Journal of Contemporary Issues in Business and Government Vol. 27, No. 2, 2021
https://cibg.org.au/

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2021.27.02.060

Prevalence of Malocclusion and Its Relationship with Deleterious Oral Habits Among 18-25 Years Old Adults Attending A Private Dental College- A Hospital Based Cross Sectional Study

AMANTHI GANAPATHI[1], JAYASHRI PRABAKAR[2*], M. JEEVITHA[3]

[1]Saveetha Dental college & Hospitals, Saveetha Institute of medical and Technical science, Saveetha University, chennai, India
[2]Senior Lecturer, Department of Public Health Dentistry, Saveetha Dental college & Hospitals, Saveetha Institute of medical and Technical science, Saveetha University, chennai, India
[3]Senior lecturer, Department of Periodontics, Saveetha Dental college & Hospitals, Saveetha Institute of medical and Technical science, Saveetha University, chennai, India
*Corresponding Author
Email ID: 151501058.sdc@saveetha.com[1], jayashri.sdc@saveetha.com[2], jeevitham.sdc@saveetha.com[3]

Abstract: Abnormal oral habit could alter a normal growth of oro-facial structure and alo related to malocclusion which is caused by various reasons such as unusual repetitive behaviours in oral cavity To evaluate the prevalence of malocclusion and its association with deleterious oral habits in adults from 18-25 years old. The present cross-sectional study was undertaken to evaluate the prevalence of malocclusion and its association with deleterious oral habits in adults, from 18-25years old in south Indian population. Case sheets of 158 patients were evaluated for adverse oral habits and malocclusion. The collected information from the case sheet of the patients was entered in Microsoft Excel 2012.Descriptive statistics were expressed by means of frequency and percentage and Chi-square test was used to find the association between Independent variables (Age and Gender) and Deleterious Oral Habits. Level of statistical significance was set at $p<0.05$. Total sample size n=158,out of which patients with biting habits-52.91%,Tongue thrusting-25.58%,Mouth breathing-15.82%,Lip biting-8.86%,Thumb sucking-6.33%,biting and lip biting-3.80%,Tongue thrusting and lip biting-3.80%,Thumb sucking biting, Thumb sucking and mouth breathing-0.63%. In conclusion, the majority of the study population had a biting habit and Angle's class I malocclusion and also found that there was no relationship between Malocclusion and deleterious oral habits among the study subjects enrolled in the present study.

Keywords: defense Deleterious oral habits, innovation, malocclusion, biting ,adults

INTRODUCTION

Abnormal oral habit could alter a normal growth of oro-facial structure and alo related to malocclusion which is caused by various reasons such as unusual repetitive behaviours in oral cavity(Lo and Moyers, 1953)(Singaraju and Chetan, 2009)(Wigdorowicz-Makowerowa et al., 1979).

Development of malocclusion is determined by combination of genetic and environmental influence.Recent years ,the etiological importance of genetic factor has been reduced considering that many malocclusion recognize a post natal origin(Nobile et al., 2007).Oral habit especially if they persist beyond the pre-school age,have been implicated as an important environmental factor associated with the development of malocclusion(Kharbanda et al., 2003).Deleterious habits can be classified into digital sucking,lip biting,Nail biting and Mouth breathing(Hanson and Andrianopoulos, 1982).These habits could alter normal growth of oro-facial structures and relate to malocclusion.

Increased concern about dental appearance during childhood and adolescent to early adulthood has been observed.The public equates good dental appearance with success in many pursits.In general,society forces define the norms for acceptable normal and attractive physical appearance.

The word malocclusion literally means "bad bite".Malocclusion can be defined as an occlusion in which there is a malrelationship between the arches in any of the planes of space or in which there are anomalies in tooth position beyond normal limits(Shivakumar et al., 2009)(Walther and Houston, 1976) has not been thoroughly investigated because they are related to pain and misery are eldom acute.A large impact on both the individuals of the society in terms of discomfort,quality of life and social and functional limitations(Ansai et al., 1993)(McLain and Proffitt, 1985).Hence,it is important to determine the prevalence of malocclusion and its occurrence and distribution in a community.

The prevalence of malocclusion various from country to country and between different age and sex group.If proper correction or treatment for malocclusion is not addresed then it will cause problems such as accumlation of food particles in between the dentition and might lead to development of dental caries(Prabakar, John and Srisakthi, 2016)(Samuel, Acharya and Rao, 2020)(Mohapatra et al., 2019)(Mathew et al., 2020).For the prevention for dental caries during the orthodontic treatment since,its difficult to main the oral hygine.Before starting the orthodontic treatment sealents and flurodie gels are given to the patients in order to prevent development of caries during the course of the treatement(Prabakar, John, I. M. Arumugham, et al., 2018)(Prabakar, John, I. Arumugham, Kumar and Srisakthi, 2018)(Khatri et al., 2019)(Kumar, Pradeep Kumar and Vijayalakshmi, 2017)(Prabhakar, Murthy and Sugandhan, 2011).During the course of the treatment and after to prevent the formation of plaque mouthwash are advised by the dentist to patients(Prabakar, John, I. Arumugham, Kumar and Sakthi, 2018).It is also important for the dentist to take proper photographs or the dentition and profile along with impression,these records must be kept safely in the dentist office for future uses(Kannan et al., 2017).

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), (PradeepKumar 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,the present study was undertaken to evaluate the prevalence of malocclusion and its relationship with deleterious oral habits among 18-25 years old adults attending a private dental college.

MATERIALS AND METHOD

Study design and study setting

This present study is a descriptive, record based study conducted in a university setting at Saveetha dental college, Chennai . The Case sheets of all the Patients in OP Department of Saveetha dental college for the period of two months [DEC 2019 and JAN 2020] were collected from the data of 86 , 000 patients visited Saveetha dental college during the time period of June 2019 to March 2020.

Sample size

The study was done for a period of 2 months (Dec 2019 to Jan 2020) with Type - 3 examination procedure. 158 case sheets were reviewed .

Ethical approval

The ethical approval is SDC/SIHEC/2020/DIASDATA/0619-0320 was passed by the Institutional ethical committee, Saveetha Dental college & Hospitals Saveetha Institute of medical and Technical science, Saveetha University,

Participants

Inclusion Criteria

- Patients aged from 18-25 years old
- Patients with deleterious oral habits
- No history of orthodontic treatment
- Non syndromic patients

Exclusion Criteria

- Craniofacial anomalies
- Without any deleterious oral habits
- Patients with previous orthodontics appliance therapy**.**

Statistical Analysis

The collected information from the case sheet of the patients was entered in Microsoft Excel 2012.Descriptive statistics were expressed by means of frequency and percentage and Chi-square test was used to find the association between Independent variables (Age and Gender) and Deleterious Oral Habits. Level of statistical significance was set at $p<0.05$

RESULTS AND DISCUSSION

In our study the total sample size is 158.Prevalence of deleterious oral habits and their malocclusion were assessed.Figure 1 shows the distribution of study subjects according to age.Patient with age group ranging from 18-19 years of age were found to be 27.22%,Patient age group of 20-21 years old were found to be 19.62%,Patient age group 22-23 years old were to be 31.65%,Patient age group between 24-25 year were found to be 21.52%.It was found in our study that patient within the age group of 22-23 years had higher prevalence of deleterious habits when compared to other.

Figure 2 shows the distribution of study subjects according to the gender.In our present study the total number of Female patients were found to be 57.59%,and the total number of male patients accounted for 42.41%.It was found in our study that high prevalence of oral habits are seen in the female population,when compared to male.Figure 3 shows distribution of study subjects according to the oral habits.In our study it was found that the patients with Thumb sucking habit were found to be 6.33%,Patients with Tongue thrusting were accounted for 26.58%,Patients with Biting habited were accounted for 32.91%,Patient with Lip biting habit were of 8.86%,Patients with Mouth breathing habit were found to be 15.82%,Patients with Biting and lip biting habit were found to be 3.80%,Patients with Thumb sucking and biting,Thumb sucking and tongue thrusting,tongue thrusting.biting and mouth breathing were accounted for 0.63% for combination of each deleterious oral habit. Patients with Tongue thrusting and lip biting recorded as the highly prevalent oral habit followed by tongue thrusting,mouth breathing and thumb sucking in our study.

Figure 4 shows the distribution of the study subjects according to malocclusion.Patients with angles class I accounts for 45.5%,class II accounts for 12%,class III accounts for 0.6%,class I with crowding accounts for 6.9%,class I with spacing accounts fo 13.2%r,class I proclination accounts for 17%,class I posterior crossbite accounts for 1.2%,class I anterior cross accounts for3.16%. In Figure 5 the Bar graph shows the association between Gender and oral habits. X axis represents the Gender and Y axis represents the Percentage distribution of patients with Oral habits. Chi- square test was done and was found to be statistically not significant [Chi-square value- 13.02; p value- 0.16 ($p>0.05$)]. However the association between Gender and oral habits was found to be statistically not significant, Thumb sucking (Blue) was found to be more common among male study subjects than females.The Bar graph (figure 6)shows the association between age and oral habits. X axis represents the age and Y axis represents the total number of patients withOral habits. Chi- square test was done and was found to be statistically not significant [Chi-square value- 33.27; p value- 0.18 ($p>0.05$)]. However the association between Gender and oral habits was found to be statistically not significant, Biting was found to be more common among all the age groups.The Bar graph(figure 7) shows the association between Age and malocclusion. X axis represents the gender and Y axis represents the Percentage distribution of the patients with malocclusion. Chi- square test was done and was found to be statistically not significant [Chi-square value- 14.37; P value- 0.04 ($p>0.05$)]. However the association between gender and oral malocclusion was found to be statistically not significant, Angle's class I (Light Blue) was found to be more common among both male and female patients.

Figure 8 represents association between Age and malocclusion. X axis represents the age and Y axis represents the Percentage distribution of the patients with malocclusion. Chi- square test was done and was found to be statistically not significant [Chi-square value- 17.67; P value- 0.67 ($p>0.05$)]. However the association between age and oral malocclusion was found to be statistically not significant, Angle's class I (Light Blue) was found to be more common among patients aged between 22-23 years old when compared to other groups.Table 1 depicts the correlation between Malocclusion and deleterious oral habits. Spearman Correlation was done and was found to be statistically not significant. A negligible correlation (correlation value- 0.13; $p>0.05$) existed between Malocclusion and deleterious oral habits. Hence proving that there was no relationship between Malocclusion and deleterious oral habits among the study population enrolled in this study.

The present study determined the prevalence of malocclusion and the relationship of associated factor such as deleterious oral habits in south indian adults population of 18-25 years old.There are many studies that reported the prevalence of abnormal oral habits in various study population which was25.8%(Pruthi, Sogi and Fotedar, 2013) and in some studies it might reach up to 96.6%(23)(Pruthi, Sogi and Fotedar, 2013; Sasigornwong et al., 2016).Thi wide range may be due to differences in race,geographic factors(region) and also various inclusion criteria of samples and classification of abnormal oral habits.

Oral habits such as mouth breathing,abnormal swallowing,thumb sucking,lip sucking and nail biting can have direct effect on the stomatognathic system of the body(Agarwal et al,2012)(Agarwal et al., 2014).One such abnormal factor which caused abnormal malocclusion is in patients suffering from oral submucous fibrosis were the patients has difficulty in mouth opening and caused continuous clenching of the teeth which further lead to bruxism(Harini and Leelavathi, 2019; Neralla et al., 2019)(Pratha, Ashwatha Pratha and Prabakar, 2019)(Pavithra, Preethi Pavithra and Jayashri, 2019) Many authors have written about the relationship between bad habits and malocclusion,Oral habits are repetitive behaviour in the oral cavity that results in loss of tooth structure and include biting,nail biting,bruxism,self injurious habit and tongue thrusting (Garde et al.,

2014).Their effect is dependent on the nature of onset,duration of habits.Persistent habit will have effect in stomatognathic system leading to imbalance between muscles(Bell et al., 2011).
In our study it was found that the highest prevalence of deleterious oral habits was biting.which was common in 32.9%.It is a similar study which has a about 65%(Giugliano et al., 2014).The habit of mouth breathing was seen in 15%.It was lower when compared to Garde et al(Garde et al., 2014). Our study found that the prevalence of class II molar relation is less when compared to the study conducted in Thailand and Pakistan (Garde et al., 2014; Sasigornwong et al., 2016)and similar to India(Sridharan et al., 2011).Other types of malocclusion associated with tongue thrusting is swallowing was also found in the study.But it was not found in other studies(Aslam, 2010)(Jalaly, Ahrari and Amini, 2009)(Al-Atabi, 2013)(Melsen, Stensgaard and Pedersen, 1979).
Since the population size of the study is small it cannot be determined to the overall population of the region.Different studies have to be conducted in various geographical locations to find out the prevalence state and the relationship with deleterious oral habits.

CONCLUSION

Within the limitations of our study we would like to conclude that the majority of the study population had a biting habit and Angle's class I malocclusion and also found that there was no relationship between Malocclusion and deleterious oral habits among the study subjects enrolled in the present study.

AUTHORS CONTRIBUTION

Author1(Amanthi Ganapathi) Carried out the retrospective study by collecting the data and drafting the manuscript after performing the necessary statistical analysis.Author 2(Dr.Jayashri.P) aided in the conception of the topic,participated in the study design,statistical analysis and supervised the preparation of the manuscript and helped in study design and has coordinated in developing the manuscript.All the authors have equally contributed in developing this manuscript.

Conflict of Interest

None to declare.

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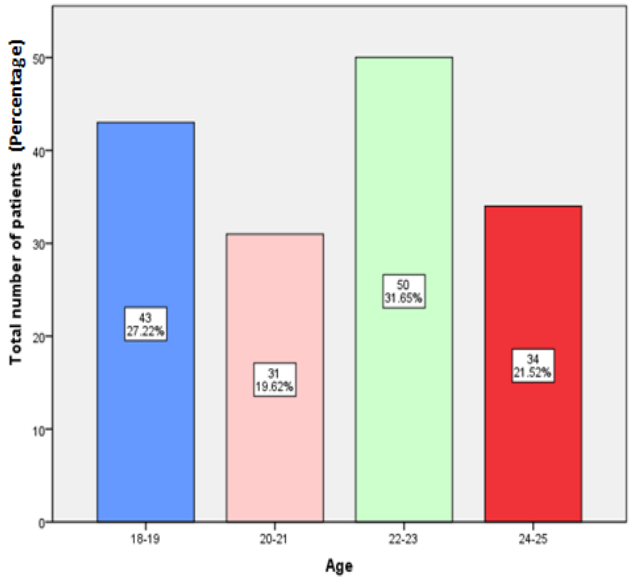

Fig.1: Bar chart represents the distribution of study subjects based on age. X axis denotes the age of the patients and Y axis denotes total number of patients(Percentage). 27.27% of the study population were distributed in the age group between 18-19 years old(Blue),19% of were in the age group between 20-21 years old(Pink) and 31% were in the age group between 22-23 years old(Green) and 21%were in the age group of 24-25 years (Red).

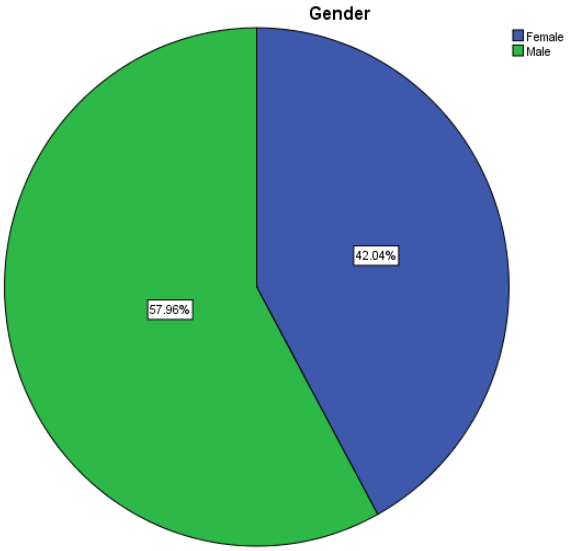

Fig.2: Distribution of study subjects according to the gender. 42% of the study population were females (Blue) and 57.9% were males (Green).

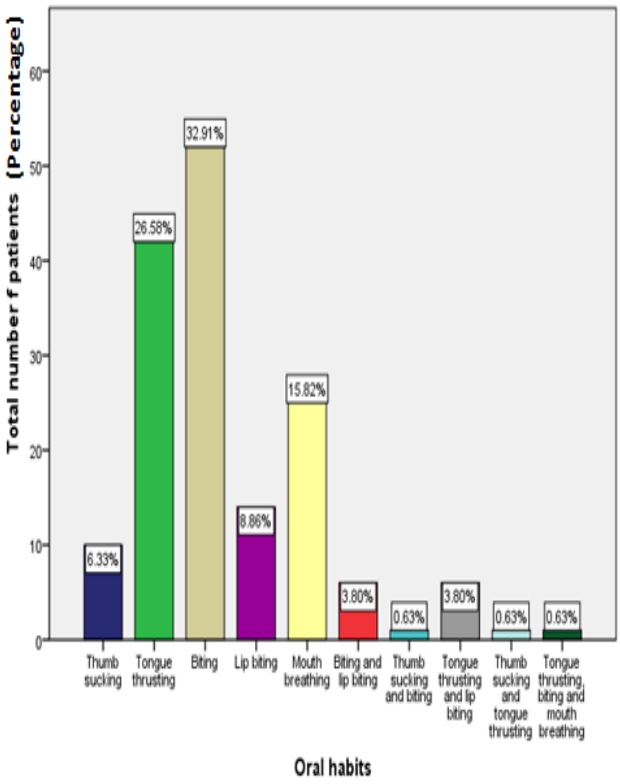

Fig.3: Bar chart depicts the distribution of study subjects according to oral deleterious habits. X axis represents the oral deleterious habits and Y axis represents the count of the total number of patients with the habit(Percentage). Nail biting(32.91) and Tongue thrusting(26.58%) are the most common deleterious oral habits among the study population.

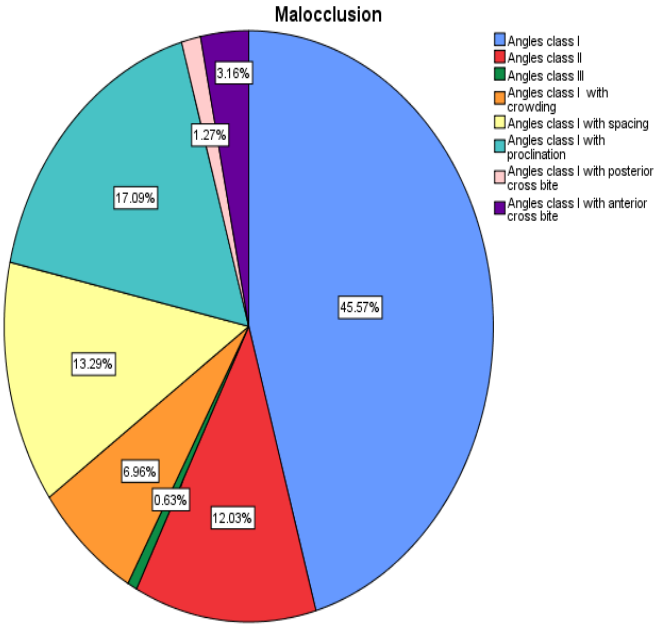

Fig.4: Pie chart depicts the distribution of the study subjects according to malocclusion. Majority of the study population (45.5%) had Angle's class I occlusion(Blue) followed by 17.09% and 12.03% of the study subjects had Angle's Class I with proclination (green) and Angle's Class II malocclusion (Red) respectively.

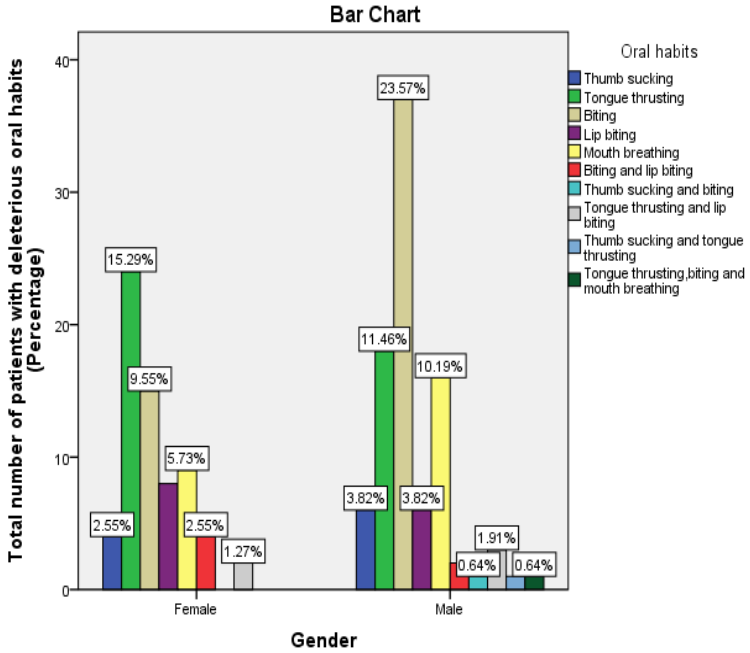

Fig.5: The Bar graph shows the association between gender and oral habits. X axis represents the Gender and Y axis represents the total number of patients with deleterious oral habit. Nail biting habit (23.57%)was found to be more common among male study subjects than females.However the association between Gender and oral habits was found to be statistically not significant. [Chi-square value- 13.02; p value- 0.16 (p>0.05)].

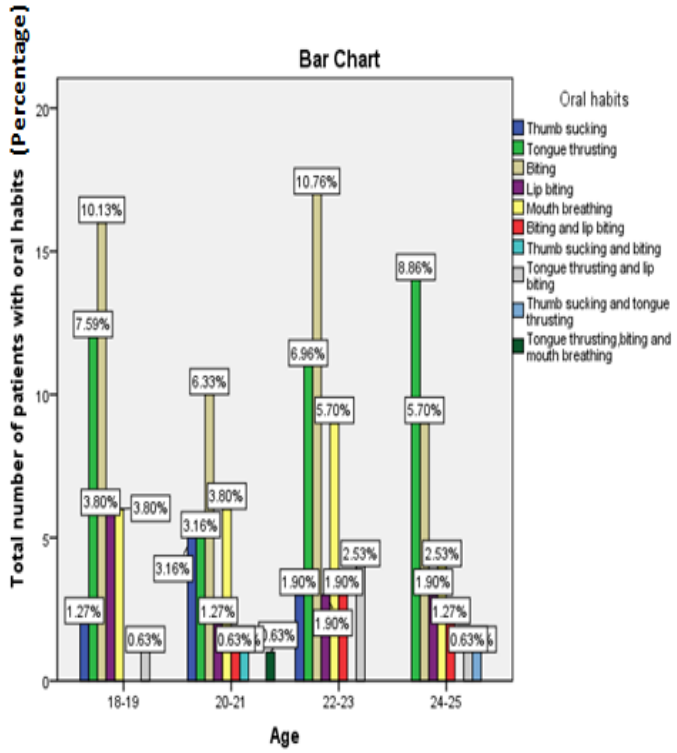

Fig.6:The Bar graph shows the association between age and oral habits. X axis represents the age and Y axis represents the total number of patients withOral habits. Nail Biting habit was found to be more common among 22-23 age groups than other age groups.However the association between age and oral habits was found to be statistically not significant.[Chi-square value- 33.27; p value- 0.18 (p>0.05)].

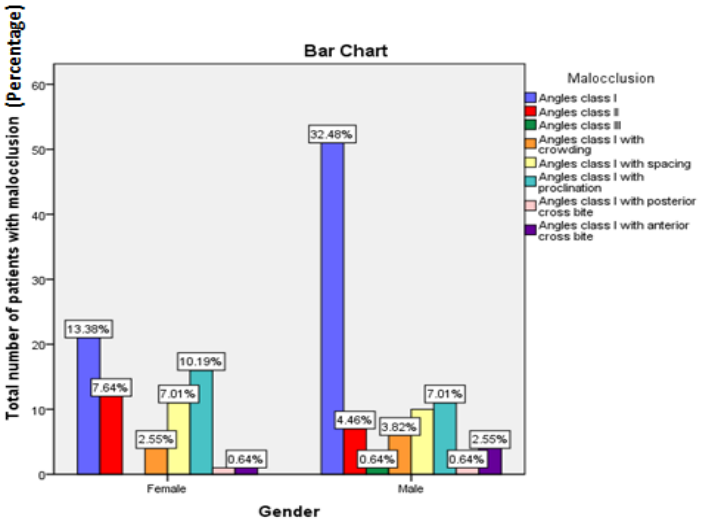

Fig.7:The Bar graph shows the association between gender and malocclusion. X axis represents the gender and Y axis represents the Percentage distribution of the patients with malocclusion(Percentage). Angle's class I (32.48%)was found to be more common among male study subjects and female patients. However the association between gender and oral malocclusion was found to be statistically not significant. [Chi-square value- 14.37; P value- 0.04 (p>0.05)].,

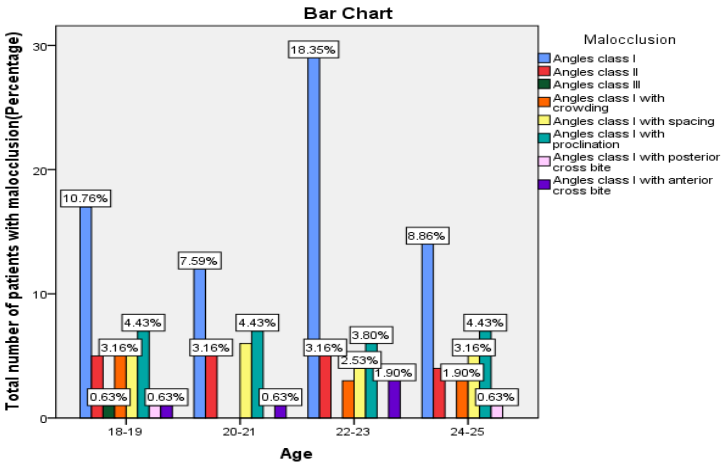

Fig.8:The Bar graph shows the association between age and malocclusion. X axis represents the age and Y axis represents the total number of patients with malocclusion(Percentage). Angle's class I (18.35%) was found to be more common among patients aged between 22-23 years old when compared to other age groups. However the association between age and oral malocclusion was found to be statistically not significant.
[Chi-square value- 17.67; P value- 0.67 (p>0.05)].

Table 1: depicts the correlation between Malocclusion and deleterious oral habits. Spearman Correlation was done and was found to be statistically not significant. A negligible correlation (correlation value- 0.13; p>0.05) existed between Malocclusion and deleterious oral habits. Hence proving that there was no relationship between Malocclusion and deleterious oral habits among the study subjects enrolled in the present study.

Variables	Spearman's rho Correlation Coefficient Value	P value
Malocclusion and Oral Habits	0.135	0.09