

Diagnosis and Referral of Orthodontic Cases: An Institutional Survey among Dental Graduates

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ABSTRACT

General dentists play an important role in intercepting the progression of malocclusion. The right stage of referral to specialist orthodontist is considered key to the success of orthodontic treatment. The objective of this study was to assess the preparedness of fresh dental graduates in dealing with orthodontic patients in general dental practice. A total of 80 general dentists who had recently completed the BDS program formed the study group. They were asked to respond to a self-administered questionnaire consisting of case scenarios to evaluate their knowledge of Angles classification, occlusal characteristics, the ideal stage of treatment and need for referral to specialist orthodontist. The response rate was 75% (n = 60). 87% (n = 52) correctly identified the Angles Classification of the presented cases. 87% (n = 52) and 100% (n = 60) correctly identified overbite and over-jet cases. Cross bite and deviated midline was correctly identified by 68% (n = 41) and 65% (n = 39) of the respondents respectively while 93% (n = 56) diagnosed median diastema correctly. Almost all the respondents (97%) identified the cases which have to be referred to the orthodontist while, more than half (55%) did not know the ideal time to initiate orthodontic treatment. The graduates recognized their limits of personal competence and successfully identified the cases that need to be referred to the orthodontist. Proper emphasis should be placed on the 'the ideal time of referral and initiation of treatment' during undergraduate orthodontic training.

Keywords: Orthodontic patients, Malocclusion, General dental practice, Dental graduate.

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INTRODUCTION

Traditionally orthodontics has rarely received enough emphasis in the undergraduate years to qualify graduates to practice orthodontic diagnosis and treatment with the same degree of proficiency as operative dentistry, surgery or prosthetic dentistry.¹ Orthodontic practice is largely seen

as a specialist's job and undergraduate programs do not usually train students in treatment of moderate to severe malocclusion cases more so when treatment involves fixed orthodontic therapy.²

Significant changes have occurred in the practice of orthodontics during the past three decades. Globally, there has been an increasing number of GDPs providing orthodontic services.³ Several studies have been conducted to determine the number of GDPs providing orthodontic care. Of the 500 GDPs surveyed in Indiana, 17.9% provided comprehensive orthodontic treatment.⁴ A study by Wolsky and McNamara found that 19.3% of the GDPs surveyed in Michigan provided comprehensive orthodontic treatment.⁵ Konchak and McDermott⁶ reported that 20 to 34% of fully banded orthodontic patients in Canada were being treated by GDPs.

Despite GDPs' limited orthodontic education and training in dental school, there are certain areas of orthodontic therapy that may fall within the realm of the general dental practice (GDP). They play an important role in intercepting the progression of malocclusion. An accurate understanding of the 'criteria for treating or referring patients' and the 'right stage of referral to the orthodontist' by the GDPs is essential for the success of orthodontic treatment.⁶ Hence, an attempt was made to assess the preparedness of fresh dental graduates in dealing with orthodontic patients in GDP.

MATERIALS AND METHODS

Study Group

The study was designed as a cross sectional survey. Eighty fresh graduates from the King Khalid University (KKU) College of Dentistry (COD), in the Kingdom of Saudi Arabia (KSA), who had entered the general dental practice, were randomly selected to form the study group. The entire group had undergone orthodontic training at various levels of their pre doctoral dental program. Care was taken not to project the survey as an examination and it was conducted in a cordial atmosphere.

The Questionnaire

A self-administered case-scenario based questionnaire was structured under three sections to evaluate the preparedness

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of the study group. The case scenarios were grouped into three sections namely; ‘Diagnosis’, ‘what to refer’ and ‘when to refer’? The first section aimed at elucidating their ability to diagnose common malocclusion traits encountered in GDP and included case scenarios related to Angles classification, over jet, over bite, cross bite, deviated midline and median diastema cases. The idea was to explore whether they can build up on the knowledge of Angles classification and identify the characteristics of occlusion. In the next section, their ‘decision making skills’ were tested to verify if they were aware of the criteria for treating or referring patients. The last section involved assessing their knowledge in comprehending the ideal stage of initiating/referring to the orthodontic treatment. The questionnaire was printed and handed individually to the study group. They were given a time period of 2 weeks to return the completed questionnaire. Participation was voluntary and the overall response rate was 75%. The collected data were analyzed using Microsoft Excel 2013 program and descriptive statistics were obtained.

RESULTS

Completed questionnaires were returned by 60 participants, giving a response rate of 75%. Eighty-seven percent (n = 52) of the respondents correctly identified the Angles classification of the presented cases (Fig. 1).

Eighty-seven percent (n = 52) and 100% (n = 60) correctly identified over bite and over-jet cases. Cross bite and deviated midline was correctly identified by 68% (n = 41) and 65% (n = 39) of the respondents respectively. Ninety-three percent (n = 56) of the respondents diagnosed median diastema correctly. The results are summarized in Table 1.

To the cases construed by surveyors as treatable by the orthodontist and not by GDPs, 86.7% (n = 52) of the future GDPs correctly responded that they would refer it to a specialist (Fig. 2).

Regarding the respondents’ responses to the ‘right time’ to initiate orthodontic treatment, 55% (n = 33) of the respondents could not correctly decide the right stage for treating malocclusion according to dental age (Graph 1).

Only 50% (n = 30) of them correctly decided the right age of treatment according to skeletal age (Graph 2). Thirty percent (n = 18) were not sure of the time of treatment (Graph 2).

DISCUSSION

This is the first institutional cross sectional study conducted in KSA to assess the diagnostic and decision making skills of fresh dental graduates related to orthodontic cases routinely encountered in GDP. In interpreting the findings of the present study, it is important to acknowledge the possible

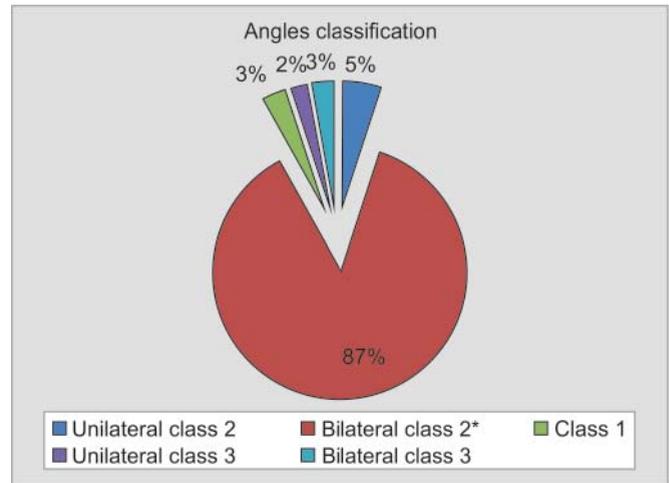


Fig. 1: Angles classification of the presented case (*Correct Answer)

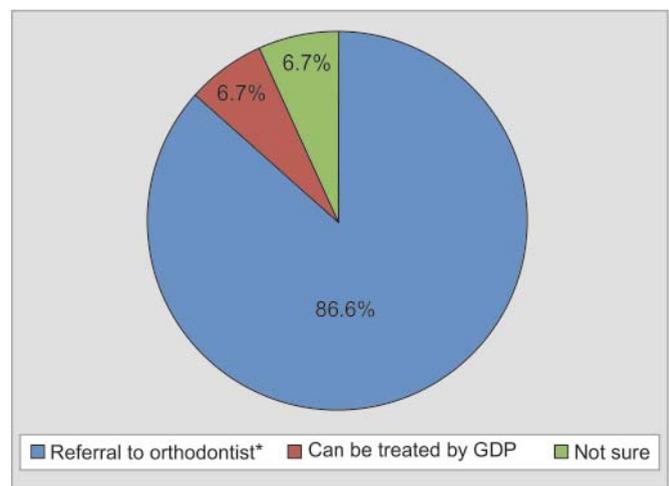
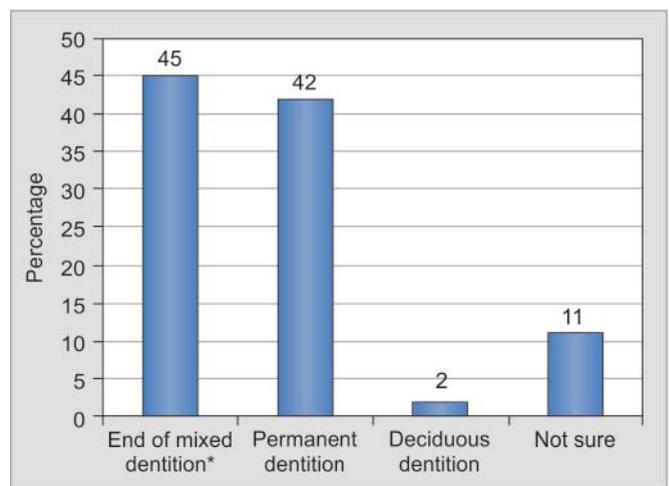
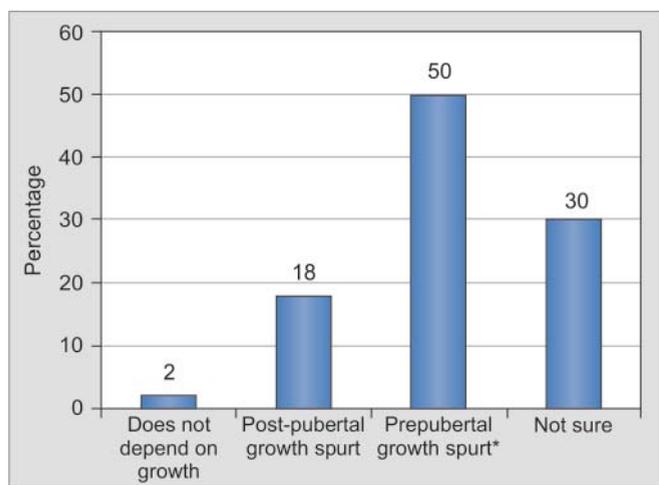


Fig. 2: Management of the presented case (*Correct Answer)

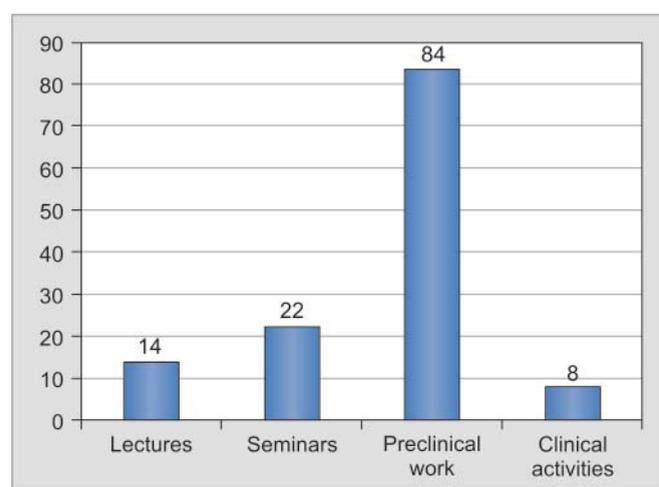


Graph 1: Ideal stage for orthodontic treatment and referral for the presented case according to dental age (*Correct Answer)

limitations. First, the sample size was small and therefore the results cannot be generalized to all the fresh dental graduates. In addition, cross-sectional studies are often limited by respondent bias, but can serve as impetus for further studies



Graph 2: Ideal stage for orthodontic treatment and referral for the presented case according to skeletal age (*Correct Answer)



Graph 3: Undergraduate orthodontic curriculum contact hours at KKU COD

in this area. There is limited research conducted in this area; therefore, it was difficult to make comparisons.

Orthodontics occupies a small proportion of total undergraduate curriculum hours in most of the dental schools.⁷ Similarly, at KKU COD, the undergraduates are exposed to 14 hours of didactic teaching, 84 hours of preclinical laboratory work, 22 hours of seminars and group discussions as well as 8 hours of clinical activities (Graph 3). Although the emphasis is placed on the removable appliances, they are taught about the functional appliances, and certain aspects of fixed orthodontic therapy.

Eighty-seven percent ($n = 52$) of the respondents were able to correctly identify the Angles classification of the presented cases (Fig. 1). The high percentage of correct answers may be due to the fact that Angles classification has been taught over the last 30 years in all undergraduate Orthodontic curricula and the respondents would have found it easy to understand and identify Angles classification of malocclusion. The study sample showed moderate to good clinical proficiency in diagnosing various simple to moderate malocclusions. All of them (100%, $n = 60$) correctly diagnosed the case with increased over jet. Eighty-seven percent ($n = 52$) of them were able to diagnose overbite respectively. This is a positive sign as these are the type of cases that are regularly encountered during general practice.

The surveyor had construed identification of a deviated midline and cross-bite to be easy; however, 35% ($n = 21$) of the respondents could not identify a deviated mid line and 10% ($n = 6$) among them, were not sure of the answer (Table 1). Thirty-two percent ($n = 19$) could not identify a cross-bite and 12% ($n = 7$) among them, were not sure of the answer (see Table 1). Even more surprising was the nonidentification of median diastema by 4% ($n = 6$) of the respondents (Table 1). These results suggest certain changes to be made to the undergraduate orthodontic curriculum. Testing the preparedness of graduating dentists while dealing with orthodontic patients in GDP scenario should become an integral part of Orthodontic training. The author also suggests conducting similar audits for other specialties, such as oral surgery and prosthodontics to assess the preparedness of graduates to deal with patients in general dental practice.

GDPS have to be well aware of the criteria for treating or referring patients. A significant lacuna in their knowledge of the stage for initiation of orthodontic treatment was discovered (Graphs 1 and 2). Delayed treatment can have an adverse impact on the prognosis of the treatment. 86.7% ($n = 52$) of them could appropriately identify the malocclusion that required specialist attention (Fig. 2). Emphasis should be placed while training with regards to the 'criteria of treating and referring' and 'the right stage of dental development for the referral'.

On graduation, a dentist should be able to recognize a malocclusion, know which patients to refer, to whom they should be sent, at what stage of dental development the

Table 1: Respondents' responses to the occlusal characteristics of the presented cases

Case response	Increased over jet		Increased over bite		Cross bite		Deviated midline		Median diastema	
	n	%	n	%	n	%	n	%	n	%
Yes	60*	100	52*	87	12	20	15	25	2	3
No	0	0	7	12	41*	68	39*	65	56*	93
Not sure	0	0	1	2	7	12	6	10	2	3
Total	60	100	60	100	60	100	60	100	60	100

(*Correct Answer)

referral is appropriate, and be able to handle orthodontic cases in a manner that improves the overall quality of dentistry offered.^{8,9} It therefore follows that an adequately qualified oral health workforce is the key to providing the best possible orthodontic and oral health service to the population. However, as far as orthodontics is concerned, such a workforce may not necessarily consist solely of specialist orthodontists. Dentists who do not possess the title of orthodontic specialist are allowed to perform orthodontic procedures provided that they possess the necessary knowledge and skills.⁷

Malocclusion is highly prevalent in Saudi Arabian population and much of the published research has shown an increased demand for orthodontic treatment in the Kingdom.¹⁰⁻¹² The literature reports that 20 to 50% of all orthodontic treatments are performed by GDPs with no certificate or degree of specialization in orthodontics.^{2,13} In this background, GDPs can be encouraged to treat simple to moderate malocclusions. Marquesa et al¹⁴ did a blind comparative evaluation of the quality of orthodontic treatment performed by orthodontists and general dentists based on the guideline established by the Cast/Radiograph Evaluation proposed by the American Board of Orthodontics. They found that orthodontists achieved better quality outcomes and had taken less treatment time than cases treated by general dentists. The author suggests that, GDPs should attend continuing education programs and hands-on training workshops to improve their knowledge and skills, prior to patient treatment.

CONCLUSION

The study found that the fresh graduates showed moderate to good clinical proficiency in diagnosing various simple to moderate malocclusions. They can therefore be trained to treat simple malocclusions in their routine dental practice. They recognize their limits of personal competence and successfully identified the cases that need to be referred to the orthodontist. Proper emphasis should be placed on the 'the ideal time of referral and initiation of treatment' during undergraduate orthodontic training.

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