



ASSESSMENT OF THE ORTHODONTIC KNOWLEDGE AND PRACTICES OF ORTHODONTIC TREATMENT AMONG GENERAL DENTAL PRACTITIONERS IN WESTERN MAHARASHTRA.

Orthodontics

Dr. Divyanshi Awasthi

BDS, School of Dental Sciences, Krishna Institute of Medical Sciences, Karad

Dr. Pratap Nivrutti Mane

MDS, Assistant Professor, School of Dental Sciences, Krishna Institute of Medical Sciences, Karad

KEYWORDS

INTRODUCTION:

General dentists serve as key players in the proper treatment of malocclusion, since they not only refer patients to further specialized care, but also provide interceptive and other orthodontics services. In fact, 19.3 percent of general dentists provide comprehensive orthodontic treatment to their patients.¹ One of the most common etiologies for the development of dental caries, fluorosis, temporomandibular disorders and gingival diseases is malocclusion.² Tooth malposition may also lead to difficulty in functional movements of the mandible, difficulty in mastication, swallowing, speech, increased susceptibility to trauma or periodontal problems.³ The referral practitioners especially general dental practitioners decide when and where to send or refer an orthodontic patients.^{4,5} A survey of predoctoral orthodontic education in the United States in the 1980s illustrated a wide range in the numbers of hours devoted to orthodontics and the timing of didactic and clinical instruction. The same survey recommended specific minimum hours of instructions be required for the topics described in the American Dental Association's Commissions on Dental Accreditation (CODA) guidelines.⁶ Studies have shown that general dentists provide many comprehensive orthodontic treatment procedures even they are not specialized to precede such cases.^{7,1} such as malocclusions like cross bite, open bites and deep bites.^{8,9} Therefore, there is a need to identify the knowledge levels of dental practitioners with respect to the orthodontic treatment as they play an important role in inculcating healthy lifestyles practices to their patients. According to Murlidhar R Sastri study show the need for increased clinically oriented education of practice and concept of orthodontic treatment.¹⁰ The result of this study may be used as a basis for evaluation of the knowledge of the general dental practitioners and assisting dental schools in evaluating their curricula to better prepare graduates in the management of orthodontic issues.

METHODOLOGY:

A structured questionnaire with extraoral and intraoral photographs is framed containing 34 questions. The questions addressed various aspects like the understanding of general dentists about orthodontics, their opinions regarding orthodontic treatment of patients, identifying and diagnosis of orthodontic problems and any suggestions regarding orthodontic curriculum. The questionnaire will be distributed to general dentist practicing in Western Maharashtra. Total number of dentists who will be answering the questionnaire is 200. The participants ranged from freshly passed out general practitioners to the elderly practitioners. Data will be analyzed and descriptive statistics will be computed using SPSS Version 17.

The Institutional Ethics Committee has hereby given permission to initiate the research project, Ref. No. KIMSDU/IEC/03/2022.

A written informed consent document was taken by all the general dental practitioners for the research project.

Inclusion Criteria:

- 1) General dental practitioners with bachelor degree.
- 2) General dental practitioners from Western Maharashtra.

Exclusion Criteria:

- 1) General dental practitioners who stop their practice.
- 2) General dental practitioners attending any orthodontic courses.

A. Questionnaire for the general questions:

In this, a total of 07 questions are formulated to know the predoctoral orthodontic clinical education in their institution. The questions consist of graduate orthodontic program in their school, full time faculty teaching, didactic and laboratory training, dental students treating orthodontic patients, dental students assisting residents, allotted curriculum time for predoctoral orthodontic clinical education.

B. Questionnaire for the knowledge about principles of orthodontic treatment:

In this, a total of 10 questions are formulated to study the knowledge about principles of orthodontic treatment. The questions consist of their knowledge regarding starting age of the treatment, treatment in mixed dentition state, facial appearance, extraction of teeth for orthodontic purpose, habits, functional appliance, anchorage, temporomandibular disorders and malocclusion, adult orthodontics.

C. Questionnaire for developing orthodontic practice:

In this, a total of 04 questions are formulated to study attitude toward orthodontic practice. The questions consist about convincing the patient, giving information to patient about malocclusion when patient comes for other dental treatment, treatment in patient of generalized periodontitis, orthodontist opinion.

D. Questionnaire for the extraoral photographs

In this, a total of 05 questions are formulated to study the extraoral photographs. The questions consist about profile, patient face proportionate, type of smile, facial form, nose shape.

E. Questionnaire for the intraoral photographs:

In this, a total of 08 questions are formulated to study the intraoral photographs. The questions consist about molar relation, canine relation, malocclusion in anteroposterior relation, anterior spacing, crossbite, buccally erupted canine, buccally erupted canine treatment. The questionnaires were distributed through softcopy to general dental practitioners in Western Maharashtra for this the general dental practitioners will be contacted personally.

Statistical analysis

Scores were calculated based on the responses given by general dental practitioners. The individual scores were summed up to get a total score. Statistical analysis was performed with the help of IBM SPSS statistics 20, with the help of Chi square test. Descriptive statistics was calculated, and mean scores and standard deviation were obtained.

RESULTS AND OBSERVATIONS

The study was done on 200 general dental practitioners in western Maharashtra. This study would be beneficial to curriculum managers to develop or modify the current curriculum to include the modern concepts and therapeutics options.

The results of this study show large disparities in the methods of teaching and assessment in predoctoral orthodontic programs.

When all the general dental practitioners were questioned general questions about the presence of graduate orthodontic program, 85.5% answered positively. The percentage of "yes" answers for question dental students observing residents in the graduate orthodontic clinic and assisting residents in the graduate orthodontic clinic were answered affirmatively by 75% and 76.5% respectively. Among all the

participants, around 37.5% dental students treated orthodontic patients in their undergraduate orthodontic program, while 62.5% did not. A proportion of general dental practitioners (38.5%) believe that allotted curriculum time for predoctoral orthodontic clinical education in their institution was inadequate (Table 1).

In the study of knowledge about principles of orthodontic treatment questions, general dental practitioners were questioned about orthodontic treatment at any age, 65% of them answered positively. The treatment of malocclusions during mixed dentition stage and the importance of well-aligned teeth for the overall facial appearance were answered affirmatively by 62.5% and 85.5% respectively, in case of all general dental practitioners. About 93.5% positive response was present for the awareness of extraction of few teeth for aligning of the irregular teeth among general dental practitioners. The maximum positive response i.e. 96.5% was given by general dental practitioners for the effect of habits like mouth breathing or thumb sucking on aligning of the anterior teeth. When the general dental practitioners were questioned about the fact that mini screws can replace molars for anchorage, 81.5% were aware about the fact while 18.5% were not familiar with concept. The use of functional appliance when advised during pre-pubertal growth spurt and temporomandibular joint disorders and malocclusion are inter-related were answered affirmatively by 81.5% and 90% respectively, for general dental practitioners. The percentage of "yes" answers for the question of knowledge about adult orthodontics was 93% by the general dental practitioners while 7% were not familiar with the concept (Table 2)

Also, the comparison of the knowledge about developing orthodontic practice among general dental practitioners showed highly significant difference.

In study of knowledge about developing orthodontic practice, the maximum correct response (86%) in general dental practitioners was given for the convincing of the orthodontic treatment. When all the participants were questioned of the malocclusion on the clinical examination when patient reports with any other complaints and call orthodontist for orthodontic treatment, 80.5% and 85% of them answered positively.

Among all general dental practitioners, around 77% believe that orthodontic treatment can be done in patients with periodontal problems, while 23% did not (Table 3).

According to the questionnaire applied there was a noticeable lack of knowledge reflected in the difficulty encountered by general dental practitioners to accurately detect extraoral and intraoral photographs, since only 44% of them identified the correct profile. The percentage of "no" answer for the question of patient face proportionate was 68.5%. And about 82.5% of them reached a correct diagnosis of identifying smile, 32.5% identified nose shape and around 23.5% were able to identify facial form.

The characteristics more readily recognized by general dental practitioners, with buccally placed canine as the most identifiable feature (94% of general dental practitioners) and around 86.5% of general dental practitioner's advice aligning the buccally erupted canine. Followed by the presence of sub-merged tooth (84% of general dental practitioners), followed by increased overjet (76.5% of general dental practitioners), class II molar relation (60.5% of general dental practitioners) and class III canine relation (38.5% of general dental practitioners). The least perceptible feature was high frenum attachment (17% of general dental practitioners).

DISCUSSION

After dental caries, malocclusion is the most common dental disease affecting children and adults. In India, the prevalence of malocclusion varies from 20% to 43%. For the improvement of the facial appearance, correction of dental malocclusion is an important factor, which is the main aim of the orthodontic treatment.^{11,12} The essential factors having impact on deciding orthodontic treatment are esthetic improvement and psychological aspect.¹² The level of dental health knowledge, dental health attitude and dental health behavior are interlinked, and this ultimately depends on the level of knowledge and positive attitude of the dental practitioners.¹³

The number of theoretical lessons and laboratory activities varies among dental institutes resulting into a variety of graduates with

variable competencies to handle orthodontic cases. These undergraduates when enter into clinical practice depict variety of skills in orthodontic treatment and planning for the common orthodontic cases. This results into low quality of orthodontic treatment and lack of positive attitude toward the importance of orthodontic treatment by the general dental practitioners.

General dental practitioners play a important role in making referral of orthodontic cases. But mostly they compete with orthodontists in providing the treatment especially simple cross bite cases.¹⁴ The quality of orthodontic treatment is a public health issue because inappropriate treatment of malocclusion can lead to irreparable damage.¹⁵ General dentists tend to treat orthodontic cases and ultimately finish these cases worse than the average professional holding a postgraduate degree in orthodontics.¹⁶ The victims of orthodontic treatment dealt by general dental practitioners are growing because those professional lacks the necessary expertise.¹⁷

In the present study, a comparative evaluation was done for the knowledge, attitude and awareness in the branch of orthodontics among general dental practitioners with the help of specially prepared questionnaires. The purpose of the questionnaire applied to general dental practitioners, who had already attended the course in orthodontics during their undergraduate curriculum, was to check whether or not some basic orthodontic concepts had been absorbed by the general dental practitioners.

Similarly, the present study found that general dental practitioners had difficulty in properly identifying orthodontic cases, since only half of the general dental practitioners did so correctly. It became clear that the respondents displayed some doubts regarding the concepts of orthodontic treatment.

The vast majority of general dental practitioners could easily perceive the existence of buccally erupted canine, increased overjet, sub-merged tooth, gummy smile and face proportionate. Since all these features are visible in the anterior region of the dental arches and extra orally, while rest of them were unable to detect the type of canine relation (61.5% of general dental practitioners), profile (56% of general dental practitioners), facial form (76.5% of general dental practitioners) and nose shape (67.5% of general dental practitioners). They also determined that the existing problem should be treated by a specialist, since 86% of general dental practitioners convince the patient for orthodontic treatment and 85% of general dental practitioners call orthodontist for orthodontic treatment.

In light of the results, it is suggested that the general dental practitioners should be capable of diagnosing dental disease along with dental occlusion problems in their patients and referring them for further orthodontic treatment. The result of this questionnaire survey among general dental practitioners in western Maharashtra shows large disparities in the methods of teaching, diagnosis of malocclusion and the need for orthodontic treatment. Therefore, educating on diagnosis, discussion and development of orthodontic treatment plan should take precedence in predoctoral orthodontic education.

CONCLUSION

After analyzing the data obtained from the questionnaire answered by general dental practitioners in western Maharashtra, a deficiency was detected in existing condition and scenario of the knowledge and attitude of general dental practitioners towards the principles and practice of the orthodontic treatment.

Therefore, these finding lead to a reflection about increased clinically oriented education of practice and concepts of orthodontic treatment. For this purpose, to improve the quality of predoctoral orthodontic education on a broad level, it is our suggestion that dental schools should emphasis on therapeutic concepts, and continuing dental education programs, with the ultimate goal of improved patient care.

Table 1: Comparison of general responses

General	Yes N (%)	No N (%)	p value [^]
1. Presence of graduate orthodontic programme	171 (85.5%)	29 (14.5%)	p<0.05*
2. Dental students treat orthodontic patients	75 (37.5%)	125 (62.5%)	p =0.061

3. Dental Students observe residents in the graduate orthodontics clinic	150 (75%)	50 (25%)	p<0.05*
4. Dental students required to assist residents in the graduate orthodontics clinic	153 (76.5%)	47 (23.5%)	p<0.05*
5. Allotted curriculum time for predoctoral orthodontic clinical education at your institution was adequate	123 (61.5%)	77(38.5%)	p= 0.076

p>0.05 – no significant difference

*p<0.05 – significant

^p value calculated using Chi square test

Table 2: Questions of knowledge about principles of orthodontic treatment

General	Yes N (%)	No N (%)	p value^
1. Can orthodontic treatment be started at any change	130 (65%)	70 (35%)	p<0.05*
2. Can malocclusions be treated during mixed dentition stage	125 (62.5%)	75 (37.5%)	p <0.05*
3. Do you consider that well-aligned teeth are important for overall facial appearance	171 (85.5%)	29 (14.5%)	P<0.05*
4. Functional appliance gives a better result when advised during pre-pubertal growth spurt period	163 (81.5%)	37 (18.5%)	p<0.05*
5. Few teeth may have to be removed for aligning irregular teeth	187 (93.5%)	13 (6.5%)	p<0.05*
6. Mouth breathing or thumb-sucking has an effect on the anterior teeth alignment	193 (96.5%)	7 (3.5%)	p<0.05*
7. Straightening the teeth makes pleasing smile, helps in mastication, better oral hygiene, easier to speak, healthy lifestyle	188 (94%)	12 (6%)	p <0.05*
8. Mini screws can replace molars for anchorage	163 (81.5%)	37 (8.5%)	P<0.05*
9. Temporomandibular joint disorders and malocclusion are inter-related	180 (90%)	20 (10%)	P<0.05*
10. Knowledge about Adult Orthodontics	186 (93%)	14 (7%)	P<0.05*

p>0.05 – no significant difference

*p<0.05 – significant

^p value calculated using Chi square test

Table 3: Questions of knowledge about developing orthodontic practice

	Yes N (%)	No N (%)	p value^
1. Convince the patient for the orthodontic treatment	172 (86%)	28 (14%)	p<0.05*
2. Look for malocclusion on clinical examination when patients has other chief complaints	161 (80.5%)	39(19.5 %)	p <0.05*
3. Patient with generalized periodontitis undergo orthodontic treatment	154 (77%)	46 (23%)	p<0.05*
4. Call orthodontist for orthodontic treatment	170 (85%)	30 (15%)	p<0.05*

*p>0.05 – no significant difference

*p<0.05 – significant

^p value calculated using Chi square test

REFERENCES:

- Wolsky SL, McNamara JA Jr. Orthodontic services provided by general dentists. Am J Orthod Dentofacial Orthop 1996;110(2):211-7.
- Siddegowda R, Rani MS. An epidemiological survey on awareness towards orthodontic treatment in South India school children. Open J Dent Oral Med 2013;1(1):5-8.
- A. Foroughi Moghaddam S, Alizadeh M, Sharifzadeh H. Awareness of orthodontic treatments among school teachers of two cities in Iran. J Dent Res Dent Clin Dent Prospects 2012;6(1):25-8.
- Bondt B, Aartman IH, Zentner A. Referral patterns of Dutch general dental practitioners to orthodontic specialists. Eur J Orthod. 2010;32:548-54.
- Ngarr P, Fields H. Orthodontic diagnosis and treatment planning in the primary dentition. ASDC J Dent Child. 1995;62:25-3.
- Nieberg LG, Sinclair PM. A survey of predoctoral orthodontic education. J Dent Educ 1988;52(4):205-7.

- Koroluk LD, Jones JE, Avery D. Analysis of orthodontic treatment by pediatric dentists and general practitioners in Indiana. ASDC J Dent Child. 1987;55:97-101.
- Galbreath RN, Hilgers KK, Silveira AM, Scheetz JP. Orthodontic treatment provided by general dentists who have achieved master's level in the Academy of General Dentistry. Am J Orthod Dentofacial Orthop. 2006;129:678-86.
- PMDC. Pmdc criteria accreditation standards, rules and regulations Islamabad: PMDC; 2015 [cited 2016 25/7/2016]. Available from: <http://www.pmdc.org.pk/Guidelines/tabid/36/Default.aspx>.
- Murlidhar R Sastri, Vijaysinh Ramchandra Tanpure, Firoz Babu Palagi, Sagar Kundlik Shinde, Kapil Ladhe, Tejaswin Polepalle. Study of the Knowledge and Attitude about Principles and Practices of Orthodontic Treatment among General Dental Practitioners and Non-orthodontic Specialties. Journal of International Oral Health 2015;7(3):44-48.
- Pandey M, Singh J, Mangal G, Yadav P. Evaluation of awareness regarding orthodontic procedures among a group of preadolescents in a cross-sectional study. J Int soc Prev Community Dent 2014;4(1):44-7.
- Baswaraaj, Jayasudha B, Kumarswamy KM, Padmini MN, Chandrakleha B. Oral self-perception of esthetics among dental students. Arch Oral Sci Res 2013;3(2):85-94.
- Siddegowda R, Rani MS. An epidemiological survey on awareness of orthodontic treatment in school children from four divisions of Karnataka State, India. World J Med Sci 2014;2(1):1-6.
- Aldawood S, Ampuan S, Medara N, Thomson W. Orthodontic treatment provision and referral preferences among New Zealand general dental practitioners. Aust Orthod J. 2011;27:145-54.
- Kragt L, Hermus Am, Wolvius EB, Ongkosuwito EM. Three-dimensional photographs for determining the Index of orthodontic treatment need in scientific studies. Am J Orthod Dentofacial Orthop.2016;150:64-70.
- Poulton D, Vlaskalic V, Baumrind S. Treatment outcomes in 4 modes of orthodontic practice. Am J Orthod Dentofacial Orthoped.2005;127:351-4.
- Popat H, Thomas K, Farnell DJ. Management of orthodontic emergencies in primary care- self reported confidence of general dental practitioners. Br Dent J.2016; 221:21-4.