

Evaluation of parent's knowledge and awareness towards early orthodontic treatment for their children among Saudi Arabia

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ABSTRACT

Background: According to McNamara, early orthodontic treatment is a therapeutic method used on the deciduous or mixed dentition for the purpose of preventing, intercepting, or repairing any orthodontic disorders. The main purpose of this research was to assess the parents' awareness and knowledge among the early orthodontic treatment for children. **Methodology:** From January 2020 to October 2021, an observational cross-sectional questionnaire survey was performed in Saudi Arabia. Saudi parents from different parts of Saudi Arabia composed the study's sample. As a research tool, structured self-administered questionnaires in English and Arabic were used. Data was gathered and entered into the "Microsoft Office excel software" (2016) for Windows program, which was then analyzed using the Statistical Package of Social Science Software program. **Results:** The study participants included 1344 respondents most of them female 75.8% and only 12.4% male, more than half were between the ages of 25 and 44, 69.3 percent earned a bachelor's degree. 36.9 percent had a monthly salary of more than 10,000 SR. The mean score for the awareness was (4.30±1.26/High level). The mean score for the knowledge was (6.25±1.91/High level). There was a significantly moderate and positive correlation between Pro awareness and knowledge ($r=0.495$, $p<0.05$), which means when people got a high knowledge also got a high awareness. **Conclusion:** Parents had a modest level of awareness and knowledge regarding their children's early orthodontic treatment. Increased socioeconomic and educational status has a substantial influence on parents' awareness and knowledge.

Keyword: Early Orthodontic Treatment, Craniofacial, Parents' Knowledge.



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1. INTRODUCTION

The definition of Early Orthodontic Treatment according to McNamara is a therapeutic approach taken place on Deciduous or Mixed dentition for the reason of preventing, intercepting or correcting any orthodontic issues (Schopf, 2003). 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. The American Association of Orthodontists defines interceptive orthodontics treatment as "that phase of the science and art of orthodontics employed to recognize and eliminate potential irregularities and malposition's in the dentofacial complex" (Nallanchakrava, 2011).

Health basis is built by community awareness. Lack of accurately established knowledge of the community can severely restrict any attempt of change. An active intervention can be done by the understanding of cultural factors and concerns (Pooja et al., 2018). Malocclusion may affect the psychosocial status of a person by reducing dentofacial features. These features illustrate a major role in social communication and interpersonal skills (Gadgil, n.d.). Social integration and interpersonal communication are enhanced by dentofacial characteristics. While correct aesthetic occlusion makes you appear more attractive, enhancing self-esteem, a more accepted and regarded personality among friends (Chetpakdeechit et al., 2010).

The American Academy of Orthodontics recommends that parents take their children to an orthodontist for examination at 7 years old. Orthodontic Interceptive treatment can reduce the prevalence of future malocclusion. This intervention can ease the treatment, reduce the treatment time, and make it cost-efficient (Gadgil, n.d.; John, 2019). In 2019, a questionnaire cross-sectional study survey was conducted and distributed at randomly selected twenty-four different primary schools' parents in KSA. This study was done only in Riyadh city without the other Saudi Arabia regions. Furthermore, researches about orthodontic early treatment young children parent awareness were done in other countries than Saudi Arabia and revealed the norm standard toward parent awareness of early orthodontic treatment (Pooja et al., 2018).

Among the existing studies, only few have been conducted on the same topic in very few different cities in Saudi Arabia, one of the studies, concluded that the level of awareness of parents in Hail city was moderate (Alswilem et al., 1994) which requires improvement, that's why we need to have a broader look and vision covering more areas in Saudi Arabia about how much the Saudi parents are aware and have knowledge of the importance of early orthodontic treatment in children. The objective of this research was to determine the level of awareness and knowledge among parents in the early orthodontic examination to exclude severe complications after the total development of their children, and to improve physical and psychological problems.

2. METHODOLOGY

This is a cross-sectional observational study conducted in Saudi Arabia from January 2020 to October 2021, on Saudi parents from different regions of Saudi Arabia. Saudi parents or legal guardians, aged 18-year-old and above are agreed to participate in this study. Non-Saudi parents (or legal guardians), younger than 18, are excluded from this study.

Sample size

The Sample size was estimated using the formula: $n = P(1-P) * Z\alpha^2 / d^2$ with a confidence level of 95%;

n: Calculated sample size.

Z: The z-value for the selected level of confidence (1- α) = 1.96.

P: An estimated prevalence of knowledge

Q: (1 - 0.50) = 50%, i.e., 0.50

D: The maximum acceptable error = 0.05.

So, the calculated minimum sample size was:

$$n = (1.96)^2 \times 0.50 \times 0.50 / (0.05)^2 = 384.$$

Method for data collection and instrument

Data collection was done in the form of the participants' responses to the questions. The questionnaire included demographic features such as age, gender, and level of education. The participants were asked about the knowledge of an early orthodontic examination, to aware the parents regarding how important it is to go to an orthodontist at a certain age for an early examination to prevent further complication, contains questions such as do you think early intervention at earlier age improves the facial appearance, early examination helps to eliminate oral habits, do they know about some cases need extraction of permanent teeth, do you think your child needs braces.

Data management and analysis

Data was collected and enter on the " Microsoft Office excel software" program (2016) for windows then analyzed using (Statistical Package of Social Science Software (SPSS)) program, version 20 (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.).

The frequencies, percentage, mean and standard deviation were computed for qualitative and quantitative variables respectively. Pearson correlation was conducted to test the correlation between awareness and knowledge. Regression test was conducted to test the prediction of demographic factors on awareness and knowledge. A p value <0.05 was considered statistically significant.

3. RESULTS

A total of 1344 parents participated in the study including 75.8% female and 12.4% male, more than a half aged between 25 and 44 years old, 69.3 got bachelor degree. 36.9% earned a monthly income of more than 10 thousand SR, while 30% earned less than 3 thousand SR. Lose to a half were form east region of Saudi Arabia (table 1).

Table 1 demographic information (N=1344)

Factor		N	%
Gender	Male	325	24.2%
	Female	1019	75.8%
Age	18-24 years old	266	19.8%
	25-34 years old	326	24.3%
	35-44 years old	371	27.6%
	45-54 years old	261	19.4%
	55-64 years old	96	7.1%
	64 years old and above	24	1.8%
Education	High School or less	278	20.7%
	Bachelor Degree	932	69.3%
	Master or PhD	134	10.0%
Monthly income	Less than 3000 SR	403	30.0%
	3000-7000 SR	228	17.0%
	7000-10000 SR	217	16.1%
	More than 10000 SR	496	36.9%
Region	West Region	376	28.0%
	South Region	91	6.8%
	North Region	27	2.0%
	East Region	632	47.0%
	Central Region	218	16.2%

Awareness distribution of Saudi parents regarding early orthodontics Treatment

As shown in Table 2 and 3 the level of awareness of Saudi parents regarding early orthodontics Treatment was measured by 7 items/statements, which were answered by "Yes", "No" and "I don't know", item (1) was answered by 4 options, which has one correct answer "Orthodontist", item (2) was not considered to be true or false either. so the statements were dichotomised/classified into "True" and "False", which is signed by one star in the tables, so the possible score ranged between zero (the less relevant to awareness) and 6 (the most relevant to awareness). True answers were the domains for all statements, which ranged between 96.8% and 48.2%, , the cost was the most reason behind not availing early orthodontic examination and treatment for child (42.2%), followed by Parent is afraid it's going to hurt the child (22.2%), while the age of the kid was the least reason (4%). The average awareness score was (4.30±1.26/High level).

Table 2 Awareness distribution of Saudi parents regarding early orthodontics Treatment (1)

Statement		N	%
1.The first consultant to go to consult regarding braces (orthodontic treatment)	<i>Orthodontist*</i>	874	65.0%
	General dentist	445	33.1%
	General physician	16	1.2%
	General physician paediatrician	9	0.7%
2.Reason behind not availing early orthodontic examination and treatment for child	Parent is afraid it's going to cost too much	563	42.2%
	Parent is afraid it's going to hurt the child	296	22.2%
	Parent do not see the need to take action	226	16.9%
	Parent is afraid it's going to take too long / miss too much school or work	99	7.4%
	Unawareness	97	7.3%
	The child is young	53	4.0%
*Correct answer			

Table 3 Awareness distribution of Saudi parents regarding early orthodontics Treatment (2)

Statement	N/%		
	Yes	No	IDK
3. Age is an important factor in the beginning and duration of orthodontic treatment?	1089* 81.0%*	90 6.7%	165 12.3%
4.In your opinion, Orthodontic screening is recommended to start at the age of 7 years old	648* 48.2%*	377 28.1%	319 23.7%
5. Does orthodontic treatment for adults and children are different?	1048* 78.0%*	41 3.1%	255 19.0%
6.Parents knowledge and awareness play a major role in convincing their child to accept any kind of orthodontic treatment	1301* 96.8%*	20 1.5%	23 1.7%
7.Early orthodontic treatment helps in eliminating oral habits such as (thumb sucking or tongue thrust) which may lead to a major dental problem later in life if not treated	826* 61.5%*	65 4.8%	453 33.7%
The mean score (level of knowledge) (Mean±SD/level)			
4.30±1.26/High			
Note : the mean score (0-2.00=low),(2.01-4.00=Moderate),(4.01=6.00=High)			
*Correct answer			

Knowledge distribution of Saudi parents regarding early orthodontics Treatment

As shown in Table 4 the level of Knowledge of Saudi parents regarding early orthodontics Treatment was measured by 9 items/statements, which were answered by “Yes/Agree”, “No/Disagree” and “I don’t know”, so the statements were dichotomised/classified into “True” and “False”, which is signed by one star in the table, so the possible score ranged between zero (the less relevant to knowledge) and 9 (the most relevant to knowledge). True answers were the domains for all statements, which ranged between 91.9% and 43.8%. The average knowledge score was (6.25±1.91/High level).

Table 4 Knowledge distribution of Saudi parents regarding early orthodontics Treatment (2)

Statement	N/%		
	Yes/Agree	Yes/Agree	Yes/Agree
Do you think early visit to the orthodontist may help your child prevent further treatment later in life	1087* 80.9%*	108 8.0%	149 11.1%

Do you think there is specific management after the early loss of milk teeth	654* 48.7%*	239 17.8%	451 33.6%
Do you think early intervention would be better if it was done at a younger age extra-oral (facial appearance) and self-esteem for your child's future	1235* 91.9%*	45 3.3%	64 4.8%
Dentofacial abnormalities are inherited and can't be treated.	133 9.9%	1011* 75.2%*	200 14.9%
Do you know, if there is an option to treat children during their growth period to fix jaw and teeth abnormalities by using orthodontics braces	999* 74.3%*	97 7.2%	248 18.5%
Early orthodontic treatment and aligning the crowded/ proclined (frontally displaced) upper incisors (front teeth) may prevent dental trauma during childhood	1031* 76.7%*	51 3.8%	262 19.5%
Do you think serial extractions of primary teeth could help correcting the permanent teeth alignment?	658* 49.0%*	197 14.7%	489 36.4%
Do you think mouth breathing play a major role in malocclusion?	588* 43.8%*	250 18.6%	506 37.6%
Do you know, for some conditions surgery is needed to correct the teeth.	1134* 84.4%*	49 3.6%	161 12.0%
The mean score (level of knowledge) (Mean±SD/level)	6.25±1.91/High		
Note : the mean score (0-3.00=low),(3.01-6.00=Moderate),(6.01=9.00=High)			
*Correct answer			

The correlation between awareness and knowledge

The correlation between awareness and knowledge was conducted using Pearson correlation. As shown in Table (5) and Figure (1) there was a significantly moderate and positive correlation between Pro awareness and knowledge ($r=0.495, p<0.05$), which means when people got a high knowledge also got a high awareness.

Table 5 The prediction of demographic factors and the level of the awareness

Predictor variables	β	SE-b	t	p	95% CI	
					Lower	Upper
Gender	0.30	0.08	3.78**	0.00	0.15	0.46
Age	0.07	0.03	2.31**	0.02	0.01	0.13
Education	0.22	0.07	3.25**	0.00	0.09	0.35
Income	0.06	0.03	1.81(ns)	0.07	-0.01	0.13
Region	-0.02	0.02	-0.67(ns)	0.50	-0.06	0.03

Note: The Awareness was the dependent variable; β is the unstandardized coefficients; SE-b is the Standard error; $R^2 = 0.04$; Adjusted $R^2 = 0.037$; $F=10.29^{**}$; $** p<0.05$; ns (not significant)

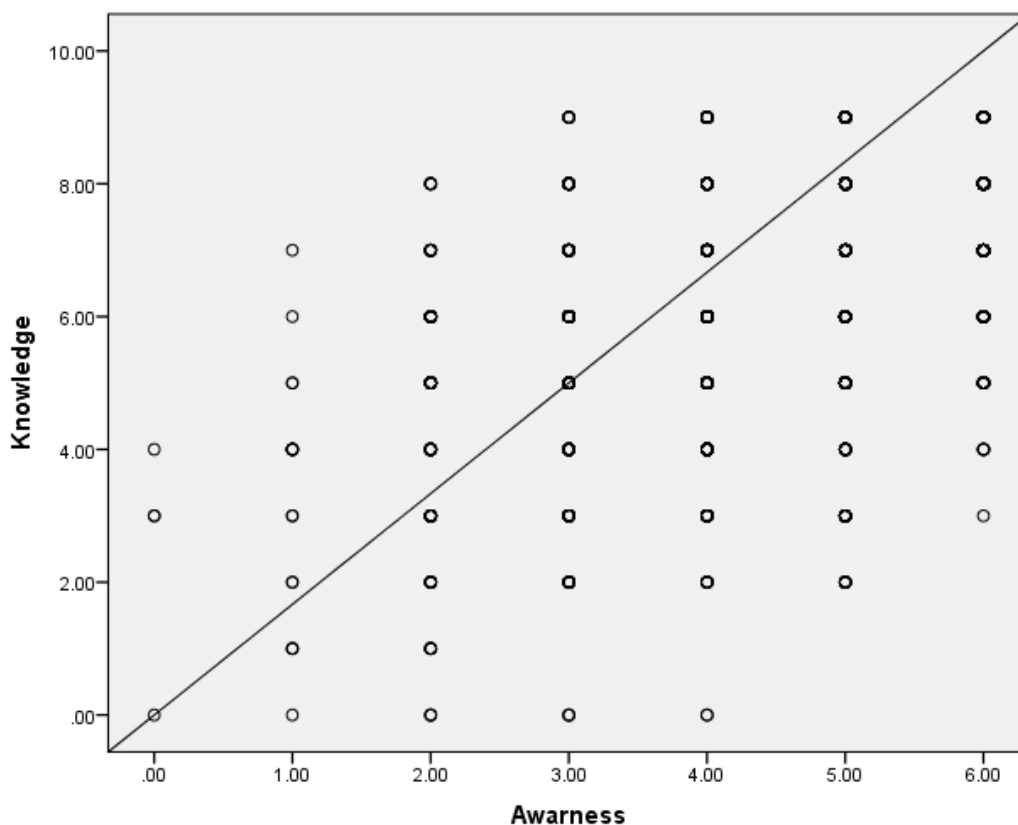


Figure 1 correlation between awareness and knowledge

The prediction of demographic factors and the level of awareness and knowledge

As shown in Table 6 the regression test was conducted to assess the prediction of demographic factors on awareness and knowledge, the significant value of path estimation (β) was examined based on the t value ($p < 0.05$). R^2 is a function of the influence of independent variables on dependent variable. Awareness: $R^2 = 0.04$, t means only 4 % of the influence made by independent variables (demographic factors) to predict the awareness, ($F = 10.29$, $p < 0.05$). Gender was the most influencer of the awareness ($\beta = 0.62$, $t = 3.68$, $p < 0.05$) with an advantage for female. Also there was an impact of the Gender on the awareness ($\beta = 0.30$, $t = 3.78$, $p < 0.05$) with an advantage for female. There was an impact of the age on the awareness ($\beta = 0.07$, $t = 2.31$, $p < 0.05$) with an advantage for older. There was an impact of the education on the awareness ($\beta = 0.22$, $t = 3.25$, $p < 0.05$) with an advantage for postgraduate. Knowledge: $R^2 = 0.03$, t means only 3 % of the influence made by independent variables (demographic factors) to predict the knowledge, ($F = 7.28$, $p < 0.05$). Education was the most influencer of the knowledge ($\beta = 0.10$, $t = 3.79$, $p < 0.05$) with an advantage for postgraduate. There was an impact of the gender on the knowledge ($\beta = 0.12$, $t = 2.46$, $p < 0.05$) with an advantage for female. There was an impact of the age on the knowledge ($\beta = 0.10$, $t = 2.50$, $p < 0.05$) with an advantage for older. There was an impact of the age on the knowledge ($\beta = 0.03$, $t = 3.12$, $p < 0.05$) with an advantage for north and central region respectively.

Table 6 The prediction of demographic factors and the level of the awareness

Predictor variables	β	SE-b	t	p	95% CI	
					Lower	Upper
Gender	0.12	0.07	2.46**	0.01	0.06	0.54
Age	0.05	0.08	2.50**	0.01	0.03	0.21
Education	0.10	0.11	3.79**	0.00	0.19	0.59
Income	0.05	0.01	0.27(ns)	0.79	-0.09	0.11
Region	0.03	0.09	3.12**	0.00	0.04	0.18

Note: The Knowledge was the dependent variable; β is the unstandardized coefficients; SE-b is the Standard error; $R^2 = 0.03$; Adjusted $R^2 = 0.025$; $F = 7.28$ **
 ** $p < 0.05$; ns (not significant)

4. DISCUSSION

The Saudi parent awareness of guiding their children to orthodontist diagnosis in young age play a major role in reducing the propagation of malocclusion in early stage while delaying the treatment to an old age can increase the complexity of the malocclusion treatment which can lead in some cases to a surgical intervention without ignoring the self-esteem of the child during development. In this study we did questionnaire for parents in Saudi Arabia's several regions to survey their knowledge and awareness of early malocclusion treatment after the total developmental of their children. A total of 1344 parents took part in the research. Studies reported that the need for orthodontic treatment is subjective by the prevalence and as well as the degree of malocclusion, gender, socioeconomic status and ethnicity, availability and funding of orthodontic services (Baram et al., 2019).

According to our results, we found that the mean awareness distribution of Saudi parents regarding early orthodontics treatment awareness was (4.30 ± 1.26) which indicates high level of awareness according to the correct answers that were discussed in the result section. However, Saudi parents have high knowledge regarding early orthodontics treatment results in mean score was (6.25 ± 1.91) , according to the number we can inform that Saudi parents have high level of awareness and knowledge regarding the early orthodontic treatment, there was significantly moderate and positive correlation between awareness and knowledge ($r=0.495$, $p<0.05$), which means when parents have high education and knowledge will have directly proportional for having high awareness. A study conducted by (Moshkelgosha et al., 2016) reported mean score of parental 0.78 and 0.38 for knowledge and awareness, correspondingly.

According to the study, 83.5 percent of parents believed that ignoring primary teeth had an impact on permanent teeth (Alswilem et al., 1994). 175 (43.75 percent) of parents had sought advice from a dentist regarding their child's orthodontic treatment needs. 231 parents (57.8%) said their kid needed orthodontic treatment, and there was a big variation ($p = 0.003$) between that and the number of kids. Zakirulla et al., (2019) reported that 88% of mothers believe that receiving good orthodontic treatment at a young age would be beneficial facial appearance. Further supportive evidence for this view is provided by (Gochman, 1975), in his study of 774 school children aged 8 - 17 years, where a large proportion of the sample mentioned social improvements, appearance, and self-confidence as the significant benefits of the treatment.

An earlier study determined that orthodontic patients have inadequate dental hygiene at home may make them more prone to progress gingivitis during orthodontic therapy. It is crucial, therefore, that the maintenance of proper oral hygiene during orthodontic treatment not be ignored (Atassi & Awartani, 2010). This was supported by (Al-Khalifa et al., 2021) as they showed higher percentage of parents are willing to visit the hygienist during the their children's orthodontic treatment (77.5%), which clearly showed that parents have a good level of orthodontic treatment awareness. Moreover, there are some barriers should be mentioned and one of the most reason for not having parents having early intervention for their children's malocclusion is cost, which resulting in 42.2% of the parents can't afford the orthodontic treatment.

Zakirulla et al., (2019) reported that 83% of participants agreed that orthodontic treatment is costly. Which is supportive with one study shows that a bulk of respondents (81.2%) Only 7.4 percent of respondents disputed that orthodontic treatment is costly, while 7 percent agreed (Almoammar et al., 2017). These findings were comparable to those of other research in which financial constraints were identified as one of the factors preventing patients from receiving orthodontic treatment. They discovered that the majority of people who chose orthodontic treatment were from a high socioeconomic background (Awaisi & Mahmood, 2012).

According to our results, gender was the most influencer of the awareness ($\beta=0.62$, $t=3.68$, $p<0.05$) with an advantage for female. There was an impact of the age on the awareness ($\beta=0.07$, $t=2.31$, $p<0.05$) with an advantage for older. Also, there was an impact of the education on the awareness ($\beta=0.22$, $t=3.25$, $p<0.05$) with an advantage for postgraduate. In Ajwa study which conducted in Riyadh city, concluded that higher socioeconomic status and higher educational status has significant impact on parents' attitude and knowledge for implication towards their children's orthodontic treatment from a young age. However, in (Alswilem et al., 1994) study conducted in Hail found the parents' awareness and knowledge was moderate due to the impact factor of parents' education and socioeconomic status. The value of our study was the verity of data was collected from different region in Saudi Arabia which concludes that there's strong correlation between education and financial status of Saudi parents regarding their decision to have early orthodontic intervention for their children.

5. CONCLUSION

Participants had moderate level of awareness and knowledge regarding early orthodontic treatment. An increased socioeconomic and educational standing had a major influence on parents' awareness, as well as a significant impact on parents' knowledge. Health conferences and campaigns are recommended to increase Saudi parents' awareness of early orthodontic treatment in their children.

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Ethical consideration

This survey study was conducted in the dental Department of Dentistry at King Abdelaziz University faculty dentistry (KAUFD), in Jeddah, Saudi Arabia in the year 2020 with IRB number (124-11-20). The research procedure and protocol were accepted by the Ethical Committee of Human Research at the School of Dentistry-KAU, in Jeddah, Saudi Arabia.

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Conflict of interest

The authors declare that there are no conflicts of interest.

Data and materials availability

All data associated with this study are present in the paper.

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