
Influence of Age on Oral Hygiene Status in Out patients Attending a Private Dental Institution - A Retrospective Study

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Abstract: Effective and efficient oral hygiene practices are essential tools for achieving good oral health. Even though the value of good oral hygiene practices has increased over the years, many studies state that poor oral hygiene levels is still highly prevalent. Preventive strategies, both at individual and population level will help to reduce the negative impact of oral hygiene on oral and general health. The aim of this study is to evaluate the association between age and oral hygiene among outpatients who reported to a private dental college and hospital. It is a university setting study. About 7987 adult patients who reported to the dental college were included in the study. The data of the oral hygiene index simplified (OHIS) of these patients were collected from patient records. The data was entered in excel and imported to SPSS software for statistical analysis. Descriptive statistics and Chi-square test was used for analyzing the data. From the results, it was observed that as age increased OHIS score also increased. OHIS score of good was prevalent in 38.2% of the study population, fair OHIS score in 56.4% and poor OHIS score in 5.4% of the outpatients. Fair OHIS(56.4%) score was the most prevalent among the study population. Age wise comparison of OHIS score revealed that fair and poor OHIS scores was most prevalent among outpatients above 55 years old and this was found to be statistically significant. This study concludes that poor OHIS scores was more prevalent among study participants above 55 years when compared to other age groups.

Keywords: Age, oral hygiene, OHIS, oral health, patients, innovative technique.

INTRODUCTION

Oral hygiene is a practice of keeping the mouth clean to control dental problems, most commonly, dental cavities, gingivitis, dental related diseases and bad breath. The promotion of good oral hygiene is advocated and supported by the World Health bodies (Petersen, 2004) (Petersen *et al.*, 2005) (Davies, Davies and Ellwood, 2003) ('The Work of the World Health Organization in 1971, Annual Report of the Director-General 4071 Geneva World Health Organization 1972 £1.50', 1973). Healthy behaviors are crucial indicators of oral health status. Effective and efficient oral hygiene practices are an essential tool for achieving good oral health (Petersen and Kwan, 2004) (Ainamo and Parviainen, 1979).

Oral health is important since it can lead to tooth loss and affect the general health and wellbeing of individuals through influence on diet and speech (Heilmann, Tsakos and Watt, 2015) (Neralla *et al.*, 2019). Oral problems and tooth loss may lead to low positive self-image, self-confidence and consequently, low quality of life (Jin *et al.*, 2016) (Leelavathi *et al.*, 2016). Many children and adults worldwide have symptoms of periodontal diseases (Mathew *et al.*, 2020) (Pavithra, Preethi Pavithra and Jayashri, 2019). It has been consistently reported that over 70% of adults have periodontal disease. (Akpata, 2004) (Kumar and John, 2011) a condition strongly associated with oral hygiene status. Presence of these diseases in childhood can predict future dental problems and affect the growth and developmental process as well as the cognitive functions in children. Most of the periodontal diseases can be treated in the early stages; however, if they are not treated and progress, they can become painful, irreversible and their complications usually remain for a lifetime (Jürgensen and Petersen, 2009) (Srudhy and Anitha, 2015).

The value of good oral hygiene practices has increased over the years and studies indicate that the removal of bacteria plaque is essential for the prevention of the most common dental conditions (Petersen, 2004) (Ainamo and Parviainen, 1979).

Dental caries is the most common chronic disease that affects all age groups of the population and interferes with normal nutrition intake, speech, and daily routine activities (Prabakar, John and Srisakthi, 2016). Consumption of sugar containing foods is one of the most important reasons for caries development (Website, no date; Samuel, Acharya and Rao, 2020) (Samuel, Acharya and Rao, 2020) (L et al., 2015). Preventable measures like use of pit and fissure sealant for young individuals will help in caries reduction to a large extent (Khatri et al., 2019), (Prabhakar, Murthy and Sugandhan, 2011), (Prabakar, John, Arumugham, Kumar and Srisakthi, 2018). Also, knowledge on correct brushing techniques, use of mouthwashes and fluoridated toothpaste must be taught to individuals to help in self maintenance of oral hygiene (Kannan et al., 2017) (Prabakar, John, Arumugham, Kumar and Sakthi, 2018). Therefore, to achieve and maintain good oral hygiene, prevent dental caries and periodontal disease, regular tooth brushing using fluoride-containing toothpaste at least twice a day is recommended (Kumar, Pradeep Kumar and Vijayalakshmi, 2017). Appropriate use of inter-dental measures, dental services and avoidance of tobacco consumption contributes to the prevention and control of oral diseases. (Petersen, 2009)

The World Health Organization (WHO) suggests that oral healthcare should be performed through regular monitoring of oral health status. ('The Work of the World Health Organization in 1971, Annual Report of the Director-General 4071 Geneva World Health Organization 1972 £1.50', 1973) The adoption of preventive strategies, both at the individual and population level, helps reduce the negative impact of oral diseases including improving the quality of life. (Patturaja, Leelavathi and Jayalakshmi, 2018; Harini and Leelavathi, 2019) Studying the relation of age and oral health will help in early intervention of disease conditions. Our department is passionate about research we have published numerous high quality articles in this domain over the past years ((Kavitha et al., 2014) , (Praveen et al., 2001), (Devi and Gnanavel, 2014), (Putchala et al., 2013), (Vijayakumar et al., 2010), (Lekha et al., 2014a, 2014b) (Danda, 2010) (Danda, 2010) (Parthasarathy et al., 2016) (Gopalakannan, Senthilvelan and Ranganathan, 2012), (Rajendran et al., 2019), (Govindaraju, Neelakantan and Gutmann, 2017), (P. Neelakantan et al., 2015), (Pradeep Kumar et al., 2016), (Sajan et al., 2011), (Lekha et al., 2014a), (Neelakantan, Grotra and Sharma, 2013), (Patil et al., 2017), (Jeevanandan and Govindaraju, 2018), (Abdul Wahab et al., 2017), (Eapen, Baig and Avinash, 2017), (Menon et al., 2018), (Wahab et al., 2018), (Vishnu Prasad et al., 2018), (Uthrakumar et al., 2010), (Ashok, Ajith and Sivanesan, 2017), (Prasanna Neelakantan et al., 2015). Thus this study is conducted to evaluate the association between age and oral hygiene among patients.

MATERIALS AND METHOD

This is a retrospective study conducted in a university setting (Saveetha dental college and hospitals, Chennai, India). Thus the data available is of patients from the same geographic location and have similar ethnicity. Approval was obtained from the institutional study committee (IEC). The ethical approval number for the present study is SDC/SIHEC/2020/DIASDATA/0619-0320. Two examiners were involved in the study. Population selection was random. Data of patients who reported to Saveetha Dental College from June 2019 to March 2020 were reviewed. The data was entered in the college system in a methodical manner. For the present study, data of oral hygiene of patients were reviewed. Oral hygiene status was assessed by using oral hygiene index simplified (OHIS), which has 2 components, the debris index simplified (DI-S) and calculus index simplified (CI-S) which is summed up to get OHIS score for an individual. The interpretation of the index is good-0 to 1.2, fair-1.3 to 3.0 and poor 3.1-6.0. Oral health diagnosis and photographs of the patients included in the study were reviewed. A total of 7987 case records were reviewed. Incomplete or censored data was excluded from the study. Cross verification of data for error was done by presence of additional reviewer and by photographic evaluation. Simple random sampling was done to minimize sampling bias. This study was generalized to the south Indian population. The data was entered in excel manually and imported to IBM SPSS software for analysis. Independent variable included age and dependent variable was oral hygiene index score. Descriptive and inferential statistics were used. Age wise distribution and OHIS score distribution of the study population was done using descriptive statistics. Chi square test was done to assess if any association was present between OHIS scores and age of the study population.

RESULTS AND DISCUSSION

From this study, it was observed that as age increased OHIS score also increased. Fair OHIS score was the most prevalent among the study population. Highest fair and poor OHIS scores was 65.9% and 10.7% respectively which was recorded in the age group of above 55 years.

Majority (55.4%) of the study population belonged to the age group of 18 to 35 years. Individuals in the age group of 36 to 55 years were 35.9% and 8.7% belonged to the age group of above 55 years (figure 1). 38.2% of the population had a OHIS score of good, 56.4% had a OHIS score of fair and poor OHIS score constituted 5.4% of the outpatients (figure 2). In the age group of 18 to 35 years, OHIS score of good was observed in 44.9%, fair in 51.4% and poor in 3.7% of the patients. Age group of 36 to 55 years showed good OHIS score in 30.7%, fair

in 62% and poor in 7.3% of the population. In the age group of above 55 years, 23.4% of them had an OHIS score of good, 65.9% fair and 10.7% had poor (figure 3). Increased OHIS score was observed in this age group. Bashirian et al (Bashirian *et al.*, 2018) stated in their study that for each year of age increase, the chance of developing calculus increased by 1.53 times and the chances of developing poor and fair oral hygiene increased by 1.36 times ($p < 0.001$). Also, they observed OHIS score of good in 65.2%, fair in 34.5% and poor in 0.3% while our study observed slightly higher values which were 38.2% for OHIS score of good, 56.4% patients with fair score and 5.4% with poor score. However, the overall observation of increase in OHIS score with age was similar between both the studies.

Mbawalla Et al (Mbawalla, Masalu and Åström, 2010) reported that only 44.8% of their study population had oral hygiene score of fair to poor while in our study the score of fair to poor was present in 61.7% of the population. Although the percentage of higher OHIS score was less they reported that higher scores were mostly observed in the older age group of their study population.

In a study done in Intellectually disabled individuals in Maharashtra by Kadam et al (Kadam *et al.*, 2014) it was observed that of total subjects with good, fair, and poor oral hygiene status were 5.73%, 43.23%, and 51.04% respectively which was significantly higher than the OHIS scores obtained in the present study. Maintenance of good oral hygiene is difficult for many ID individuals, as frequently they lack muscular coordination and recognition of the importance of brushing and flossing. In many instances, the oral hygiene care of these subjects becomes the responsibility of guardian, or caregiver (Solanki, 2014).

Some studies reported that poor oral hygiene in terms of increasing accumulation of plaque and calculus with increasing age have been reported in both developed and developing countries ('The Work of the World Health Organization in 1971, Annual Report of the Director-General 4071 Geneva World Health Organization 1972 £1.50', 1973) (Saied-Moallemi *et al.*, 2009) (Kumar, Pradeep Kumar and Preethi, 2017). Lolita Et al (Lolita *et al.*, 2015) study on oral health in elder population observed that all the patients presented with poor oral hygiene and high calculus deposits. Also, many other studies have reported that oral hygiene levels decreased with increase in age (Seth *et al.*, 2016) (Ganesh *et al.*, 2019) (Suomi and Doyle, 1972).

Overall, it was noted that with increase in age, oral hygiene maintenance reduced resulting in poor oral health. This is mainly attributed with age-related salivary changes (Pratha, Ashwatha Pratha and Prabakar, 2019), poor diet, increased usage of medication, increased gingival recession, systemic diseases and importantly physical disability due to aging which makes toothbrushing and other activities difficult in older individuals.

This study could pave way for more research to be done on oral hygiene levels to create awareness among individuals at an early age so that early intervention can be done to prevent other oral disease like decay, mobility and finally leading to tooth loss in younger and older age groups. The limitations of the present study is limited to certain demographic and sample size. The results obtained do not represent all ethnic groups or populations. Also there was no equal distribution of sample size among all age groups.

CONCLUSION

Within the limitations of the study, it can be concluded that good oral hygiene based on OHIS score was prevalent among the 18- 35 yrs old study population. Poor oral hygiene scores were more prevalent among study participants above 55 yrs of age.

Authors Contribution

First author, Faazila Fathima performed the data collection by reviewing patient details, filtering required data, analysing and interpreting statistics and contributing to manuscript writing.

Second author, Dr. Leelavathi contributed to conception of study title, study design, analysed the collected data, statistics and interpretation and also critically revised the manuscript.

Third author, Dr. Senthil Murugan P participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

Conflict of Interest

The authors declare that there is no conflict of interests.

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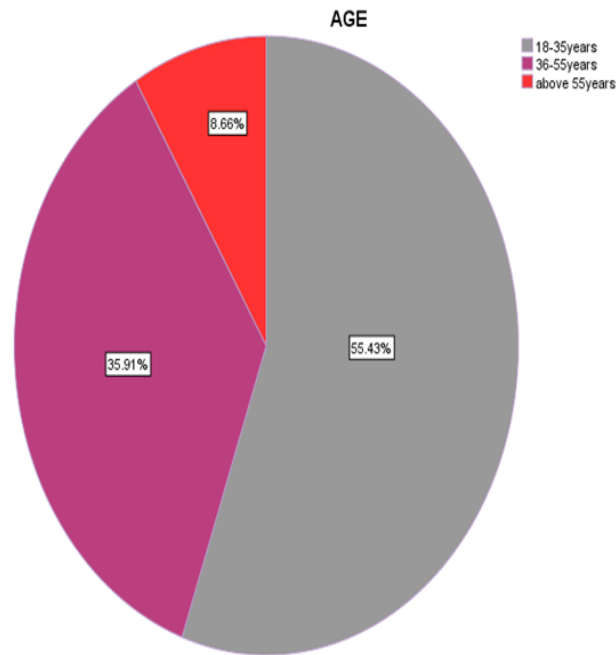


Fig.1: Pie chart depicts the distribution of age among the study population. It's seen that 55.4% of the outpatients belonged to the age group of 18-35years(grey), 35.9% belonged to the age group of 36-55years(violet) and 8.6% belonged to the age group of above 55 years(red).

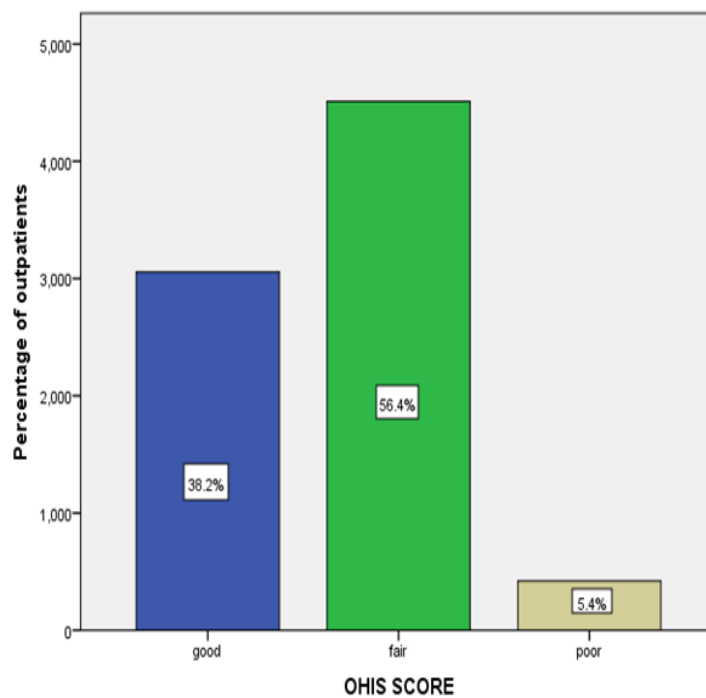


Fig.2: Bar graph depicts the distribution of OHIS score among the study population. X axis denotes OHIS score and Y axis denotes the percentage of outpatients. It's seen that 38.2% of the outpatients had OHIS score of good(blue), 56.4% had OHIS score of fair(green) and 5.4% had OHIS score of poor(brown).

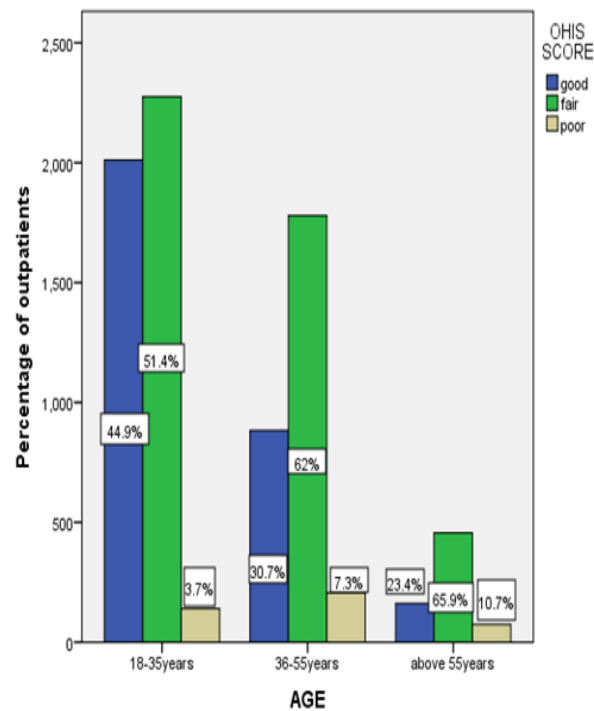


Fig.3: Bar graph depicts the association of age and OHIS score among the study population. X axis denotes age group and Y axis denotes the percentage of outpatients with OHIS score. It is observed that good OHIS scores were prevalent among the 18- 35 yrs old study population. Higher prevalence of fair(green) and poor(brown) OHIS scores were more prevalent in the participants above 55years when compared with other age groups and this was found to be statistically significant. (Pearson's Chi Square value - 283.831 , p value - 0.000 (P<0.05))