



Analysis of the correlation between malocclusion, bad oral habits, and the caries rate in adolescents: A systematic review

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ABSTRACT

Background: Prevalence of malocclusion in the deciduous (primary), intermediate, and permanent dentitions varied widely across studies and countries because of population differences (races/ethnicity), sample sizes, age range of the surveyed children, and methods of measurement. Bad habits (oral habits) are things that are often done repeatedly and spontaneously in the oral cavity in children. Oral habits are often found in the developmental phase of children, but sometimes parents and children do not realize them or are considered normal so they are more often ignored than treated. Bad habits in children such as thumb/finger sucking, nail biting, tongue thrusting, mouth breathing, bruxism, and using pacifiers for too long will have a big impact on children in the future.

Objective: To determine the correlation between malocclusion, bad oral habits and the caries rate in adolescent.

Results & Discussion: The prevalence of malocclusion as a result of oral habits is increasing in children and adolescents, and from these malocclusions caries can occur which is the most common case in children and adolescents. The most common cases of oral habits found are thumb sucking, mouth breathing and nail biting.

Conclusion: Oral habits have a very large impact on malocclusion directly, whereas caries has an indirect effect on children and adolescents. Malocclusion in children requires immediate orthodontic treatment to prevent further damage.

Keywords: malocclusion, bad oral habits, caries, early orthodontic

INTRODUCTION

Malocclusion refers to deformities of teeth, jaws, and faces arising from congenital genetic factors and acquired environmental factors. Patients mainly show individual tooth dislocation, abnormal dental arch morphology,

and abnormal tooth arrangement.¹⁻⁶ Malocclusion deformity has a significant influence on the body and psychology of patients. Except for affecting the maxillofacial development of young children, it also affects oral health, oral function, and appearance,

and the influence will become more obvious with the age.7-9 Clinical studies have found that there is a certain correlation between caries and malocclusion, and some special malocclusions have a high correlation with the caries rate.10

Bad habits can occur in children during the growth and development phase. Examples are finger sucking, mouth breathing, lip sucking and lip biting, pushing the tongue forward, sticking out the tongue, or biting the nails. This habit is better known as oral habit. Oral habits are normal behaviors in infants, usually temporary and go away on their own by around 3-4 years of age. This habit would not cause significant problems for the oral cavity at that time, because basically the body can respond to external stimuli since it was in the womb.11-12 This reaction is a sign that the child's psychological development has begun to be seen from spontaneous or repeated reactions. Problems will arise if the habit is repeated until the child enters school at the age where this habit continues because parents pay less attention to their child.13

Prevalence of malocclusion was 62.3%, 28.4%, and 9.3% respectively seen among 15- to 17-year-old children. Malocclusion affects esthetics, the physical, psychological, and social life of a person. It is very important to take the orthodontic treatment, which mainly depends on knowledge and awareness of the person towards orthodontic treatment. Awareness is the state or ability to perceive, to feel or to be conscious. Planning for oral health is important to have a basis for awareness of regarding general health as an inseparable part. Indices and information related to malocclusion and treatment needs are available from all around the world.14-17

Age more than six years is the age of children entering elementary school. Children who have entered elementary school will be faced with socializing with their friends at school as well as problems regarding lessons and pressure from the teacher. Attention and the way parents educate and foster children will influence children's behavior at school.18 Lack of parental attention will affect the child's psychological state which can encourage children to do oral habits. 4-5 Parental attention is also very much needed in children aged more than six years to be able to

pay attention to an abnormal body function such as the presence of nasopharyngeal polyps and allergies which can cause oral habits. 19 If parents pay little attention to the child's bodily dysfunction which can lead to these oral habits, then the child will continue to do these oral habits so that they can affect the development of the child's dento-facial structure.20

Bad habits in the oral cavity have a direct influence on quality of life and can affect the body's stomatognathic system. There are several studies that determine the prevalence and association of oral habits with malocclusion in a population of school-age children 7 to 13 years in Aseer, Saudi Arabia. Malocclusion occurs in individuals with eruption of all permanent teeth, thus young adolescents in the late mixed dentition period and young permanent dentition stage have a high prevalence of malocclusion and oral habits.21-23 A previous study studied the association of malocclusion and destructive oral habits in preschool children in Brazil and found a high prevalence in the population of children under 5 years of age and a positive correlation with oral damage.2

The etiology of thumb sucking among children has been extensively studied and there are differences in the literature. Among them are changes in behavior and mood reactions in the family and lack of affection. Increased use of pacifiers in some countries has resulted in a reduction in the prevalence of thumb sucking.3,7,24 The prevalence is reported to be between 13-100%. Oral habits such as thumb sucking are one of the most obvious etiologies of malocclusion, in that thumb sucking habits that persist beyond 3 years of age are involved in the development of the anterior open bite. 4,6,25 The etiology of bruxism is still difficult to determine. It is suspected that the causative factors include local, systemic, and psychological factors. Local factors include occlusion mismatch due to dental fillings that are too high. Highest systemic factors due to epilepsy, meningitis, and gastrointestinal disorders. Psychological factors are caused by conditions of anxiety and stress. This psychological factor is considered the most basic cause of bruxism, so it is found that bruxism often occurs in children who are easily angered

and have other accompanying bad habits such as thumb sucking and nail biting.^{8,12,16,26}

Orthodontic and dentofacial orthopedics specialty is a method of prevention, diagnosis, and correction of malocclusions due to skeletal and neuromuscular abnormalities related to developing or mature dentofacial structures. Orthodontic care whether performed due to the professional assessment or patient self-perception brings about beneficial effects, including aesthetic enhancement, functional improvement, and psychosocial wellbeing.²⁷⁻²⁹

Orofacial muscles work in harmony during any oral function like mastication, deglutition, speech, and affect the shape of the arches and position of the teeth. Any alteration in the activity of these muscles can compromise the orofacial morphology, functioning, well-being and oral health-related quality of life from childhood. One of the main functional factors of orofacial dysfunction is the presence of oral habits that influence the development of malocclusion. Oral habits are repetitive behavior in the oral cavity that result in loss of tooth structure, effect of which is dependent on the nature, onset and duration of these habits.^{9,14-20}

Orthodontic treatment is often carried out for aesthetic rather than functional considerations, since it is assumed that failure to meet social norms for dental aesthetics will have negative psychosocial effects and these effects may well-exceed the biological problems.²⁴⁻²⁶

Adolescents aged 11–14 are in the peak period of growth and development. During the peak period

of growth and development, a series of significant changes occur in human bones and muscles. At the same time, the orthodontic community generally believes that the best treatment age for orthodontic treatment is still 11–14 years old.³⁰

METHOD

Determination of journals collected with inclusion criteria: (1) Research journals related to the influence of oral habits on child development (2) English-language research journals (3) Year of Publication 2012-2022.

Search Method Data was collected through electronic search. Sources of data search conducted included Google Scholar, PubMed, Wiley, Ebsco with a publication period from 2012-2022.

Search Details Journal searches used keywords: oral habits, malocclusion, bruxism, mouth breathing, caries

Data Collection and Data Analysis The author obtained research journal articles through electronic databases according to keywords of 373 journals. The author selects the research journals that result from searches based on the title and abstract of the research, in order to obtain relevant titles and abstracts of 35 journals. Authors read full-text journal articles to determine that the study met the criteria. Studies that met the criteria then underwent quality assessment and data extraction. The author reviews and selects 6 journal articles that are included in the synthesis table.

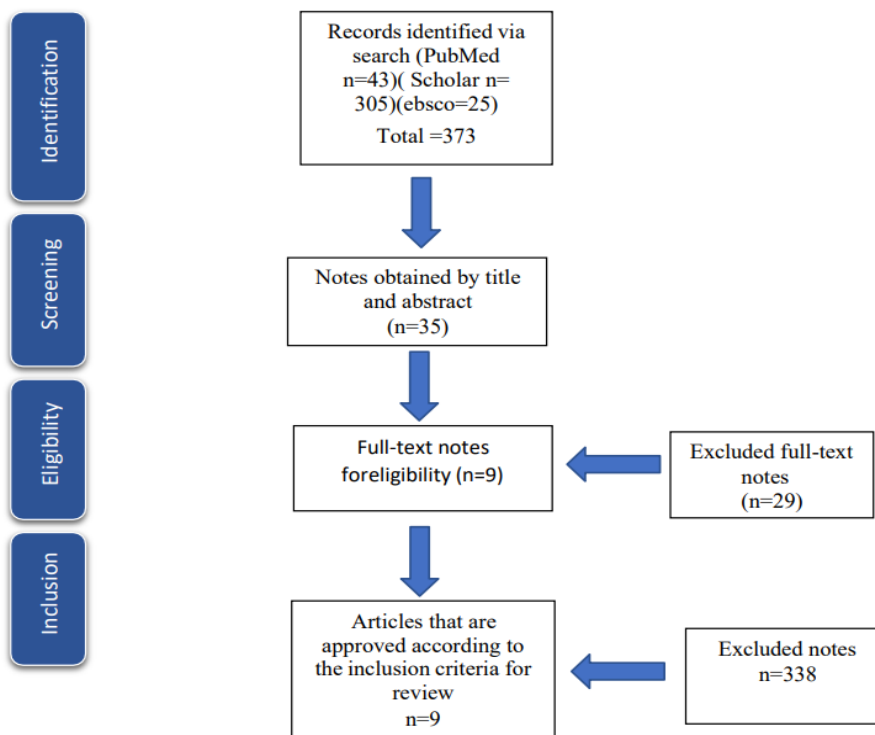


DIAGRAM 1: Journal Article Search Flow

TABLE 1

No	Journal (Year)	Author	Title	Objective	Method	Result
1	International Journal of Dentistry, 2015.	Antoine Hanna, Monique Chaaya, Celine Moukarzel, Khalil El Asmar, Miran Jaffa, and Joseph G. Ghafari	Malocclusion in Elementary School Children in Beirut; Severity and Related Social/Behavioral Factors	To assess severity of malocclusion in Lebanese elementary school children and the relationship between components of malocclusion and sociodemographic and behavioral factors.	Dental screening was performed on 655 school children aged 6–11 from 2 public (PB) and 5 private (PV) schools in Beirut. A calibrated examiner recorded occlusion, overjet, overbite, posterior crossbite, midline diastema, and crowding. Another examiner determined the DMFT (Decayed/Missing/Filled Teeth) score. A questionnaire filled by the parents provided data on sociodemographic and behavioral factors. Multinomial, binomial, and multiple linear regressions tested the association of these factors with occlusal indices.	Malocclusion was more severe in PB students. Age and sucking habit were associated with various components of malocclusion. Crowding was more prevalent among males and significantly associated with the DMFT score. Income and educational level were significantly higher (p < 0.05) in PV pupils and deleterious habits were more frequent in PB children.

2	Research & Reviews: Journal of Dental Sciences, 2017	Tulika Wakhloo	Assessment of Orthodontic Treatment Need in Mixed Dentition Period (11- 12 Years)	This study was undertaken to evaluate the orthodontic treatment need in mixed dentition (11-12	A representative sample of 447 school children aged 11-12 years was evaluated. The examination was carried out by a single trained calibrated examiner. The orthodontic treatment need was	The prevalence of children showing definitive orthodontic treatment need in the studied population according to DHC of IOTN and modified Aesthetic Component (AC) was 14.18% and 8.47% respectively
			Among School Children in Marathahalli, Bangalore	years) among school children of Marathahalli, located in Bangalore, India..	assessed using DHC of the IOTN and modified AC. Angles molar relationship for permanent molars was also assessed. The study followed WHO recommendation.	with no gender predilection. Increased overjet was found to be the most prevalent occlusal trait (69.8%). Angle's Class I Molar Relation was found in 63.63% of the studied population.
3	BMC Oral Health 2014	Sajith Vellappally, Seby J Gardens, Abdul-Aziz Abdullah Al-Kheraif, Madhusudan Krishna , Suresh Babu , Mohamed Hashem , Vimal Jacob and Sukumaran Ani	The prevalence of malocclusion and its association with dental caries among 12-18-year-old disabled adolescents	To assess the prevalence of malocclusion among 12-18-year-old disabled adolescents in Chennai, Tamil Nadu, India, by using the Dental Aesthetic Index (DAI) and to determine the association of malocclusion with dental caries.	This cross-sectional study included 243 children with various mental disabilities with or without physical infirmities. The Dental Aesthetic Index (DAI) and the World Health Organization Oral Health Surveys – Basic Methods (1997) Pro-forma. The Decayed (D), Missing (M) and Filled (F) components of the DMF index were calculated using the Dentition Status and Treatment Need (DSTN). A Chi-square test, ANOVA, and t-test were used to derive inferential statistics.	The mean DAI score ± standard deviation was 39.0 ± 12.3. A total of 123 (50.6%) participants (74 males and 49 females) had DAI scores of 36 and above, which indicated a handicapping malocclusion requiring mandatory orthodontic treatment. Sixty-nine (28.4%) adolescents (36 males and 33 females) had DAI scores between 31 and 35, which indicated severe malocclusion, for which orthodontic intervention was desirable. Incisal segment crowding (84.8%) was the most common aspect of the malocclusion. The mean DMFT score was 4.36 ± 3.81, and 82.8% of the participants had a DMFT score > 0. There was no statistically significant correlation between the mean DAI and DMFT scores (r = 0.090, p = 0.15). Only 16 (6.6%) of the adolescents had minor or no anomaly not needing orthodontic treatment.
4	Journal of Orthodontic Science, 2015	Prajna P Nayak, KVV Prasad, Y Manohar Bhat	Orthodontic treatment need among special health care needs school children in Dharwad, India: A comparative study	To assess and compare the prevalence of orthodontic treatment need among various special health care needs (SHCN) school children and adolescents in Dharwad, India.	This cross-sectional study was carried out among 492 subjects in age group of 12-19 years (mean age 14.02 ± 1.84 standard deviation [SD]) who were examined for occlusal anomalies using dental aesthetic index (DAI). They were classified into five groups as: Visual impairment, speech and hearing disability	None of the children were undergoing or had undergone orthodontic treatment for malocclusion. Mean DAI score was 28.81 ± 11.64 (SD). Orthodontic treatment was indicated in 50.2% of study population who had DAI scores of 26 and above. Mandatory orthodontic treatment (DAI ≥36) was required in as high as

					(SH), physical disability, mentally subnormal and multiple disabilities (MD). Chi-square test was used to compare the orthodontic treatment need among various SHCN groups. One-way ANOVA and ANCOVA were performed to test any significant differences in mean DAI scores among the SHCN groups	29% of MD individuals when compared to only 10% of SH individuals. Significant differences in DAI scores were found between the SHCN groups
5	West Afr J Orthod, 2012	Disa HA , Modu MA , Sukai SS , Ligali TO , Otuyemi ODb	Malocclusion and Orthodontic Treatment Needs of Public and Private Secondary School Students in North-Eastern Nigeria using the Dental Aesthetic Index (DAI)	To determine the status of malocclusion and the orthodontic treatment needs among 12-18 year-old adolescents in Maiduguri, Northern Nigeria.	The examined population comprised of 339 subjects from two socio-economically different communities in the city using Dental Aesthetic Index (DAI). Data was collected using specially designed recording chart. The chart included the age as at last birthday, the school, gender and all 10	Overjet of 3mm or more was the most prevalent malocclusion trait. Most of the children (67%) had dental appearance where no orthodontic treatment was indicated. Over 18% of the subjects fell into malocclusion group where treatment is considered 'elective'. The rest of the sample had severe to handicapping malocclusion where
					parameters of the DAI. Intra and inter examiners' errors were very negligible. Analysis of variance (ANOVA) was used to assess differences between variables.	treatment is considered 'highly desirable' (8.3%) and 'mandatory' (6.2%). There were no statistically significant differences (P>0.05) between DAI scores and age groups, gender and socioeconomic background of the students.
6	Journal of Clinical and Diagnostic Research. 2014	R. Ramachandhra Prabhakar , R. Saravanan M.K. Karthikeyan , C. Vishnuchandran , Sudeepthi	Prevalence of Malocclusion and Need for Early Orthodontic Treatment in Children	To evaluate the prevalence of dental feature that might result in malocclusion and need for early orthodontic treatment	Groups of 532 school going children were selected and complete case history was taken and were categorized based on the type of malocclusions, dental features that can predetermine need for early orthodontic treatment. Statistical analysis used.	The results shows the increase in prevalence of malocclusion and the dental features that gives clues for an orthodontist to frame up his treatment modalities not just for corrective orthodontics but for also preventive and interceptive orthodontics.
7	Scientific World Journal, 2019	Derek Baram, Yanqi Yang , Chong Ren, Ziling Wang, Ricky Wing Kit Wong, Urban Hägg , Colman McGrath, and Min Gu	Orthodontic Treatment Need and Psychosocial Impact of Malocclusion in 12-Year-Old Hong Kong Children	To determine the prevalence of orthodontic treatment need in 12-year-old children in Hong Kong and its relationship with the psychosocial impact of malocclusion and to assess their	A random sample of 687 12-year-old children was recruited from 45 secondary schools in Hong Kong. Orthodontic treatment need was assessed on study models by five indices: the Dental Health Component of the Index of Orthodontic Treatment Need (IOTN-	The final number of participants was 667 (339 boys and 328 girls, participation rate 667/687 = 97.1%). The prevalence of orthodontic treatment need varied depending on the indices used (10.9–47.8%), but significant correlations were found among the five indices (p < 0.01). The uptake of treatment among the

				associations with sociodemographic factors	DHC), the Aesthetic Component of the IOTN (IOTN- AC), the Dental Aesthetic Index (DAI), the Index of Complexity Outcome and Need (ICON), and the Peer Assessment Rating (PAR). The psychosocial impact of	cohort was 2.3%. Boys had higher IOTN-DHC ($p < 0.05$), DAI ($p < 0.05$), and PAR ($p = 0.05$) scores than girls. IOTN-AC was significantly associated with the psychosocial impact of malocclusion ($p < 0.05$).
					malocclusion on participants and sociodemographic factors were obtained from a questionnaire. Logistic regression was used to examine the correlations between treatment need and the psychosocial impact of malocclusion as well as their associations with sociodemographic factors.	Parents' level of education and household income were not significantly associated with either treatment need or the psychosocial impact of malocclusion ($p > 0.05$).
8	International Journal of Health Science, 2022	Ashish Chauhan, Aftab Azam, Vaibhav Vashishta, Chaitra Patil, Nikhil S, Sneha E	Prevalence of malocclusion and orthodontic treatment need among 15 year old school children of rural Central India	To assess the prevalence of malocclusion and orthodontic treatment need among the rural school going 15- years- old children.	A descriptive cross sectional study was carried out among 400 school going children in the central part of India. Occlusal features such as overjet, overbite, crossbite, crowding, and spacing were documented using a structured proforma and the need for orthodontic treatment was evaluated using the index of orthodontic treatment need dental health component.	The prevalence of malocclusion among the study participants was 70%, and the overall treatment need was 29.5%.
9	Transl Pediatr, 2021	Zhonghua Wang, Jianmei Feng, Qin Wang, Yongchao Yang, Jinping and Xiao	Analysis of the correlation between malocclusion, bad oral habits, and	To provide a basis for prevention and decision-making for the prevention of dental caries and oral health of the entire	In this study, 1,093 adolescents aged 11 to 14 enrolled in 2–3 schools in Zhangjiakou area from September 2020 to June 2021 were selected as the research subjects. The basic	The results showed that the incidence of malocclusion was 72.66% and the caries rate was 68.8% among adolescents aged 11– 14 in this area. The 4 bad oral habits of biting, mandibular protrusion,
			the caries rate in adolescents	population, and to provide clinical data support for the public health and health of the entire society	data of these adolescents were collected by questionnaires. Malocclusion and caries were examined by on-site inspection. Their bad oral habits were also investigated. After data collection, the chi-square test, logistic regression, the Mann-Whitney U test, and the Kruskal-Wallis H test were used for multivariate analysis	lateral chewing, and mouth breathing were the influencing factors of malocclusion in adolescents. Bad oral habits, malocclusion, and frequent consumption of sugary beverages were independent risk factors for caries in adolescents, and significantly positively correlated with the caries rate.

RESULT AND DISCUSSION

Malocclusion has physical, social and psychological impacts on individuals and society. Therefore, epidemiological studies are essential to achieve extensive data in developing public health plans for orthodontic prevention. Over the last three decades, a significant increase in the demand for orthodontic treatment has occurred as a result of higher rates of perceived malocclusion and greater attention to aesthetic factors.²⁶⁻²⁸ Malocclusion is a form of maxillary and mandibular relationship that deviates from the standard form that is accepted as a normal form, malocclusion can be caused due to a dentofacial balance. Malocclusion is a fairly large dental and oral health problem in Indonesia and its prevalence is still very high, around 80% of the total population, and is in third place after dental caries and periodontal disease.¹⁷⁻¹⁹ The etiology of malocclusion can be classified into general factors and local factors. Common factors are factors that do not have a direct effect on the teeth. Local factors are factors that directly affect the teeth. Bad habits are one of the common factors that play a role in the occurrence of malocclusion. Various kinds of bad habits are finger and thumb sucking, tongue thrusting, lip and nail biting, wrong swallowing habits, mouth breathing, and bruxism.²⁹

Thumb sucking habits (26.9%) in a study showed protrusive conditions, deep bites, cross bites and posterior open bites. This result is different from the theory according to Premkumar (2014) that the habit of thumb sucking can cause an anterior open bite, changes in facial shape and constriction of the maxilla/maxilla. get enough breast milk, where direct breastfeeding can provide comfort to the child.³⁰⁻³² This causes children to lose the feeling of security and comfort that comes from their parents, especially mothers, and thumb sucking is a habit that can divert this situation and can provide a feeling of comfort. Several other situations such as hunger and fear can stimulate thumb- sucking in children because it is the condition they experience most often.³³

The relationship between bad oral habits and malocclusion is also influenced by the length of time the habit occurs. These two variables will be

related to each other if bad oral habits have occurred for more than three years. Bad oral habits can actually occur for a while, but if they continue, they can cause poor dental health to the point of malocclusion. Oral bad habits that are not treated immediately can have an impact on stomatognathic system disorders.³⁴⁻³⁶

The Orthodontic treatment need is reported to be assessed by considering the severity of malocclusion traits, age group and dentition period of the children to be treated so that interceptive treatment and timely referral can be carried out efficiently. Interceptive orthodontic treatment regarding functional crossbite, maxillary canine eruption and excessive overjet and Class II malocclusion has been reported to reduce the phase two treatment.^{4,11,30,37}

Malocclusion prevalence is reported to vary from 14.4% to 96.5% in Indian children due to ethnic differences, limitations in sample selection, methodology and lack of uniform criteria in recording malocclusion and its traits. The present study has revealed that Class I molar relation constituted 63.6% of the studied population which agrees with the findings of Mohandas U et al. (62%) but is lower than the findings of Siddegowda R et al.²¹ (79.7%) which were conducted on a similar study population. The prevalence rates of Class II and Class III molar relation in this study were 35.2% and 1.14% respectively. A population of same origin can, however, show variability in distribution of different types of malocclusion.^{4,8,16}

The overall prevalence of malocclusion was found to be high among north Jordanian school children. Ninetytwo per cent of the subjects examined had one or more anomaly ranging from mild to severe. Occlusal anomalies were the most common (60.7%) followed by space and dental anomalies (26.9 and 12.3 per cent respectively).^{5,11,22,40}

Prevalence of Class II molar relationship was similar to that reported in literature for various populations. However, it was less than Class II molars reported for Kenyan school children who had less Class II dentoalveolar arch relationship. The ancestral background of the various populations may have an effect on the prevalence

of Class II malocclusion. Only true Class III molar relationship was recorded in this study.^{16,38} This was evident from the comparable percentages of Class III molar relationship and reverse overjet. A functional anterior displacement due to anterior interferences usually results in Class III molars and reverse overjet on centric occlusion but Class I molars on retruded mandibular position. Recoding molar relationship without taking this feature into account explains large variations between different populations.^{5,10,41}

The prevalence of anterior openbite in Jordanians was close to that reported for the Swedish children but much lower than that for the Saudi, the Kenyan and the Colombian school children. Racial differences as well as variation in the prevalence of oral habits between the different populations may have contributed to such difference.^{7,12,36,41}

In this study, specific criteria for random subject selection were used and the racial composition of the sample was representative of Bogotians with an ancestry from the central part of the country. The sample consisted of children and adolescents of different ages; none had been orthodontically treated, either by interceptive or by corrective measures.^{12,42} In studies of prevalences of malocclusion, the material should be obtained from a well-defined population, be large enough, and cover non-orthodontically treated children and adolescents of different ages. The results showed that 88 per cent of the subjects had some type of anomaly, from mild to severe. Such a high prevalence is in agreement with most previous published studies using the same classification system (Table 1a). Many papers have used Angle's classification (1907) or various modifications of his system, which will jeopardize comparison of the total prevalence of malocclusion traits. However, as Table 1a clearly shows, racial differences do exist. It can also be seen that differences exist between chronological ages.^{6,19}

A few studies on prevalence of malocclusions in preschool children have been published based on various classification systems. The numbers of children examined in the different studies are of about the same magnitude as for children in the

deciduous group in the present investigation, so comparisons of some malocclusion traits may be made. Generally, the present study shows a lower prevalence of anterior open bite (10.7 per cent) and especially posterior crossbite (7.2 per cent), but a higher prevalence of crowding (17.4 per cent) than in Europeans and white Americans.^{15,31} The prevalences in Bogotian preschool children are, however, closer to those of Indians and black Americans. Sex differences in some malocclusion prevalences were demonstrated in the different dental stages. It is well known that there are developmental differences in tooth eruption time between boys and girls, as well as between individual children; some are 'early' and some 'late' throughout their occlusal development.^{3,7,42} This is also valid for the present sample, as the various dental stage groups comprised children of different ages. Due to these great individual variations, grouping by dental stage, rather than by chronological age would seem to increase the probability of detecting sex differences in malocclusion prevalence during the development of the dentition.^{6,19,40-44}

The distributions of the ages were 65.4% were 11-13 years of age and 34.6% were 8-10 years of age. There were no significant differences in distribution of malocclusion based on genders. After statistic analysis there was wide difference between the children who needed orthodontic treatment (63.4%) and children who doesn't need orthodontic treatment.^{9,11}

According to the findings of this study, 70% of the participants had some sort of malocclusion and according to the IOTN, however, just 29.5% of participants need orthodontic treatment. Orthodontic therapy has become more popular in India during the last few decades. Due to the increased understanding of aesthetics, it was discovered that young adults demanded more. Because there are only a few institutions that give orthodontic treatment to the general population, it is critical to define the orthodontic treatment requirement. The prevalence among Indian rural 15 year old school children was similar to the Srilankan and United Kingdom school children. In a study from United Kingdom which was conducted among students of 15 year old, 21% of

students were noted to have definite orthodontic treatment need¹¹ and in a similar study in Srilanka only 26.6% of students were identified to have orthodontic treatment need.¹² In a prevalence study carried out in Rajasthan, the treatment need was found to be 33.3%, the needs were assessed adapting the Dental Aesthetic Index.^{10,16,39}

There is some evidence that the majority of young adults are satisfied with their dental appearance regardless of various degrees of objective treatment need calculated that the odds ratio of being satisfied with dental appearance was three times higher in orthodontically treated subjects. Untreated subjects in the present investigation showed the best satisfaction scores but their malocclusion–satisfaction correlation was low. Twenty per cent, on average, of orthodontically treated patients showed no change or even a worsening in DAI scores with treatment, while results of present investigation show that the malocclusion–satisfaction correlation was stronger in previously treated patients. They may be the most competent group to judge the relationship between their previous malocclusion and an individual functionalocclusal optimum achieved by therapy.^{3,44-47}

CONCLUSION

Oral habits have a very large impact on malocclusion directly, whereas caries has an indirect effect on children and adolescents. Malocclusion in children requires immediate orthodontic treatment to prevent further damage.

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