

Assessment Of Prevalence And Gender Based Distribution Of Various Dental Malocclusion - A Retrospective Study

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Abstract

At All Social Levels, Well-Aligned Teeth And A Pleasing Smile Reflects Positive Status, And Irregular Or Protruding Teeth Reflect Negative Status. In Majority, Balanced Facial Feature Is Considered To Be Pleasing For Each Race And Sex. Malocclusion Can Be Defined As An Occlusion In Which There Is Mal-Relationship Between The Arches In Any Of The Three Planes Or Anomalies In Tooth Position Beyond Normal Limits

Aim

The Aim Of The Study Was To Assess The Prevalence And Gender Based Distribution Of Different Dental Malocclusion.

Materials And Methodology

This Was A Retrospective Cross Sectional Study. Samples Were Collected From Patient Records From Saveetha Dental College Between June 2019- March 2020. Of The Total Case Records Of 41,000 Patients, Age Sorting Was Done And The Final 17150 Patient Data Between The Age Group 18-35 Years Were Collected. The Data Was Collected Only For Patients Who Had All Teeth Present For Diagnosis Of Molar Relation. Tabulated With Parameters Of Age, Gender And Dental Malocclusion. It Was Imported To Spss For Statistical Analysis. Descriptive Statistics And Chi Square Test Was Done.

Results

Out Of A Total Of 41,000 Patients, Analysis Showed That There Were 17150 Patients In The Required Age Group Of Which 60.4% Were Males And 39.6% Were Females. The Prevalence Of Male Patients Was More When Compared To Female Patients And The Common Age Group In The Study Analysis Is 26-30 Years. Class I Malocclusion Was Found To Be The Most Predominant Dental Malocclusion (94.3%) And Class Ii Division 2 Subdivision Was The Least Prevalent . There Was A Statistically Significant Difference In The Prevalence Of Various Dental Malocclusion In Male And Female Population With A P Value Of 0.000.

Conclusion

Assessment Of Prevalence And Gender Based Distribution Of Various Dental Malocclusion - A Retrospective Study

Within The Limits Of The Study, In Both The Gender, Class I Malocclusion Was More Prevalent And Class Ii Division 2 Subdivision Was Least Prevalent.

Keywords :Age; Angle's Classification; Diagnosis; Gender; Molar Relation.

Introduction

Oral Health Can Affect The General Health, Education And Development Of A Well Being. Facial Appearance Plays A Major Role In All Stages Of Human Life And This Has A Great Impact During Various Phases [1]. At All Social Levels, Well-Aligned Teeth And A Pleasing Smile Reflects Positive Status, And Irregular Or Protruding Teeth Reflects Negative Status [2,3]. In Majority, Balanced Facial Feature Is Considered To Be Pleasing For Each Race And Sex [4]. Malocclusion Is A Disorder Affecting Normal Development Of The Occlusion And Has A Multifactorial Etiology [5]. It Can Be Defined As An Occlusion In Which There Is Mal- Relationship Between The Arches In Any Of The Three Planes Or Anomalies In Tooth Position Beyond Normal Limits. If A Malocclusion Is Identified Early; Simple, Preventive And Interceptive Measures Can Alleviate A Developing Malocclusion [6]. The Incidence Of Various Categories Of Malocclusion In A Particular Population Is Necessary To Provide A Basis For Planning, Preventive And Interceptive Orthodontics. Although Malocclusion Is Not Life-Threatening [7], It Can Be Considered As A Public Health Problem Due To Its High Prevalence And Its Effect On Social And Medical Well Being. [8], [9]. The Major Causes Of Malocclusion Have Been Extra Teeth, Lost Teeth, Impacted Teeth, Or Abnormally Shaped Teeth [10], [11]. Malocclusions Feature The Third Highest Prevalence Among Oral Pathologies, Second Only To Tooth Decay And Periodontal Disease And Therefore Rank Third Among World-Wide Dental Public Health Priorities [12].

Malocclusions Are The Result Of Orofacial Adaptability To Various Etiological Factors, Which Result In Various Implications Such As Psychosocial Problems Related To Impaired Dentofacial Aesthetics, Disturbances Of Oral Function, Such As Mastication, Swallowing, Speech And Greater Susceptibility To Trauma And Periodontal Disease [13]. It May Have A Stronger And Longer Lasting Impact On Oral Health-Related Quality Of Life Than Other Factors Because It Is Associated With Poor Speech Capability And Poor Chewing Capability [14]. A Number Of Studies Have Demonstrated Its Impact On Quality-Of-Life [15], [16]. Since The Public Equates Good Dental Appearance With Success In Many Pursuits And Societal Forces Define The Norms For Acceptable, Normal And Attractive Physical Appearance, An Individual With Malocclusion Might Develop A Feeling Of Shame About Their Dental Appearance And May Feel Shy In Social Situations Or Lose Career Opportunities.

There Are Several Methods That May Be Used To Evaluate, Describe And Classify Occlusion. Since Its Development In 1986, The Dental Aesthetic Index (Dai) Has Proven To Be Simple And Rapidly Applied [17]. A Previous Report Has Demonstrated The High Reliability And Validity Of This Index, Which Also Compares Favourably With Other Indices [18], [19]. It Is A Cross-Cultural Index That Links Clinical And Esthetic Components Mathematically To Produce A Single Score. This Index Can Be Used For Different Communities And Populations Without Requiring Any Modification [20].

Angle's Classification Of Malocclusion In 1899 Was An Important Step In The Development Of Orthodontics [21], [22]. It Classified The Major Types Of Malocclusion, Provided The First Clear Definition Of Normal Occlusion In Natural Dentition And Still Remains The Most Widely Used And Accepted Method Of Assessment Of Malocclusion Internationally [23]. Most Of These Studies Have Been Conducted To Determine The Prevalence Of Malocclusion Based On A Narrow Perspective Focusing On Specific Age Groups To Fulfil The Goal Of The Investigation [24]. A Review Of The Literature Related To The Recording Of Malocclusion Reveals Published Investigations Which Consider Children And Adolescents And Only A Few Concentrate On Malocclusion Distribution For Adults [25]. So More Studies Are Required To Focus On The Malocclusion Distribution In Adults. The Recognition Of Malocclusion As An Important Problem In The Public Dental Health Services Implies A Need For Rational Planning Of Preventive And Therapeutic Orthodontic Measures. Previously Our Team Has A Rich Experience In Working On Various Research Projects Across Multiple Disciplines The [26–28][29–40].

The Aim Of This Study Was To Assess The Prevalence And Gender Based Distribution Among Male And Females.

Materials And Methodology

The Retrospective Study Was Done Under A University Setting. Records Of Patients Who Visited Saveetha Dental College And Hospitals, Chennai Were Evaluated Between June 2019-March 2020. This Study Was Approved By The Institutional Ethics Board. Two Reviewers Were Involved In This Study. Of The Total Case Records Of 41,000 Patients, Age Sorting Was Done And The Final 17,150 Patient Data Between The Age Group 18-35 Years Were Collected. Only The Patients Who Had All Teeth Were Present For Evaluation Of Molar Relation. Any Missing Teeth Or Any Development Disorder Was Considered As The Exclusion Criteria. To Minimise Sampling Bias, All Available

Data Was Included With A Sorting Process Of Removing Double Entries. Internal Validity Of The Study Was To Record The Molar Relation Of All The Patients And The External Validity Was Needed For A Large Sample To Define The Entire Population.

Data Collection Was Evaluated By The Patient Record Visiting Saveetha Dental College And Hospitals, Chennai During The Given Time Frame . This Data Was Obtained From The Molar Relation Of The Clinical Examination Diagnosis Given For All The Patients And It Was Further Tabulated. This Data Was Again Verified Along With Clinical Pictures. If Any Missing Teeth Were Present , They Were Excluded From The Study. Data Was Verified By One External Reviewer. This Data Was Then Exported To Spss And The Variables Were Identified. Descriptive Statistics And Chi Square Test Were Performed On The Data Using Spss Version 20 Software. Age And Gender Were Considered As Independent Variables. Molar Relation Was Considered As A Dependent Variable.

Results

The Data Collected From The Patient Case Records Were Tabulated In Spss And The Descriptive Statistics Was Obtained. Out Of A Total Of 41,000 Patients, Analysis Showed That There Were 17,150 Patients In The Required Age Group Of Which 60.4% Were Males And 39.6% Were Females.

Most Common Age Group Present In The Study Analysis Was 26-30 Years Which Constitutes About 31.06 % Of The Total Population. The Frequencies Of Different Age Groups Were Depicted In Figure 1.1 , Figure 1.2 Showed Frequency And Percentile Of Male And Female Involved In The Study Which Showed That Males Constituted The Highest Percentage (60.4%).

In The Present Data, Patient Records Identified Included Class I Malocclusion (9782 Males And 6385 Females), Class Ii Div 1 Malocclusion (244 Males And 222 Females); Class Ii Div 1 Subdivision (107 Males And 87 Females) ; Class Ii Div 2 (45 Males And 25 Females) ; Class Ii Div 2 Subdivision(15 Males And 6 Females) ; Class Iii Malocclusion (129 Males And 42 Females) And Class Iii Subdivision, (42 Males And 19 Females). Class I Malocclusion Is The Most Prevalent Dental Relation Which Is Depicted In , Figure 1.3 – Showing The Frequency And Percentage Of Dental Malocclusion Involved In The Study.

Chi Square Test Was Done Between Gender And Dental Malocclusion Of The Population. Results Showed That There Was A Statistically Significant Difference In The Prevalence Of Various Dental Malocclusion In Male And Female Population With A P Value Of 0.000. Most Common Dental Malocclusion Seen In Males Is Class I Malocclusion Which Is Represented In (Figure 2)

Discussion

Maintaining Proper Oral Hygiene Goes A Long Way In Preventing Any Form Of Dental Disease [41]. An Adequate Alignment Among The Teeth And Interdigitation Between The Arches Will Reduce Gum Recession, Trauma To The Teeth, Cavity, Gum Diseases, And Attainable Loss Of Teeth In The Population [42], Malocclusion And Dentofacial Deformities Are Highly Prevalent And Can Influence Physical, Social, And Psychological Functioning, Thus Playing An Important Role In Social Acceptance And Interactions.[43]. Orthodontic Treatments Are Done To Correct Malocclusions And Craniofacial Abnormalities, By Providing Proper Alignment Of Teeth, Provide Harmony Between Occlusal And Jaw Relationship, Help Improve Mastication, Phonation, With Beneficial Effects On The General And Oral Health, Individual's Comfort And Self Esteem, And Having A Positive Role In Improving Their Quality Of Life [44].

There Are Numerous Studies [45], Published Describing The Prevalence Of Malocclusion And Its Different Types. But Some Authors [46], Found Many Difficulties To Compare These Findings Because Of The Great Variability Of Methods And Indices Used By One Examiner And Another To Record Occlusal Relationships. Distribution Of Different Types Of Malocclusion May Show Great Variability Even In A Population Of The Same Origin.

As We Moved Onto Our Study, The Most Common Gender Present In The Study Was Male. This Was In Agreement With The Study Conducted By Siddegovda R Et Al [47] , Which Concluded That Males Are The Most Predominantly

Assessment Of Prevalence And Gender Based Distribution Of Various Dental Malocclusion - A Retrospective Study

Present In The Study Compared To Females. This Similarity Is Seen Due To Similar Sample Size And Ethnicity Of Population.

A Study Conducted By Silva Rg Et Al [48], Reported That The Most Common Molar Relation Seen In His Study Was Angle's Class I Malocclusion. This Was In Acceptance With The Present Study Where The Most Prevalent Molar Relation Is Angle's Class I Malocclusion – 94.3% Followed By Class Ii Div 1 – 2.7% , Class Ii Subdivision- 1.1%, Class Ii Div 2 – 0.4%, Class Ii Div2 Subdivision- 0.1%, Class Iii – 1%, Class Iii Subdivision – 0.4% . The Possible Reason For This Similarity Is Seen In The Majority Of The Population.

Alkarakat Sf Et Al [49] , Reported That The Most Common Age Group In This Study Was 12-20 Years. This Was In Contradiction With The Present Study Which Reported The Common Age Group Was 26-30years Old. The Reason For This Difference Is Seen Due To Different Categories Of Samples Size.Our Institution Is Passionate About High Quality Evidence Based Research And Has Excelled In Various Fields ([50–60].

Few Limitations Of The Study Design Might Be That The Study Was Single Centred, Similar Ethnicity And Geographical Location. Any Patient With Missing Teeth Was Also Considered A Limitation To The Study. From The Study, It Was Understood That Extensive Research Involving A Larger Population Was Required. To Overcome The Shortcomings With The Angles System Of Classification, Other Methods Can Also Be Used Provided Sufficient Details Are Available For Larger Samples.

Conclusion

Within The Limits Of The Study, In Both The Gender, Class I Malocclusion Was More Prevalent And Class Ii Division 2 Subdivision Was Least Prevalent. Furthermore, Appraisal Of Malocclusion Knowledge In Children Can Facilitate Efforts To Prevent Such A Disorder And Its Consequences Making It Possible To Reduce Complexity Of Expensive Orthodontic Treatment. This Might Help To Minimise Or Eliminate Further Treatment Needs.

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Author Contribution

Perna Contributed In Study Design, Manuscript Preparation, Dr. Nivethigaa B Contributed To Manuscript Writing And Proof-Reading And Dr. Manish Contributed To The Statistical Framework.

Conflict Of Interest

Nil

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Assessment Of Prevalence And Gender Based Distribution Of Various Dental Malocclusion - A Retrospective Study

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Assessment Of Prevalence And Gender Based Distribution Of Various Dental Malocclusion - A Retrospective Study

List Of Titles For All Figures :

Figure 1.1. Age Distribution Involved In The Study

Figure 1.2 . Gender Distribution Involved In The Study

Figure 1.3. Dental Malocclusion Involved In The Study

Figure 2. Cross Tabulation Between Gender And Dental Malocclusion

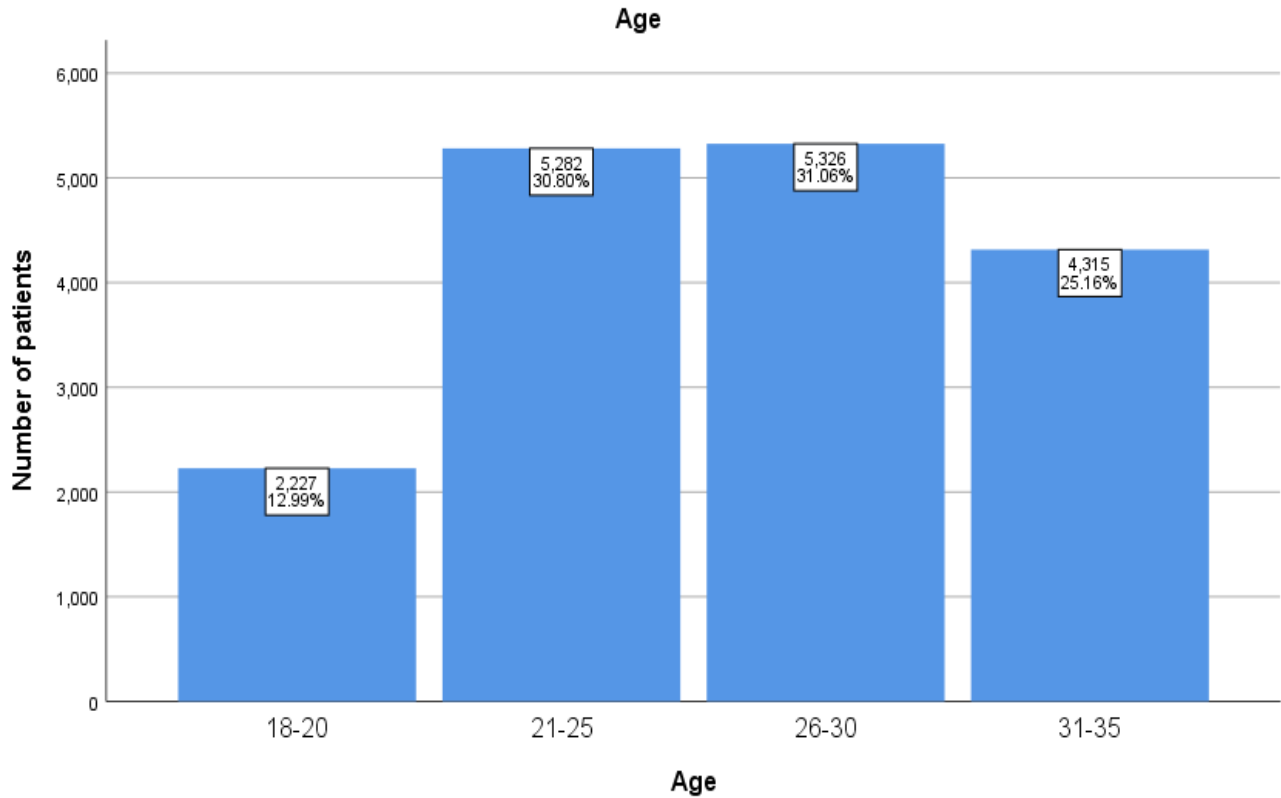


Figure 1.1: Age Distribution Involved In The Study. This Graph Shows Frequency Distribution Of Samples In Various Age Groups. X Axis Denotes Age Distribution And Y Axis Denotes Number Of Patients. Out Of The 17150 Patients In The Study, 2,227 (12.99%) Patients Were In The Age Group 18-20 Years, 5,282 (30.8%) Patients Under 21-25 Years; 5,326 (31.06%) Patients In 26-30 Years Old And 4,315 (25.16%) Patients In The Age Group Of 31-35 Years Old. The Samples Were Mostly Within 21- 30 Years Of Age Group.

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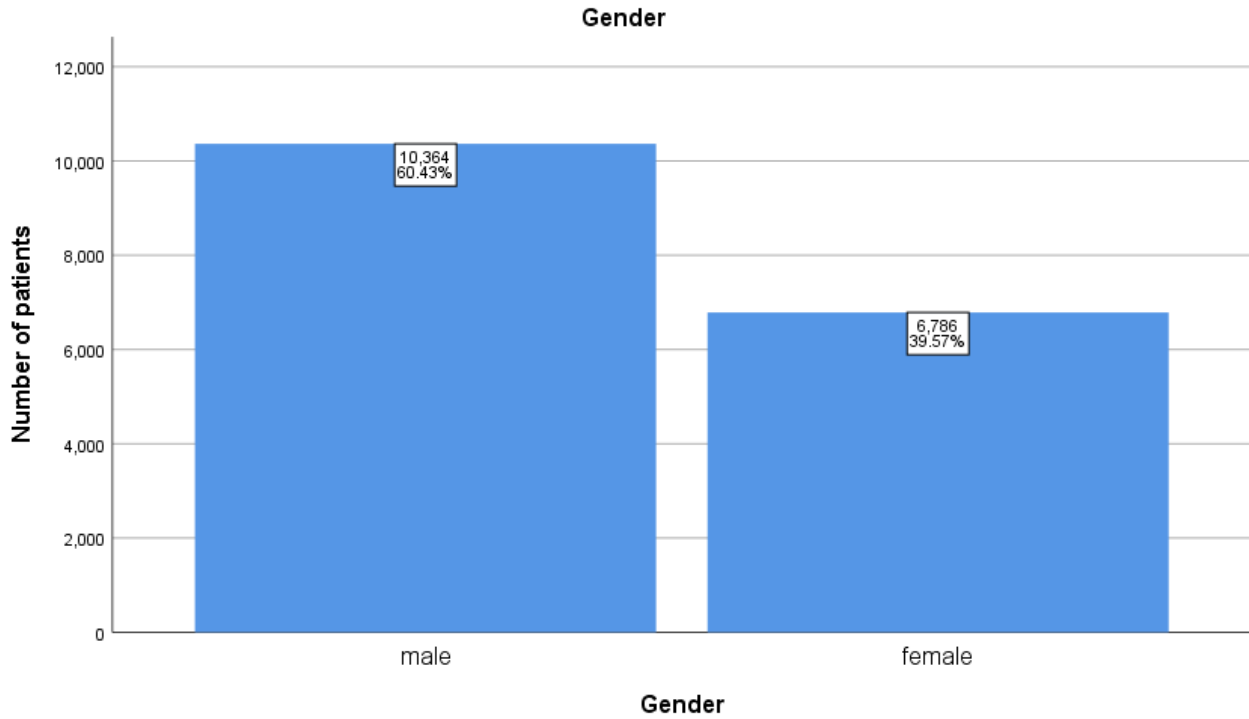


Figure 1.2 : Bar Graph Shows Gender Distribution Of The Study Samples. X Axis Denotes Gender Distribution And Y Axis Denotes Number Of Patients. Out Of The 17150 Patients In The Study, 10,364 (60.43%) Patients Were Males And 6,786 (39.57%) Patients Were Females.

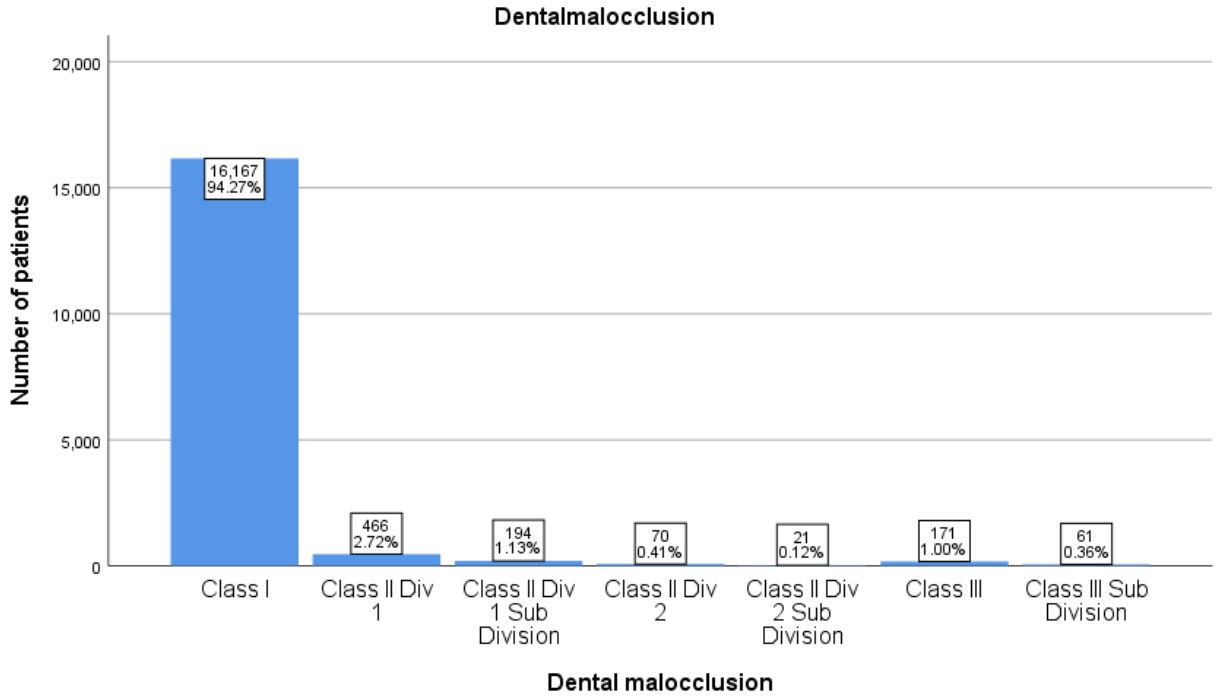


Figure 1.3: Bar Graph Shows Frequency Distribution Of Dental Malocclusion Among The Number Of Patients. X Axis Denotes Dental Malocclusion And Y Axis Denotes Number Of Patients. Out Of The 17150 Patients In The Study; 16,167 (94.27%) Patients Were Diagnosed With Class I Malocclusion ; 466 (2.7%) Patients - Class Ii Div 1 ; 194 (1.1%) Patients - Class Ii Div 1 Subdivision ; 70 (0.45) Patients - Class Ii Div 2 ; 21(0.1%) Patients - Class Ii Div 2 Subdivision ; 171 (1%) Patients - Class Iii ; 61 (0.36%) Patients - Class Iii Subdivision. Class I Malocclusion Was Most Prevalent And Class Ii Div 2 Subdivision Was Least Reported.

Assessment Of Prevalence And Gender Based Distribution Of Various Dental Malocclusion - A Retrospective Study

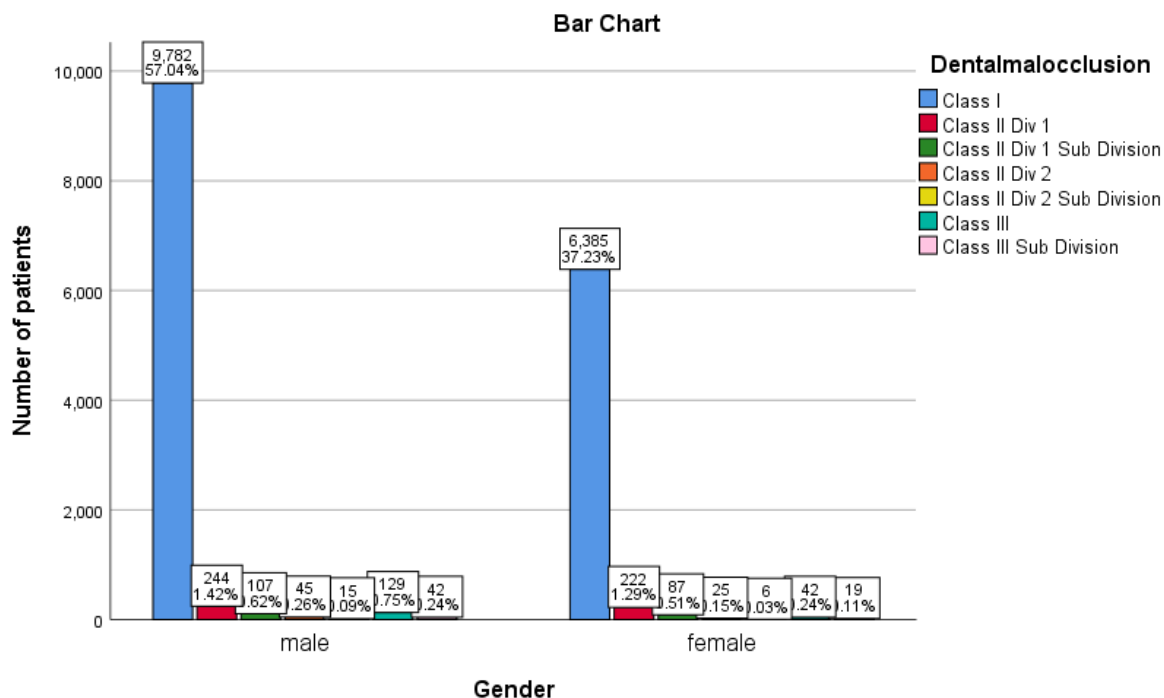


Figure 2 :Bar Graph Represents The Association Between Gender And Dental Malocclusion Of Number Of Patients In The Age Group Of 18-35 Years Where Blue Colour Denotes Class I Malocclusion, Red Colour Denotes Class Ii Div 1 , Green Colour Denotes Class Ii Div1 Subdivision, Orange Colour Denotes Class Ii Div 2, Yellow Colour Denotes Class Ii Div 2 Subdivision, Turquoise Blue Denotes Class Iii And Pink Colour Denotes Class Iii Subdivision . X Axis Denotes The Gender And Y Axis Denotes The Number Of Patients. Pearson’s Chi Square Value : 34.403, P Value :0.000 , Hence Statistically Significant (Chi Square Analysis) Both In Male And Female Population, Class I Malocclusion Was Most Prevalent And Class Ii Division 2 Was Least Prevalent And The Results Of The Study Showed Statistical Significance Between Both Genders, Probably Because Of The Difference In The Samples Among Both Gender.