



## Association of age with dental plaque score- A record based analysis

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### ABSTRACT

Dental plaque is a soft deposit that forms the biofilm adhering to the tooth surface or other hard surface in the oral cavity including removable and fixed restoration. It can either be a supragingival or subgingival plaque. The standard plaque index followed is Silness and Loe's index (1964). The study is done in order to find a correlation between age and dental plaque score. To evaluate the association between age and dental plaque score. The study was conducted in a university set up in a Private Dental College, Chennai. The standard index used in the study is Silness and Loe's plaque index. The data was collected from the hospital digital database by reviewing and analysing the case sheets of patients who visited the hospital between June 2019 to March 2020. The sample size was 1235. Tabulation and results were generated using SPSS version 19, chi-square test was performed. The age group 18 to 35 years had 52.3% of good plaque score, 42.6% of fair and 5% of poor plaque score. The age group 36 to 50 years had 40% of good plaque score, 49.9% of fair and 10.1% of poor plaque score. The age group 51 to 70 years had 32.2% of good 50% of fair and 17.8% of poor plaque score. P value was found to be significant <0.05. Within the limits of the study, it was observed that the age group 51 to 70 years had notably higher prevalence of fair and poor plaque scores when compared to other two age groups. This study can be used as a reference for understanding the pattern of age wise distribution of dental plaque.



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### INTRODUCTION

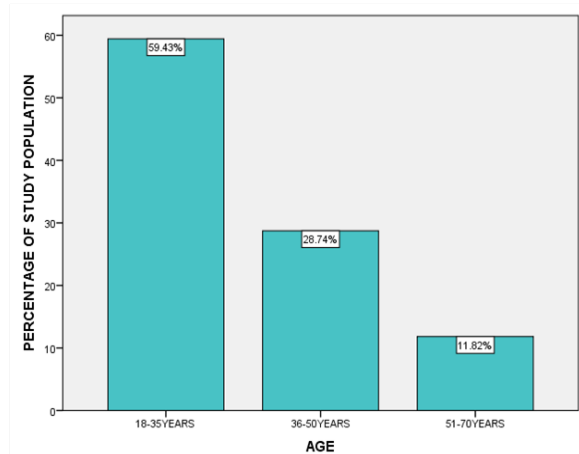
Dental plaque can be defined as a diverse community of microorganisms found on the tooth surface

as a biofilm which is embedded in an extracellular matrix of microbial origin (Marsh, 2004). The dental plaque can be divided into sub gingival plaque and supragingival plaque. The supragingival plaque is found at or above the gingival margin and is often referred to as marginal plaque. The subgingival plaque is found below the gingival margin between the tooth and gingival sulcular tissue (Avila et al., 2009). Dental plaque biofilm is one of the main considerations in maintenance of oral health. With the increase in volume of biofilms located at or below the gingival margin it paves way for pathological conditions such as chronic gingivitis and chronic periodontitis to take over the oral health (Lazar et al., 2017).

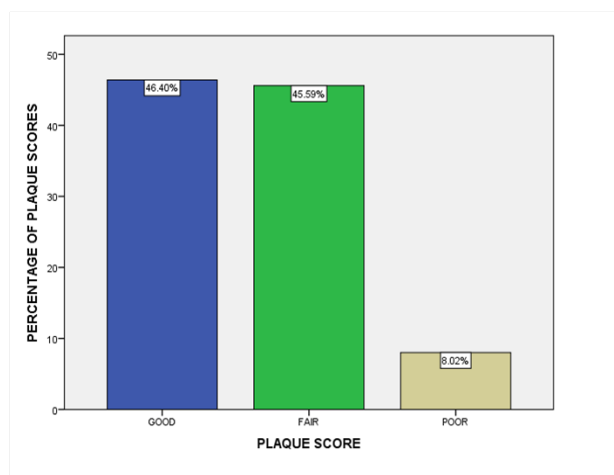
Figure 1, shows The highest frequency was noted in the age group of 18-35 years (59.4%).

Figure 2, depicts It is observed that high prevalence was noted with good plaque score (46.4%).

Figure 3, shows Poor plaque score was more prevalent in age group 51-70 years. (Pearson chi-square value-46.032, df:4, Pvalue-0.000).



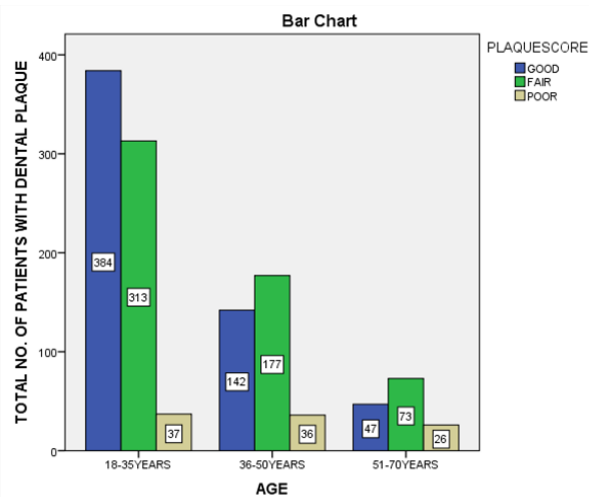
**Figure 1: Bargraph showing frequency of age wise distribution of study population**



**Figure 2: Bar graph showing frequency of distribution of study population based on the plaquescore**

Maintenance of oral hygiene becomes difficult in patients with mal- positioned teeth, overhanging restoration, patients with removable or fixed dental prosthesis and patients undergoing orthodontic treatment. There is a high chance of increased plaque retention in these patients (Kovács et al., 2007). The dental plaque remains as a key pathogenic predecessor for formation of dental calculus (Marsh, 2006), which eventually leads to gingival inflammation and in later stages manifest as periodontal diseases (Listgarten, 1988).

Various indices are used to quantify the dental plaque accumulation. These indices allow ease



**Figure 3: Bar graph showing association between age and plaque score**

of comparison between groups for quantifying the clinical conditions using the same criteria (Löe, 1967). One such index is the Silness J and Loe H plaque index which was described in 1964. The commonly used method for measuring the dental plaque accumulation is by staining the tooth at the dental plaque regions (Lang et al., 1972; Becker et al., 1984). A newer method that has come is the quantitative light induced fluorescence. QLF digital can detect dental plaque in red fluorescent that appears due to porphyrin produced by the bacteria (Lennon et al., 2006).

Few studies have discussed plaque induced dental caries and have found dentifrices with anti-plaque and anticariogenic properties such as in probiotic, CHX toothpaste to be effective (Prabakar et al., 2018b). Soft bristle toothbrush is being prescribed with 0.1% CHX mouth rinse as an oral hygiene regimen for patients with avulsed teeth (Leelavathi et al., 2016). Few studies suggest that the adhesion of S.mutans and plaque accumulation was found to be more in steel crowns when compared to Zirconia (Mathew et al., 2020). The oral health is also affected by different factors including the type of nutrient intake (L et al., 2015; Neralla et al., 2019), by the adverse habits such as tobacco usage (Harini and Leelavathi, 2019), by the use of carbonated beverages (Pratha and Prabakar, 2019).

Evidence suggests that low pH in plaque paves way for S.mutans and lactobacillus to grow resulting in demineralisation which leads to cavity formation (Marsh, 2010). Sreenivasan R et al has discussed the ECC in preschool children (Samuel et al., 2020). Jayashri P et al, has conducted a study to evaluate caries frequency in school going children , it was observed that the caries prevalence of 34.5%

in 11 to 15 years and 50% above 15 years (Prabakar *et al.*, 2016).

Previously our team had conducted numerous clinical trials and surveys (Kumar and Preethi, 2017; Indiran, 2017) over the past five years. Now we are focusing on epidemiological studies. The idea for the present study stemmed from the current interest in the community.

Thus the dental plaque accumulation has shown considerable oral health damage and the removal of plaque biofilm is the most basic and effective step in preventing oral health destruction. The present study is being conducted to find a correlation between age and plaque score. As the age increases, the periodontal disease also shows a considerable increase in the form of inflammation, mobility and attachment loss. The aim of the study was to evaluate the association between age and dental plaque score.

## MATERIALS AND METHODS

The study was conducted in a Private dental College, Chennai which is a University set up the population chosen for the study included patients above the age of 18 years and who visited the college. The data was collected from the hospital digital database by reviewing and analysing case sheets of patients who visited the hospital between June 2019 to March 2020. Two examiners were included in the study.

To carry forward with the study, Silness and Loe's plaque index was taken as a standard index for all the patients. The study is a retrospective study. The data was collected over a period of nine months- from June 2019 to March 2020. The final sample size was 1235. The collected data was verified with photographs. The inclusion criteria was all patients above the age of 18 years. The exclusion criteria was insufficient or unavailable data plaque index score and patients below 18 years. The internal validity standard plaque index (Silness and Loe) was used to calculate the score.

### Data collection

The collected data was grouped based on their age and plaque score. Age was grouped into three categories; group I- 18 to 35 years (1), group II- 36 to 50 years (2) and group III - 51 years and above (3). Plaque score was grouped according to the index. 1- good (0.1-0.9), 2- fair (1.0-1.9), and 3- fair (2.0-3.0).

### Statistical analysis

The collected data was entered in an excel sheet and tabulated using SPSS software version 23. Descriptive statistics was used to correlate between the age

and dental plaque score. The dependent variable was plaque score and the independent variable was age. Chi square test was performed and the level of significance was set at 0.05.

### Ethical approval

The ethical approval for the retrospective study was obtained from the Institutional scientific review board.

## RESULTS AND DISCUSSION

The individual frequency observed for each age group was, 18 to 35 years- 59.4%, 36 to 50 years- 28.7% and 51 to 70 years- 11.8% (Figure 1). The individual frequency observed for the block score was, 0.1-0.9 - 46.4%, 1.0-1.9 -45.6% and 2.0-3.0 -8% (Figure 2). The mean plaque score noted for each age group was, 18 to 35 years- 1.1, 36 to 50 years- 1.3 and 51-70 years- 1.33. It was observed that correlation between age and plaque score showed, the age group 18 to 35 years had 52.3% patients with good plaque scores, 42.6% had fair and 5% had poor plaque scores. The age of 36 to 50 years showed 40% good plaque score, 49.9% fair and 10.1% poor plaque score. The age group 51-70 years showed 32.2% good plaque score, 50% fair and 17.8% poor plaque score (Figure 3). P value was found to be significant - 0.000 (<0.05).

From the Current study it was observed that, the plaque score good (0.1-0.9) was more prevalent in the age group 18 to 35 years (52.3%) the plaque score fair (1.0-1.9) was more prevalent in the age group 51 to 70 years (50%) followed by the age group 36 to 50 years with 49.9% prevalence. The plaque score poor (2.0-3.0) was more prevalent in the age group 51 to 70 years (17.8%). P value was found to be significant <0.05.

In Abdul B et al, it was observed that, the mean plaque score recorded was 4.29 +/-1.58 and the mean age noted was 19.1 +/-2.47 (Memon *et al.*, 2015). This studies in contrast to our article the mean age of our study was 37.17 +/-2 years. According to Daniluk T et al, The prevalence of good score was seen in 26.3% patients fair score was seen in 47.4% and poor score was seen in 26.3% (Daniluk *et al.*, 2006). This study is in contrast to our study where the good score was recorded to have more prevalence among the population- 46.4%. Sreenivasan PK et al, in the study has found that the age group 18 to 27 years had a mean plaque score of 2.49 +/- 0.5 and the age group 48 years and above had a mean plaque score 2.5 +/- 0.5 (Sreenivasan *et al.*, 2016), this is not in accordance with the current study as there is a significant difference in the

mean plaque score observed. Jonathan M et al, in the study recorded the plaque scores as 0.75 for 18 years 0.76 for 26 years and 36 years which is in contrast to the present study (Broadbent et al., 2011). Saeed B et al, has noted the plaque score increased by 2.4 times for one year increase in age, this pattern was not observed in our study (Bashirian et al., 2018). Study conducted by Kiruthika P et al has observed that, majority of the endodontist prefer rotary instruments and few opt to use mtwo files in their practice (Patturaja et al., 2018).

Increased plaque retention can lead to cavity formation. Sealants are used in prevention of cavity formation (Prabakar et al., 2018a,c). Sachin G et al has conducted a study on sealants and found Aegis had a better retention property lowering the caries activity (Khatri et al., 2019). Other than sealants, fluoride also plays a major role in caries prevention (Kumar and Vijayalakshmi, 2017). It is the duty of health professionals to provide proper insight about the various factors affecting their oral health and also inform them about the possible treatment options thus contributing towards their better health (Srudhy and Anitha, 2015).

Considering all the above literature, the present study is not in accordance with the previous literature. This can be attributed to the fact that all of the patients were not assessed and also due to variations in ethnicity of the population may have given a different result. Also, there has been a limited study done with the same parameters. Thus further study to be conducted with inclusion of all age groups, with other parameters, though this study was found to be significant.

## CONCLUSION

Within the limits of the study it was observed that, the age group 51 to 70 years had notably higher prevalence of fair (50%) and poor (17.8%) plaque status when compared to other two age groups. Thus, awareness on oral health among the population must be enhanced.

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## Conflicts Of Interest

The authors declare that they have no conflict of interest for this study.

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