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Parents' Knowledge and Awareness of Orthodontics and Orthodontic Treatment in Saudi Arabia

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Running Title: Parents' knowledge and orthodontic treatment

Abstract: ***Aim**: To assess and study parents' knowledge and awareness of orthodontics and orthodontic treatment of their children. **Methods**: This cross-sectional survey was conducted at the King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia, from October to November 2020. A total of 218parents were included in this study. Demographic variables such as age, family status, occupation, nationality, education level and parents' knowledge as well as their awareness of orthodontics and orthodontic treatment were collected using a standardized, validated questionnaire consisting of 32 different statements. **Results**: The overall finding of the study showed a high level of knowledge and awareness of orthodontics and orthodontic treatment among parents although only 32.1% had previous orthodontic treatment, the majority of parents were university graduate (57.3%) and/or masters' graduates (31.2%) which may be correlated to their high knowledge of orthodontics. Most parents (93.6%) stated that a beautiful smile is essential for the healthy development of the child's personality. More than 75% of parents reported that orthodontic treatment usually takes years and more than 84% of parents stated that poor oral hygiene usually leads to failure of orthodontic treatment. A higher percentage(93.6%) of parents knew it is not advisable to start the orthodontic treatment before treating carious teeth, and59.2% of parents reported orthodontic treatments are usually expensive. A higher percentage (95%) of parents stated that orthodontic treatment should be provided by a specialist orthodontist only, 77.5% stated that patients with braces can visit the hygienist during the orthodontic treatment and 88.5% stated that diagnosis and treatment plan could not be formulated without taking dental impressions and x-rays. Approximately 55% stated that the best age of orthodontic treatment depends on child's gender and orthodontic problem, and a higher percentage (86.2%) of parents stated that orthodontic treatment could be done at any age with adequate oral and dental health. A higher percentage (81.7%)of parents stated that the most important factor in choosing their orthodontist is his/her reputation, more than the cost or the brand of the hospital or polyclinic and91.3% of the parents will treat their children that need the most treatment regardless of their gender, no preferential treatment between the boys or the girls. Around 60% said that if they cannot afford the treatment they delay it, and 40% said they may take a loan to pay for it, the numbers were close for boys and girls. **Conclusion**: It is concluded that there is a relatively high level of awareness and knowledge among parents in Saudi Arabia about orthodontics and orthodontic treatment. However, well designed randomized controlled trials with higher sample sizes are essential to validate our findings.*

Keywords: Parents' knowledge, awareness, orthodontics, orthodontic treatment, Saudi Arabia

1. Introduction

In recent years, the major emphasis in dentistry has moved from treatment and repair of damage to the prevention of disease, and the public's role is changing from passive recipient to participant in prevention[1]. Serving persons to assume responsibility for preserving their oral health is an imperative goal that cannot be succeeded without public education and motivation [2].Studies reported that, people who are dissatisfied with their facial appearances, however, often express more dissatisfaction with their teeth than with any other facial feature[3, 4].The lack of a proportional and attractive smile could influence the self-esteem of an individual, influencing the psychological and physical health. This condition can disturb the socio-emotional features of well-being and may impact social interaction [3, 4].

Earlier studies stated that children who are teased about their teeth expressed disappointment with their dental appearance and had a wish for orthodontic treatment [5, 6]. It is important to mention that orthodontic usages have increased recently, due to the occurrence in the prevalence and incidence of malocclusions, which currently represents as a public health problem around the world. Further, earlier studies have described that tooth misalignment might cause a number of difficulties, comprising social discrimination due to different facial appearance, oral function difficulties such as difficulties in jaw movements (lack of muscle coordination or pain), temporomandibular joint disorder, swallowing or speech, problems of the masticatory system, and increased susceptibility to trauma, periodontal disease or caries [7, 8].

Better patients' awareness of facial appearance and smile beauty modalities are detected more frequently in day-to-day clinical practice, and the orthodontic specialty is not an exemption[9]. In the current dentistry,for aesthetic reasons, the orthodontic treatments occupy a great importance. The delivery of orthodontic therapies has developed over the last few decades in alignment with the rise in the level of expectation from dental treatment and longevity reflected by society [5, 9, 10].In the recent years, an increase in the number of orthodontic treatments has been seen in most developed countries [5, 11]. Demand for orthodontic treatment is influenced not only by the malocclusion prevalence and severity but also by sex, socioeconomic status, and ethnic origin, as well as availability and funding of orthodontic services [12]. Awareness forms the origin for

planning oral health, which is an inseparable part of overall health.

Generally, decisions concerning orthodontic treatment are made in childhood, and desire for treatment is commonly influenced by parental awareness, attitudes, and values. Hence, the determination of parents' awareness of the early appliance of orthodontic treatment for their children is of great value. However, so far, limited studies have been published regarding the awareness about orthodontic and orthodontic treatments among parents in Saudi Arabia. Hence, the present study aimed to find out the awareness regarding orthodontics and orthodontic treatment among parents in Saudi Arabia

2. Methods

This cross-sectional survey was conducted at the King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia, from October to November 2020. A total of 218 parents were included in this study. Demographic variables such as age, family status, occupation, nationality, education level and parents' knowledge as well as their awareness of orthodontics and orthodontic treatment were collected using a standardized, validated questionnaire consisting of 32 different statements.

The study was conducted in accordance with the declaration of Helsinki, and the study protocol was approved by the Research Ethics Committee of King Faisal Specialist Hospital &Research Centre, Riyadh, Saudi Arabia.

3. Statistical analysis

Data analysis was carried out using Microsoft Excel 2010(Microsoft Corporation, Seattle, WA, United States) and Statistical Package for Social Sciences version 22 (SPSS Inc., Chicago, IL, United States). Descriptive analysis was used to analyze the data.

4. Results

Table 1 shows the demographic data of the parents. A higher percentage of parents within the age group 50-59 (29.3%) followed by 40-49 age group (24.8%). The majority of parents are having one (44.8%) or two of their kids (29.6%) under orthodontic treatment. A higher number of responders are mothers (50.5%) and majority of parents are university/masters graduates (88.5%).

Table 2 shows the awareness about orthodontic treatment among the study population. The majority (67.9%) of parents had not had orthodontic treatment. However, a higher percentage of parents (93.6%) stated that a beautiful smile is essential for the healthy development of the child's personality. A majority (75.2%) of parents reported that orthodontic treatment usually takes years. More than 84% of parents stated that poor oral hygiene usually leads to failure of orthodontic treatment, and 93.6% of parents stated that it is not advisable to start the orthodontic treatment before treating carious teeth. A higher percentage of parents (82.1%) stated that both hereditary and bad oral habits like mouth breathing or thumb sucking were important reasons for malocclusion in children. A higher percentage (59.2%) of the study population reported that orthodontic treatments are usually expensive. Almost 45% of parents' stress upon the importance of restoring and/or replacing missing teeth before starting orthodontic treatment, and 44.9% of parents stated that to increase the stability of their children's teeth, it is important to wear the retainers for long time.

Table 3 shows the orthodontic treatment preference among parents. Majority of parents (79.4%) usually consult more than one orthodontist. Gender was not an important factor for prioritizing orthodontic treatment for either boys or girls, 91.3% of parents reported whoever needs the treatment will have it, regardless the gender. If parents cannot afford orthodontic treatment if they are planning to buy a house, 60.6% prefer to delay orthodontic treatment as an option in favor to buy a house (39.4%). While if parents cannot afford orthodontic treatment for their kids, gender was not a factor for delaying, taking loan and/or cancelling the treatment. A higher percentage of parents (58.2 % for girls and 61% for boys) agree to postpone the treatment if they cannot afford it.

Choices of orthodontic specialist vs. general dentist as choice for managing the treatment were asked among the study population and it is displayed in table 4. A significant high percentage (95%) of responders stated that orthodontic treatment better to be provided by a specialist orthodontist, not by general dentist, 77.5% stated that they can visit the hygienist during the orthodontic treatment, 88.5% stated that diagnosis and treatment plan could not be formulated without taking dental impressions and x-rays. More than 81% stated that the most important factor in choosing the doctor by their reputation as an orthodontist.

Table 5 shows the preferred choice when to start orthodontic treatment among the study population. A higher percentage of parents (55.1%) stated that the best age of orthodontic treatment depends on orthodontic problem, and a higher percentage (86.2%) of parents stated that orthodontic problems could be done at any age with adequate oral and dental health.

5. Discussion

The oral-facial region is usually an area of important concern for the persons because it draws the premier attention from other people in interpersonal interactions and is the major source of vocal, physical, and emotional communication[13]. As a effect, patients who search for orthodontic treatment are concerned with improving their exterior and social acceptance, frequently more than they are with improving their oral function or health [13].It is well known that orthodontic treatment is a highly technique-sensitive and time-consuming clinical procedure[14]. Children and adolescents are the important category of the target group who look for orthodontic treatment. Hence, parents are the most imperative motivating factors to guidance the requirement for orthodontic treatment among children and adolescents. Recently, an escalation in the number of orthodontic treatments has been seen in majority of the industrialized countries [15, 16]. However, in

comparison with the developed countries, the number of research interventions on parents' knowledge and awareness of orthodontics and orthodontic treatment of children are limited in Saudi Arabia. Hence, in this present study, we aimed to find out parents' knowledge and awareness of orthodontics and orthodontic treatment of their children.

Studies reported that the demand for orthodontic treatment is subjective not only by the prevalence and severity of malocclusion but also by gender, socioeconomic position, and ethnic origin, as well as availability and funding of orthodontic services [15, 16]. For instance, it has been stated that girls, in general, experience orthodontic treatment more often than boys[17], we did find a slightly high percentage of parents preferred to treat their girls (7.8%) which is expected versus than their boys (0.9%) if they cannot afford both treatments.

In our study results showed that the majority of parents(79.4%) usually consult more than one orthodontist for their children, and among their children, 91.3% reported whoever (either male or female) needs the treatment preferred first regardless of their gender. Earlier studies stated that compared to male, females showed more concern for their appearance particularly among the teenagers [17, 18]. It should be noted here that 39.4% of parents of the present study population stated that they postpone buying houses in favors for their children's orthodontic treatment and a similar percentage of parents stated that they would take a loan to pay their children orthodontic treatment. It clearly shows that parents had good knowledge about the importance of the children's orthodontic treatment.

An earlier study stated that improving smile esthetic was found to be the keyinspiring factor for the patient [19]. Parents who observed the uneven teeth and their consequences in other children are more aware of motivating their children to experience orthodontic treatment to reach good dentition and esthetics. Tung, et al. stated in their study that 75% of parents were disappointed with their children's appearance of teeth and 54% of parents wanted their children to look pretty [20]. This is similar to our study, where the majority of parents (93.6%) stated that beautiful smile is important for the healthy development of the child's personality and ready to give high preference for their children orthodontic treatment.

Parents' knowledge and awareness of orthodontics and orthodontic treatment were high among parents, which confirms by parents' responses in the present study. A higher percentage (95%) of the responders stated that orthodontic treatment could be provided by a specialist orthodontist only, not by any dentist, 77.5% stated that they can visit the hygienist during their children's orthodontic treatment and 88.5% stated that diagnosis and treatment plan could not be formulated without taking dental impressions and x-rays. An earlier study determined that poor oral home care among orthodontic patients 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[21] and the present study showed higher percentage of parents are willing to visit the hygienist during the orthodontic treatment for their children (77.5%), which clearly showed that parents have a good level of awareness about the of orthodontics and orthodontic treatment. It is further confirmed by the responses that the majority of parents stated that they selected the doctors based on their reputation as a dentist. It should be noted here that the majority of our study participants were university graduates (57.3%) and 31.2% have master's or higher degree. Education level was an effective in increasing the level of parents' knowledge about orthodontic problems. An earlier cross-sectional study about parental knowledge and attitude towards early orthodontic treatment for their primary school children in Iran also showed that highly educated parents presented an considerably greater level of attitude and knowledge[22].

Orthodontic treatments are typically undergone by children and adolescents who have less attention and fewer skills to their oral health [23]. Hence, parental awareness is vital for orthodontic treatment and future life. In our present findings it shows that a higher percentage of parents stated that the best age of orthodontic treatment depends on the child gender and orthodontic problem and a higher percentage of parents stated that orthodontic treatment could be done at any age with good oral and dental health.

The study has few limitations which include relatively small sample size (218 participants), cross-sectional in nature and the limited number of risk factors examined. More studies on a larger scale are needed to address the limitations indicated in the study. Despite the limitations, the study delivers valuable data for parents' knowledge and awareness of orthodontics and orthodontic treatment in Saudi Arabia. Conclusively, the study shows that there is a high level of awareness and knowledge about orthodontics and orthodontic treatment among parents in Saudi Arabia. However, well designed randomized controlled trials with higher sample sizes are essential to validate our findings.

Table 1: Demographic data of the responders

Variables	Percentage	number
Age		
20-29	11.5%	25
30-39	19.3%	42
40-49	24.8%	54
50-59	29.3%	64
60-69	14.2%	31
70-79	0.9%	2
You are the		
Father	37.6%	82
Mother	50.5%	110
Other	11.9%	26
who pays for the treatment		
Me	61.9%	135
Health insurance	22.9 %	50
A government entity	9.2%	20
other	6%	13
Family status		
Married	90.8%	198
Divorced	6%	13
Widow	3.2%	7
Number of children		
1	9.2%	20
2	17%	37
3	14.2%	31

4	25.7%	56
> 5	33.9%	74
The number of children currently having orthodontic treatment (n=125)		
1	44.8%	56
2	29.6%	37
3	14.4%	18
>4	11.2%	14
Government employee		
Work in private sector	32.1%	70
Self employed	17.9%	39
Retired	9.2%	20
Student	27.5%	60
Other	3.2%	7
Government employee	10.1%	22
Your educational level		
High school and below	11.5%	25
University degree	57.3%	125
Master's degree and higher	31.2%	68
Nationality		
Saudi	83.9%	183
Non-Saudi	16.1%	35

Table 2: Awareness about orthodontic treatment among the study population

Variables	Percentage	number
Have you ever had orthodontic treatment?		
Yes	32.1%	70
No	67.9%	148
A beautiful smile is important for healthy development of the child's personality		
True	93.6%	204
False	6.4%	14
The orthodontic treatment usually takes		
Weeks	0.5%	1
Months	24.3%	53
Years	75.2%	164
The periodic orthodontic visit is usually every		
2 weeks	13.8%	30
4 weeks	61.4%	134
6 weeks	12.4%	27
8 weeks	12.4%	27
Poor oral hygiene usually leads to		
Failure of treatment	84.4%	184
Does not affect the treatment	15.6%	34
If the child have cavities in his teeth		
You can start the orthodontic treatment first then treat the cavities	6.4%	14
You cannot start the orthodontic treatment before treating the cavities	93.6%	204
The causes of malocclusion in children are		
Hereditary	6%	13
Bad oral habits like mouth breathing or thumb sucking	11.9%	26
Both	82.1%	179
Do you believe that the orthodontic treatments are usually expensive?		
The cost is usually reasonable	13.3%	29
The cost is usually high , but justifiable	27.5%	60
The cost is usually high and not justifiable	59.2%	129
If the patient had missing teeth		
They get replaced before the orthodontic treatment	44.5%	97
They get replaced after the orthodontic treatment	33.5%	73
No difference	22%	48
The teeth after finishing the orthodontic treatment will		
stay stable and never move	4.6%	10
You have to wear a retainer to stabilize the teeth for 6 months	28%	61
You have to wear a retainer to stabilize the teeth for 2 years	22.5%	49
If you want to guarantee the stability of the teeth you have to wear the retainers indefinitely	44.9%	98

Table 3: Orthodontic treatment preference among the study population

Variables	Percentage	number
Do you usually prefer to consult more than one orthodontist?		
Yes , I usually consult more than one orthodontist	79.4%	173
No , I start the treatment with the first orthodontist I consult	20.6%	45
If you have more than one child that need orthodontic treatment and you cannot afford to treat them all , you		
Prefer to treat the boys	0.9%	2
prefer to treat the girls	7.8%	17
treat whomever need the treatment more regardless of their gender	91.3%	199
If you were planning to buy a house and found out you need pay for child's treatment and cannot afford both at the same time , you		
Postpone buying the house	39.4%	86
Postpone the orthodontic treatment	60.6%	132
If you cannot afford the treatment of your "Daughter" , you		
Cancel the treatment	1.8%	4
Postpone the treatment	58.2%	127
Take a loan to pay for the treatment	40%	87
If you cannot afford the treatment of your "Son" , you		
Cancel the treatment	2.8%	6
Postpone the treatment	61%	133
Take a loan to pay for the treatment	36.2%	79
If you find that your child have crowding in his teeth		
You don't do anything until the growth is completes, because growth may solve the problem	11%	24
You have to treat the problem as soon as possible	8.7%	19
You have to consult an orthodontist because he will know the best time for treatment	80.3%	175

Table 4: Orthodontic treatment doctors involvement among the study population

Variables	Percentage	numbers
The orthodontic treatment can be provided by		
Any dentist	1.3%	3
A specialist orthodontist	95%	207
No deference between them	3.7%	8
Do you have to commit to one doctor?		
Yes , and you should not change your	30.7%	67

doctor		
No problem of having different doctors during the treatment	5.5%	12
You can change your doctor after you coordinate between them	63.8%	139
Can you visit the hygienist during the orthodontic treatment?		
Yes	77.5%	169
No	22.5%	49
The dentist can diagnose the case and propose the treatment by		
A clinical exam only	11.5%	25
The diagnosis and treatment plan cannot be formulated without taking dental impressions and x-rays	88.5%	193
What is the most important factor that affect how you choose your doctor?		
The source of his degree	7.3%	16
His reputation as a dentist	81.7%	178
The reputation of the dental center	6.9%	15
The expense of the treatment	4.1%	9

Table 5: Orthodontic treatment and starting treatment time among the study population

Variables	Percentage	numbers
The best age to start the orthodontic treatment is		
7 years	4.1%	9
10 years	4.6%	10
13 years	23.4%	51
16 years	12.8%	28
All are possible answers and best age depends on the child's gender and orthodontic problem	55.1%	120
The orthodontic treatment for the adults		
Cannot be done after age 30	5.1%	11
Cannot be done after age 40	8.7%	19
Can be done at any age with good oral and dental health	86.2%	188

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