

Orthodontists and Orthodontic Residents' Education: Effect on Professional Attitudes and Behavior

Abstract

Introduction: Dental education aims at shaping the future professional behavior of their students, thus contributing to reduce oral health disparities and increasing care for the society. **Objective:** The objective of this study was to access the perception of the quality classroom-, clinic-, and community-based orthodontic postgraduate education devoted to the management of cleft lip palate cases, surgical orthodontic cases, and growth modification cases. **Null Hypothesis:** No relationship exists between the quality of postgraduate dental education and professional attitude and behavior in providing care to cleft lip palate cases, surgical orthodontic cases, and growth modification cases. **Materials and Methods:** A total of 200 active members were involved. The first group included approximately 100 residents of Central India and the second group consisted of approximately 100 active orthodontists of Central India. The questionnaire was given to each group about the different clinical condition. Answers were given on 5-point scale to access the professional attitude and behavior. **Conclusions:** The finding of this study challenges administrators about the postgraduate dental program in the specialty of orthodontics and reflects the degree to which this education contributes to the orthodontic health of the society.

Keywords: Cleft lip and palate, growth modification, orthodontist, residents, surgical orthodontic

Introduction

The most visible mission of dental education is to develop future professionals. With advances in science and technology and increasing needs of the patient, there is a shift toward greater accountability to the society. This, in turn, increases the responsibility of the education system as a whole.

Terrell and Beaudreau^[1] argued that Dental Colleges are meant to take up the responsibility of preparing dental professionals in such a way that they accept their civic responsibility of providing care for needy patients. Several studies of dental students found that the providers of education better evaluate their educational preparation to provide care to needy patients.^[2]

The absence of competent dental education can lead to a lack of confidence in the ability to effectively treat patients from certain groups, and this lack of confidence might ultimately affect provider's willingness

to treat or quality of treatment.^[3] Burtner and Dick^[4] found negative (poor) attitude of dentist in providing care to the patients with special needs as cleft lip and palate. In turn, positive attitude becomes part of the motivation to provide care for these patients.^[5] In India, no research so far has analyzed whether postgraduate orthodontic education has correlation with professional attitude in the management of cases of severe skeletal malocclusion as cleft lip and palate, growth modification cases, and surgical orthodontic cases.

Thus, a study was planned to analyze the degree to which orthodontic residents and orthodontic practitioners (both have studied the same syllabus) perceived that their postgraduate orthodontic education has prepared them to treat cases of severe skeletal malocclusion as cleft lip and palate, skeletal malocclusion in growing patients by growth modification, and skeletal malocclusion in nongrowing patients using orthodontic surgical approach and whether this education affected their professional attitude and behavior in providing care to these cases.

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Aim

The aim of this study was to determine the relationship between the quality of postgraduate dental education and professional attitude and practice behavior of orthodontist and orthodontic residents in the management of cleft lip and palate, growth modification, and orthodontic surgical malocclusion patients.

Materials and Methods

This research was approved by the Institutional Ethics Committee.

Data were collected from 100 orthodontic residents and 100 practicing orthodontists who are members of orthodontic society. A questionnaire was mailed to randomly selected orthodontist and orthodontic residents. The validity of the questionnaire was tested by face validity (discussing with fellow orthodontist) and from a psychometrician (expert in questionnaire).

The survey from both groups assessed the respondents’ demographic and practice characteristics as well as their educational experiences concerning providing care for three patients groups [Table 1]. The three groups were patients with cleft lip and palate, growth modification, and orthodontic-surgical malocclusion patients. In addition, the respondent’s professional attitude concerning the treatment of these patients groups was assessed. The residents were asked to indicate their behavioral intentions concerning providing care for these patients in their future professional lives. Practicing orthodontist was asked about their current professional behavior concerning care to these patients.

The survey included six educational items designed to elicit the respondent’s perception of the quality of their theory-based and clinical-based education about treating patients of the three groups [Tables 2 and 3].

Table 1: Demographic and practice characteristics of the two respondent groups, in this study, by percentage of total respondents in each group

	Residents (%)	Orthodontists (%)	P
Gender			
Male	61	74.6	0.07
Female	39	24.39	
Age (years)			
Mean			
SD	26.86	34.86	0.03
Range			
Practice characteristic	NA		
Mean		7.71	NA
Range		4 month - 40 years	NA
Solo practice		90%	
Team		10%	

NA – Not applicable

The second analysis included responses to 15 items concerning attitude toward treating patients for cleft lip and palate, growth modification, and orthodontic-surgical malocclusion patients.

One additional consideration was that the orthodontist reported their actual professional behavior concerning the treatment of patients while the orthodontic residents reported their intentions to treat these patients in their future professional lives. If the actual number of patients treated by the residents at the time of the survey had been included in these analyses, this variable would not have reflected the residents’ own motivation for treating because during residency programs the students treated assigned patients and cannot freely choose whom they would like to treat. Therefore, the respondents indicated their behavioral intentions concerning treating these patients in the future because research has found that behavioral intentions are the best predictors of future behavior. To construct a behavioral indicator, the numerical responses of the orthodontists concerning how many patients from a certain group “ I like to treat” were provided on five-point answer scale ranging from “disagree strongly” to “agree strongly.” The responses “1” to “3”(disagree strongly, disagree, and neutral) were categorized as an indication of not being likely to treat these patients, and the responses “4” and “5” (agree and agree strongly) were categorized as having a behavioral intention to treat these patients. By categorizing the actual professional behavior of the orthodontist and the behavioral intentions of the orthodontic residents, a behavioral-dependent variable was created [Tables 4 and 5].

Data were analyzed with SPSS version 20 (IBM, Armonk, NY). Factor analyses were used to construct educational and attitudinal indices. The reliability of these scales was determined by computing a Cronbach’s alpha reliability coefficient for each scale. Descriptive statistics (percentages and means) were used to provide an overview of the distribution of respondents’ answers concerning the concept of interest [Tables 1-3]. Correlation analyses with Pearson correlation coefficients were performed to determine whether the educational background responses and the attitudinal responses correlated as predicted [Table 5].

Results

Table 1 provides an overview of demographic and practice characteristics of the residents and orthodontists participating in this study. This table shows that while both groups of respondents males were more, the percentage of female residents was larger than the percentage of female orthodontists (39% vs. 24.39%) Residents were, of course, on average, significantly younger than orthodontists (26.86 years vs. 34.86).

Information about the practice characteristics of the orthodontists showed that they had on average practiced for

Table 2: Respondents' assessment of their educational experiences concerning different groups, by percentage of total respondents in each category

	Respondents	1 and 2	3	4 and 5	Mean (SD)	P
Cleft lip and palate						
Theory education during postgraduation prepared me well to treat cleft lip and palate	Residents	20	29	51	3.45 (1.02)	0.20
	Orthodontists	23	12	65	3.66 (1.21)	
Clinical education during postgraduation prepared me well to treat cleft lip and palate	Residents	21	20	59	3.53 (1.03)	0.83
	Orthodontists	23	15	62	3.56 (1.26)	
Growth modification						
Theory education during postgraduation prepared me well to treat patients by growth modification	Residents	01	13	86	4.23 (0.70)	0.84
	Orthodontists	06	04	90	4.25 (0.88)	
Clinical education during postgraduation prepared me well	Residents	2	13	85	4.22 (0.74)	0.90
	Orthodontists	7	6	87	4.20 (0.90)	
Surgical orthodontics						
Theory education during postgraduation prepared me well to treat surgical orthodontic cases	Residents	26	24	50	3.31 (1.22)	0.98
	Orthodontists	24	28	48	3.31 (1.16)	
Clinical education during postgraduation prepared me well to treat surgical orthodontic cases	Residents	25	22	53	3.43 (1.16)	0.65
	Orthodontists	25	26	49	3.34 (1.28)	

Answers were given on five-point answer scales from 1=disagree strongly to 5=agree strongly. Responses "1" and "2" were combined, and responses "4" and "5" were combined. SD – Standard deviation

7.71 years (ranges from 4 months to 40 years) and almost all orthodontists practiced in solo practice (90%).

Educational experience

Table 2 provides descriptive statistics concerning the residents and orthodontist's perception of the quality of their own educational experiences in treating cleft lip and palate cases, growth modification, and surgical orthodontic malocclusion patients. Relatively higher percentages of both residents and orthodontists agreed/agreed strongly with the statement that theory and clinical education prepared them well to treat growth modification cases (theory education residents 86% and orthodontists 90% and clinical education residents 85% and orthodontists 87%). Concerning educational experience in treating cleft lip and palate cases and orthodontic surgical malocclusion, shows that lower percentages of residents and orthodontist agreed/strongly agreed that their theory and clinical education prepared them well to treat cleft lip and palate cases (theory education residents 51% and orthodontists 65% and clinical education residents 59% and orthodontists 62%) and still lower percent agreed/strongly agreed that they were well prepared to treat orthodontic surgical malocclusion (theory education; residents 50% and orthodontists 48% and clinical education: residents 53% and orthodontists 49%).

Professional attitude and behavior

Table 3 provides an overview of professional attitude concerning the treatment of patients from the three groups of interest. This table shows that the majority of residents and orthodontists said they like to treat patients of cleft lip and palate (residents 83% and orthodontists 87%) and orthodontic surgical cases (residents 92% and orthodontists 92%) but only 78% residents and 79% orthodontists agreed/strongly agreed

with the statement "they like to treat growth modification cases."

To the second question, "I like to refer cases to government or corporate hospital" for all the three group of patients, majority residents, and orthodontists disagreed, for cleft lip and palate (residents 81% and orthodontists 76%), growth modification (residents 97% and orthodontists 95%), and surgical orthodontic cases (residents 89% and orthodontists 88%).

For the next three questions, cleft lip and palate, growth modification, and surgical orthodontic cases, both residents and orthodontists disagreed/strongly disagreed. In the management of cleft lip and palate, to the statements "I like to treat only by alignment of teeth by fixed mechanotherapy (residents 89% and orthodontists 83%)," "I do not treat because treatment duration is long (residents 83% and orthodontists 90%)," and "I do not treat because of financial reasons (residents 85% and orthodontists 90%)." Similarly, in the management by growth modification majority disagreed to the statements "I like to treat only by alignment of teeth by fixed mechanotherapy (residents 93% and orthodontists 80%)," "I do not treat because treatment duration is long (residents 84% and orthodontists 86%)," and "I do not treat because of financial reasons (residents 85% and orthodontists 91%)." In the management of surgical orthodontic cases, majority disagreed to the statements "I like to treat only by alignment of teeth by fixed mechanotherapy (residents 95% and orthodontists 98%)," "I do not treat because treatment duration is long (residents 85% and orthodontists 92%)," and "I do not treat because of financial reasons (residents 88% and orthodontists 93%)."

Table 3: Professional attitudes concerning the treatment of patients with different groups, by the percentage of total respondents in each category

	Respondents	1 and 2	3	4 and 5	Mean	P
Cleft lip and palate						
I like to treat cleft lip and palate case with a multidisciplinary team	Residents	10	7	83	4.15 (1.10)	0.85
	Orthodontists	10	03	87	4.12 (1.07)	
I like to refer cleft lip and palate cases to government/corporate hospitals	Residents	53	28	19	2.49 (1.28)	0.82
	Orthodontists	62	14	24	2.54 (1.23)	
I like to treat cleft lip and palate cases only by alignment of teeth by fixed mechanics	Residents	69	20	11	2.14 (1.21)	0.92
	Orthodontists	70	13	17	2.16 (1.23)	
I do not treat because treatment duration is long	Residents	72	11	17	2.17 (1.37)	0.08
	Orthodontists	84	6	10	1.85 (1.06)	
I do not treat because of financial reasons	Residents	76	9	15	2.09 (1.31)	0.17
	Orthodontists	85	5	10	1.83 (1.09)	
Growth modification						
I like to treat growth modification cases by functional or orthopedic applications	Residents	14	8	78	3.93 (1.14)	0.89
	Orthodontists	14	7	79	3.95 (1.18)	
I like to refer growth modification cases to government/corporate hospitals	Residents	78	19	3	1.83 (0.91)	0.35
	Orthodontists	83	12	5	1.70 (0.93)	
I like to treat growth modification cases only by fixed mechanics	Residents	79	14	7	1.85 (1.01)	0.08
	Orthodontists	78	2	20	2.13 (1.03)	
I do not treat because treatment duration is long	Residents	68	16	16	2.09 (1.37)	0.60
	Orthodontists	80	6	14	1.98 (1.29)	
I do not treat because of financial reasons	Residents	72	13	15	2.12 (1.31)	0.06
	Orthodontists	88	03	09	1.76 (1.26)	
Surgical orthodontics						
I like to treat surgical orthodontic cases with a multidisciplinary team	Residents	1	7	92	4.46 (0.67)	0.63
	Orthodontists	5	3	92	4.41 (0.87)	
I like to refer surgical orthodontic cases to government/corporate hospitals	Residents	65	24	11	2.25 (1.10)	0.33
	Orthodontists	68	20	12	2.80 (5.56)	
I like to treat surgical orthodontic cases only by alignment of teeth by fixed mechanotherapy	Residents	82	13	5	1.87 (0.90)	0.39
	Orthodontists	87	11	2	1.76 (0.78)	
I do not treat because treatment duration is long	Residents	82	3	15	1.95 (1.27)	0.06
	Orthodontists	91	1	8	1.64 (1.03)	
I do not treat because of financial reasons	Residents	76	12	12	2.01 (1.25)	0.01
	Orthodontists	90	03	07	1.62 (0.94)	

Answers were given on five-point answer scales from 1=disagree strongly to 5=agree strongly. Responses “1” and “2” were combined, and responses “4” and “5” were combined. *P*<0.05- statistically significant

Relationship between educational experiences and professional attitudes and behavior

A primary goal of this study was to assess the relationship between educational experiences with professional attitude that addressed the treatment of patients of special needs as cleft lip and palate, severe malocclusions requiring surgical orthodontic treatment, and growth modification approach which modifies growth at early age with simple appliances;. Table 5 shows correlations of educational responses with the professional attitudes and behaviors. The educational experiences and attitude to treat were analyzed for three different clinical conditions for providing care to cleft lip and palate cases, 83% residents and 87% orthodontists want to treat; however, their theory and practical knowledge of residents are 51%–59% and of orthodontist are 65%–62%; growth modification cases, 72% residents and 78% orthodontists want to treat and their theory and

practical knowledge of residents are 86%–85% and of orthodontist are 90%–87%; surgical orthodontic cases, 92% residents and orthodontists want to treat but the theory and practical knowledge of residents are only 50%–52% and of orthodontist are 48%–49%.

Discussion

A number of studies have demonstrated the effect of dental education on the professional attitudes of future providers and on their actual professional behavior.^[3-5] The objective of this study was to explore the quality of postgraduate dental education and its impact on the professional behavior of orthodontic postgraduate students as well as practicing orthodontists.

Data were collected from practicing orthodontists and residents in orthodontics of dental colleges. The

Table 4: Percentages of orthodontists and residents educational experience behavior

S. No	Category	Resident agree	Orthodontist agree	Resident disagree	Orthodontist disagree
1.	Theory education during postgraduation prepared me well to treat A, B, and C cases				
	Cleft lip and palate	51	65	49	35
	Growth modification	86	90	14	10
	Surgical orthodontics	50	48	50	52
2.	Clinical education during postgraduation prepared me well to treat A, B, and C cases				
	Cleft lip and palate	59	62	41	38
	Growth modification	85	87	15	13
	Surgical orthodontics	53	49	47	51
3.	I like to treat A, B, and C cases with multidisciplinary team				
	Cleft lip and palate	83	87	17	13
	Growth modification	72	79	22	21
	Surgical orthodontics	92	92	8	8
4.	I like to refer A, B, and C cases to government/corporate hospital				
	Cleft lip and palate	19	24	81	76
	Growth modification	03	05	97	95
	Surgical orthodontics	11	12	89	88
5.	I like to treat A, B, and C cases with only by alignment of teeth by fixed mechanotherapy				
	Cleft lip and palate	11	17	89	83
	Growth modification	07	20	93	80
	Surgical orthodontics	05	02	95	98
6.	I do not treat A, B, and C cases because the treatment duration is long				
	Cleft lip and palate	17	10	83	90
	Growth modification	16	14	84	86
	Surgical orthodontics	15	8	85	92
7.	I do not treat A, B, and C cases because of financial reason				
	Cleft lip and palate	15	10	85	90
	Growth modification	15	9	85	91
	Surgical orthodontics	12	7	88	93

Table 5: Correlations of responses concerning education with professional attitudes and behaviors

	Respondent type	Education		Attitude to treat (%)
		Theory (%)	Practical (%)	
Cleft lip and palate	Residents	51	59	83
	Orthodontists	65	62	87
Growth modification	Residents	85	85	72
	Orthodontists	90	87	78
Surgery orthodontics	Residents	50	52	92
	Orthodontists	48	49	92

distribution of male versus female respondents in the two groups reflects that increasing number of female residents (39%) is entering orthodontic residency programs compared to the number of females among practicing orthodontists (24.39%).

The first objective of this study was to analyze the degree to which orthodontic postgraduate education has prepared residents and orthodontist to treat cases of special needs as cleft lip palate, surgical orthodontic cases, and growth modification cases. Majority of both residents and orthodontist said they were well prepared in theory and clinical education to treat growth modification. However, significantly smaller percentages agreed that their postgraduate education had prepared them to treat cleft lip and palate and surgical orthodontic cases. This data raises concern as not feeling well prepared could affect the provider’s professional confidence when they encounter these patients in their own practices or in turn would affect the quality of treatment. Important to note that the residency program which the orthodontist went through is the same today as which the residents are undergoing both with respect to clinical and theory hours.

The second objective of this study was to assess whether this education has affected their professional attitude and behavior in providing care to cleft lip palate, growth modification cases, and surgical orthodontic cases. Concerning the residents and orthodontist attitude toward providing care for these patients group, the data show clearly that the respondents had positive attitude toward providing care for cleft lip and palate and surgical orthodontic cases than growth modification; however, when compared with the respondents' educational experience, they were not well prepared both in theory and clinical education for cleft lip and palate and surgical orthodontic cases but were well prepared for growth modification. This indicates in conditions where the respondents want to provide care they are not well prepared and what they would less like to treat they are very well prepared. If this is so, it raises concern to the quality and the confidence with which the providers will manage these cases of cleft lip and palate and surgical orthodontics. From this finding, two questions are raised in view of educational experience. First, why the residents and orthodontist are well prepared in the management of growth modification; second, why in the management of cleft lip and palate and surgical orthodontic cases they are not well prepared. This alerts the dental educators to improve and to update the quality of education and to give more weightage in teaching to the malocclusions which need special orthodontic training as in cleft lip and palate and surgical orthodontic malocclusions to give quality results to these patients.

The central question of this study was whether there is a relationship between the quality of postgraduate dental education about providing care for growth modification, cleft lip and palate, and surgical orthodontic cases and professional attitude. Findings indicate no such relationship exists.

While this study focused on one particular dental specialty, orthodontics, and only three types of malocclusions, research should explore this question in other areas of orthodontics and also in other dental specialties as well. An answer to these questions could locate the missing link between education and patient care and could challenge postgraduate dental program faculty and administrators alike to reflect on their own program and the degree to which their programs contribute to reducing access to care problems.

If we go back to the history of orthodontics in India, the postgraduate training in this specialty started in 1960's first at Mumbai. The syllabus since then has not changed. This study clearly shows it needs to be updated. The reason why both residents and orthodontists were well prepared theoretically and clinically in the management by growth modification is that in practical examination this is one of the exercises; hence, it shows examination-related preparation then professional as very few want to practice later. To prepare students in the management of cleft lip and palate cases, the residents should be given a

posting (2 months) to the smile train center/plastic surgery department of the medical college, and it should be made compulsory to show one cleft lip and palate patient in the examination, treated/undergoing treatment. Of the three groups, the poorest educational experience was with orthodontic surgical cases. To improve the standards in this area, the syllabus should mention a minimum quota of cases for example 10 cases, which each resident should treat and one case to be presented in the examinations. Thus, if the syllabus and examination pattern are updated the purpose of postgraduate education will be served – to train in areas which the society needs care and where the orthodontist likes to treat with quality and confidence so that the motto of dental education “Service to humanity” is truly fulfilled.

Conclusions

Based on these findings, several conclusions can be drawn. First, residents and orthodontists largely agreed that their classroom- and clinic-based postgraduate dental education prepared them well to treat patients of growth modification; however, both residents and orthodontist indicated they are less prepared to treat cleft lip and palate and surgical orthodontic cases. Second, actual behavior concerning the treatment for all the three groups of patients was significantly higher with both residents and orthodontist showing willingness to contribute to reducing the access to care problems in the society. Finally, an inverse relationship was found between the teaching program and actual clinical practice behavior of the respondent. Faculty members and administrators in orthodontic postgraduate programs should realize the important contribution, and these educational experiences can make to increasing access to care for the needy patients' populations.

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Conflicts of interest

There are no conflicts of interest.

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