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ASSESSMENT OF ORTHODONTIC TREATMENT NEED IN MIXED DENTITION STAGE

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ABSTRACT

The aim of orthodontic treatment in children is to maintain or improve arch integrity for the eruption of permanent teeth and to prevent the development of malocclusion. The importance of proper diagnosis prior to the treatment of mixed dentition patients cannot be neglected since this could reduce the severity of the skeletal, dental and soft tissue problems if adequately treated at the right time. The aim of this study was to assess the orthodontic treatment need in the mixed dentition stage. 41,400 patient records were reviewed from June 2019 to March 2020. Orthodontic treatment suggestions of patients between 7 -12 years of age were retrieved from the case records and tabulated in excel and imported to SPSS.795 (25%) patients were in need of orthodontic treatment in mixed dentition stage. Out of 795 patients, 437 patients were male and 358 patients were female. The current study concluded that 25% of the patients were in the need of orthodontic treatment in the mixed dentition stage. People should be made aware about the fact that if noted at the developing phase, treatment would be more economical as well as less time consuming.

Keywords: Interceptive orthodontics; Malocclusions; Mixed dentition; Orthodontic treatment

INTRODUCTION

Orthodontics is a speciality of dentistry that deals with diagnosis, prevention and correction of malpositioned teeth and jaws. Early orthodontic intervention can be broadly classified as preventive orthodontics and interceptive orthodontics. Interceptive orthodontics deals with control of developing problems and correcting existing early malocclusion all of which might decrease the occlusion from worsening **[1]**.

Dental traumas such as tooth fractures are three times more likely to occur when the child has an malocclusion **[2]**. The percentage of children who would benefit reported 14% to 49% from interceptive orthodontics **[3, 4]**. Mixed dentition is the transition state between primary and permanent dentition. Mixed dentition treatment is an important subject because treatment at this stage could not only correct the occlusion but also may ensure normal development of teeth and jaws.

It has been found that hurtful comments about teeth were more in the age group of the 9-10 year age group **[5]**. Hurtful comments about teeth made by peers psychologically affects the children which can be improved by earlier orthodontic treatment. The benefits of early treatment includes correct harmful oral habits, gain space / preserve space for erupting permanent teeth, influence jaw growth, prevent trauma to protruded upper incisors, improve eruption pattern, aesthetics and self esteem. One of the major advantages of early treatment is the correction of malocclusions without extraction of permanent teeth and non-surgically **[6]**.

For estimation of the need for early intervention, data on incidence of malocclusions and their progression is required together with information on the validity of treatment needs (Foster 1980) **[7]**. Previously our college had conducted many clinical trials **[8-13]**, in vitro studies **[14-16]**, literature updates **[17-20]** and case reports **[21, 22]** in the last five years. Now we are focussed on retrospective study. Hence a retrospective study was planned to evaluate prevalence of orthodontic treatment needed in mixed dentition stage.

The aim of this study was to assess the orthodontic treatment need in the mixed dentition stage.

MATERIALS AND METHODS

The present study was a cross sectional retrospective study done in a university setting. Ethical approval for this study was obtained from the Institutional Scientific Review Board. Case records of 41,400

patients were reviewed from the archive of records between June 2019 to March 2020. Age sorting was done to include only the samples within the age group of 7-12 years. Tabulation was then done and the parameters noted include Orthodontic treatment suggestions of patients between 7 -12 years of age. This would yield the required prevalence of treatment needed in the mixed dentition stage. Samples were cross verified by another examiner to avoid any missing data. Sampling bias was minimised by including all data with no sorting process. Data was tabulated in excel and imported to SPSS. Descriptive statistics tests and chi square tests were performed to determine the statistical significance of the results obtained.

RESULTS AND DISCUSSION

Overall 41,400 patients records were reviewed in this study of which 3197 were in the mixed dentition phase. Of the 3197 patients in the mixed detention phase, 795(25%) of patients were in need of orthodontic treatment **(Figure 1)**. The gender distribution of patients was that 437 (55%) male and 358(45%) female were in need of orthodontic treatment in mixed dentition stage. Overall, 25%(795) of patients were in the need of orthodontic treatment in the mixed dentition stage. Taushche *et al* reported urgent treatment needs in early mixed dentition was 26.2% using Dental Health Component (DHC) and 21.5% with the Standard Component of Aesthetic Need (SCAN). When the borderline cases were taken into consideration, the treatment need increased to 51.7% with DHC and 66% with the SCAN. He also added that treatment need for age between 9-11 yrs, according to IOTN -DHC including grade 3(moderate or borderline cases) was 45% excluding grade 3 was found to be 20% **[23]**. Rapeepattana *et al* reported that approximately one fifth of children in his study were in DHC of IOTN grade 4&5 indicated a high need of orthodontic treatment **[24]**. Dias and Gleiser *et al* reported only 9.8% of children were in need for treatment by both dental health component and esthetic component **[25]**. Tak *et al* reported 33.3% of orthodontic treatment needs among 12-15yrs old school children **[26]**. Xin Yu reported 79.4% children presented occlusal abnormalities **[27]**.

65(2.03%) patients in 7-8 yrs, 87(2.72%) patients in 8-9yrs, 113(3.53%) patients in 9-10 yrs, 151(4.72%) in 10-11yrs,159(4.97%) patients in 11-12 yrs, 220(6.88%) patients in 12-13 yrs required orthodontic treatment in mixed dentition stage **(Figure 2)**. Association between age and orthodontic treatment need in mixed dentition stage was found to be statistically significant

(p=0.000,<0.05). 31(3.90%) male patients, 34(4.28%) female patients in 7-8 yrs, 53(6.67%)male patients,34(4.28%) female patients in 8-9yrs, 64(8.05%) male patients, 49(6.16%) female patients in 9-10 yrs, 80(10.06%) male patients,71(8.93%) female patients in 10-11yrs,85(10.69%) male patients,74(9.31%) females patients in 11-12 yrs,124(15.60%) male patients, 96(12.08%) female patients in 12-13 yrs required orthodontic treatment in mixed dentition stage **(Figure 3)**. Association between age and gender distribution in patients with orthodontic treatment need in mixed dentition stage was found to be not statistically significant (p=0.650,>0.05)

In this study, it is evident that with increase in age, the need of orthodontic treatment also increases and males are in higher need of orthodontic treatment in mixed dentition stage than females. Whereas Xin Yu reported boys had a very similar rate of malocclusion to that of girls in his study in early mixed dentition **[27]**.

The findings from the present study add to the consensus of previous studies. However few literature evidence contradicted the present study because of different populations.

Limitations of the present study include small sample size which does not provide results of the entire population. Since it is a retrospective study, errors are possible during data collection. Future studies can be done with a large population and as a multicentric study.

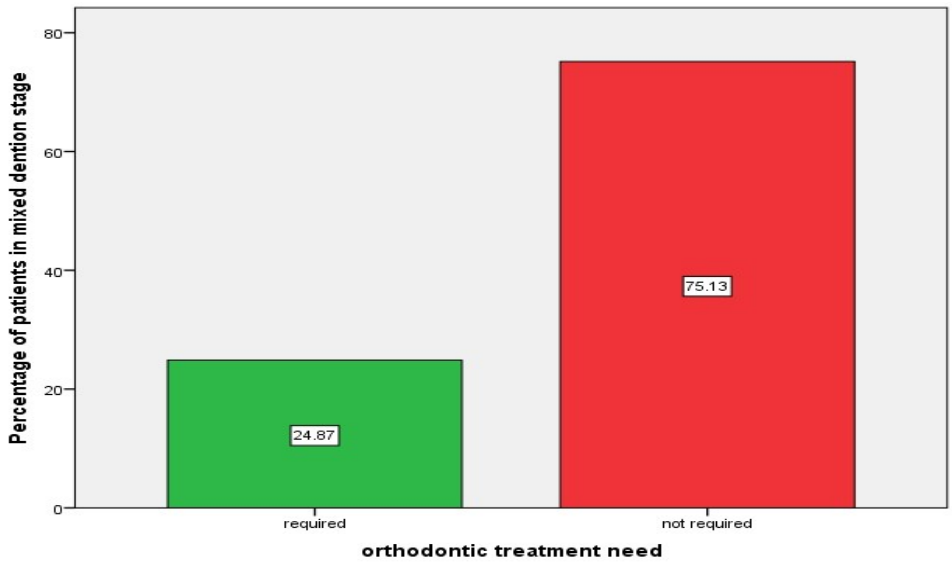

Figure 1: Bar chart depicts the prevalence of orthodontic treatment need in the mixed dentition stage. X axis denotes orthodontic treatment need in mixed dentition stage. Y axis denotes percentage of patients in the mixed detention stage. 24.87% patients were in need of orthodontic treatment (green) whereas 75.13% patients did not require any orthodontic treatment (red) in the mixed dentition stage.

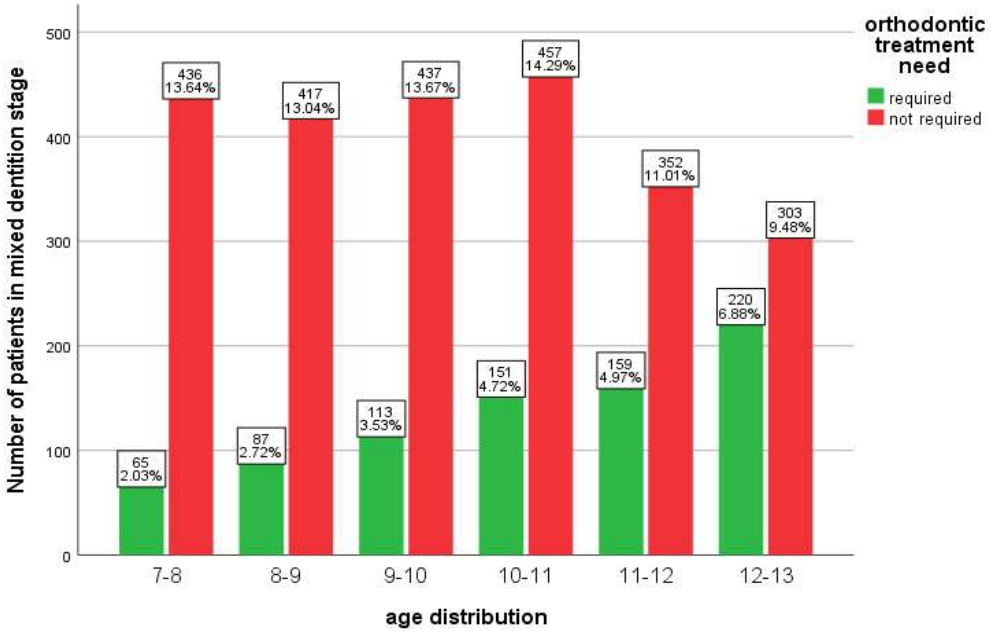

Figure 2: Bar chart depicts association between orthodontic treatment need and age distribution in the mixed dentition stage. X axis represents age distribution, Y axis represents number of patients in mixed detention stage.There is a steep rise seen in the number of patients who require orthodontic treatment(Green) reporting with increase in age and the difference is statistically significant. (Chi-square test; p value=0.000(p< 0.05 which is statistically significant))

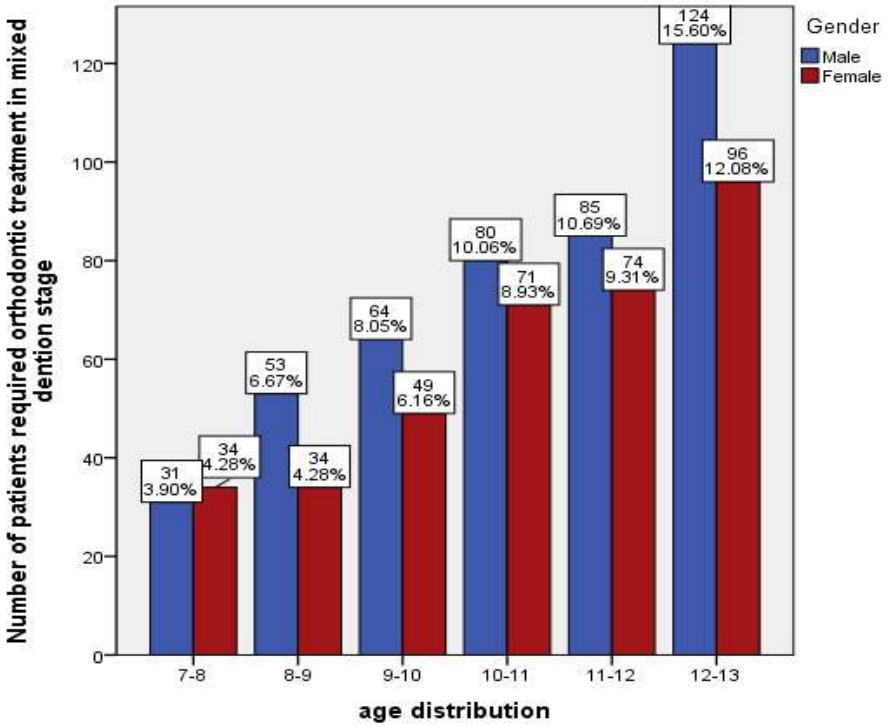

Figure 3: Bar chart depicts association between age groups and gender distribution with orthodontic treatment needs. X axis represents gender distribution, Y axis represents number of patients required orthodontic treatment in mixed detention stage.There is a steep rise seen in the number of patients who require orthodontic treatment reporting with increase in age in both sexes with male (blue) population being comparatively higher than the female population (brown)(Chi-square test; p value=0.650(p< 0.05 which is not statistically significant))

CONCLUSION

This study concluded that 25% of the overall study population, comparatively with a higher male predilection in the mixed dentition stage required orthodontic treatment of malocclusion. In an orthodontist perspective, more screening, identification and diagnosis of malocclusion at earlier stages would prevent the malocclusion from worsening. Awareness regarding the need for regular dental visits and orthodontic consultations from 6 years of age should be emphasised. Further, multicentric studies with diverse populations can be done to determine the treatment needed at earlier phases of dental and skeletal development.

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