



## The Prevalence Risk of Malocclusion among Afghan Children Aged 12-18 Years Old, Kabul, 2022

Rayhana Rahyab<sup>1</sup>, Naseer Ahmad Shinwar<sup>2</sup>, Fayzrahman Ahmad<sup>3</sup> and Ahmad Mujtaba Barekzai<sup>4,5,6\*</sup>

<sup>1</sup>Department of Dentistry, Spinghar Institute of Higher Education, Afghanistan

<sup>2</sup>Department of Biotechnology and Microbial Technology Spinghar Institute of Higher Education, Afghanistan

<sup>3</sup>Dental House Clinic, Kabul, Afghanistan

<sup>4</sup>Spinghar Institute of Higher Education, Kabul Campus, Afghanistan

<sup>5</sup>Department of Public Health, Spinghar Institute of Higher Education, Kabul Campus, Afghanistan

<sup>6</sup>Technical Manager of Food Safety, Providing Quality and Quantity Inspection Services for UN-WFP KIC, Afghanistan

### Abstract

**Objective:** Malocclusion is one of the most common dental problems worldwide. No study showed the prevalence of malocclusion among children in Afghanistan. Therefore, we aimed to report the prevalence of malocclusion among Afghan children in Kabul, Afghanistan.

**Method:** This is a cross-sectional study the total number of participants is 304, of which 62.8% are male and 37.2% are female among the age group 12 to 18 years old children, randomly selected at Spinghar Institute of Higher Education, Dental Clinic, Kabul, Afghanistan. None of the subjects had previous orthodontic treatment, and all had their first permanent molars. The patients were examined at their respective clinics, using a sterile mouth mirror and flashlight. All occlusal relationships were evaluated at a centric occlusion position, which was achieved by asking the subject to swallow and then bite on his or her teeth together.

**Results:** More than 20 percent of our participants were aged 18 years, and 6.3 percent of the study populations were aged 12 years. In our study we have more than 62 percent were males and 37.2 percent were women. The 64.5 percent of our study population were fed by bottles, and 20.1 percent had breastfed during infant criteria. According to family dental problems, more than 60 percent of participants had this problem. Additionally, 44.7 percent of the population had finger sucking, when they were infants.

**Conclusion:** We can say with great conviction that the risk of malocclusion increase among children due to bottle feeding, finger sucking, and fewer teeth loss in Kabul. To develop our findings, need a case-control study.

**Keywords:** Prevalence; Risk of malocclusion; Afghan children

### Introduction

Malocclusion is one of the most common dental problems worldwide, most studies demonstrated that have malocclusion the upper and lower teeth do not align when you close your mouth [1]. According to the world health organization, the incidence rate of malocclusion in most countries World Health Organization (WHO) considers malocclusion one of the most important oral health problems, after caries and periodontal disease [2]. Its prevalence is highly variable and is estimated to be between 39% and 93% in children and adolescents [2]. The prevalence of malocclusion among 12 to 18 children is also highly reported in Chennai, Tamil Nadu, India [3]. In addition, the treatment of malocclusion of 3,500 American dollars in the USA [4]. However, in our country, the minimum rate of treatment the malocclusion is eighty-thousand Afghani during one year (one thousand American dollars).

They are several risk factors that may contribute the risk to of malocclusion among children. For instance, premature loss of primary teeth, bottle-feeding, genetics, the environment in the etiology of dental malocclusion, Allergic rhinitis, and sleep-related breathing disorders. A cross-sectional study revealed that premature loss of teeth impacts malocclusion among 307 male children aged

### OPEN ACCESS

#### \*Correspondence:

Ahmad Mujtaba Barekzai, Department of Public Health, Spinghar University, Kabul Campus, Afghanistan, Tel: 0093784913193;

E-mail: mujtaba.barekzai.7@gmail.com

Received Date: 18 Jul 2022

Accepted Date: 09 Aug 2022

Published Date: 15 Aug 2022

#### Citation:

Rahyab R, Shinwari NA, Ahmadi F, Barekzai AM. The Prevalence Risk of Malocclusion among Afghan Children Aged 12-18 Years Old, Kabul, 2022. *J Dent Oral Biol.* 2022; 7(4): 1202.

ISSN: 2475-5680

**Copyright** © 2022 Ahmad Mujtaba Barekzai. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

9 to 11 years old in the Eastern [5]. As well, the premature loss of primary teeth remains a strong risk factor for malocclusion because the loss of space for permanent successors often leads to overcrowding [6]. Children with congenital conditions affecting the head and neck should be considered at risk for malocclusion that may require treatment [7]. Furthermore, the low prevalence of posterior cross-bite in the remote indigenous populations compared with urban populations may relate to prolonged breastfeeding and an absence of pacifiers in the indigenous groups [8]. In addition, a case-control study in children showed that allergic rhinitis is a significant risk factor for the development of malocclusions in general and is associated with the development of posterior cross bite and increased over jet [9]. Based, a cross-sectional study in a group of children aged 8 to 15 years which was performed from June to November 2016 shows a high effect prevalence of posterior cross bite in the remote indigenous populations compared with urban populations may relate to prolonged breastfeeding and an absence of pacifiers in the indigenous groups [10]. Furthermore, a systematic review and meta-analysis contribute that 72% of participants have malocclusion among young children, which this study considers malocclusion in Saudi Arabia [11]. After along searching in Afghanistan, we found that there is no study that showed the prevalence of malocclusion among children in Afghanistan. Therefore, we aimed to report the prevalence of malocclusion among Afghan children in Kabul, Afghanistan.

## Materials and Methods

**Study design:** This is a cross-sectional study the total number of participants is 304, of which 62.8% are male and 37.2% are female among the age group 12 to 18 years old children, randomly selected at Spinghar Institute of Higher Education, Dental Clinic, Kabul, Afghanistan. None of the subjects had previous orthodontic treatment, and all had their first permanent molars. All the students were examined by a single operator after obtaining informed consent from the subjects and their parents. The study was ethically approved by the SU Ethics Committee (code: 1386-1411).

**The study participants:** The patients were examined at their respective clinics, using a sterile mouth mirror and flashlight. All occlusal relationships were evaluated at a centric occlusion position, which was achieved by asking the subject to swallow and then bite on his or her teeth together. The occlusion was then classified into normal occlusion or malocclusion using the first permanent molars as described by Angle. The cheeks were fully retracted to obtain a direct lateral view of the dentition in occlusion on each side. In subjects with class I malocclusion, class I molar relation existed with one or more of these characteristics: Crowded incisors or labial canines, or both (Dewey type I), protruded maxillary incisors (Dewey type II), anterior end to end occlusion or (Dewey type III), unilateral or bilateral posterior crossbite (Dewey type IV), the mesial drift of

molars (Dewey type V), anterior or posterior open bite, deep anterior overbite. The prevalence of these features was assessed in subjects showing Class I malocclusion. The collected data were tabulated and analyzed statistically.

**Sampling:** In this part, we use a standard questionnaire which consists of variables and cofounders, with trained people in the data collection. The formula of the cross-sectional study was done according to a standard formula for recognizing each variable we prepare a special person to full fill the questionnaire with the primary basic.

## Results

According to our analysis, and process of patient treatment. Figure one demonstrated the before treatment, figure two revealed the process during treatment, and the final figure showed the after treatment in our clinic (Figure1-3). The process of treatment in Afghanistan took more than one year, as well; it depends on the type of and style of teeth. Table 1 demonstrated that more than 20 percent of our participants were aged 18 years, and 6.3 percent of the study population was aged 12 years. In our study we have more than 62 percent were males and 37.2 participants were women. The 64.5 percent of our study population were fed by bottles, and 20.1 percent had breastfed during infant criteria. According to family dental problems, more than 60 percent of participants had this problem. Additionally, 44.7 percent of the population had finger sucking, when they were infants.

## Discussion

In the current study, we found several associations of malocclusion among Afghan children. The association was independent of potential confounders such as age, sex, fed by bottles, genetics, and other various environmental factors. To the best of our knowledge, this is the first study to report the risk of malocclusion among Afghan children in the Kabul province of Afghanistan.

According to our findings, a cross-sectional study in 2019 demonstrate 70% malocclusion among Shanghai, China children besides an epidemiological survey of malocclusion among 8 to 9 year-old children revealed high rate of malocclusion in mixed dentition [12]. Moreover, in a cross-sectional study showed that early intervention and rectification of occlusal discrepancies will convenience the treatment and eliminate possible weakness among 12 to 15 years old male school children [13]. In addition to this a meta-analysis results confirmed that malocclusion has become a serious oral health problem in Chinese schoolchildren, highlighting the need for proactive interventions at an early age [14]. Moreover, high-quality epidemiological studies on malocclusion are still required 1991 to 2018 studies showed a high prevalence of malocclusion among



Figure1: Before treatment.

**Table 1:** Demographic of participants of 12-18 years old age in Afghanistan.

Variables		Frequency	Percentages
<b>Age</b>	12 year	19	6.3
	13 year	70	23
	14 year	57	18.8
	15 year	30	9.9
	16 year	36	11.8
	17 year	31	10.2
	18 year	61	20.1
	<b>Gender</b>	Boys	191
Girls		113	37.2
<b>Marriage Status</b>	Single	302	99.3
	Engaged	1	0.3
	Married	1	0.3
<b>Education</b>	Master	10	3.3
	Bachelor	31	10.2
	Diploma	20	6.6
	High school	116	38.2
	Secondary school	118	38.8
	Illiterate	9	3
<b>Nationality</b>	Pashton	184	60.5
	Tajik	113	37.2
	Uzbek	2	0.7
	Hazara	2	0.7
	Pashai	1	0.3
	Other	2	0.7
<b>Family residents</b>	2-10	250	83.2
	11-28	93	17.6
<b>Family worker</b>	1-4	291	95.7
	5-10	13	7.2
<b>Job</b>	Doctor	27	8.9
	Engineer	10	3.3
	jobless	151	49.7
	Nurse	3	1
	Teacher	23	7.6
	Carpenter	1	0.3
	shopkeeper	18	5.9
	Student	9	3
	Worker	60	19.7
	Trader	2	0.7
	<b>Drink tea</b>	Yes	283
<b>Dry milk</b>	Yes	244	80.3
<b>Type of milk used</b>	Breastfeed	61	20.1
	Biomol	17	5.6
	Extra meal	1	0.3
	Lactogen	28	9.2
	Milk SMA	108	35.5
	Nido	5	1.6
	NL33	1	0.3

<b>Bottle feeding</b>	Yes	196	64.5	
	2-3 times /day	15	4.9	
	1/week	10	3.3	
	<b>Brushing</b>	2-3 times/week	89	29.3
		3-6 times/week	19	6.3
		5-6 times/week	153	50.3
	None	18	5.9	
<b>Family dental problem</b>	Yes	185	60.9	
<b>Teeth loss</b>	Yes	149	49.0	
<b>Malocclusion</b>	Yes	184	60.5	
<b>Abnormal behavior</b>	Yes	76	25	
<b>Finger sucking</b>	Yes	136	44.7	
<b>Mouth breathing</b>	Yes	47	15.5	

Iranian children [15]. As well, a cross sectional study revealed that the prevalence of malocclusion outbreak the highest percentage in Class I in comparison with other malocclusions, among male school children in Riyadh City [16]. The most common type of malocclusion was increased over jet (34.99%) in the sagittal direction, deep overbite (37.58%), and midline deviation (25.32%) in the vertical and transverse directions, respectively in Xi'an, China [17]. In addition, a systematic review and meta-analysis demonstrated that the prevalence of malocclusion among Iranian children is higher than the other neighbor's countries of Afghanistan [18]. Moreover, the incidence of malocclusion between primary and mixed dentitions among Brazilian children was found (94.1%), individuals with previous anterior open bite, greater over jet, and the posterior cross-bite had a greater risk of having the same characteristics in the mixed dentition [19]. In the same way across sectional study shows that 20.42% of the children among 16 and 17 year-old examined had malocclusion in Shimla city, Himachal Pradesh in 201 as well. a sampling method shows that 21.8% of the Iranian children among 11 to 20 year has got malocclusion in 2010. Also, a descriptive cross sectional study was conducted among 1000, in the age group 12 to 15 year old school children in India, which shows 19.9% had malocclusion in 2009 in addition, a cross sectional study in 2009 shows 0.5 mm, malocclusion in four hundred and ninety-four German schoolchildren (237 males and 257 females), median age 9 years furthermore an epidemiological study in 2009 shows the prevalence of Class II malocclusions was the most severe forms of Class II malocclusions were rare in this Iranian Population. The survey in china shows that thirty-seven eligible articles describing 117,682 samples were investigated. The pooled national prevalence for malocclusion was 47.92% (95% CI: 58.6% to 71.9%). For the Angle classification, the overall prevalence rates were 30.07% (95% CI: 25.37% to 35.48%), 9.91% (95% CI: 7.41% to 13.79%), and 4.76% (95% CI: 3.85% to 6.54%) for Class I, Class II, and Class III malocclusion, respectively. A deep overbite (16.67%, 95% CI: 11.50% to 23.08%) was shown to be the most common trait of malocclusion. When stratified by sex, males had a slightly higher prevalence than females (RR=1.04, 95% CI: 1.01 to 1.06). More importantly, an ascending trend and substantial variations across the country were observed [20].

This cross-sectional study included 243 children with various mental disabilities with or without physical infirmities. This shows that the mean DAI score  $\pm$  standard deviation was  $39.0 \pm 12.3$ . A total of 123 (50.6%) participants (74 males and 49 females) had DAI



Figure 2: During the treatment.



Figure 3: After the treatment.

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  $4.36 \pm 3.81$ , 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 [21]. Our strength of study, this is the first study to report the risk of malocclusion among children in Afghanistan. However, patients in Afghanistan especially children and women are not very convenient answering correctly in filling the questionnaires. Human errors might have occurred in the collection of correct information.

## Conclusion

We can say with great conviction that the risk of malocclusion increase among children due to bottle feeding, finger sucking, and less teeth loss in Kabul. To develop our findings, need a case-control study.

## Acknowledgments

We all thank full from the data collection team and participants.

**Data availability statement:** The raw data supporting the conclusions of this article will be made available by the authors, on reasonable request to the corresponding author.

**Ethical approval statement:** This study was ethically approved

by the medical bioethics committee of the SIHE ethics committee (code: 1386-1411). The patients/participants provided their written informed consent to participate in this study.

**Author contributions:** RR was involved in the study's conception, design, statistical analysis, and interpretation of the data. AMB, RR, NAS, and FZ were involved in data collection, data cleaning, statistical analysis, and manuscript drafting. AMB supervised the study. All authors approved the final manuscript for submission.

## Funding

The financial support for this study was provided by SIHE.

## References

1. D'Onofrio L. Oral dysfunction as a cause of malocclusion. *Orthodont Craniofac Res.* 2019;22:43-8.
2. Scott CR, Goonewardene MS, Murray K. Influence of lips on the perception of malocclusion. *Am J Orthodont Dent Orthopedic.* 2006;130(2):152-62.
3. Vellappally S, Gardens SJ, Abdullah Al Kheraif AA, Krishna M, Babu S, Hashem M, et al. The prevalence of malocclusion and its association with dental caries among 12-18-year-old disabled adolescents. *BMC Oral Health.* 2014;14(1):1-7.
4. Tanne K. Current status of clinical orthodontics in European and American countries. *APOS Trends Orthod.* 2020;10(4):204-23.
5. Al-Shahrani N, Al-Amri A, Hegazi F, Al-Rowis K, Al-Madani A, Hassan KS. The prevalence of premature loss of primary teeth and its impact on malocclusion in the Eastern Province of Saudi Arabia. *Acta Odontologica Scandinavica.* 2015;73(7):544-9.
6. Grist F. *Basic guide to orthodontic dental nursing.* 2020.

7. Mitchell RB, Archer SM, Ishman SL, Rosenfeld RM, Coles S, Finestone SA, et al. Clinical practice guideline: tonsillectomy in children (update). *Otolaryngol Head Neck Surg.* 2019;160(2):187-205.
8. Doğramacı JE, Rossi-Fedele G, Dreyer WC. Malocclusions in young children: Does breast-feeding really reduce the risk? A systematic review and meta-analysis. *J Am Dent Assoc.* 2017;148(8):566-74.
9. Luzzi V, Ierardo G, Viscogliosi A, Fabbrizi M, Consoli G, Voza I, et al. Allergic rhinitis as a possible risk factor for malocclusion: A case-control study in children. *Int J Paediatr Dent.* 2013;23(4):274-8.
10. Balachandran P, Janakiram. Prevalence of malocclusion among 8-15 years old children, India—A systematic review and meta-analysis. *J Oral Biol Craniofac Res.* 2021;11(2):192-9.
11. da Silva CG, Pereira CP, Porporatti AL, Savi MG, Peres MA, Mir CF, et al. Prevalence of clinical signs of intra-articular temporomandibular disorders in children and adolescents: A systematic review and meta-analysis. *J Am Dent Assoc.* 2016;147(1):10-8.
12. Yu X, Zhang H, Sun L, Pan J, Liu Y, Chen L et al. Prevalence of malocclusion and occlusal traits in the early mixed dentition in Shanghai, China. *Peer J.* 2019;7:e6630.
13. Paço, Duarte JA, Pinho T. Orthodontic treatment and craniocervical posture in patients with temporomandibular disorders: An observational study. *Int J Environment Res Public Health.* 2021;18(6):3295.
14. Lin M, Xie C, Yang H, Wu C, Ren A. Prevalence of malocclusion in Chinese schoolchildren from 1991 to 2018: A systematic review and meta-analysis. *Int J Paediatr Dent.* 2020; 30(2):144-55.
15. Eslamipour F, Afshari Z, Najimi A. Prevalence of malocclusion in permanent dentition of Iranian population: A review article. *Iranian J Public Health.* 2018;47(2):178.
16. Mtaya M, Brudvik P, Astrøm AN. Prevalence of malocclusion and its relationship with socio-demographic factors, dental caries, and oral hygiene in 12-to 14-year-old Tanzanian schoolchildren. *Eur J Orthodont.* 2009;31(5):467-76.
17. Zhou Z, Liu F, Shen S, Shang L, Shang Le, Wang X. Prevalence of and factors affecting malocclusion in primary dentition among children in Xi'an, China. *BMC Oral Health.* 2016;16(1):1-11.
18. Akbari M, Lankarani KB, Honarvar B, Tabrizi R, Mirhadi H, Moosazadeh M. Prevalence of malocclusion among Iranian children: A systematic review and meta-analysis. *Dent Res J.* 2016;13(5):387.
19. Góis EG, Vale MP, Paiva SM, Abreu HM, Serra-Negra JM, Pordeus IA. Incidence of malocclusion between primary and mixed dentitions among Brazilian children: A 5-year longitudinal study. *Angle Orthodontist.* 2012;82(3):495-500.
20. Shen L, He F, Zhang C, Jiang H, Wang J. Prevalence of malocclusion in primary dentition in mainland China, 1988–2017: A systematic review and meta-analysis. *Sci Rep.* 2018;8(1):1-10.
21. Kazeminia M, Abdi A, Shohaimi S, Jalali R, Vaisi-Raygani A, Salari N, et al. Dental caries in primary and permanent teeth in children's worldwide, 1995 to 2019: A systematic review and meta-analysis. *Head Face Med.* 2020;16(1):1-21.