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Prevalence of Various Malocclusions Among Patients Presenting at Dental OPD of a Tertiary Care Hospital

Rafey Hameed[1], Syeda Fozia[2], Laiba Munawar[3], Wasio Aziz[4], Lailatul Huda[5], Livaza Memon[6]

1 *BDS, Dental Department, Liaquat University of Medical & Health Sciences, Jamshoro Pakistan*
Contributed to data collection and analysis, and provided critical feedback on the manuscript

2 *Lecturer, Department of Oral Pathology, Muhammad Medical & Dental College Mirpurkhas Pakistan*
Conceived and designed the study, collected data, and wrote the first draft of manuscript

3 *BDS, Dental Department, Liaquat University of Medical & Health Sciences, Jamshoro Pakistan*
Contributed to the conceptualization and methodology

4 *BDS, Dental Department, Liaquat University of Medical & Health Sciences, Jamshoro Pakistan*
Contribution in literature review

5 *BDS, Dental Department, Liaquat University of Medical & Health Sciences, Jamshoro Pakistan*
Contribution in analysis and formatting

6 *Lecturer, Department of OMFS, Isra University Hospital, Hyderabad Pakistan*
Contribution in manuscript writing

CORRESPONDING AUTHOR
Dr. Syeda Fozia
Lecturer, Department of Oral Pathology, Muhammad Medical & Dental College Mirpurkhas Pakistan
Email: sfoziazakir@gmail.com

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ABSTRACT

Background: Malocclusion refers to the misalignment or improper positioning of teeth when the jaws are closed. It can affect an individual's oral health, aesthetics, and overall quality of life. Identifying the prevalence of malocclusion is crucial for dental professionals to diagnose and plan appropriate treatments. Each case of malocclusion is unique, and understanding the frequency of different malocclusion types helps in tailoring treatment strategies. **Objective:** To find out the prevalence of malocclusion among patients reporting at Dental OPD of Liaquat University Hospital (LUH), Hyderabad. **Study Design:** Descriptive cross-sectional study. **Settings:** Dental OPD of Liaquat University Hospital, Hyderabad Pakistan. **Duration:** From April-2022 to May 2022. **Methods:** Patients with age range of 25 to 35 years presence with all permanent teeth with or without 3rd molar were included. The oral cavity of participants was examined using examination instruments. Patients were asked to close their mouth in centric occlusion by the saliva deglutition method. The records were collected first by the presence of dental malocclusion or not and further as per Angle's Classification of malocclusion and then further they their relationship was correlated with vertical plane. After data collection, the whole data was analyzed by IBM SPSS Statistics 28.0. **Results:** This study involving 267 patients, and results showed 79.8% of the patients had a dental malocclusion. Class I malocclusion was the most common, accounting for 59.6%, class II malocclusion was 12.4% and Class III malocclusion was found in 7.9% cases. In the overall population, 62.2% of cases exhibited a normal vertical overlap of teeth, while 27.7% had a deep bite, 9% had an open bite, and there were very few cases of crossbite and edge-to-edge bite. Further analysis within the different malocclusion classes revealed variations in vertical patterns. In Class I malocclusion, 64.3% of cases had a normal deep bite, 25.8% had a deep bite, 8.9% had an open bite, and a minimal 0.9% had an edge-to-edge bite. In Class II malocclusion, 51.5% had a normal bite, 45.5% had a deep bite, and 3% had an open bite. Class III malocclusion had 57.1% of cases with a normal bite, 19% with deep bite, 19% with open bite, and 4.8% with crossbite. **Conclusion:** Dental malocclusion was observed to be highly prevalent, with Class I malocclusion being the most common type among patients presenting at the dental OPD. Additionally, a significant portion of the population had deep bites or open bites, which can have implications for both oral health and aesthetics.

Keywords: *Malocclusion, Angle's Classification, Vertical relationship.*

INTRODUCTION

Malocclusion refers to the misalignment of teeth, which can manifest as teeth protruding, gaps between teeth, overcrowding, or irregularities in the size and the shape of the teeth, leading to the condition of malocclusion.[1,2] It is believed that malocclusion can have negative impacts on the aesthetic aspects of both dental and facial features, resulting in detrimental psychological and social consequences as well as affecting the individual's overall quality of life.[3] A malocclusion ought

to be viewed as a developmental condition and doesn't address a solitary element. Rather, it is the aggregate of many complex occlusal attributes, which exhibits multifactorial heritage like hereditary, environmental, physiological, and pathology.[4]

Deviance from normal occlusion doesn't be guaranteed to be treated; it all depends on the severity in oral health, function, aesthetics, and patient satisfaction.[5] The prevalence of malocclusion has already been published in different populations in a large number of studies. There is variation in the incidence, for about 39 to 93 percent which shows that many people have an appreciable deviation of the teeth from ideal. [6-8]

The variation in their prevalence depends upon ethnicity, age and gender, and previous orthodontic treatment taken by people making it more diverse.[9] A prevalence study has been carried out in different geographic areas, different countries, and small cities throughout the world to initiate the treatment guidelines for a malocclusion. There are many countries and cities in the world, in which malocclusion is under consideration and they are working on treatment guidelines for malocclusion therefore the prevalence studies are necessary to highlight the importance of treatment guidelines. Malocclusion can be classified in several ways based upon sagittal (anteroposterior), vertical, transverse dimension, deformity of bone, space between the teeth, and overly crowded. Malocclusion can be because of both skeletal and dental discrepancies.[6]

Various examinations have been directed on the recurrence of various kinds of malocclusion in different ethnic populace subgroups. There is a high recurrence of Class I malocclusion in White Americans, Black Americans, in Nigerians. While, in Oriental populaces, class III was found on a mission to be generally predominant, though Class II issues are more common in whites of northern European plummet. The reasoning of the present review was to figure out the recurrence of various kinds of malocclusion in our populace as distinguishing malocclusion recurrence can assist with deciding the intervention required in orthodontics, for public dental projects, focusing on orthodontic patients, and managing orthodontics.[10]

The clinical ramifications from these findings could imply that the orthodontic administration of a specific sort of malocclusion would be normally experienced in Pakistan. As recurrence in various populaces is unique; the present review was intended to decide the recurrence of malocclusion in the Pakistani populace. This data is used to compare the present study with other studies.

METHODS

This was a cross-sectional study and was carried out at Liaquat University Hospital Hyderabad Sindh (a tertiary care Hospital). Study was conducted during a period of one year from April-2022 to May 2022.

Patients with age range of 25 to 35 years presence with all permanent teeth with or without 3rd molar were included. Patients with decayed, missed filled molars, recent extractions, undergoing orthodontic treatment, having bridges, and TMJ problems were excluded.

Informed consent was obtained from all the patients after providing a clear explanation of the study's objectives, purpose, and the assurance of confidentiality. Patients were also informed of their right to withdraw from the study if they chose to do so. Malocclusion was categorized by Angle's Classification of malocclusion and its association with the vertical plane. The examination process involved patients being seated in a dental unit, and their oral cavities were examined using specific instruments to assess their occlusal relationship and vertical patterns. Initially, a general assessment was conducted for all patients to determine the presence or absence of malocclusion. Factors such as well-aligned molars, minimal spacing, or crowding were considered normal, while deviations from these criteria were considered indicative of malocclusion.

To determine molar relationships, examinations were carried out in the most retruded contact position of the mandible, known as centric occlusion position (COP). Patients were asked to swallow and then bring their teeth together. Cheeks were retracted using a mouth mirror to assess the immediate molar relationship on both the right and left sides. Simultaneously, the vertical positioning of teeth, including identifying deep bite, open bite, and edge-to-edge relations, was also checked. All collected data was then entered into IBM SPSS, and descriptive statistics were used to calculate frequencies and percentages for analysis.

RESULTS

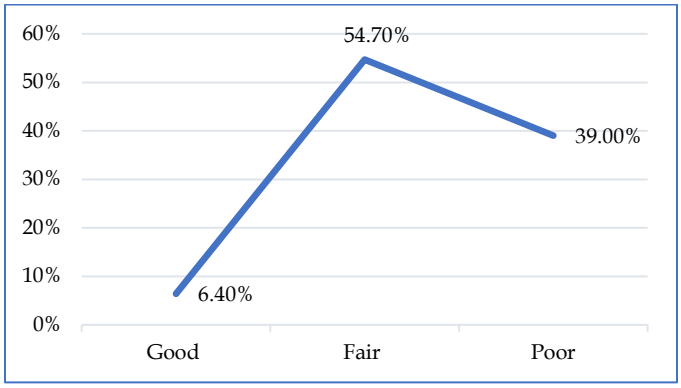
Among the 267 patients included in the study, the majority fell within the age groups of their 20s and 30s, meeting the inclusive criteria. Additionally, the research predominantly consisted of a higher representation of females. Out of the 267 patients, 79.8% exhibited dental malocclusion, while 20.2% did not have any dental malocclusion, followed by total number of cases for Class I, Class II, and Class III malocclusions accounted for 59.6%, 12.4%, and 7.9%, respectively, as presented in table 1.

Table 1: Frequency and classification of malocclusion n=267

Variables			Frequency	Percent
Malocclusion	No		54	20.2%
	Yes	Class I	159	59.6%
		Class II	33	12.4%
		Class III	21	7.9%
		Total	267	100.0%

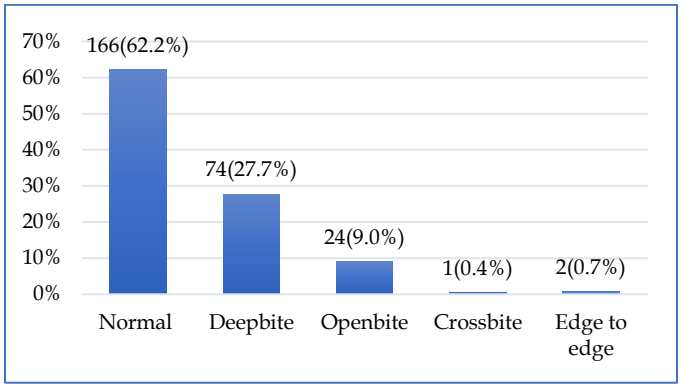
Out of all, 39.0% cases were presented with poor oral hygiene, 54.7% were found with fair oral hygiene and unfortunately only 6.4% cases were observed with good oral hygiene. Figure 1

Figure 1: Oral hygiene status (n=267)



The assessment of vertical patterns in these patients revealed that 62.2% (166) had a normal vertical overlap of teeth, 27.7% had Deep bite, 9% had open bite, and very few cases of crossbite (0.4%) and edge-to-edge bite (0.7%) were observed, as outlined in figure 2.

Figure 2: Vertical pattern of patients (n=267)



In the evaluation of vertical patterns, the "Deep bite" category encompassed 25.8% of cases in Class I, 7.0% in Class II, and 1.9% in Class III. In the "Open bite" category, 8.9% of cases were observed in Class I, 0.5% in Class II, and 1.9% in Class III malocclusion. Furthermore, one case (0.5%) of "Crossbite" was identified within Class III malocclusion, and two cases (0.9%) of "Edge-to-edge" bite were present in Class I malocclusion. P-value, indicating a statistically significant relationship between malocclusion classification and vertical pattern, with a 0.047 level of significance. Table 2

Table 2: Vertical pattern according to malocclusion classification (n=213)

Vertical pattern	Malocclusion classification			Total	p-value
	Class-I	Class-II	Class-III		
Normal	83	17	12	112	0.047
	39.0%	8.0%	5.6%	52.6%	
Deep bite	55	15	4	74	
	25.8%	7.0%	1.9%	34.7%	
Open bite	19	1	4	24	
	8.9%	0.5%	1.9%	11.3%	
Cross bite	0	0	1	1	
	0.0%	0.0%	0.5%	0.5%	
Edge to edge	2	0	0	2	
	0.9%	0.0%	0.0%	0.9%	
Total	159	33	21	213	
	74.6%	15.5%	9.9%	100.0%	

DISCUSSION

Malocclusions can significantly impact an individual's oral health and facial aesthetics. Understanding the prevalence of various malocclusions and employing crucial diagnostic tools is essential for effective treatment planning, especially when considering the impact on facial aesthetics. In this study discussed the prevalence of different malocclusions and the importance of accurate diagnosis for facial aesthetic assessment. The result of this study showed that out of the 267 patients, 79.8% exhibited dental malocclusion, and 20.2% did not. Specifically, Class I, Class II, and Class III malocclusions accounted for 59.6%, 12.4%, and 7.9%, respectively. Results showing Class I Malocclusion being the most common type of malocclusion which is similar to another study done in Casablanca, Morocco in which Angle Class I malocclusions in 61.4%, Class II in 24%, Class III in 10%.[11] The results of another study showed that about 71% of the patient had malocclusion, Which matches with my above results and Class I malocclusion constituted the major proportion of malocclusion which was found in 62% of the studied population.[12]

Another study in Nepalese Orthodontic Patients involving Study models of 464 orthodontic patients (165 male and 299 female) showed 54.7% Class I, 36.9% Class II, and 8.4% Class III.[13] A similar study in Nigeria based on Angle's Classification of malocclusion shows molar relationships among them is: class I - 76.5%, Class II - 15.5%, and Class III - 8.0%.[14] One more study on Saudi Population in Asser Region shows Maximum (75%) of the participants had Angle's Class I molar relation followed by Angle's Class II and III. In India, among dental and nursing students' similar examination was done using a study cast, which shows malocclusion to be 51.6 percent

more prevalent than normal occlusion. in this study, it is also indicated that Class I malocclusion was the most prevalent class followed by Class II malocclusion and Class III malocclusion showed the least prevalence.[2] Prevalence of Malocclusion in Adolescents in Tabriz shows 51% had Class I, 21.9% had Class II and 17.1% had Class III malocclusion.[15]

A similar study was done in Punjab Pakistan, which shows results of the Prevalence of classes I, II, and III were found to be 65%,26%, and 9% respectively. Our study also shows normal overbite to be most prevalent with a normal overbite in 62.2% cases, then deep bite in 27.7% cases followed by open bite of 9% cases, crossbite in 0 .4% cases, edge to edge bite in 0.7% cases. This is seen in a similar article Prevalence of deep bite in orthodontic patients in Sulaimani city shows Normal overbite was found in 51% of the patients and deep bite in 41% whereas open bite was found in 8% of the patients.[16]

One more article by Alhammadi MS *et al*[17] showed similar results. Another study on school children in Northern Saudi Arabia also shows class 1 malocclusion to be the most common and similar vertical pattern as seen in our research.[18] Department of Orthodontics, Faisalabad Medical University, and de, Montmorency College of dentistry did research on the frequency of deep bite which is 25%, and near to our research which shows 27%. slight variation could be due to no of patients.[19]

Although several studies have been done to know the prevalence of malocclusion in different regions. But cannot be compared in all aspects as it is different in the quantity of patient, study criteria, method of study, age and gender. All of these cause a wide diversity in results. As much research work shows Class I to be most common, on the other hand, there is one study done in Aga Khan Hospital Karachi which shows class II to be more prevalent.[20]

This confirms that the prevalence of malocclusion is influenced by environmental factors and varies among different patient populations. The World Health Organization recognizes malocclusion as a significant oral health issue, ranking it as the most important problem after caries and periodontal disease.[21,22] Therefore, conducting epidemiological surveys on malocclusion is crucial for gaining a more comprehensive understanding of its prevalence. Such surveys can contribute to the development of more effective treatment plans and strategies.

CONCLUSION

Dental malocclusion was observed to be highly prevalent, affecting 79.8% of the patients, with Class I malocclusion being the most common type, and Class III malocclusion being the least prevalent among patients presenting at the dental OPD. When considering the vertical relationship, a normal overbite was the most common, followed by an abnormally deep bite, and open bite. These findings remained consistent when examining all patients and when dividing them into different classes.

LIMITATIONS

The study has a limited sample size, and its findings may be influenced by the characteristics of patients seeking treatment at the Dental OPD. Additionally, the study does not include important demographic information, such as socioeconomic status and lifestyle factors, including dietary habits, which can have a significant impact on the prevalence of malocclusion.

SUGGESTIONS / RECOMMENDATIONS

The development and implementation of educational programs and preventive measures can play a crucial role in addressing malocclusion at an early stage, potentially reducing its prevalence and severity.

CONFLICT OF INTEREST / DISCLOSURE

None.

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