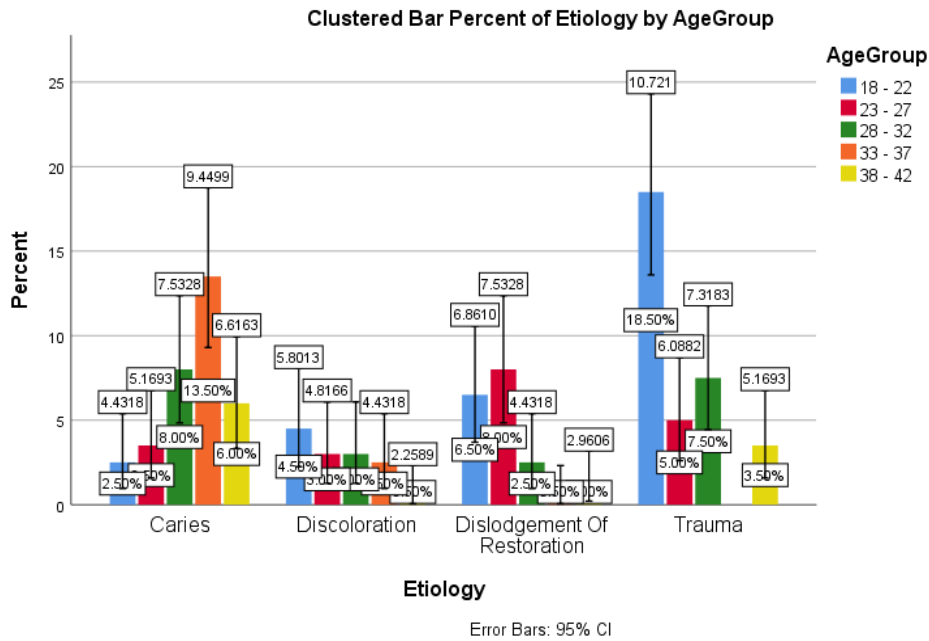


Figure 5: Bar chart shows the association of Etiology of restoration and the respective age groups. X axis represents the etiology of restoration . Y axis represents the corresponding age group. Chi- square analysis was done and the association was found to be statistically significant. Pearson chi-square value-82.640; DF-12, p-value -0.00. It is evident that trauma was the main etiological factor in 18-22 age group 18.50% (blue) , followed by caries which was the main etiological factor in 33-37 (orange) age group 13.50%, dislodgement of restoration was mostly associated with 23-27 age group (red) 8.00% and lastly 38-42 age group (yellow) was also mainly associated with caries 6.00%.