

Measuring Dental Student's Awareness and Knowledge About Lingual Orthodontics in Saudi Arabia

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ABSTRACT

Study Design: Cross-sectional

Aim: This study aimed to evaluate the student's knowledge about lingual orthodontics in Saudi Arabia

Methods: A cross-sectional study was conducted after receiving clarifications regarding the objectives of the research and signing a statement of informed consent. The participants of the study comprised of total number of 300 dental students (Male-185; Female-115) with age range from 18- to 30- years-old to understand the knowledge about lingual orthodontics in Saudi Arabia. The questionnaire was formulated and given and data was collected from dental students. The data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS 20). A P-value of less than 0.05 was considered to be statistically significant.

Results: Majority of the dentists 195 (65%) agreed to switch Lingual Orthodontic treatment from traditional braces. As many as 155 (52%) of dental students said that Lingual Orthodontic treatment better than traditional braces. When question was asked regarding the preference of orthodontic treatment they said 36 (12%) for conventional braces, 75 (25%) for self-ligating wire treatment, 69 (23%) for clear aligners and 120 (40%) agreed for Lingual braces treatment respectively. Only 96 (32%) of dental students said that lingual orthodontics will not take up a lot of clinical chair side time, 126 (42%) said yes to above question.

Conclusions: Study findings revealed that dental students possess a high level of knowledge and education towards lingual orthodontics. However, further progress is needed on all educational levels, in addition to advanced level training of lingual orthodontics. This questionnaire-based survey was undoubtedly helpful in analyzing how well-versed among dental students.

Keywords: Knowledge, Lingual orthodontics, Dental students, Malocclusion, Saudi Arabia.

INTRODUCTION

Lingual orthodontics, also known as "invisible braces," refers to a specialized branch of orthodontics that involves the use of braces attached to the inner or lingual side of the teeth, as opposed to the traditional approach where braces are placed on the front surface of the teeth. Because the braces are almost invisible to other people, this treatment option is more discreet and aesthetically pleasing.¹ Custom-made brackets and wires that are custom-made for each patient's teeth are used in Lingual orthodontics. When a person smiles or speaks, these brackets are bonded to the person's inner or lingual side of the teeth. With the discreet placement of the braces, lingual orthodontics are becoming increasingly popular with older teenagers and adults who want to straighten their teeth without giving traditional braces the appearance of the teeth. One of the main benefits of lingual

orthodontics is the ability to treat a variety of orthodontic problems, including spacing issues, overcrowding, and crooked teeth.² The patient will visit their orthodontist regularly to have adjustments made to their braces throughout the course of treatment. To move the teeth into their desired positions, the wires must be tightened or loosen to achieve this. Depending on the level of the case's complexity, the entire length of lingual orthodontic treatment can range from one to three years. Orthodontists are all in agreement that more patients are requesting a more visual alternative to their malocclusion than the current situation.³ Obvious orthodontic treatment discourages the treatment of many adult patients for aesthetic and functional reasons. Although orthodontist treatment has recently been viewed by both the general public and health professionals as being appropriate for younger patients, more adults are now accepting it. Linguistic orthodontics remain a distinct

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appliance despite the popularity of cosmetic brackets and clear plastic sequential appliances among many orthodontists and patients in recent years. Although cosmetic brackets may be used to conceal the orthodontist appliance's appearance, it still poses a problem for some patients.⁴ Therefore, the aim of this study is to assess the dental student's knowledge about lingual orthodontics in Saudi Arabia.

METHODS

A cross-sectional study was conducted after receiving clarifications regarding the objectives of the research and signing a statement of informed consent. The participants of the study comprised of total number of 300 dental surgeons (Male-185; Female-115) with age range from 20- to 30- years-old to understand the knowledge about lingual orthodontics. Simple random sampling method was employed in the study to collect the sample. Ethical approval [IRB/KKUCOD/ETH/2023-24/027] for performing the survey was obtained from the Scientific Research Committee of King Khalid University, College of Dentistry.

Questionnaire Structure: The study involved a total of 300 dental students at King Khalid University, Saudi Arabia. The questions were designed and were circulated through online google forms among dental students, questionnaire that was divided into two sections: demographic data (age, gender) and ten questions with multiple-choice responses and questions that had the option of being answered "yes" or "no", and multiple choice answers. Piloting was used to evaluate the questionnaire's validity and reliability.

Piloting: Before the main data collection, the questionnaire was pre-tested with a comfort sample of 20 dental students. These participants were interviewed to gather feedback on the questionnaire's clarity, length, and overall acceptability. Based on their feedback, necessary adjustments and corrections were made to the questionnaire.

Validity and Reliability: The questionnaire underwent validity and reliability testing to ensure that it measured what it intended to measure consistently. This is a common practice in survey research to ensure the quality and accuracy of the data collected. Validity was assessed to ensure that the questionnaire was appropriate for the study's objectives and the characteristics of the participants.

Data Evaluation: Both descriptive and analytical statistical strategies were employed to investigate the info collected from the individuals. The evaluation was executed using SPSS 18 software program. Overall, it seems like a structured and systematic approach was taken to design, test, and administer the questionnaire to gather data from dental students at King Khalid University for the research study. The use of pilot testing and validity checks reflects an effort to ensure the quality and reliability of the data collected.

RESULTS

A total of 300 (186 males and 114 females) dentists responded to the questionnaire. 42% were of 18-25 years, 38% were of 25-30 years and 20% of study subjects were of >30 years [Table. 1]. Knowledge among dental students on the lingual orthodontics were shown in Table. 2. The majority of participants, 267(89%) were said that they were aware about lingual orthodontics. Majority of participants 198(66%) said that they visited dentist before for dental treatment.

Participants 155(52%), stated that they have taken orthodontic treatment before. Majority of the dentists 195(65%) agreed to switch Lingual Orthodontic treatment from traditional braces. As many as 155(52%)

of dental students said that Lingual Orthodontic treatment better than traditional braces. When question was asked regarding the preference of orthodontic treatment they said 36(12%) for conventional braces, 75(25%) for self-ligating wire treatment, 69(23%) for clear aligners and 120(40%) agreed for Lingual braces treatment respectively. Only 96(32%) of dental students said that lingual orthodontics will not take up a lot of clinical chair side time, 126(42%) said yes to above question. Majority of dental students (85%) agreed to conduct increased awareness and training programs in lingual orthodontics.

Table 1. Demographic data includes Age and Gender

AGE	n (300)	%
18-25 years	126	42%
25-30 years	114	38%
>30 years	50	20%
GENDER		
Male	186	62%
Female	114	38%

Table 2. Response of dental student's towards knowledge about lingual orthodontics

QUESTIONNAIRE	n (300)	%
Q1. Have you heard about Lingual orthodontic treatment?		
Yes	267	89%
No	33	11%
Q2. Have you ever visited a dentist?		
Yes	198	66%
No	102	34%
Q3. Have you been on orthodontic treatment?		
Yes	155	52%
No	145	48%
Q4. What are your common concern while using lingual orthodontics?		
Long treatment duration	60	20%
Frequent patient visits	48	16%
Increased appointment duration	96	32%
Increased patient discomfort	45	15%
Increased breakages	51	17%
Q5. Can you switch to Lingual Orthodontic treatment from traditional braces?		
Yes	195	65%
No	69	23%
Don't know	36	12%
Q6. Is Lingual Orthodontic treatment better than traditional braces?		
Yes	155	52%
No	64	21%
Don't know	81	27%
Q7. Which appliance do you prefer for orthodontic treatment?		
Conventional Braces	36	12%
Self Ligating braces	75	25%
Clear Aligners	69	23%
Lingual braces	120	40%
Q8. Do you feel lingual orthodontics take up a lot of clinical chair side time?		
Yes	114	38%
No	126	42%

Don't know	60	20%
Q9. DO you feel lingual orthodontics take up a lot of clinical chair side time?		
Yes	126	42%
No	96	32%
Don't know	78	26%
Q10. Do you feel there is need to conduct increased awareness and training programs in lingual orthodontics?		
Yes	255	85%
No	24	8%
Don't know	21	7%

n = Number; % = Percentage.

DISCUSSION

The aim of this study was to assess the dental student's knowledge about lingual orthodontics in Saudi Arabia. Although orthodontic treatment has previously been viewed by both the public and clinicians to be a therapy for younger patients, the acceptance by more adults to seek treatment has increased. While in recent years, aesthetic brackets and clear plastic sequential appliances have gained popularity among many orthodontists and patients, lingual orthodontics remain a unique appliance on its own. The concept of a full, lingual, multibracket appliance can be attributed to Dr. Kinya Fujita and Dr. Craven Kurz, who independently developed appliances that could be placed on the inner surfaces of the teeth.⁵ Development of fully customized lingual systems using CAD-CAM technology has overcome major drawbacks associated with traditional lingual orthodontics. Bracket bases can be customized to precisely adapt to the lingual surfaces of each tooth, resulting in more accurate bonding, reduced bond failure, with an optimal finish being achieved more efficiently. Accurate bracket slot production and individualized archwires have also significantly reduced chairside archwire adjustments and contributed to improved efficiency and enhanced clinical outcomes. Fully customized brackets are designed to have a lower profile which minimizes the patient discomfort associated with lingual braces.⁶⁻⁸

Along with increasing modernization the appeal for aesthetics is increasing in common population. At the same time the ever increasing cost of living shortens the range of appliances preferred by population based on cost. Various appliance design with respect to biomechanical approach and materials are available which gives many options but along with that creates confusion regarding the selection of appliances both for patient and clinician.⁹ Therefore there is a need for evaluating the attractiveness, acceptability and value of various orthodontic appliances among population. Several studies have noted that the advancement in lingual systems have reduced limitations and allowed clinicians to successfully treat any case they would treat with traditional labial systems to a satisfactory level, including those combined with Herbst appliance and orthognathic correction of skeletal discrepancies.^{10,11} Yet, As many as 155 (52%) of dental students said that Lingual Orthodontic treatment better than traditional braces.

Orthodontics in their routine clinical practice, the difficulty they face during treatment and also the common concerns and perceptions about Lingual orthodontics.¹² Firstly, a sample size was estimated based on previous studies done related to the same topic. The sample size was calculated using software for sample size calculation. The sample size was estimated to be 300. A Questionnaire was then fabricated on Google Forms which was then circulated and collected the data for analysis. When question was asked regarding the preference of orthodontic treatment they said 36 (12%) for conventional braces, 75

(25%) for self-ligating wire treatment, 69 (23%) for clear aligners and 120 (40%) agreed for Lingual braces treatment respectively. Only 96 (32%) of dental students said that lingual orthodontics will not take up a lot of clinical chair side time, 126 (42%) said yes to above question. Future studies with a higher sample size and response rate need to be done in this area of research to better understand the factors influencing dentist's preference of adopting lingual orthodontics.

CONCLUSION

Study findings revealed that dental students possess a high level of knowledge and education towards lingual orthodontics. However, further progress is needed on all educational levels, in addition to advanced level training of lingual orthodontics. This questionnaire-based survey was undoubtedly helpful in analyzing how well-versed among dental students. Technical difficulties, availability of alternative appliances, lack of demand and patient discomfort were some of the factors that may be the reason for not going for lingual orthodontics in current practices.

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Competing Interest: None

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