

Attitudes and Awareness toward Advanced Orthodontic Procedures and Characteristic of Orthodontic Practice in Saudi Arabia

Hassan Alzoubi¹, JasserMarzouq Al Shamani Al Harbi² and Mohammed Sami Ahmed^{3*}

¹Assistant Professor of Orthodontics, Paediatric Dentistry and Orthodontics Department, College and Dental Hospital, Taibah University, Madinah, Kingdom of Saudi Arabia

²Dental internee, College and Dental hospital, Taibah University, Madinah, Kingdom of Saudi Arabia

³Associate Professor of Dental Public Health, Departments of Preventive Dental Sciences, College and Dental Hospital, Taibah University, Madinah, Kingdom of Saudi Arabia

***Corresponding author:** Dr. Mohammed Sami Ahmed, Associate Professor of Dental Public Health, Departments of Preventive Dental Sciences, College and Dental Hospital, Taibah University, Madinah, Kingdom of Saudi Arabia, Tel: +966531640794; E-mail: msamiahmad@hotmail.com

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Abstract

Introduction: Orthodontics is a specialty and technological innovation, which has a large role in determining its practice. Orthodontists have shown enthusiasm and willingness to incorporate developing technologies into their clinical practices despite limited independent scientific evidence.

Objectives: To evaluate the attitudes and awareness among orthodontists toward advancement of Orthodontic procedures in Saudi Arabia.

Methods: This is a cross sectional and descriptive questionnaire based study. A questionnaire composed of 30-items, containing multiple choices and check box was e-mailed to the seventy orthodontists practicing and licensed from different regions of Kingdom of Saudi Arabia. An orthodontist that did not respond subsequently contacted at least 3 times by email living in the different provinces of Saudi Arabia. The questionnaires were divided into segments: demographics, choosing orthodontic procedures and advances of their orthodontic practice. The data was analyzed by using SPSS version 21, Chicago, Illinois. Basic statistics and comparative analyses with chi-square were undertaken.

Result: A total of 63 orthodontists (50 males and 13female) completed the survey correctly and among them 35% were Saudi and 65% Non-Saudi. Response rate was 90%. Maximum numbers of orthodontist (35%) were from age group of 31-40years and least (8%) from 25-30 years (Table 1). Eighty-nine percent orthodontists were qualified as doctorate and master and mostly working as specialist and get qualification from Arab countries. Most of the orthodontists were using digital imaging 85%, 2-phase treatment 87% and functional appliance 92% Fig 1. Maximum number of orthodontists having PhD and Master degree using digital imaging and functional appliances where as others was using maximum self-ligating and invisalign.

Conclusion: The subjects are well aware toward advanced Orthodontic procedures such as self-ligating brackets, TADs and Invisalign as a new technique into their practices, and few were averse to using either.

Keywords: Digital imaging; Functional appliances; Invisalign; 2-phase treatment; Self-ligating

Introduction

Mal occluded teeth can cause psychosocial problems related to impaired dentofacial aesthetics to patients; in addition, it can affect oral health by increasing the prevalence of dental caries and periodontal diseases as well as temporomandibular disorders [1]. In developed countries, an increase in awareness of orthodontics among children and adult because of regular community oriented preventive program [2]. The correction of malocclusion into stable occlusal relationship can be brought by means of orthodontic appliances. Thus orthodontic function is to restore pleasant smile and esthetics with healthy masticatory function [3]. The success of the orthodontic treatment depends on many factors including the compliance of the patient and the level of awareness and attitude of the patients [4]. The latest developed occlusal indices have been used to quantify malocclusion severity and orthodontic need in an objective manner. Experience with their use in Europe suggests that they have a useful role in resources allocation and planning and better uniformity in patient identification and referral [5].

Orthodontics has gained immense popularity as a postgraduate dental specialty in Saudi Arabia and it is an evolving specialty, and technological innovation has a large role in determining how it is practiced [6]. Orthodontists have shown enthusiasm and willingness to incorporate developing technologies into their clinical practices despite of limited independent scientific evidence supporting efficacy. Along with technological innovation, the attitudes and aspirations of orthodontists will undoubtedly shape the practice of orthodontics [7].

Orthodontic practitioners, adopting the latest technology can help in delivering an enhanced level of treatment and it produces impressive results on the patients that can contribute significantly to a thriving practice. The general dentists who refer a patient for orthodontic treatment look to specialists who adopt the latest technology to ensure the favourable outcomes for their patients [8]. Certainly there still remains no substitute for the skill, experience, and education of a well-trained orthodontic practitioner. However, contemporary treatment philosophies are changing the way of treatments among majority of patients. The improvements in tools and techniques enable orthodontists to achieve great results with far less discomfort in short period of treatment time [9-11].

Aims and Objectives

The aim of this study was to evaluate the attitudes, awareness and obtain information's regarding advances orthodontic procedures, and characteristic of Saudi's orthodontic practice as well as to improve orthodontic practices in Saudi Arabia.

Materials and Method

This study was a questionnaire based cross sectional and descriptive study. Questionnaires having 30-items survey were emailed to the seventy licensed orthodontists practicing in different provinces of Saudi Arabia. An orthodontist that did not respond would subsequently contact at least 3 times by email. The orthodontists were invited to complete anonymously a 30-item survey containing multiple choice and check box answer. The personalized link prevented respondents

from completing the survey more than once. To ensure privacy and anonymity, no personal information was recorded and this clearly emphasized to all orthodontists with each communication. The survey questionnaire was divided into segments: demographics, reasons for choosing orthodontic procedures and advances of their orthodontic practice, and awareness toward evidence-based practice. The data was compiled into Statistical Package for Social Services version 22(SPSS Inc., Chicago, Illinois, USA). The frequency analysis and descriptive statistics were performed for all variables. Chi-square evaluations were undertaken to know the significant value ($P < 0.05$). Ethical approval for the study was obtained from the Ethical Committee of Taibah University College of Dentistry.

Result

A total of 70 orthodontists were emailed and out of this 63 participants (50 males, 13 female) completed the survey from all the region of Saudi Arabia. Response rate was 90%. Majority of respondents belong to the age group of 31-40 years and among them 80% were male. The number and percentage of participants according age, gender, nationality, qualification, place of obtaining qualification and job are shown in table 1. Majority of the orthodontists got qualification from Arab Countries 24(38) and doing job as specialists 26(41).

Table 1: Demographic data of respondent (N=63)

Respondents	N	%
Age		
25 – 30 years	5	8
31 – 40 years	22	35
41 – 50 years	18	28.5
51 years and above	18	28.5
Gender		
Male	50	80
Female	13	20
Nationality		
Saudi	22	35
Non-Saudi	41	65
Qualification		
PhD	24	38
Master	32	51
Others	7	11
Place of obtaining qualification		
America	13	20
Europe	17	27
Arab countries	24	38
Other Places	9	15
Job Status		
Academics and Consultants	15	24
Senior Specialists	11	17.5
Specialists	26	41
Residents	11	17.5

Figure 1 shows that most of the orthodontists were practicing functional appliances (92%) followed by 2-phase treatment (87%), TADs (73%), self-ligating bracket (78%) and less number of participants used lingual orthodontic, and clear Aligner Therapy. Among all 76% used cone-beam computerized tomography and 86% digital imaging.

Majority of orthodontists were using 3M Unitek company (44.4%) followed by American orthodontics company (31.7%) (Table 2). The orthodontists were asked the reason of using particular company, most of them replied because of the quality of bracket (Table 3).

Figure 1: Practice used by orthodontists in Saudi Arabia by percentage

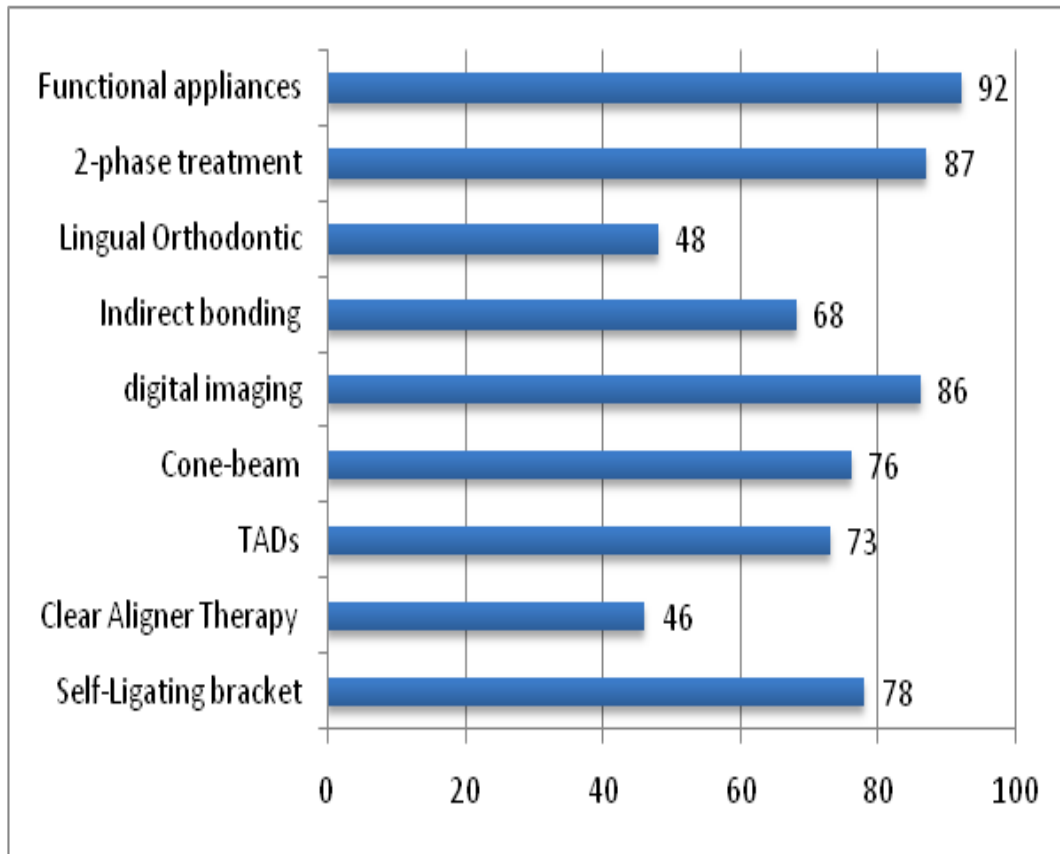


Table 2: The commonly used bracket by the orthodontists

SN	Types of bracket	N	%
1	3M Unitek	28	44.4
2	TP Ortho	2	3.2
3	American Orthodontics	20	31.7
4	Ormco	6	9.5
5	GAC	3	4.8
6	Ortho technology	1	1.6
7	Others	3	4.8

Table 3: Reason of orthodontists purchase brackets from a specific company

SN	Reason of orthodontic bracket purchase	N	%
1	Using it as an orthodontic student (Resident) and liked it	19	30.2
2	Quality of the Bracket	26	41.3
3	Customer Service	4	6.3
4	Ease of use	8	12.7
5	Cost	4	6.3
6	Being used by the practice	1	1.6
7	Popularity	1	1.6

Table 4 shows the liking of the orthodontic treatment according to the qualification of orthodontists. PhD holders generally used all the technique equally except invisalign, which was used by less percentage (37.5%) whereas fewer Master holders and others used lingual orthodontics. Other people used mostly self-ligating technique. Lingual orthodontics, indirect bonding and cone-beam method was significant relation with the qualification of the orthodontists ($P=0.007, 0.006, 0.000$).

Table 4: Orthodontics used according to qualification

Used	PhD N = 24	Master N = 32	Others N = 7	Chi-Squire (P value)
	No (%)	No (%)	No (%)	
Self-ligating	19 (79.1)	24 (75.0)	6 (85.7)	0.809
Clear aligner therapy: Invisalign	9 (37.5)	15 (46.8)	5 (71.4)	0.282
TADs	19 (79.1)	21 (65.6)	6 (85.7)	0.383
Cone-beam computerized tomography	20 (83.3)	26 (81.2)	2 (28.5)	0.007*
Digital imaging	22 (91.6)	26 (81.2)	6 (85.7)	0.545
Indirect bonding	22 (91.6)	18 (56.2)	3 (42.8)	0.006*
Lingual Orthodontics	19 (79.1)	10 (31.2)	1 (14.2)	0.000*
2-phase treatment	23 (95.8)	27 (84.3)	5 (71.4)	0.181
Functional appliance	23 (95.8)	32 (100)	3 (42.8)	0.000*

* Significant at the level of $P<05$

Table 5 show the orthodontics use according to the professional classification of jobs. Here we find that there were not many differences among orthodontists, academics, consultants, and senior specialists that were 93.3%, 81.8% and 69.2% using indirect bonding whereas residents were using only 18.1% of this technique. Use of lingual techniques was having very significant relation with the job status of the orthodontists (P value is 0.000).

Table 6 shows the relation of orthodontics technique used by the orthodontists who gained qualification from different places.

Discussion

In the presence study 92% orthodontists either they are PhD or master holders, were using functional appliance for orthodontic treatment. Mostly consultants, academician and senior specialists used self-ligating brackets and invisalign as compare to residents. In a Canadian study, most of the US respondents incorporate self-ligating brackets and Invisalign (Align Technology, Santa Clara, Calif) as a new technique into their practices, and few were averse to using either [12]. The extensive marketing of self-ligating brackets and Invisalign by orthodontic companies might influence their acceptance and most of our academicians and consultants were qualified from American and European countries. But the majority of orthodontists used functional appliances technique and brackets from 3M Company because of bracket quality like finishing, low breaking rate and comfort ability of the patients. 3M Company brackets are also available in most governmental and private centres and this could be explained by the high popularity of 3M Company among orthodontists in Saudi Arabia.

Nasir et al. reported that 50% of orthodontists residents were used self-ligating, 64% invisalign, 86% used TADs and about 72% planned to used cone-beam and 89% digital imaging. Indirect bonding and lingual orthodontic was used only 39% and 28% respectively. In our study results were more or less similar but indirect bonding and lingual orthodontic was used more as compare to Nasir et al. study. Nasir et al. studied on only residents who were new in their experience where as our study included academicians, consultants and senior specialities who has more working experiences.

An overwhelming number of respondents orthodontists plan to use Temporary Anchorage Devices (TADs), A group of orthodontists who met in 2004 reported that orthodontists are the best qualified to place TADs. 5 Most respondents indicated that they are using a digital imaging program, and some said they use Cone Beam Computerized Tomography (CBCT) for craniofacial imaging. It provides volumetric information by virtual three-dimensional imaging that help in diagnosing asymmetries in complex craniofacial patients [13]. This might be due to significantly reduces in the radiation doses and allows scans of patients with radiation exposure that is much closer to the dose from cephalograms. Indirect bonding and lingual orthodontics were used mostly by PhD and Master holder and practicing as academician and consultant as compare to specialists and residents. This might be a simply academician and consultants were more exposure during their training and experienced to develop confidence on this type of treatment whereas residents had limited exposure during their training and unfamiliarity with its philosophy and mechanics. Most orthodontists used 2-phase treatment and they believe that dentoalveolar outcome in 2-phase orthodontic treatment for Class II malocclusion gives good results. One-study clinicians found that 2-phase treatment approach to the treatment of class II malocclusion has not much difference in compare to 1-phase approach. Ninety two per cent orthodontists used functional appliances in our study in contrast no evidence from recent clinical evidence questioned on effectiveness of these appliances whether these appliances influence on facial growth and their skeletal effects [7,8,10,14].

Table 5: Orthodontics used according to Professional classification

Used	Academic & Consultant N = 15	Seni-Spec N = 11	Specialist N = 26	Resident & GP N = 11	Chi-Sqire (P value)
	No (%)	No (%)	No (%)	No (%)	
Self-ligating	13 (86.6)	9 (81.8)	20 (76.9)	7 (63.6)	0.557
Clear aligner therapy: Invisalgin	7 (46.6)	3 (27.2)	12 (46.1)	7 (63.6)	0.402
TADs	12 (80.0)	9 (81.8)	17 (65.3)	8 (72.7)	0.666
Cone-beam computerized tomography	13 (86.6)	8 (72.7)	21 (80.7)	6 (54.5)	0.249
Digital imaging	14 (93.3)	10 (90.9)	21 (80.7)	9 (81.8)	0.657
Indirect bonding	14 (93.3)	9 (81.8)	18 (69.2)	2 (18.1)	0.000*
Lingual Orthodontics	11 (73.3)	8 (72.7)	11 (42.3)	0 (0.0)	0.001*
2-phase treatment	13 (86.6)	11 (100)	23 (88.4)	8 (72.7)	0.290
Functional appliance	15 (100)	10 (90.9)	25 (96.1)	8 (72.7)	0.057

* Significant at the level of $P < 0.05$

Table 6: Orthodontics used according to place of qualification

Used	America N = 13	Europe N = 17	Arab Countries N = 24	Other Countries N = 9	Chi-Sqire (P value)
	N (%)	N (%)	N (%)	N (%)	
Self-ligating	10 (76.9)	13 (76.4)	17 (70.8)	9 (100)	0.353
Clear aligner therapy: Invisalgin	2 (15.3)	11 (64.7)	11 (45.8)	5 (55.5)	0.054
TADs	8 (61.5)	14 (82.3)	18 (75.0)	6 (66.6)	0.603
Cone-beam computerized tomography	11 (84.6)	15 (88.2)	17 (70.8)	5 (55.5)	0.225
Digital imaging	12 (92.3)	17 (100)	17 (70.8)	8 (88.8)	0.052
Indirect bonding	12 (92.3)	12 (70.5)	13 (54.1)	6 (66.6)	0.126
Lingual Orthodontic	12 (92.3)	11 (64.7)	6 (25.0)	1 (11.1)	0.000*
2-phase treatment	12 (92.3)	17 (100)	18 (75.0)	8 (88.8)	0.109
Functional appliance	12 (92.3)	17 (100)	20 (83.3)	9 (100)	0.191

*Significant at the level of $P < 0.05$

Functional appliances have been used for over 100 years in orthodontics to correct class II malocclusion. However despite these clinical effectiveness of these appliances is acknowledged and very useful in the correction of sagittal arch discrepancies [15]. Perhaps residents have reviewed these studies in detail and identified their deficiencies [16] or perhaps they see these approaches as potential practice builders [17] and because the growth modification is done with head-gear or a functional appliance, and it is equally effective and more efficient to do it during the adolescent growth [17]. All the orthodontists qualified from different countries or more or less experience consultant, academicians, senior specialists, specialists or residents all preferred to use functional appliances as it was convenient and they believed as it was used from a longer period.

Limitations

This study was an analytical cross-sectional study; therefore, no direct relationship between variables and outcomes can be proved. A second limitation is the potential reporting bias associated with the self-administered questionnaire with the possibility that subjects tend to over-report compliance.

Conclusion

The subjects are well aware toward advanced Orthodontic procedures such as self-ligating brackets, TADs and Invisalign as a new technique into their practices, and few were averse to using either.

Recommendations

According the results of this study, most of orthodontists know and use the advanced orthodontic procedures but there few were averse to using these procedures so, they have to improve their possibilities to deliver an enhanced level of treatment and impressive results for the patients that can contribute significantly to a thriving practice.

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