Preference of Posterior Dental Restorations Among Patients Visiting A Private Dental Institution - A University Based Study

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ABSTRACT

INTRODUCTION:

Composite restorative materials represent one of the many successes of modern biomaterials research, since they replace biological tissue in both appearance and function. Unfortunately, demands on these restorations with regard to mechanical properties, placement, and need for in situ curing leave significant room for advancements, particularly with respect to their properties, polymerization shrinkage and polymerization-induced stress, thermal expansion mismatch, fracture, abrasion and wear resistance, marginal leakage, and toxicity. Ultimately, these shortcomings reduce a restoration’s lifetime and represent the driving force for

improvement in dental composites. This study aims to assess the restoration preference of patients visiting the private dental institution.

MATERIALS & METHODS:

Dental patients who visited our institution from June 2019 - july 2021 , 200 patients who had undergone class 1 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 population has undergone composite restoration which is about 59.50%. Majority of the female had composite restoration compared to the male population which is about 32.50%, followed by age group of 18-22 had undergone composite restoration more compared to other age group

CONCLUSION: Within the limit of the study , it was concluded that composite restoration was the most common material used during class 1 restoration with female predilection. Furthermore studied to be done in a large sample size for better results.

KEYWORDS: Dental caries, Composite restoration, amalgam restoration, females,posterior.

INTRODUCTION

Dental caries is a biofilm-mediated, sugar-driven, multifactorial, dynamic disease that results in the phasic demineralization and remineralization of dental hard tissues[1]. Caries can occur throughout life, both in primary and permanent dentitions, and can damage the tooth crown and, in later life, exposed root surfaces.Composite restorative materials represent one of the many successes of modern biomaterials research, since they replace biological tissue in both appearance and function[2][3]. Composite resins are excellent esthetic restorative materials. Composite materials are available in various shades to match the esthetic requirements of individual restorations. Even though composite restorations are highly technique sensitive, they demonstrate good clinical longevity if placed with care[4,5]. Unfortunately, demands on these restorations with regard to mechanical properties, placement, and need for in situ curing leave significant room for advancements, particularly with respect to their mechanical properties, polymerization shrinkage and polymerization-induced stress, thermal expansion mismatch, fracture, abrasion and wear resistance, marginal leakage, and toxicity[4]. Ultimately, these shortcomings reduce a restoration’s lifetime and represent the driving force for improvement in dental composites[6].The development and implementation of composite dental restorative materials rely on a comprehensive understanding of each component of the composite and consideration of methods for changing each component. Here, we discuss basic components of composite restoratives and their role in the ultimate restoration[7][7,8]. Composites are composed of three distinct phases, each with its own role in dictating material properties: the polymerizable resin, filler, and the filler-resin interface. The resin phase is composed of

polymerizable monomers that convert from a liquid to a highly crosslinked polymer upon exposure to visible light, which catalyzes the formation of active centers, typically radicals, that induce polymerization[9][10]. The filler has several roles, including enhancing modulus, radiopacity, altering thermal expansion behavior, and reducing polymerization shrinkage by reducing the resin fraction. Finally, the filler-resin interface serves as a bridge by coupling polymerizable moieties to the particle surface[7,8,11]. Each component represents an opportunity for improvements in the overall composite and is the target of recent research reviewed here. Specifically, this article provides background for the general behavior observed in photopolymerization, including the origins of polymerization-induced shrinkage stress, photoinitiation systems used to improve the restoration curing behavior, recent research on these topics and novel monomers that have been explored, development of new photopolymerization mechanisms, and the filler and interface components of the formulation[12][13].Worldwide and for more than 150 years, amalgam has been known for more than being a dental restorative material, it has proved to be a valuable and dependable filling material which is relatively cheap and tolerant to the oral environment with minimum problems for millions of patients around the world[14][15].Alternatives to amalgam are composite restorations that have been improved in their formulations in order to withstand and tolerate excessive stress and wear in addition to glass ionomer restorations and compomer.Our team has extensive knowledge and research experience that has translate into high quality publications [16].[17–26],[27–30],[31–35] [36]

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 1 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 population has undergone composite restoration which is about 59.50% **[Figure:3]**. Majority of the female had composite restoration compared to the male population which is about 32.50% **[Figure:4]**, followed by age group of 18-22 had undergone composite restoration more compared to other age group **[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.[37]. 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% .

According to Nahel H et al.,[38] Awareness of safety of dental amalgam among the dentists was low, with a large agreement that postoperative complications were mainly due to composite restorations. For the patients, the majority of them did not know anything about issues related to the mercury content of the amalgam and the majority of them favored the placement of composite restoration similar to the color of their teeth.

According to Ela Kristek Zurich et al., [39]Women in this study were less satisfied with the colour and surface texture of their composite fillings and all colour assessments.Their general impression of the maxillary teeth restorations was lower compared to men. Colour of the restorations and the composite material are significant factors which affect dental appearance of maxillary teeth in patients.

According to Opdam NJ et al., [40]Caries risk and number of restored surfaces play a significant role in restoration survival, and that, on average, posterior resin composite restorations show a good survival, with annual failure rates of 1.8% at 5 years and 2.4% after 10 years of service.

According to Bohaty BS et al., [41]Restoring posterior teeth with resin-based composite materials continues to gain popularity among clinicians, and the demand for such aesthetic restorations is increasing. Manufacturers are working aggressively to improve resin composite

materials by modifying components to decrease polymerization shrinkage, to improve mechanical and physi- cal properties, and to enhance handling characteristics. The two main causes of posterior composite restoration failure are secondary caries and fracture

CONCLUSION

Within the limit of the study , it was concluded that composite restoration was the most common material used during class 1 restoration with female predilection. Furthermore studied to be done in a large sample size for better results.

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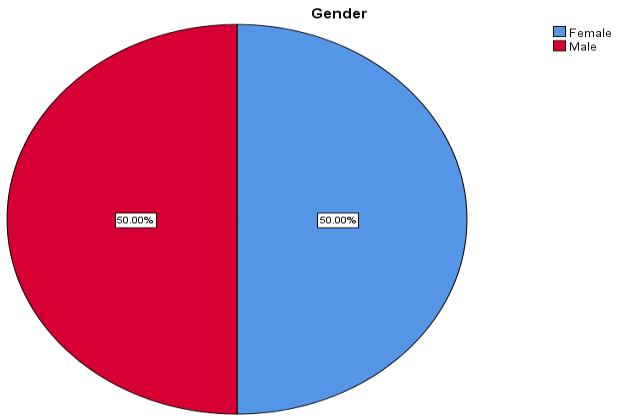

Figure 1: Pie chart shows the gender distribution of the study population. It is evident that Male and the Female gender were of equal distribution 50%.

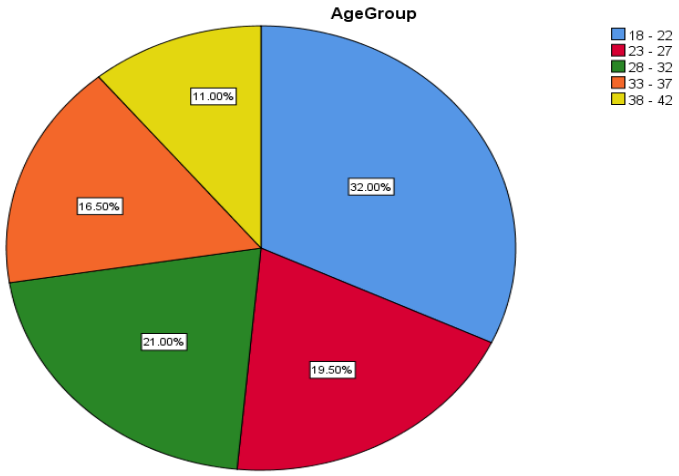

Figure 2: Pie chart shows the age distribution of the study population. It is evident that the majority of the study population belonged to the 18-22 age group 32.00% (blue), followed by 28-32 age group 21% (green), 23-27 age group 19.50% (red), 33 - 47 age group 16.50%(orange) and lastly by 38-42 age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

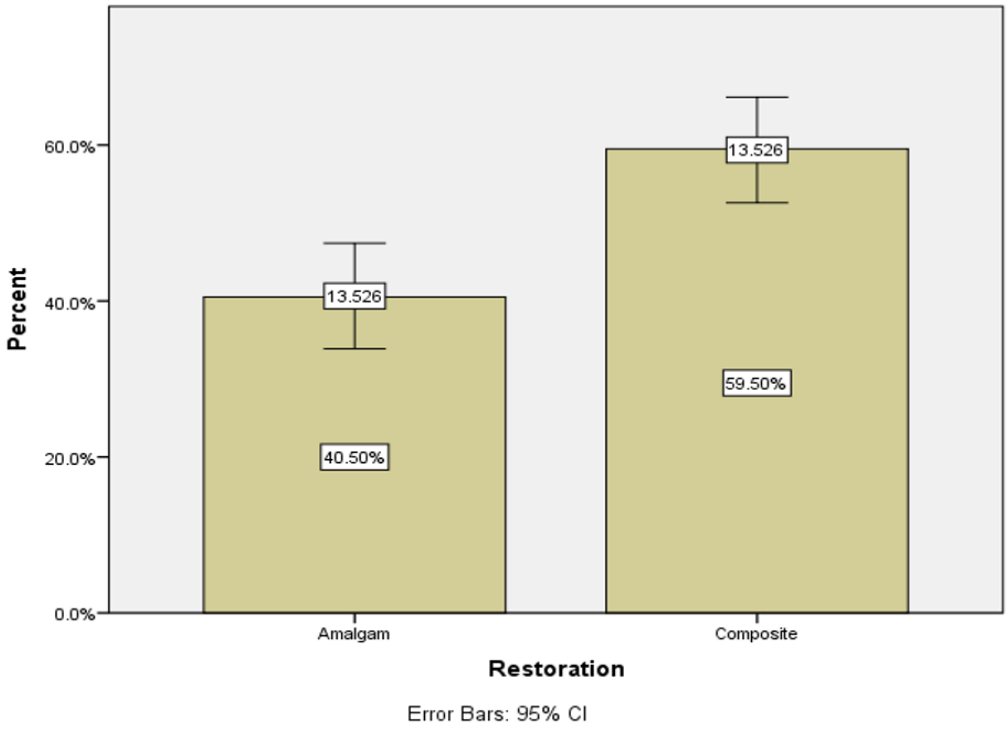

Figure 3: Pie chart shows the distribution of the type of restoration . It is evident that the majority of the study population has done composite restoration which is about 59.50% followed by amalgam restoration which is about 40.50%.

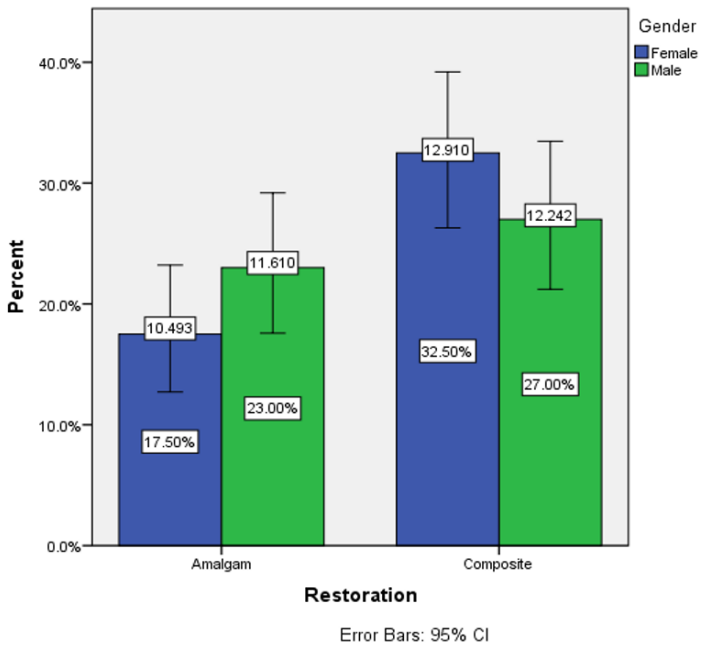

Figure 4: Bar chart shows the association of Type of restoration and the respective gender groups. X axis represents the type of restoration . Y axis represents the corresponding gender group. Chi- square analysis was done and the association was found to be statistically not significant. Pearson chi-square value-2.511; DF-1, p-value <0.07. It is evident that the majority of the female population 32.50% had undergone composite restoration and the majority of the male population had undergone amalgam restoration 23.00%.

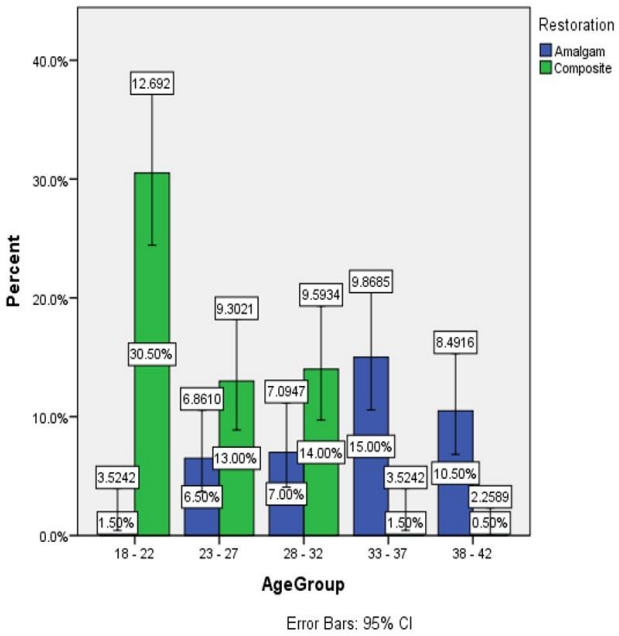

Figure 5: Bar chart shows the association of Type of restoration and the respective age groups. X axis represents the type of restoration . Y axis represents the corresponding age group. Chi-square analysis was done and the association was found to be statistically significant. Pearson chi-square value-82.640; DF-12, p-value -0.00. It is evident that composite restoration is more, which is about 30.50% in the 18-22 age group 18.50% (green) .