

## Association Between Patient Demographics And Compliance Towards Preventive Dentistry - A Population Based Retrospective Study

Research Article

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### Abstract

**Background and objective:** Demography refers to the scientific study of a controlled population. Many conceptual models eliciting the association between a patient's compliance towards oral health and sociodemographic factors such as age, gender and socio-economic status, have been demonstrated in recent times.

**Materials and Methods:** In this study, the data collected for a period of 6 months (01-07-2019 to 01-01-2020) were screened for patients who have undergone treatments such as preventive resin restoration and topical fluoride application. The independent variables were age group and demographics whereas the dependent variables were the preventive treatment and the statistical mean value obtained. The statistical test used was the chi-square test.

**Results:** From the study, it was estimated that 800 patients have undergone preventive resin restoration and topical fluoride application out of which 68 patients (8%) have undergone topical fluoride application and 732 patients (92%) have undergone preventive resin restoration. Chi square test was done to associate the age group and treatment and gender and treatment. The p value obtained was 0.3628 and 0.412 ( $P < 0.5$ ) respectively and both were statistically significant.

**Conclusion:** Lack of willingness to maintain proper oral hygiene makes prevention of dental diseases complicated. Better oral hygiene can be practised by adapting to healthy oral habits and early diagnosis of diseases.

**Keywords:** Compliance; Demographics; Dental Caries; Preventive Resin Restoration; Topical Fluoride Application.

### Introduction

MucDental caries can be simply defined as the breakdown of teeth due to acids produced by bacteria. The cavities elicited, will range between a number of complications including tissue inflammation around the tooth, loss of tooth or teeth, and abscess formation. This is the most common chronic disease among children, affecting vulnerable parts of the population and elicits severe problems to children, families, and health systems. Therefore, efforts produced toward oral health promotion and disease prevention are highly effective when compared to dental rehabilitation which follows disease development [1, 2]. Martins et al in the year 2011, insisted school based learning of oral health

maintenance wherein the quality of brushing is enhanced among school children through proper health education [3].

Some of the approaches to preventing caries are the usual oral hygiene with fluoride-containing toothpaste, reduction in the consumption of sugary foods, as well as local and systemic fluoridation. Many approaches for sensitive anatomical areas such as pits and fissures have been implemented. Sealing pits and fissures of occlusal surfaces had already been established in the 1960s. Sealing of pits and fissures creates a physical barrier thereby blocking the biofilm's nutrition culminating in prevention of biofilm growth [4]. Therefore, the use of sealants is a simple solution because fluorides inhibit demineralization, promote remineraliza-

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**Received:** April 28, 2021

**Accepted:** July 09, 2021

**Published:** July 30, 2021

**Citation:** Nivesh Krishna R, Sri Sakthi, Arvind S. Association Between Patient Demographics And Compliance Towards Preventive Dentistry - A Population Based Retrospective Study. *Int J Dentistry Oral Sci.* 2021;8(7):3558-3562. doi: <http://dx.doi.org/10.19070/2377-8075-21000728>

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tion and also prevent the acid formation by plaque bacteria. Various benefits of resin-based sealants have been demonstrated in numerous investigations. Few studies have demonstrated that a time delayed application of the fissure sealant led to a substantial increase in caries frequency. However, its efficiency depends on the tight closure.[5, 6]

There is a strong recommendation for the use of sealing materials in permanent molars in children and adolescents. A lot of studies were conducted to compare the efficacy of sealants and cavity varnishes. Moreover, studies demonstrated a reduction of about 73% of the incidence of occlusal caries in permanent molars after two to three years in groups that had sealants placed when compared to the groups that had fluoride varnishes placed [7]. A study by Koerber et al. demonstrated that placing sealing materials on sound occlusal surfaces elicited the incidence of only 27% in sealed surfaces when compared to the incidence of 77% in unsealed surfaces. This was even compared with fluoride varnishes whereby the incidence was about 56%, in another control group [8]. A clinical study wherein a 15 year period observation of 360 children showed reduction in caries of 36% when all first molars were sealed and 54% when all the posterior teeth were sealed [9]. Previously our team had conducted numerous clinical trials, surveyed and reviewed various aspects of community dentistry over the past five years.[10-24] Now we are focusing on retrospective studies, the idea for which has stemmed from the current interest in our community. The aim of this study is to estimate the association between patient demographics and compliance towards preventive dentistry.

## Materials And Methods

### Sampling

The data required for the study was collected from July 2019 to January 2020. The case sheets of the patients above 18 years of age who had reported to Saveetha Dental college for the treatment of preventive resin restoration and topical fluoride application were reviewed. The external validity was good, as it is generalisable among patients of the same ethnic origins within the state and country.

### Ethical approval

Ethical approval was obtained from the Institutional Ethical Committee and scientific review board [SRB] of Saveetha Dental

College. SDC/SIHEC/2020/DIAS/DATA/0619-0320

### Data Collection

The data collected from July 2019 to January 2020 after screening the records and study subjects were selected based on the parameters such as patient's name, age, gender, demographic and the type of treatment done. The types of treatment included are preventive resin restoration and topical fluoride application. To estimate the predominant age group, patients were divided into 3 age groups and patients from peri urban,urban and rural areas were recorded seperately. The sample size of the study was 800 patients. The data was collected and tabulated in the excel sheet and imported to spss software for statistical analysis.

### Statistical analysis

The data was imported to spss software by IBM version 25.0 for Windows OS in which the output variables were defined. The independent variables were age group, demographics and gender whereas the dependent variables were the type of preventive treatment done and the statistical mean value obtained. The statistical test used was the chi-square test to establish the results.

### Methodology

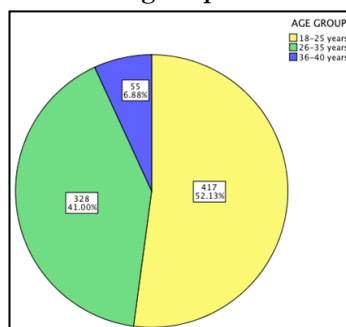
The study patients who have undergone preventive treatments were collected and divided into three classifications.Based on age groups,locality and the type of preventive treatment. Among the age groups, group 1includes 18-25 years, group 2 includes 26-35 years, group 3 includes 36-40 years. Based on locality, patients were divided into urban, peri-urban, rural. Among the types of preventive treatment undergone, Topical fluoride application and Pit and fissure sealants were considered. The most predominant age group, gender and locality of the patients who underwent topical fluoride application and preventive resin restoration treatment were estimated and correlated using chi-square analysis.

## Results

From the study, it can be estimated that 800 patients from 18-40 years of age have undergone preventive treatments such as preventive resin restoration and topical fluoride application.

Among the age groups, group 1 [18-25 years] had 417 patients, group 2 [26-35 years] had 328 patients and group 3 [36-40 years]

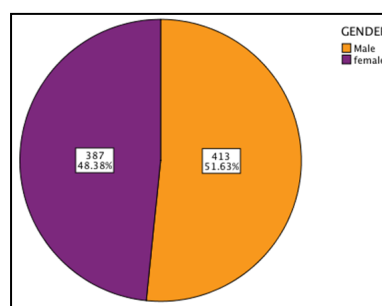
**Figure 1.** denotes the distribution of study population based on age group. Sample size was 800 cases. The patients were divided into three age groups, 18-25 years [group-1], 26-35 years [group-2 ]and 36-40 years [group-3 ]respectively. In the figure, group-1[yellow] with 417 patients[52%], group-2 [green] with 328 patients[41%] and group-3 [blue] with 55 patients[6.8%]. The majority of patients who have undergone preventive treatments belonged to Group 1[18-25 years].



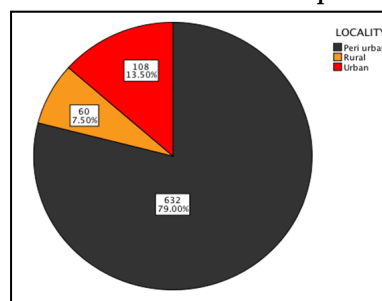
had 55 patients. The predominant age group was group 1 [18-25 years] based on fig 1. Among the genders 413 patients were males and 387 patients were females. Predominant gender is male(fig 2). Among the types of treatment, 68 patients have undergone treatment for topical fluoride application and 732 patients have undergone treatment for preventive resin restoration (fig 3). Among the patient locality, 632 patients belonged to peri urban areas, 108 patients belonged to urban areas and 60 patients belonged to rural areas. The predominant type of treatment undergone is the preventive resin restoration and majority of patients belonged to peri urban and urban areas compared to the rural areas based on fig 4. Chi square test was done to associate the age group and treatment and p value obtained was 0.3628, thus was statistically significant. Based on fig 5 it can be inferred that the majority of

cases of both topical fluoride application and preventive resin restoration was higher among the age group 18-25 years and was statistically significant. Chi square test was done to associate the gender and treatment and p value obtained was 0.412, thus was statistically significant. Based on fig 6 it can be inferred that in the majority of cases both topical fluoride application and preventive resin restoration was higher among males than females and was statistically significant. Chi square test was done to associate the locality and treatment and p value obtained was 0.196, thus was statistically significant. Based on fig 7 it can be inferred that the majority of cases of both topical fluoride application and preventive resin restoration were from peri urban locality and were statistically significant.

**Figure 2.** denotes the distribution of study population based on gender. Sample size was 800 patients. Among the study population, 413 patients were males and 387 patients were females. In the below graph, orange colour denotes the percentage of male patients [52%] and violet colour denotes the percentage of female patients [48%]. The predominant gender was male.



**Figure 3.** denotes the distribution of study population based on locality. Among 800 patients, 612 patients (79%) were from peri urban areas, 60 patients (7%) were from rural areas and 108 patients (13%) were from urban areas. In the figure, black colour denotes peri urban, orange denotes rural and red denotes urban areas. Predominant number of patients who underwent preventive treatment were from peri urban areas.



**Figure 4.** denotes the distribution of study population based on the type of treatment. Sample size was 800 patients. It can be estimated that among 800 patients who underwent preventive treatments, 68 patients (8%) underwent topical fluoride application and 732 patients (92%) underwent preventive resin restoration treatment. In the figure, the colour green denotes topical fluoride application, yellow denotes preventive resin restoration. It can be inferred that the majority of patients underwent preventive resin restoration procedure.

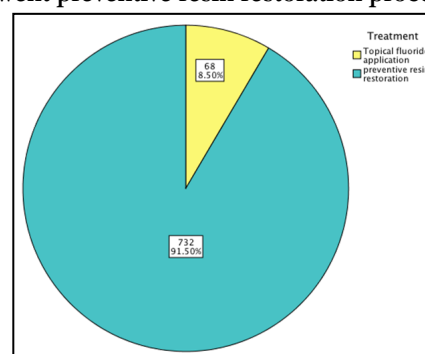


Figure 5. bar graph denotes the association between the age group of the patient and the treatment done. X axis indicates the age group of the patients and Y axis indicates the number of cases underwent preventive treatment among 800 cases. In the figure, colour yellow denotes the treatment count for topical fluoride application [68 patients] and colour black denotes the treatment count for preventive resin restoration [732 patients] among the 3 age groups respectively. Chi square test was done and p value obtained was 0.36 ( $p < 0.5$ ), thus was statistically significant. Based on this figure 5 it can be inferred that the majority of cases of both topical fluoride application and preventive resin restoration was higher among the age group 18-25 years and was statistically significant.

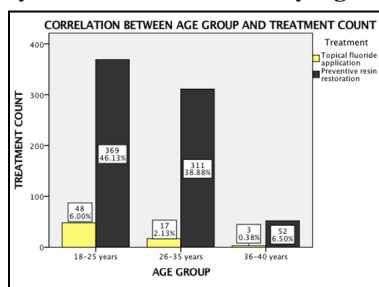


Figure 6. denotes the association between the gender of the patient and the treatment done. X axis indicates the gender of the patients and Y axis indicates the number of cases underwent preventive treatment among 800 cases. In the figure, colour yellow denotes the treatment count for topical fluoride application with 37(4.6%) males and 31(3.8%) females and colour black denotes the treatment count for preventive resin restoration with 376 males and 356 female patients respectively. Chi square test was done and p value obtained was 0.41 ( $p < 0.5$ ), thus was statistically significant. Based on this figure 6 it can be inferred that in the majority of cases both topical fluoride application and preventive resin restoration was higher among males than females and was statistically significant.

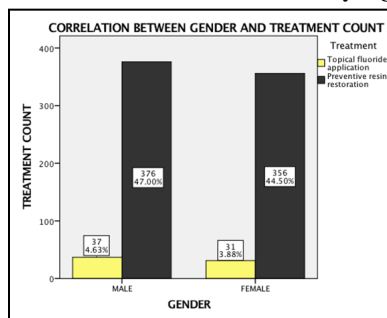
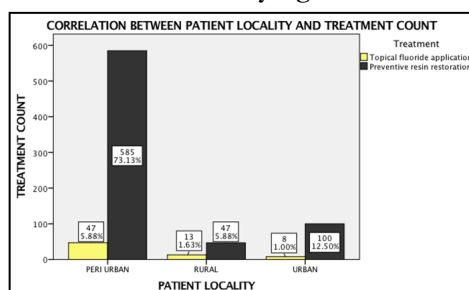


Figure 7. denotes the association between the locality of the patient and the treatment done. X axis indicates the locality of the patients and Y axis indicates the number of cases underwent preventive treatment among 800 cases. In the figure, colour yellow denotes the treatment count for topical fluoride application with 47 patients from peri urban, 13 patients from rural and 8 patients from urban locality and colour black denotes the treatment count for preventive resin restoration with 585 patients from peri urban, 47 patients from rural and 100 patients from urban locality respectively. Chi square test was done and p value obtained was 0.196 ( $p < 0.5$ ), thus was statistically significant. Based on this figure 7 it can be inferred that the majority of cases of both topical fluoride application and preventive resin restoration were from peri urban locality and were statistically significant.



## Discussion

A huge number of trials have been made to inhibit the development of caries, particularly the occlusal caries. This is due to the occlusal pits and fissures of teeth, which get infected with bacteria within 10 years of eruption. Numerous efforts had been taken to create awareness about preventive dentistry and the use of sealants and fluorides to control the spread of dental caries at an early age [25]. In our study, we have estimated that people of age group 18-25 years were more aware about preventive treat-

ment than adults. A study by Rumondini L et al indicates that adolescents and adults below 25 years of age were more aware of preventive treatments and self prevention of caries by proper oral hygiene techniques which coincides with our study [26]. In this current study, we have observed that rural populations have undergone the least number of preventive treatments. Silva SR et al conducted a study to evaluate the level of knowledge on preventive treatments among rural populations and stated that not even 25% of the population were aware of preventive treatments. This is mainly due to lack of awareness and lack of regular dental

visits by the patients. This coincides with our study as the urban and peri urban population were much more aware than the rural population.[27]

Only limited evidence suggests the fact that sealants reduce the incidence of caries by 76% on sound occlusal surfaces, when compared to the non-use of sealants during the 2-3 follow up period.[28] In our study, no evidence of long term caries prevention effect of sealants were observed. But in a study by Al-Shammari KF et al it was estimated that at longer follow-up periods of 48 to 54 months, the quality of evidence was low but the caries preventive effect of sealants was retained. However, there was very low quality of evidence when comparing the caries preventive effect of glass-ionomer based sealants with the use of no sealant [29].

## Conclusion

From this study it can be concluded that the predominant type of preventive treatment undergone by the patients is preventive resin restoration with 18-25 years being the most predominant age group, common mostly among male patients belonging to peri urban and urban areas than the rural areas. Awareness on the significance of preventive treatment should be stressed among children and adolescents and proper oral hygiene maintenance should be enhanced by regular brushing and oral health practices. The people of rural areas should be made aware about the importance of oral hygiene for the betterment of health.

## Author Contributions

First author [Nivesh Krishna R] performed analysis, interpretation and wrote the manuscript. Second author [Dr.SRISAKTHI] contributed to conception, data designs, analysis, interpretation and critically revised the manuscript. Third author [Dr.Arvind S] participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

## Acknowledgement

I sincerely express my gratitude and acknowledgement to the Director, Dean and management for their support and also thank the Research and IT department of Saveetha dental college (SI-MATS) for their affable assistance in analyzing the data.

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