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PARENT`S KNOWLEDGE AND PRACTICE REGARDING THEIR CHILDREN MALOCCLUSION AND ORTHODONTIC TREATMENT IN SAUDI ARABIA

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Abstract

Background: Malocclusion poses significant dental and psychological challenges, impacting children's quality of life and self-esteem. In Saudi Arabia, the prevalence of malocclusion is approximately 62.4%. This research aims to assess the knowledge levels of Saudi parents about their children's malocclusion and evaluate their practices toward seeking orthodontic treatment.

Methods: A cross-sectional online survey was administered to a sample of 746 Saudi parents aged 20 to 60 years, recruited through various social media platforms. The questionnaire included demographic information and inquiries about parents' understanding and attitudes towards malocclusion and orthodontic care.

Results: The majority of participants (76.4%) were female, with a mean age of 30.9 years; 62.7% held a bachelor's degree, and 45.6% reported an income exceeding 12,000 SAR. While 73.2% recognized the adverse effects of malocclusion on self-esteem, 66.8% acknowledged the benefits of early intervention. Despite this awareness, 51.2% had not considered orthodontic treatment for their children. Notably, 70.2% believed orthodontic consultations were necessary between ages 1 and 7, yet 55.8% preferred to delay treatment until adolescence. Alarmingly, only 25.7% demonstrated a high level of knowledge regarding malocclusion, and financial constraints significantly affected access to care, as indicated by 31.8% of respondents.

Conclusion: Although many parents in Saudi Arabia exhibit awareness of the implications of malocclusion and the importance of timely orthodontic intervention, a considerable gap exists between knowledge and practice. Further educational initiatives are warranted to enhance parental understanding and encourage proactive orthodontic care for children, addressing barriers such as cost and accessibility to improve overall dental health outcomes.

Keywords: Knowledge, Practice, Orthodontic treatment, Malocclusion, Saudi Arabia.

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Introduction:

Malocclusion is a serious health concern in dentistry. This ailment, which is linked to improper relationships between the teeth or dentition in any dimension, is also the third most common oral disease. Malocclusion is seen as a public health issue since it can lead to dental cavities, periodontal disease, and a higher risk of TMJ dysfunction [1]. People are greatly impacted by their dentofacial look, particularly children [2]. Therefore, a recommendation has the potential to profoundly and favorably alter a person's life. Early intervention serves the same purpose as interceptive orthodontics in that it eliminates variables that impede the regular development of dental arches and avoids or lessens the progression to a fully established malocclusion later in life [3]. Malocclusion is the term used to describe the departure from normal occlusion, a process that started during the early stages of human development. Environmental circumstances, genetic factors, or a mix of the two can affect this illness. Although malocclusion is not a medical condition, it does have certain detrimental impacts on one's quality of life [4].

Research has shown that the prevalence of malocclusion varies by nation; in the United States, it has been found to vary between 20% and 35%, 62.4% in Saudi Arabia, 20% to 43% in India, 88.1% in Colombia, and 87.7% in Nigeria among teens [5]. Increasing parent awareness of their child's dental needs is essential because it will help to avoid occlusal issues later on [6]. Prior research has demonstrated that parents who have received orthodontic treatment in the past or who are prepared to do so are more likely to support their children receiving it [7]. It has been found that the idea that orthodontic treatment can increase a person's self-confidence and social acceptance is shared by parents and their children [8]. Children's orthodontic treatment is also greatly influenced by parents' knowledge of malocclusion and when a child should see an orthodontist [9].

In 2022 research has been published that aims to measure parental knowledge and practice regarding their children’s malocclusion and orthodontic treatment need.80% of parents stated that they were willing to convince their children toward orthodontic treatment based on professional advice. However, 40.5 and 34% of the lower- and middle-income groups would rather wait for public-funded services even if their child is in high need of treatment ($p < 0.000$), compared to 18% of the higher-income group stated the same [10]. Only 4% had good knowledge and 76.2% had poor knowledge regarding IOT in a study done in 2022. The majority of the participants agreed that orthodontic correction in early childhood would improve the child’s facial appearance. Nearly half of the participants had awareness regarding the use of space maintainers. Only one-quarter of the participants were aware of the importance of maintaining primary teeth [11]. In Asser region, research conducted in 2020 showed that Eighty-nine participants (59%) think that hereditary can influence the occurrence of malalignment of teeth a total of participants agreed that oral habits have an ill effect on teeth; 62% did not decide 84% to remove the primary tooth with pain and caries. Mothers (55%) believe that early removal of primary teeth will affect the eruption of permanent teeth into irregular. (88%) of participant know that taking proper orthodontic treatment at an early age would improve their facial appearance [12].

Parents' knowledge and perspective of the importance of seeking consultation and receiving orthodontic treatments in children with malocclusion is still largely neglected. This is particularly important in developing awareness among parents of the Saudi Arabian population. This study aimed to assess the knowledge level of parents regarding their children's malocclusion in Saudi Arabia and to evaluate the practice level of parents toward orthodontic treatment.

Methodology:

Study Design and Setting:

This is cross-sectional research carried out in 2024 among the patients and their families in Saudi Arabia

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by an online survey. The online questionnaire was formed including questions about personal and demographic data followed by questions linked to their opinion and preferences regarding orthodontic treatment among their children.

Study setting:
participants, recruitment, and sampling procedure: The study's participants were Saudi Arabian parents both male and female, ages from 20 to 60 years old. The sample collected through social media platforms (Facebook, Instagram, WhatsApp, Twitter, Snapchat, and so on).

Sample size:
From July 2024 - December 2024 was the beginning of data collecting. Data collection involved a target sample of 384 patients (confidence level: 95%; margin of error: 5%). The sample size was estimated using the formula. n = P(1-P) * Zα 2 / d 2 with a 95% confidence level. n: Calculated sample size. Z: The z-value for the selected level of confidence (1- a) = 1.96 . P: An estimated prevalence of knowledge. Q: (1 – 0.50) = 50%, i.e., 0.50 .D: The maximum acceptable error = 0.05Therefore, the calculated minimum sample size was: n = (1.96)2 X 0.50 X 0.50/ .(0.05) 2 = 384

Inclusion and Exclusion criteria:
The inclusion criteria were Saudi parents, both males and females, ages ranging from 20 to 60 years old, from all provinces of the Kingdom of Saudi Arabia, general population subjects who have or do not have the knowledge of malocclusion and proper consultation and orthodontic treatment options available, and subjects who would agree to participate in this study and complete questionnaire. Exclusion criteria were dental practitioners both males and females, parents refusing to participate or giving complete answers questionnaire.

Method for data collection, instrument and score system:
With the author's permission, some of the survey questions were relied upon from their questionnaire form [13]. The Data collection was done by Google Forms in the form of the participant's answers to the survey questions. The questionnaire consists of 39 questions and is divided into three parts. Part 1 starts with a brief description of the study and the consent question and includes demographic features such as age, gender, residential area, educational level, income and basic personal questions about orthodontic treatment. Part 2, contains 11 knowledge questions about children’s malocclusion and orthodontics treatment, its yes or no questions. Part 3 contains 19 practice questions about parental attitudes toward orthodontics treatment and malocclusion in children. The participants asked about their knowledge and practice level of parents in Saudi Arabia regarding their children's malocclusion and orthodontic treatment.

Scoring system:
The questionnaire was composed of three sections:
Section 1: Demographic data (sex, age, education, income levels, and history of orthodontic treatment for the parents).
Section 2: Measured parental knowledge regarding their children's malocclusion and treatment needs using 11 questions with three-option answers ("Yes", "no", "I do not know").
The correct answer was always "Yes" and was scored as 1. - "I do not know" was scored as 0.
"No" was always the wrong answer and was scored as -0. The maximum knowledge score is 11 divided by the original Bloom's cut-off points, 80.0%-100.0%, 60.0%-70%, and 59.0%, The participants divided

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into three groups based on their scores.
Those with scores of 6 or below classified as having a low level of knowledge, those with scores between 7and 8 as having a moderate level of knowledge, and those with scores of 9 or above as a high level of knowledge.
Section 3: Consisted of 19 questions evaluating parental practice when their child needs orthodontic treatment. The scores are divided into two types of questions: the first 7 questions are scored as the correct answer was always "Yes" and was scored as 1. - "I do not know" was scored as 0.
"No" was always the wrong answer and was scored as -0. And the rest is scored using Likert scales (five Point, and Agreement Scales) the maximum score is 67 divided by the original Bloom's cut-off points, 80.0%-100.0%, 60.0%-79%, and 59.0%, The participants divided into three groups based on their scores.
Those with scores 39 or below are classified as having a low practice level, those with scores between 40 and 53 as having a moderate practice level, and those with scores 54 or above as having a high practice level.

Pilot test:
Plain and simple Arabic language was used, and all dental and orthodontic terms were translated into an understandable Arabic format. 20 participants from the targeted population are used to assess the clarity and understanding of the questions. Feedback and comments were addressed prior to questionnaire distribution.

Analyzes and entry method:
The computer was used to enter data using the "Microsoft Office Excel Software" (2021) Windows software. After that, the data was imported into IBM SPSS Statistics for Windows, Version 25.0, (the statistical package for social science software (SPSS) version 25. IBM Corp., Armonk, NY) for statistical analysis.

Results:

Table (1) displays various demographic parameters of the participants with a total number of (746). The results also show that respondents are relatively young with the mean age of 30.9 and more than half of respondents (45.2%) is 25 and under. Proportion of gender provides relatively higher percentage of female clients (76.4%) and thus may represent general societal or cultural setting of the specific target group. Spatially, these distribute the participation of the subjects in the study by geographical region wherein 70% of the participants were from the Southern region which behooves certain regional socio-economic factors to come into play to affect the results. In terms of educational level, 62.7% of the participants are hold bachelor's degree, what means this group of participants is relatively educated, during there are a small number of participants who is uneducated. Also, distribution of income tends slightly towards higher income where 45.6% of the respondents claimed their income to be over 12,000 SAR.

Table (1): Sociodemographic characteristics of participants (n=746)

Parameter		***No.***	***Percent (%)***
Age	22 or less	174	23.3
(Mean:30.9, STD:10.6)	23 to 25	164	22.0

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	26 to 30	114	15.3
	31 to 40	148	19.8
	more than 40	146	19.6
Gender	Female	570	76.4
	Male	176	23.6
Residential region	Northern region	28	3.8
	Southern region	522	70.0
	Central region	66	8.8
	Eastern region	22	2.9
	Western region	108	14.5
Educational level	Primary school	14	1.9
	Middle school	16	2.1
	High school	134	18.0
	Diploma	72	9.7
	Bachelor's degree	468	62.7
	University student	8	1.1
	Postgraduate degree	30	4.0
	Uneducated	4	.5
Monthly income	Less than 7000	198	26.5
	7001 to 12000	208	27.9
	More than 12000	340	45.6

As shown in figure 1, among the total sample of 746 participants the majority, 546 or 73%, agreed that malocclusions reduce children's confidence and self-esteem, while 90 or 12% disagreed with this statement with about 90 or 12% of participants don't know if this statement was correct.

Figure (1): Illustrates whether malocclusions reduce children's confidence and self-esteem among participants.

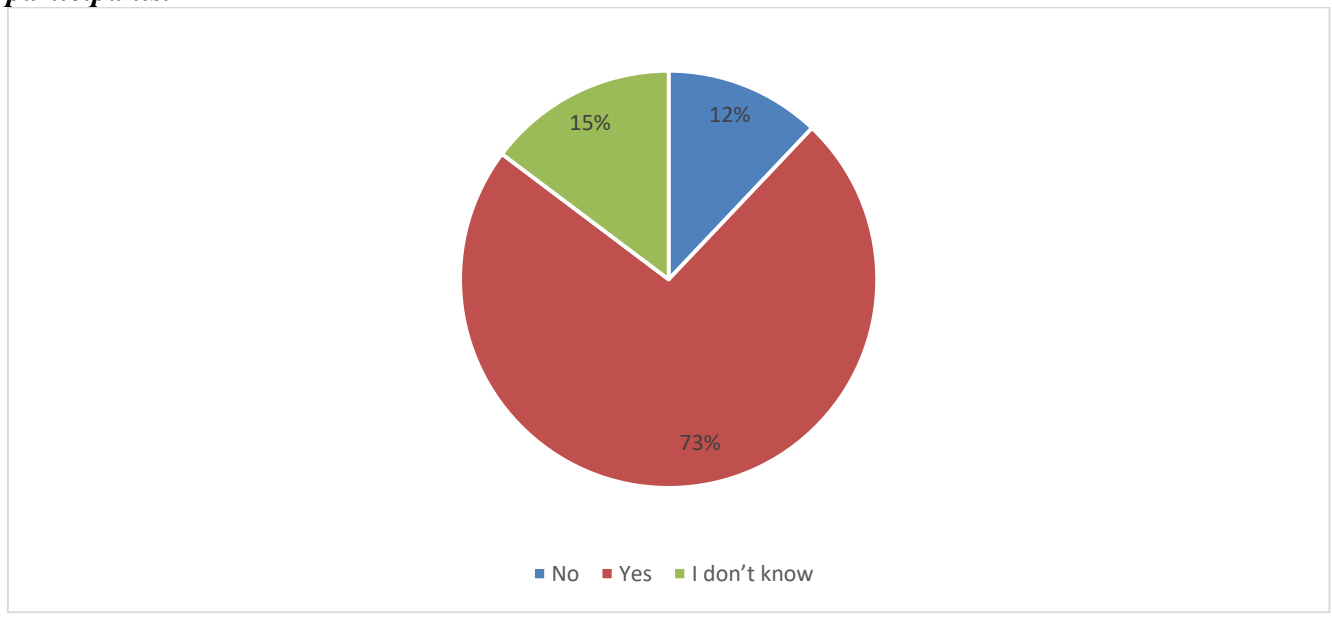

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Table (2) shows an overview of parents' knowledge and perception about malocclusion and orthodontic treatment in children using 746 respondents. Of particular note is that a significant majority (73.2%) also think that malocclusions may harm children's confidence and self-esteem, given the impact malocclusion has on children's dental aesthetics. It also shows that the majority (66.8%) are aware that early intervention may reduce the need for extensive orthodontic intervention later in life. However, as many as 51.2 percent of respondents say they have not thought about orthodontic treatment for their children. The difference in such a manner could be a result of a lag between awareness and action which may represent cost, accessibility, or lack of sufficiently prompt referral by a primary caregiver. Furthermore, the findings indicate that most participants have basic knowledge of having malocclusion and its treatment (e.g., 77.7% are in agreement that orthodontic means vary among children and adults).

Table (2): Parameters related to knowledge regarding children malocclusion and orthodontic treatment (n=746).

Parameter		***No.***	***Percent (%)***
Do you have children aged 7 years and over?	No	406	54.4
	Yes	340	45.6
Have you had orthodontic treatment experience?	No	438	58.7
	Yes	308	41.3
Are you satisfied with the current appearance of your teeth?	No	232	31.1
	Yes	462	61.9
	I don't know	52	7.0
Do you want or are you thinking about getting orthodontics for your teeth?	No	382	51.2
	Yes	294	39.4
	I don't know	70	9.4
Malocclusions reduce children's confidence and self-esteem	No	90	12.1
	Yes	546	73.2
	I don't know	110	14.7
Dental malocclusion is inherited from the mother or father	No	174	23.3
	Yes	294	39.4
	I don't know	278	37.3
Malocclusion is often a misalignment of the entire upper jaw with the entire lower jaw	No	118	15.8
	Yes	446	59.8
	I don't know	182	24.4
Prominent protrusion of the front teeth can increase the likelihood of injuries to them	No	64	8.6
	Yes	552	74.0
	I don't know	130	17.4
Orthodontic treatment methods vary between children and adults	No	46	6.2
	Yes	580	77.7
	I don't know	120	16.1
Orthodontic treatment for girls often occurs at an earlier age than for boys due to their earlier onset of puberty	No	112	15.0
	Yes	304	40.8
	I don't know	330	44.2
	No	180	24.1

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Space between Primary teeth and space between permanent teeth up to the age of 12 do not require orthodontic intervention	Yes	346	46.4
	I don't know	220	29.5
Treating malocclusion at an early age may reduce or eliminate the need for orthodontic treatment in the future.	No	90	12.1
	Yes	498	66.8
	I don't know	158	21.2
There are other devices for treating malocclusion in children besides the common metal braces shown in the picture.	No	72	9.7
	Yes	358	48.0
	I don't know	316	42.4
Early orthodontic treatment may reduce the need for future surgical intervention to correct malocclusion.	No	48	6.4
	Yes	584	78.3
	I don't know	114	15.3
Orthodontic treatment may require correction of the upper or lower jaw position using orthodontic appliances.	No	54	7.2
	Yes	500	67.0
	I don't know	192	25.7

As shown in figure (2), among the total sample of 746 participants the majority, 500 or 67%, agreed that orthodontic treatment may require correction of the upper or lower jaw position using orthodontic appliances, while 54 or 7% disagreed with this statement with about 192 or 26% of participants don't know if this statement was correct.

Figure (2): Illustrates if orthodontic treatment may require correction of the upper or lower jaw position using orthodontic appliances among participants.

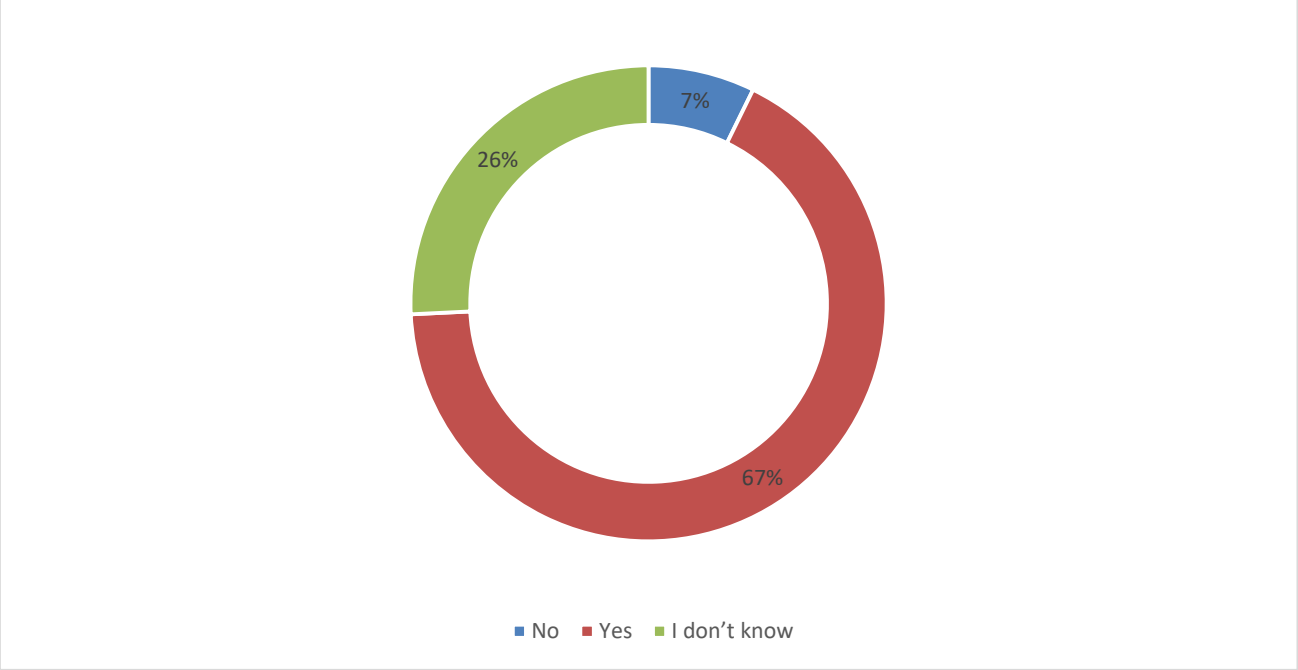

Table (3) provides a lot of interesting insight into how parents address children's malocclusion and orthodontic treatment within a sample of 746 participants. A whopping 70.2 percent of parents agree orthodontic consultation is necessary when their children are in between 1 to 7 years of age, indicating

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high level of awareness regarding early orthodontic intervention. 72.1% also regularly monitor the alignment of their children's teeth, demonstrating an involved method of dental health. Additionally, 76.9% of respondents expressed a desire to persuade their children to accept doctor recommended treatment even when their children resist at first. Nevertheless, a more intricate intervention dynamic around when children start orthodontic treatment arises, with 55,8% of these people denying that children should start orthodontic care until they are adolescents, delaying assessment required. Financial consideration is a major barrier as 31.8 per cent strongly agree that the costs prevent people from access to-orthodontic-care.

Table (3): participants' practice regarding children malocclusion and orthodontic treatment (n=746).

Parameter		***No.***	***Percent (%)***
Be sure to consult an orthodontist for your children when they reach the age of 1 to 7 years.	No	124	16.6
	Yes	524	70.2
	I don't know	98	13.1
I consistently monitor whether my children's teeth are aligned or misaligned.	No	104	13.9
	Yes	538	72.1
	I don't know	104	13.9
I try to convince my son to undergo orthodontic treatment (as recommended by the doctor) even if he is not willing.	No	98	13.1
	Yes	574	76.9
	I don't know	74	9.9
I know if my son/daughter has malocclusion (significant protrusion of one of the jaws).	No	70	9.4
	Yes	558	74.8
	I don't know	118	15.8
I am aware of if my child is malocated (for example, a significant advancement of the lower jaw over the upper jaw or the opposite).	No	70	9.4
	Yes	564	75.6
	I don't know	112	15.0
My child will only receive orthodontic treatment after reaching adolescence and when all of their permanent teeth have sprouted.	No	194	26.0
	Yes	416	55.8
	I don't know	136	18.2
Even if there is a more than a year-long waiting period, I would prefer to wait for the free orthodontic treatment at the government hospital rather than go to the private sector if it is determined that my child requires it right away.	No	368	49.3
	Yes	262	35.1
	I don't know	116	15.5
The reasons I would advise my son or daughter to get orthodontic treatment			
Due to the fact that I observed my son's teeth to be crowded and uneven	Strongly agree	440	59.0
	Agree	206	27.6
	Neutral	84	11.3
	Disagree	6	.8
	Strongly disagree	10	1.3
Since I care about my son's appearance.	Strongly agree	456	61.1
	Agree	206	27.6
	Neutral	54	7.2

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	Disagree	14	1.9
	Strongly disagree	16	2.1
Because my son's appearance causes him to be teased by classmates or at school	Strongly agree	356	47.7
	Agree	248	33.2
	Neutral	106	14.2
	Disagree	26	3.5
	Strongly disagree	10	1.3
Since my son requested that I	Strongly agree	346	46.4
	Agree	238	31.9
	Neutral	136	18.2
	Disagree	18	2.4
	Strongly disagree	8	1.1
Since I don't want my son to hold me accountable for not getting him orthodontic treatment in the future	Strongly agree	356	47.7
	Agree	216	29.0
	Neutral	128	17.2
	Disagree	30	4.0
	Strongly disagree	16	2.1
The dentist has advised that my youngster should have treatment.	Strongly agree	414	55.5
	Agree	210	28.2
	Neutral	90	12.1
	Disagree	20	2.7
	Strongly disagree	12	1.6
Reasons why I don’t think about getting my child orthodontic treatment			
The price of receiving orthodontic care	Strongly agree	237	31.8
	Agree	164	22.0
	Neutral	160	21.4
	Disagree	130	17.4
	Strongly disagree	55	7.4
Extended orthodontic treatment duration	Strongly agree	182	24.4
	Agree	178	23.9
	Neutral	174	23.3
	Disagree	142	19.0
	Strongly disagree	70	9.4
Regular orthodontist appointments per month	Strongly agree	204	27.3
	Agree	208	27.9
	Neutral	134	18.0
	Disagree	124	16.6
	Strongly disagree	76	10.2
My employment does not permit me to take my son for orthodontic treatment on a monthly basis.	Strongly agree	116	15.5
	Agree	128	17.2
	Neutral	188	25.2
	Disagree	210	28.2
	Strongly disagree	104	13.9

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Because, despite the doctor's recommendations, my son refuses to receive therapy	Strongly agree	102	13.7
	Agree	102	13.7
	Neutral	232	31.1
	Disagree	220	29.5
	Strongly disagree	90	12.1
Despite the fact that my son is not happy with the way his teeth look, I am content with the way they look.	Strongly agree	102	13.7
	Agree	114	15.3
	Neutral	168	22.5
	Disagree	202	27.1
	Strongly disagree	160	21.4

Table 4 provides a slightly negative showing of the frequency distribution of knowledge levels of respondents about children's malocclusion and orthodontic treatment. In fact, only about 25.7% of participants have a high knowledge level, while 31.6% do moderate knowledge, resulting in over or 42.6% who had low knowledge.

Table (4): Shows knowledge regarding children malocclusion and orthodontic treatment score results.

	Frequency	**Percent**
High knowledge Level	192	25.7
Moderate knowledge	236	31.6
Low Knowledge level	318	42.6
Total	746	100.0

Table 5 presents the data demonstrating important information about the current orthodontic practice in relation to children and their malocclusion among the surveyed population. Indeed, a high 64.3 percent of respondents reported moderate level practice. On the other hand, 24.7% showed a high level of practice and 11.0% had insufficient level of practice, alarmingly.

Table (5): Shows practice regarding children malocclusion and orthodontic treatment score results.

	Frequency	**Percent**
High level of practice	184	24.7
Moderate practice	480	64.3
Low practice level	82	11.0
Total	746	100.0

Table (6) shows that knowledge level regarding children malocclusion has statistically significant relation to gender (P value=0.001), age (P value=0.0001), residential region (P value=0.0001), educational level (P value=0.0001), household income (P value=0.015), whether they have children aged 7 or more (P value=0.005), and previous orthodontic treatment (P value=0.0001).

Table (6): Relation between knowledge regarding children malocclusion and orthodontic treatment and sociodemographic characteristics.

Parameters	***Knowledge Level***		

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		High or moderate knowledge	**Low Knowledge level**	***Total (N=746)***	***P value****
Gender	Female	346	224	570	0.001
		80.8%	70.4%	76.4%	
	Male	82	94	176	
		19.2%	29.6%	23.6%	
Age	22 or less	98	76	174	0.0001
		22.9%	23.9%	23.3%	
	23 to 25	126	38	164	
		29.4%	11.9%	22.0%	
	26 to 30	72	42	114	
		16.8%	13.2%	15.3%	
	31 to 40	60	88	148	
		14.0%	27.7%	19.8%	
	more than 40	72	74	146	
		16.8%	23.3%	19.6%	
Residential region	Northern region	6	22	28	0.0001
		1.4%	6.9%	3.8%	
	Southern region	326	196	522	
		76.2%	61.6%	70.0%	
	Central region	38	28	66	
		8.9%	8.8%	8.8%	
	Eastern region	6	16	22	
		1.4%	5.0%	2.9%	
	Western region	52	56	108	
		12.1%	17.6%	14.5%	
Educational level	Primary school	2	12	14	0.0001
		0.5%	3.8%	1.9%	
	Middle school	8	8	16	
		1.9%	2.5%	2.1%	
	High school	66	68	134	
		15.4%	21.4%	18.0%	
	Diploma	42	30	72	
		9.8%	9.4%	9.7%	
	Bachelor’s degree	8	0	8	
		1.9%	0.0%	1.1%	
	University student	272	196	468	
		63.6%	61.6%	62.7%	
	Postgraduate degree	26	4	30	
		6.1%	1.3%	4.0%	
	Uneducated	4	0	4	
		0.9%	0.0%	0.5%	
	Less than 7000	130	68	198	0.015

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Household monthly income		30.4%	21.4%	26.5%	
	7001 to 12000	108	100	208	
		25.2%	31.4%	27.9%	
	More than 12000	190	150	340	
		44.4%	47.2%	45.6%	
Do you have children aged 7 years and over?	No	252	154	406	0.005
		58.9%	48.4%	54.4%	
	Yes	176	164	340	
		41.1%	51.6%	45.6%	
Have you had orthodontic treatment experience?	No	218	220	438	0.0001
		50.9%	69.2%	58.7%	
	Yes	210	98	308	
		49.1%	30.8%	41.3%	

****P value was considered significant if ≤ 0.05.***

Table (7) shows practice level regarding children malocclusion has statistically significant relation to gender (P value=0.012). It also shows statistically insignificant relation to age, residential region, household monthly income, whether they have children aged 7 or more and previous orthodontic treatment.

Table (7): Practice level regarding children malocclusion and orthodontic treatment in association with sociodemographic characteristics.

Parameters		***Practice Level***		***Total (N=746)***	***P value****
		High level of practice	***Moderate or low practice***		
Gender	Female	128	442	570	0.012
		69.6%	78.6%	76.4%	
	Male	56	120	176	
		30.4%	21.4%	23.6%	
Age	22 or less	34	140	174	0.131
		18.5%	24.9%	23.3%	
	23 to 25	40	124	164	
		21.7%	22.1%	22.0%	
	26 to 30	38	76	114	
		20.7%	13.5%	15.3%	
	31 to 40	36	112	148	
		19.6%	19.9%	19.8%	
	more than 40	36	110	146	
		19.6%	19.6%	19.6%	
Residential region	Northern region	8	20	28	0.314
		4.3%	3.6%	3.8%	
	Southern region	120	402	522	
		65.2%	71.5%	70.0%	
	Central region	22	44	66	

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		12.0%	7.8%	8.8%	
	Eastern region	4	18	22	
		2.2%	3.2%	2.9%	
	Western region	30	78	108	
		16.3%	13.9%	14.5%	
Educational level	Primary school	0	14	14	N/A
		0.0%	2.5%	1.9%	
	Middle school	4	12	16	
		2.2%	2.1%	2.1%	
	High school	30	104	134	
		16.3%	18.5%	18.0%	
	Diploma	24	48	72	
		13.0%	8.5%	9.7%	
	Bachelor's degree	118	350	468	
		64.1%	62.3%	62.7%	
	University student	0	8	8	
		0.0%	1.4%	1.1%	
	Postgraduate degree	8	22	30	
		4.3%	3.9%	4.0%	
	Uneducated	0	4	4	
		0.0%	0.7%	0.5%	
Household monthly income	Less than 7000	52	146	198	0.099
		28.3%	26.0%	26.5%	
	7001 to 12000	40	168	208	
		21.7%	29.9%	27.9%	
	More than 12000	92	248	340	
		50.0%	44.1%	45.6%	
Do you have children aged 7 years and over?	No	106	300	406	0.318
		57.6%	53.4%	54.4%	
	Yes	78	262	340	
		42.4%	46.6%	45.6%	
Have you had orthodontic treatment experience?	No	102	336	438	0.298
		55.4%	59.8%	58.7%	
	Yes	82	226	308	
		44.6%	40.2%	41.3%	

P value was considered significant if ≤ 0.05.

Discussion:

Orthodontics and dentofacial orthopedics is defined as "the field of dentistry that focuses on the prevention, interception, and treatment of malocclusion, along with the skeletal and neuromuscular abnormalities in both developing and mature dentofacial structures" [14]. The efficacy of orthodontic treatment, whether initiated through professional assessment or based on a child's self-perception,

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positively influences children's self-esteem and their quality of life related to oral health. Malocclusion that goes untreated can negatively impact the social and emotional development of children and is linked to lower academic performance in adolescents. Additionally, adolescents with multiple traits of malocclusion often exhibit significantly lower self-esteem than their peers with only a single trait [15]. Certain characteristics of malocclusion may worsen over time; therefore, the age at which a child seeks an orthodontic consultation can greatly affect the severity of the malocclusion. This subsequently impacts both the complexity of the chosen treatment strategy and the duration of treatment for various orthodontic issues [16]. The American Association of Orthodontics recommends that children undergo their first orthodontic evaluation by the age of 7 at the latest [17]. A study recently published in Saudi Arabia revealed that numerous factors influence parents' decisions to pursue orthodontic treatment for their children, including the desire to enhance facial aesthetics, the perceived availability of orthodontic services, and the overall cost of treatment [18]. Furthermore, parents' understanding of malocclusion and the suitable timing for their child to seek orthodontic care plays a significant role in determining the orthodontic treatment for children [19]. Thus, we aimed in this study to assess the knowledge level of parents regarding their children's malocclusion in Saudi Arabia and to evaluate the practice level of parents towards orthodontic treatment.

In our study, we found that a substantial proportion of parents (73.2%) believe that malocclusions negatively impact their children's self-esteem, which indicates a higher level of awareness than that reported by Aldweesh et al., where 79.35% of parents recognized that children's smile esthetics influence their personality [20]. This suggests a nuanced understanding among parents about the broader implications of dental aesthetics beyond mere appearance. Furthermore, the recognition of the need for orthodontic consultations among parents in our study is echoed in the findings of Alnafaa et al., where 72.6% indicated they would seek orthodontic intervention for their children [21]. However, our data revealed a concerning trend where 55.8% still believe that orthodontic treatment should commence during adolescence, which may paradoxically delay necessary evaluations, in contradiction to the inclination from other studies, such as Basri et al., which reported that 65% of parents are likely to consider orthodontic treatment, with 48.2% favoring the initiation of screening at age seven [22]. This highlights potential inconsistencies in perceived treatment timing among parents. The disparity in knowledge levels is further complicated by our findings, which show that while 25.7% of participants had high knowledge regarding malocclusion, a striking over 42% displayed low understanding. This is comparable to the study by Almarhoumi et al., where adequate knowledge and a positive attitude were found in 55.6% and 68.4% of participants respectively [23], suggesting that while some parents may prioritize orthodontic care, a significant number still lack comprehensive understanding. Al-Khalifa et al. also showed that many parents in Dammam, Saudi Arabia, had poor knowledge about preventive orthodontics [24]. Additionally, the study conducted by Aldweesh et al. found that 79% of parents believed their children's dental condition significantly impacted their personality, with 64.5% acknowledging their children had dental issues, which prompted 76% of these parents to consult orthodontists [25]. Moreover, a study conducted by Hassan et al. noted that almost half of the participants (51.1%) sought assistance from such specialists, aligning with our findings that highlight the gap between awareness of treatment necessity and actual consultation [26]. Our observation that 31.8% deemed financial constraints as significant barriers resonates with Moshkelgosha et al., who found a correlation between socioeconomic status and levels of knowledge and attitude toward early treatment [27]. While 64.3% of our surveyed parents reported a moderate degree of engagement in orthodontic care practices, this remained lower than expected, highlighting the practical challenges in accessing orthodontic care.

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Conclusion:
In conclusion, this study underscores a critical gap in the knowledge and practice of Saudi Arabian parents regarding their children's malocclusion and the importance of orthodontic treatment. While a notable proportion of parents acknowledge the negative impact of malocclusion on their children's self-esteem and recognize the importance of early orthodontic consultations, a concerning number still believe that treatment should primarily commence during adolescence, which may delay necessary interventions. The findings indicate that although awareness is present, the actual practice of seeking orthodontic care is hindered by barriers such as financial constraints and misconceptions regarding the appropriate age for treatment initiation. Moreover, the relatively low overall knowledge levels regarding malocclusion signify an urgent need for targeted educational initiatives to empower parents. By enhancing awareness and accessibility to orthodontic information and services, we can potentially improve the oral health outcomes and quality of life for children suffering from malocclusion in Saudi Arabia.

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Ethical approval:
After fully explaining the study and emphasizing that participation is optional, each participant gave their informed consent. The information gathered was safely stored and utilized exclusively for study.

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The authors declare no conflict of interest.

Informed consent:
Written informed consent was acquired from each individual study participant.

Data and materials availability:
All data associated with this study are present in the paper.

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