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Research Article

A Survey of Orthodontic Practice in Mid-Western India

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Abstract

Dental practice is booming in India, with many conventional and advanced setups providing orthodontic services. Orthodontics as a specialty has come to the forefront. As awareness of orthodontic therapy has increased with most of the orthodontic practice scattered in urban areas. The rural population has less availability of orthodontic services. Moreover, the orthodontic treatment modalities available in the urban and rural practice differ due to the unavailability of various factors.

Aim- This article aims to define the scope of the current Orthodontic practice in Mid-Western India.

Technique: - Descriptive quantitative study based on a questionnaire with 21 questions addressing various aspects of Orthodontic practice.

Conclusion and Significance- The study shows that dental specialists have low to moderate awareness, positive perception, and poor practice regarding orthodontic practice and principles. Age group, type of specialty, year of practice, and number of orthodontic cases treated per month significantly associated with awareness, perception, and practice of dental professionals regarding orthodontic practice and principles.

Keywords: Awareness, orthodontics, perception, practice

Introduction

The profession of Dentistry has spread wide and thick across India; with more than 300 dental colleges graduating about 25000 new dentists every year and about 3500 Post Graduate seats, India will have a surplus dentist in the years ahead.¹ Inception of Indian orthodontics can be marked to the year 1935 when Dr. H. D. Merchant returned from Germany and delivered the first of lectures on orthodontics in Nair Hospital Dental College, Mumbai. He later formed a department of orthodontics in the same college and also was instrumental in establishing the initial Orthodontic practices in India and was termed a Father of Indian Orthodontics.² Similarly, after about 85 glorious years of orthodontics in India, the orthodontic practice has bloomed with increasing orthodontists every year³ and many general dentists practicing orthodontics with the knowledge gained in an undergraduate course or by taking up orthodontic certificate courses under Private Academies. ^{4,5}

A study by Bawankule et al.⁶ raises a number of questions on the existing oral health care delivery system and suggests strategizing reorganization of oral health programs to reduce the burden of oral diseases. There is also a need for improvement in infrastructure and personnel at urban primary centers for better utilization of dental care services.⁷

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With most of the orthodontic practice scattered in urban areas, the rural population has less availability of orthodontic services. Usually, orthodontists from the cities visit the rural areas on specific days of the week or month for providing their services, or the dentist provides few orthodontic services based on their undergraduate training, or additional training gained thereof. Recently the orthodontists have started to practice in rural areas with increasing the saturation in urban cities.

Classification of the current Orthodontic practice in India⁸

This classification involves three steps, as described in Table 1. Method of using the classification: The classification yields a code for any type of orthodontic practice that can be easily read, communicated, and recorded [Table 2]. Code has 3 data: first is upper case alphabet for the group, second is a digit for type, and third is a lower-case alphabet for subtype, for example; Code B3b means a secondary or comprehensive orthodontic care center which is a subunit of a private/corporate super-specialty providing a visiting or on-call orthodontic expert.

Table 1: Three steps of the proposed classification.

Step 1: Group allocation based on the diagnostic and treatment services provided at the center in 3 tiers.

Group A- Preliminary or Basic Orthodontic Care Center

Group B- Secondary or Comprehensive Orthodontic Care Center

Group C- Tertiary or Advanced Orthodontic Care Center

Step 2: Type allocation based on ownership/management of the practice in 5 types.

Type 1	Government hospital or health care centers
Type 2	Educational Institutes or Colleges and their subunits
Type 3	Subunit of super-specialty private/corporate hospital
Type 4	Multicenter private or corporate dental/orthodontic clinics
Type 5	Self-owned or stand-alone private dental/orthodontic clinic

Step 3: Subtype allocation based on employment type of operating orthodontist/dentist in 3 subtypes.

Subtype a- In-house or full-time Orthodontist available

Subtype b- Visiting or on-call Orthodontist available

Subtype c- Orthodontic treatment provided by the resident dentist

Table 2: Method of using the classification			
Group	Туре	Subtype	
A	1	a	
В	2	b	
С	3	С	
	4		
	5		

Orthodontics covers a wide variety of procedures, knowledge, and skills to provide diagnostics and treatment services to patients. Orthodontics is classified into three branches:

- 1. Preventive orthodontics
- 2. Interceptive orthodontics
- 3. Corrective orthodontics.

Given the current scenario of practice, providing all types of services in orthodontic practices is questionable and needs to be evaluated. Hence the aim of this study is to evaluate the scope of orthodontic practice in private dental practice in Mid-Western India.

Subjects and Methods

This survey is a descriptive quantitative study based on a questionnaire with 21 questions (Annexure 1).

An online survey was prepared on Google forms and published on social media platforms like Facebook and WhatsApp. Responses were auto-populated in Google forms. Collected responses were evaluated statistically.

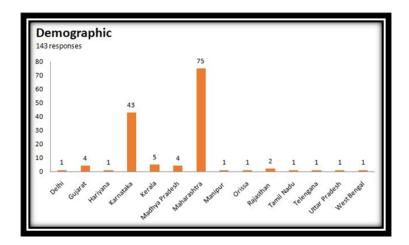
Total 143 responses from private dental practitioners from various demographic areas in Mid Western India were gathered in a duration of 50 days.

- The first three questions are regarding the personal and contact details.
- The following three questions are regarding the qualification, experience, and type of dental practice.
- The next questions are regarding orthodontic service providers and the most common age group of patients seeking treatment for orthodontic problems at respective clinics.
- The following questions are regarding the branches of orthodontics being practiced and the availability of various preventive, interceptive, and corrective procedures at the clinic.
- The next question is regarding the level of awareness for diagnosis and treatment planning to the general dentist.
- Final questions are for a desire to upgrade the knowledge for orthodontic diagnosis and treatment planning and opinion regarding the need for a change of curriculum for the same.
- The questionnaire ends with an open question for any suggestions or advice the participant has regarding the same issue being addressed in the questionnaire.

Results

Subject demographics

Demographic proportions of responses based on states are illustrated in Graph 1 with a maximum of 52.44 % (75) responses from Maharashtra, 30.06 % (43) responses from Karnataka state, and 3.5 % (5) responses from Kerala, 2.79 % each (4) responses from Gujarat and Madhya Pradesh, 1.4 % (2) response from Rajasthan and single response 0.7 % each from Delhi, Haryana, Manipur, Orissa, Tamil Nadu, Telangana, Uttar Pradesh, and West Bengal were collected.



Graph 1: Demographic proportions of responses.

Qualification

Qualification of the respondents is shown in Graph 2, in which the proportion of respondents based on their qualification. 57 (39.9%) respondents were MDS Orthodontics, 56 (39.2%) were BDS, 32 (22.4%) respondents were MDS other than Orthodontics, and only a single respondent (0.7% each) were PG Diploma holders and dental hygienist.

Qualifications

143 responses

BDS

MDS orthodontics

MDS Other than orthodontics

PG DIPLOMA

—1 (0.7%)

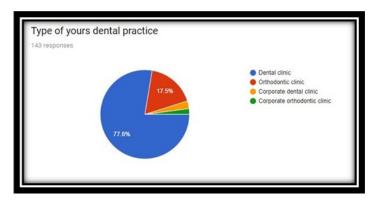
Dental hygienist
—1 (0.7%)

0 20 40 60

Graph 2: Qualification of the respondents.

Type of dental practice

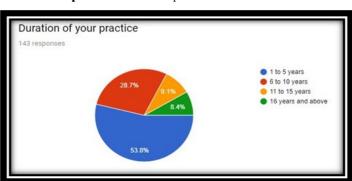
Graph 3 shows the type of practice of the respondents reveals that 77.6% (111) respondents have Dental clinics, and 17.5% (25) respondents had orthodontic clinics. At the same time, corporate orthodontic and corporate dental clinics were 2.8% (3) and 2.1% (4), respectively.



Graph 3: Type of dental practice.

Duration of practice

The experience or duration of the private practice of the respondents is presented in Graph 4 shows 53.8% (77) of respondents have 1-5 years of practice, 28.7% (41) have 6-10 years of practice, 9.1% (11) have 11-15 years of practice and 8.4% (10) have a practice of 16 years and above.



Graph 4: Duration of practice.

Orthodontic treatment at the clinic

Graph 5 shows Orthodontic treatment at the clinic was performed by visiting Orthodontist in 61.5 % (88) of the clinics, 34.3 % (49) clinics had a full time or in-house Orthodontist performing the treatment. 2.8 % (4) of clinics provide treatment by the resident dentist, and 1.4 % (2) clinics do not provide orthodontic treatment.

Orthodontic treatments done at your clinic by

143 responses

Resident dentist
Resident orthodontist
Visiting orthodontist
Orthodontic treatment not provided at your clinic

Graph 5: Orthodontic treatment at the clinic.

The most common age group of patients

The most common age group of patients taking orthodontic treatment is shown in Graph 6, in which 99 respondents (69.2 %) have 15 to 19 years of patients mostly taking orthodontic treatment, where are 44 (30.8%) have patients above 20 years. Only 28 (19.6 %) have patients ranging from 10 to 14 years taking orthodontic treatment in clinics, and four respondents (2.8 %) have patients below nine years of age taking orthodontic treatment.

Most common age-group of orthodontic patients in your clinic

143 responses

5 to 9 years

10 to 14 years

15 to 19 years

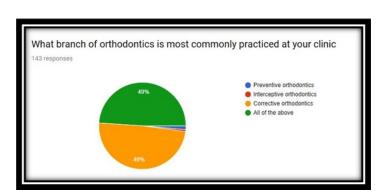
20 years and above

0 20 40 60 80 100

Graph 6: Most common age group of patients.

Most commonly practiced branch in Orthodontics

The most common practicing branch of orthodontics in the clinic is shown in Graph 7 in which corrective orthodontics in 70 (49%) clinics where is on 2 (1.3%) and 1(0.7%) practice preventive and interceptive orthodontics, whereas 70 (49%) clinics provide all three types of treatment.



Graph 7: Most commonly practiced branch in Orthodontics.

Percentage of clinics providing few modalities of treatment are listed in table 3 below, and their graphs 8 – 15 are as follows.

Table 3: Percentage of clinics providing few modalities of treatment

		No. and percent of	No. and percent of	No. and percent of
Sr. No.	Name of the Procedure	clinics providing	clinics Not provid-	clinics Maybe
		the procedure	ing the procedure	providing the pro-
				cedure
1	Serial Extraction	53 (37.1%)	44 (30.8%)	46 (32.2%)
2	Habit breaking	112 (78.3%)	8 (5.6%)	23 (16.1%)
3	Space maintainer	94 (65.7%)	31 (21.7%)	18 (12.6%)
4	Functional	111 (77.6%)	15 (10.5%)	17 (11.9%)
5	Orthopedic	72 (50.3%)	45 (31.5%)	26 (18.2%)
6	Fixed orthodontic	139 (97.2%)	2 (1.4%)	2 (1.4%)
7	Surgical orthodontic	50 (35%)	60 (42%)	33 (23%)

Advising serial extraction in the clinic

Graph 8- 53 (37.1%) respondents advise serial extraction at their clinic, 44 (30.8%) respondents were against advising serial extraction, while 46 (32.2%) respondents were neutral towards advising serial extraction at their clinic.

Do you or your orthodontist advise Serial extraction at your clinic

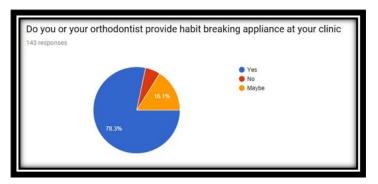
143 responses

Yes
No
Maybe

Graph 8: Serial extraction in the clinic.

Provision of habit breaking appliance at the clinic

Graph 9 - The provision of the habit-breaking appliance at the clinic is explained graphically in which habit breaking appliance was provided by 112 (78.3%) whereas 8 (5.6%) dental professionals did not practice it and 23 (16.1%) were uncertain regarding it.

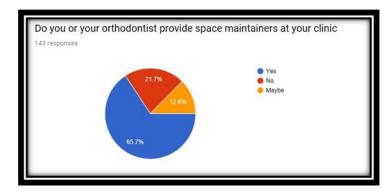


Availability of space maintainers at the clinics

Graph 10-Treatment with space maintainers availability in the clinic in which 94 (65.7%) practitioners offer the treatment modality while 31 (21.7%) did not provide it and 18 (12.6%) were uncertain about it.

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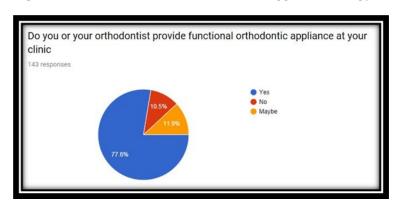
Graph 10: Availability of space maintainers at the clinics.



Provision of functional orthodontic appliance at the clinics

Graph 11 - The provision of functional orthodontic appliance therapy at their clinic in which 111 (77.6%) Orthodontic practitioners provided it, 15 (10.5%) did not, and 17 (11.9%) were uncertain regarding it.

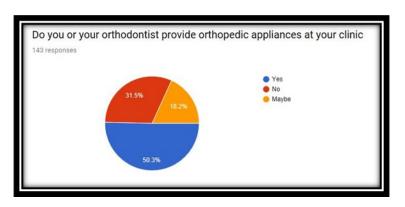
Graph 11: Provision of functional orthodontic appliance therapy.



Availability of Orthopaedic appliances at the clinics

Graph 12- 72 (50.3%) practicing orthodontists provide Orthopedic appliances at their clinic while 43 (31.5%) did not provide it, and 28 (18.2%) were uncertain regarding it.

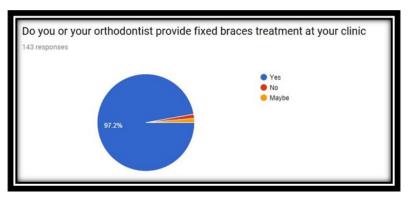
Graph 12: Availability of Orthopaedic appliances at the clinics.



Provision of fixed braces at the clinics

Graph 13- 138 (97.2%) practicing clinics provide fixed braces treatment at their clinics.

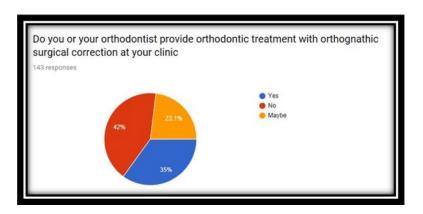
Graph 13: Provision of fixed braces at the clinics.



Provision of Orthognathic surgery at the clinic

Graph 14- 62 (42%) practicing orthodontists did not provide orthodontic treatment with orthognathic surgery at their clinic while 50 (35%) provided the treatment modality and 33 (23.1%) orthodontists were uncertain regarding it.

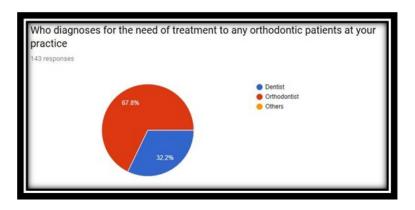
Graph 14: Provision of Orthognathic surgery at the clinic.



Diagnosis for the need for Orthodontic treatment at the clinics

Graph 15- 97 (67.8 %) respondents have Orthodontists diagnosing for the need of orthodontic treatments at the clinic, whereas only 46 (32.2%) diagnose themselves.

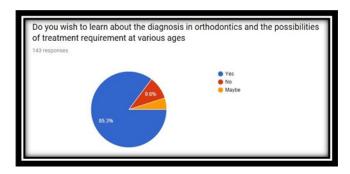
Graph 15- Diagnosis for the need for Orthodontic treatment at the clinics.



Need to learn about diagnosing Orthodontic patients

Graph 16- 122 (85.3%) respondents feel the need to learn about diagnosing orthodontic patients and treatment possibilities, but only 14 (9.8%) do not feel the need for the same 7 (4.9%) may be interested to learn the same.

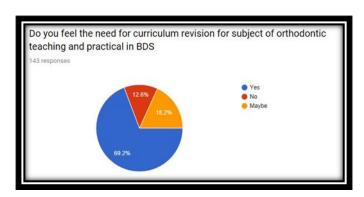
Graph 16- Need to learn about diagnosing Orthodontic patients.



Need for a curriculum revision for Orthodontics

Graph 17- 99 (69.2%) feel the need for change in the curriculum for teaching and practice for the subject of orthodontics, but 18 (12.6%) do not feel the need, whereas 26 (18.2%) are not sure of the need.

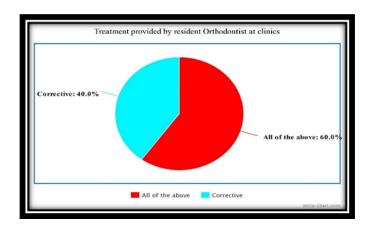
Graph 17- Need for a curriculum revision for Orthodontics.



Treatment provided by resident Orthodontist and visiting Orthodontist

Graph 18 shows the treatment provided by resident Orthodontists at clinics in which 60% of the resident Orthodontist provide all of the above, i.e., preventive, interceptive, and corrective treatment, while 40% provide only corrective treatment.

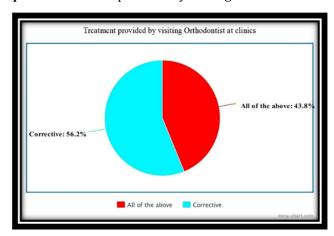
Graph 18: Treatment provided by resident Orthodontists.



The treatment provided by visiting Orthodontist at clinics

Graph 19 shows the treatment provided by visiting Orthodontist at clinics in which 43.8% of the visiting Orthodontist provide all of the above, i.e., preventive, interceptive, and corrective treatment, while 56.2% provide only corrective treatment.

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Graph 19: Treatment provided by visiting Orthodontist.

The open suggestions from the respondents were as follows:

- The dentist should be made aware of preventive and interceptive treatments, the importance of functional appliances, and case diagnosis for the same
- Orthodontics should be taught at the college level as a clinical subject.
- Orthodontics syllabus and training for undergraduate should be revised
- Orthodontics should be taught in detail to UG students
- One should highlight the general dentist's role in Orthodontic treatment right from the stage of diagnosing a case. Due consideration should be given to Orthodontic Triage. Also, strict protocols for doing Orthodontic treatment by specialists, I.e., by orthodontists only, should be implemented. Orthodontic awareness and management by general dentists is a topic that needs to be taught to general dentists through CDE programs.
- Need of correction in all branches syllabus not only in orthodontics
- One case follow up should be shown at BDS level so students can see changes
- Orthodontic subject especially habits breaking appliance, and at list minor correction by fix, appliances taught in undergraduate level. Should include in internship protocol
- More hands-on experience for BDS students
- Survey had 86 non-orthodontic respondents in which 52 were BDS graduate practitioners, and 32 MDS other than orthodontics and 1 BDS with PG Diploma and 1 Practicing hygienist were present. Eighty-one respondents practiced in dental clinics, and only four practiced in a corporate dental clinic, and a single dentist practiced in an Orthodontic clinic
- Forty respondents had a new practice of 1 to 5 years, whereas 31 respondents had 6 to 10 years of practice and only 11 respondents were 11 to 15 years of practitioners, and only four were above 16 years of practice.
- Seventy-four respondents had to visit orthodontists in the clinics providing orthodontic treatments, whereas only
 eight respondents had a resident orthodontist providing treatment, three respondents had resident dentists providing orthodontic treatment. One clinic did not provide orthodontic treatment at their clinic.
- Only two clinics have patients of age 5 to 9 years 18 clinics had orthodontic patients in a range of 10 to 14 years, whereas 57 had patients 15 to 19 years and 30 clinics had patients of age 20 and above.
- 36 respondents provide all type of orthodontic treatment, and 48 provide only corrective orthodontic treatment, and only two mostly provide interceptive orthodontics.

- 40 respondents have dentists diagnosing for orthodontic treatment needs, and 46 have the Orthodontist diagnosing the patients for the same.
- Eighty-one respondents are interested to learn more about diagnosis and treatment planning in orthodontics, whereas three are not interested, and two are not sure if they need it.
- Sixty-nine respondents feel the need for revision for the BDS curriculum in orthodontics, whereas only six do not feel the need, but 11 are not sure of the need for revision.
- A total of 57 orthodontists responded, of which 24 run an orthodontic clinic, 30 dental clinics, and 3 incorporate orthodontic clinic.
- Thirty-seven orthodontists were having a practice of 1 to 5 years, and 10 had a practice of 6 to 10 years, only 2 had a practice of 11 to 15 years, and 8 had a practice of 16 years and above.
- Forty respondents have the resident Orthodontist providing the orthodontic treatment, where are 14 respondents have to visit Orthodontists providing treatment, while only one has a resident dentist providing treatment. Only one respondent doesn't provide treatment in the clinic.
- The most common age group of patients was 5 to 9 years in only two clinics, and ten clinics have 10 to 14 years age most common. Forty-one respondents have the most common age group of 15 to 19, and only 14 respondents have patients of age 20 years most common.
- 22 practice mostly corrective orthodontics, whereas one practice interceptive, and 34 practice all the branches only.
- Fifty-one respondents have an orthodontist themselves diagnosing for orthodontic treatment needs, whereas 6 have a resident dentist who diagnoses for the same.
- Forty-one orthodontists themselves feel the need to learn to diagnose and decide for treatment needs for orthodontic treatment, where ad 11 do not feel the need and five are not sure.
- 30 respondents feel the need for changes in BDS curriculum for orthodontics, and 12 respondents do not feel the need, whereas 15 are not sure.

Results of non-orthodontic practitioners: (Table 4)

Sr. No.	Name of the Procedure	No. and percent of clinics providing the procedure	No. and percent of clinics Not providing the procedure	No. and percent of clinics Maybe providing the procedure
1	Serial Extraction	31	24	31
2	Habit breaking	58	7	21
3	Space maintainer	49	23	14
4	Functional	57	13	16
5	Orthopedic	26	37	23
6	Fixed orthodontic	82	2	2
7	Surgical orthodontic	17	46	23

Results for Orthodontist respondents (Table 5)

Sr. No.	Name of the Procedure	No. and percent of clinics provid- ing the proce- dure.	No. and percent of clinics Not providing the procedure.	No. and percent of clinics Maybe providing the procedure.
1	Serial Extraction	22	20	15
2	Habit breaking	54	1	2
3	Space maintainer	45	8	4
4	Functional	54	2	1
5	Orthopedic	46	3	8
6	Fixed orthodontic	57	0	0
7	Surgical orthodontic	33	14	10

Discussion

Malocclusion is the second most basic dental disorder in youngsters and youthful grown-ups. In India, the predominance of malocclusion differs from 20% to 43%. For the improvement of the facial appearance, adjustment of dental malocclusion is a significant factor, which is the primary point of the orthodontic treatment. The present examination is a cross-sectional poll study led to decide the Orthodontic practice in the private dental sector of India with regards to the type of practice in terms of age of the patient, treatment modalities advised and available, and the awareness about diagnosis in non-orthodontic practitioners.

The people who responded to this survey were mostly orthodontist, general dentist, MDS of other special branch in addition with dental hygienist, among India mostly from Maharashtra and Karnataka. A wide variety of practitioners and their workplace have increased variation in awareness, perception, and practice regarding orthodontic practice and principles. According to this study, in 61.5% clinics Orthodontic treatment was performed by visiting Orthodontist and 34.3 % (49) clinics had a full time or in-house Orthodontist. In most of the clinics, dentists preferred corrective orthodontic treatment with fixed orthodontic therapy and 49% clinics provide all three types of treatment i.e. preventive, interceptive and corrective orthodontics. Among all the type of orthodontic treatment, fixed appliances (braces) remain the most popular type of orthodontic appliance. They now come in a wide range of types including metal (stainless steel), ceramic (tooth-colored) braces. Similar results have been obtained in our present study where ninety seven percent dental clinics provide fixed orthodontic treatment followed by habit breaking appliances, functional and orthopedic appliances. Surgical orthodontics is the least preferred treatment option in India.

Gorczyca *et al.*and Jacobs *et al.* found that the number of orthodontic procedures provided by general dentist or other practionar is increased with the number of hours of orthodontic continuing education attended. A similar relationship was found in a study done by Jayaprakash PK, where dentists in the provider group appeared more likely to have attended a continuing education course in orthodontics and to have attended more courses than dentists in the nonprovider group. A variety of materials can be used to keep up to date in orthodontics, for example, journals and textbooks.⁹

General dental practitioners' interest in orthodontics has been found to be associated with the provision and expanding provision of orthodontic services. One of the questions in the attitude to orthodontic service provision scale asked the practitioner to indicate whether or not they found providing orthodontic services interesting. Approximately 80% of the dentists surveyed stated that they found orthodontic service provision interesting. Assessment of dentists' satisfaction with the level of orthodontic services they were providing revealed that a minority of dentists wanted to treat fewer malocclusions or less difficult malocclusions.⁵

Hilgers KK found in his survey that the amount of time pediatric dentists spent providing orthodontic treatment generally decreased since 1983, but the percentage of practitioners providing comprehensive orthodontic treatment has stayed the same. Most dual-trained practitioners (pediatric dentistry and orthodontics) reported continuing to practice both pediatric dentistry and orthodontics. Practitioners who received more general Continued education hours per year treated more patients in all stages of dental development (primary, early mixed, late mixed, permanent).⁴

Diagnosis and treatment planning for dental malocclusion is mostly done by the orthodontists and not by the general dentist due to lack of knowledge and experience of subject. So, dental practitioners other than orthodontist need to learn about the diagnosis of dental malocclusion and possibilities of different treatment planning at different ages. For this purpose, clinical knowledge about orthodontic diagnosis and treatment planning should be taught in detail at under graduation level only.

Limitation of the study

Although the study consist of samples spread all over India, most of the respondent are clustered in Mid western area of India. Including the participants from more wider areas is desirable to report a generalized results.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil

Conflict of interest

There are no conflicts of interest.

Conclusion

From above, it has been concluded that dental specialists have low to moderate awareness, positive perception, and poor practice regarding orthodontic practice and principles. Age group, type of specialty, year of practice, and a number of orthodontic cases treated per month are significantly associated with awareness, perception, and practice of dental professionals regarding orthodontic practice and principles. Various CDE programs are needed to be conducted to improve the practice of specialists from other specialties to improve awareness.

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