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# Parents' knowledge and attitudes towards malocclusion and early identification of dentofacial deformities linked to oral habits in children

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**ABSTRACT**

*Introduction:* Early intervention avoids or minimizes full-blown malocclusion later in childhood and removes elements that interfere with dental arch development. Parents have a significant role in their children's oral health and related habits. This study aimed to assess parental awareness of children's oral health and habits and its impact on the malocclusion. *Materials and Methods:* A convenience sampling technique was used to recruit parents of children aged 4-9 years old in Jeddah. A self-administered questionnaire was utilized to collect parents' awareness and knowledge about oral health, oral habits and early identification of malocclusion. *Results:* A total of 485 eligible parents participated in the study. About 79% of parents agreed that it was essential to keep baby teeth in place to prevent malocclusion. It was reported by 24.7% and 17.7% of the parents that genetics and oral habits are the reasons for a malocclusion. The overall knowledge level was found to be moderate among the parents, where 36.7% had demonstrated 'good' knowledge related to oral habits and oral health and their relationship with malocclusion. Good knowledge levels were significantly higher among parents who had higher educational levels ( $p < 0.001$ ). *Conclusion:* Unlike previous studies done in Saudi Arabia, this study showed comparatively good awareness of oral habits and oral health and its impact on malocclusion among parents. This research highlights the role of pedodontists as key players in imparting knowledge to parents in preventing malocclusion among children.

**Keywords:** Malocclusion, interceptive orthodontics, oral habits, prevention.

**1. INTRODUCTION**

Dentistry is increasingly focusing on disease prevention as opposed to treatment and damage restoration and the public's role has shifted from a passive recipient to a participant in prevention (Bakdash et al., 1983). Emphasizing the necessity of raising parent knowledge of children's dental requirements is crucial since it will help to prevent oral health problems in the

future (Pullishery et al., 2013). Recently, it has been observed that many parents assume their children's brushing method is proper and pay insufficient attention to their dental health status (Alshammari et al., 2021). Long-term oral habits can occasionally cause serious malocclusion, which is a well-known fact (Warren et al., 2001). Thumb sucking is the most common oral habit among school-aged children; aged 7 to 15 and parafunctional oral habits are highly prevalent, according to two studies conducted in Saudi Arabia (Al-Hussyeen, 2010; Farsi and Salama, 1997). If this behavior continues for 48 months, it can negatively affect the dental arch, occlusion, anterior open bite, posterior crossbite and speech deficiency (Larsson, 1994). Numerous oral behaviors can result in severe malocclusion modification. For instance, biting your nails may cause tooth root resorption (Baghchechi et al., 2020). Mouth breathing increases the likelihood of anterior open bite, abnormal speech and anterior protrusion of the maxillary incisors during development (Harari et al., 2010; Kasparaviciene et al., 2014).

Malocclusion compromises periodontal health and accelerates the risk of tooth decay, severe dental trauma and problems with the temporomandibular joint (Dimberg et al., 2015). Young children's social engagement and self-esteem may be compromised by physical attributes such as malocclusion, which may have implications in social life (Ahammed et al., 2013). The longer a behavior is continued, the higher the chance of developing malocclusion and these could be prevented to a larger extent if the habits are controlled (Yu et al., 2019). In large part, through awareness, the negative effects of oral habits can be avoided and eradicated (Habibian et al., 2003). The success of treatment may also be improved by knowing how to control oral habits. Since knowledge often motivates individuals, parents' education about normal occlusion and the complications of oral habits aided their children in receiving an early diagnosis and treatment (Pratelli et al., 1998; Shahraki et al., 2012). It is impossible to maintain general oral health without raising public awareness (Chhabra and Chhabra, 2012; Pullishery et al., 2021). The main goal of this research was to explore parents' knowledge and attitudes towards malocclusion and early identification of dentofacial deformities linked to oral habits in children in Saudi Arabia.

## 2. MATERIALS AND METHODS

This cross-sectional study targeted parents of children aged 4-9 years old and recruitment was done using a convenience sampling technique. A pretested questionnaire was given to the participants and they were told to complete them to the best of their abilities. Consent was taken from each participant. The study was carried out during the period of August 2022 to October 2022. A self-administered survey was created in English and then translated into Arabic, the official language of the population. A pilot study was done to check the feasibility and evaluate the questionnaire's validity. The pilot study was done on ten volunteers (parents) who were visiting the dental clinics of Batterjee Medical College. There were no discernible changes in the content or construct validity. When the questionnaire was examined repeatedly, there was a high degree of agreement (Cohen's kappa coefficient= 0.86). To avoid any potential bias, those who took part in the pilot study were not taken into account for the main study. The Cronbach's alpha value obtained was 0.81, indicating a satisfactory level of reliability.

The questionnaire began with a brief explanation of the study's purpose and benefits, followed by items that recorded the child's and parent's characteristics (such as the child's age and how the child is bonded to the individual, the number of children, gender and educational background of the parent). The second section tested the knowledge of parents about the care of primary teeth, modification of oral habits, facial deformity, early diagnosis and orthodontic correction. Members of the study team were exposed to parents while completing questionnaires, giving them experience in dealing with questions and concerns they could have. The study's confidentiality was protected at every stage. SPSS for Mac (Version 23.0, Chicago, SPSS Inc.) was used for statistical analysis and Data management. The responses were carefully entered by a calibrated investigator, which was then tabulated accordingly in the software. An independent biostatistician analyzed the data. For data analysis, descriptive statistics were utilized and these were displayed in tables and figures. Pearson's chi-square evaluated the possible association between categorical variables.

## 3. RESULTS

We received 485 responses, where 255 (52.5%) were the child's mother and 230 (47.5%) were the father. It was found that 73% of the parents reported they had a female child aged 4-9 years. About 75.4% of the parents had a bachelor's level of education and above. Other sociodemographic characteristics are given in Table 1.

**Table 1** Demographic Details and characteristics of Participants

Questions	Responses	N	%
Parent	Father	230	47.4
	Mother	255	52.6

Child's gender	Females	354	73.0
	Males	131	27.0
Age of the parent	< 25 years	110	22.7
	26-35 years	96	19.8
	36-45 years	78	16.1
	46-55 years	120	24.7
	>55 years	82	16.9
Dispersion of child's age	4 years	55	11.3
	5 years	67	13.8
	6 years	83	17.1
	7 years	47	9.7
	8 years	103	21.2
	9 years	130	26.8
Total number of children	1	144	29.7
	2	198	40.8
	3	111	22.9
	4	24	4.9
	>4	8	1.6
Parents'educational background (Father/Mother)	Bachelors level or above	366	75.5
	Secondary level	79	16.3
	Middle school or below	40	8.2
Nationality of the parent	Saudi	294	60.6
	Non-Saudi	191	39.4

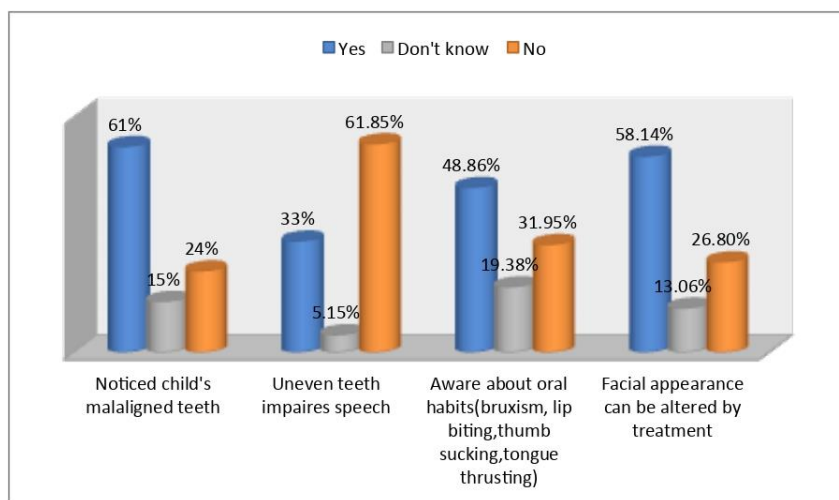
When we assessed participants' awareness regarding malocclusion and its treatment, about 79% of parents agreed that it was essential to keep baby teeth in place, 77.5 % stated that bad oral habits should be addressed and corrected and 77.2 % understood the need for early detection and intervention in orthodontic issues. Nearly a quarter of the participants (24.7%) believe that misaligned teeth are a genetic trait and almost a third (28.65%) prioritized aesthetic worries when considering how to address malocclusion. It was found that about 64.1% of respondents delayed dental visits because of the COVID-19 pandemic, 60.4% knew that orthodontic treatment is more effective when done during the child's growing phase and 59.6% were aware of various surgical treatments for a malocclusion. The primary reason (41.4%) for getting fixed orthodontic treatment was smile concerns (Table 2).

**Table 2** Parents' awareness and concern about child's teeth maintenance, early diagnosis and correction of oral habits

Questions	Responses	N	%
Do you know the importance of caring for baby teeth to avoid misalignment?	Yes	383	79.0
	No	69	14.2
	Don't know	33	6.8
Recognize the necessity of correcting oral habits	Yes	377	77.7
	No	72	14.8
	Don't know	36	7.4
Do you know about early orthodontic correction diagnosis and treatment?	Yes	375	77.3
	No	76	15.7
	Don't know	34	7.0
What is the cause of misaligned teeth?	Genetic	120	24.7
	Oral Behavior	86	17.7
	Lack of growth	115	23.7

	Other causes	71	14.6
	Don't know	93	19.2
What is the prime reason for treating children's uneven teeth?	Aesthetic	139	28.7
	Operational	120	24.7
	Mental reason	134	27.6
	Don't know	92	19.0
Which of the following conditions, in your opinion, requires treatment with braces?	Smile concern	201	41.4
	Irregularly arranged teeth	105	21.6
	Unevenly spaced teeth	85	17.5
	Misaligned jaw	29	6.0
	Other reasons	20	4.1
	Don't know	45	9.3
Are you aware that there is a treatment option for children to use during their growth period?	Yes	293	60.4
	No	119	24.5
	Don't know	73	15.1
Did you know that there are some circumstances where dental surgery is required to correct the problem?	Yes	289	59.6
	No	191	39.4
	Don't know	5	1.0
Do you believe the recent COVID-19 outbreak caused a delay in taking your child to the dentist for teeth correction?	Yes	311	64.1
	No	174	35.9

The assessment of parents' awareness and perceptions towards dentofacial deformity are depicted in Figure 1. It was observed that the majority of parents had noticed (61%) malaligned teeth and 61.85% were of the opinion that malaligned teeth could impair speech. Nearly half of the parents (48.86%) noticed oral habits such as bruxism, lip biting, thumb sucking and tongue thrusting and a considerable (58.14%) portion were aware that the facial abnormality might be treated to correct it.



**Figure 1** Parents Awareness and Approaches toward Dentofacial Deformity

The total knowledge level among the participants was calculated and it was found that 178 (36.7%) had demonstrated 'good' knowledge levels, whereas 52.4% had 'fair' and 10.9% had 'poor' knowledge levels. It was found that parents belonging to the age group of 25-35 years and 36-45 years had significantly shown more 'good' knowledge level than other age groups ( $p < 0.001$ ). When we compared the knowledge level between the two genders, males' parents demonstrated significantly more 'good' knowledge levels than females ( $p < 0.001$ ). The knowledge levels were significantly better in Saudi parents than non-Saudi parents ( $p < 0.001$ ). Parents with a bachelor's degree or more significantly showed more 'good' knowledge than others with lower educational status ( $p < 0.001$ ) (Table 3).

**Table 3** Knowledge levels of the parents and its comparison with their characteristics

		Knowledge Level			Total	P value*
		Good n (%)	Fair n (%)	Poor n (%)		
Age of the parent	< 25 years	34 (30.9)	53(48.2)	23(20.9)	110(100)	<0.001
	26-35 years	54 (56.3)	35 (36.5)	7 (7.3)	96 (100)	
	36-45 years	31 (39.7)	39 (50)	8 (10.3)	78 (100)	
	46-55 years	34 (28.3)	82 (68.3)	4 (3.3)	120(100)	
	>55 years	25 (30.9)	45 (55.6)	11(13.6)	82 (100)	
Gender	Female	93 (36.5)	120 (47.1)	42(16.5)	255(100)	<0.001
	Male	85 (37)	134 (58.3)	11 (4.8)	230(100)	
Nationality	Saudi	128(43.5)	135 (45.9)	31(10.5)	294(100)	<0.001
	Non-Saudi	50 (26.2)	119 (62.3)	22(11.5)	191(100)	
Educational level	Middle school or less	14 (35)	17 (42.5)	9 (22.5)	40 (100)	<0.001
	Secondary and high school level	24 (30.4)	32 (40.5)	23(29.1)	79(100)	
	Bachelors or more	140 (38.3)	205 (56.0)	21 (5.7)	366 (100)	

\*p value<0.05 is considered statistically significant

#### 4. DISCUSSION

The World Health Organization (WHO) lists malocclusion as a major oral health problem, next to dental caries and periodontal and gingival diseases (Dos Santos et al., 2012). The estimated prevalence among children and teenagers ranges from 39–93% (Mtaya et al., 2009). However, these statistics vary between different countries. The pubertal growth spurt is an important factor in the functional orthodontic treatment of skeletal problems (Baccetti et al., 2000). When compared to males, girls typically reach puberty two years earlier, which means that if malocclusion issues aren't addressed at an early stage, the skeletal disparity may worsen, resulting in the need for more extensive and expensive treatment (DiBiase et al., 2015). The findings of our study showed that parents demonstrated moderate knowledge regarding malocclusion and its effects. It was found that 79% of the parents believed that primary teeth maintenance is essential for preventing malocclusion. A recent study conducted in Riyadh by Ansari et al., (2020) reported that only 43% of the parents believed that it is not important to maintain primary teeth. However, the findings of our study showed that the overall knowledge related to malocclusion and its impact on a child's future oral health was significantly higher among the father of the child compared to the mother. The majority of the previous studies had reported contrasting findings where the mother of the child seems to have improved knowledge of primary dentition and its relationship with malocclusion (Ansari et al., 2020; Chhabra and Chhabra, 2012; Rajab et al., 2002). Especially when their children are small, mothers are typically responsible for providing emotional support, nurturing, establishing routines, establishing norms and structuring their children (Bornstein and Putnick, 2016; Noor, 1999).

The findings of our study showed that more than three-fourths of the parents believed that it is vital to rectify oral habits and that treating orthodontic issues early on will be beneficial. It was reported by Danaei et al., (2011) that parents with higher educational qualifications demonstrated a better understanding of malocclusion and its impact on a child's future oral health. Similarly, in our study, it was also found that the awareness was significantly higher in parents who had higher educational qualifications. Both parents and children's dental health are significantly impacted by parental and educational factors. There is evidence that families from lower socioeconomic backgrounds have poorer oral health (Vittobaand Srinivasan, 2016). A good percentage of parents were aware that there is a treatment option for children during their growing period, which is similar to a survey by Basri et al., (2021) among Saudi parents. Nearly one-third of the parents agreed that malocclusion would cause speech problems in the child and this is consistent with another study done in the kingdom (Alharbi et al., 2022).

Evidence shows that having more children improves parents' outlook on and understanding of the importance of caring for their kids' primary teeth (Abraham et al., 2016; Kowash et al., 2000). It's likely that parents have learned their lesson after seeing the effects of neglect on their younger children's primary teeth. The findings of a study conducted in Brazil (De Sousa et al., 2016) and

Japan (Yamashita et al., 2008) were consistent with our findings, which reported that smile or esthetics was the prime concern for teeth malaligned teeth. Concerning the cause of malaligned teeth, the most commonly answered reason by the parents was hereditary and this finding is similar to the findings of (Mossey, 1999). The most influential factor in determining whether children with anomalies in their dentition and occlusion received orthodontic treatment was the opinion of their parents, particularly their mothers. Therefore, it is crucial for pedodontists to educate patients and caregivers on the need for such occlusal interventions for children with occlusion problems. In order to effectively treat malocclusion and earn the trust of both the children and their parents, we suggest that pedodontists must deliver accurate diagnoses of occlusal abnormalities during their clinical encounters. The study has some limitations. The self-reported nature of the questionnaire would have resulted in some kind of social desirability bias and recall bias. Secondly, we didn't classify the sample based on other factors of social stratification except for educational levels. The study was carried out in one city (Jeddah), which is an urban area and thus the findings of the study cannot be generalized to the whole population of Saudi Arabia.

## 5. CONCLUSION

The study found that a good percentage of the parents were aware of their children's malocclusions. The knowledge and awareness among parents regarding malocclusion have to be enhanced to a more acceptable level. Parents with higher levels of education support the idea of preserving the primary teeth in place to prevent misalignment; along with this, oral habits should be picked out and rectified if they exist. Malocclusions in children can be avoided to a larger extent if parents are motivated and educated about the condition. During clinical visits and other oral health care campaigns, dentists must educate both children and their caregivers about the need and benefits of early occlusal therapy for children with malocclusion.

### Author contributions

The author Dareen Aljehani was the principal investigator who developed the concept and design of the research and final review of the manuscript. Abdul Majeed Kaki was responsible for the manuscript and preparation.

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### Ethical Approval

Ethical approval was obtained from the college research center, Batterjee Medical College (RES-2019-0061).

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This study has not received any external funding.

### Conflict of interest

The authors declare that there is no conflict of interests.

### Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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