

Awareness on functional orthodontic treatment among dental students in Chennai city

Ashok Kumar, Dhanraj Ganapathy*, R. M. Visalakshi

ABSTRACT

Introduction: Functional appliances are used for growth modification procedures that are aimed at intercepting and treating jaw discrepancies. Certain studies reveal that there is a lack of knowledge among dental students on functional orthodontic therapy. This study aims to assess the awareness on functional orthodontic therapy among dental students in Chennai city. **Materials and Methods:** The study was conducted as a cross-sectional survey among 50 dental students pursuing final year and internship in Chennai city. 15 questions eliciting information about the knowledge about awareness on functional orthodontic treatment were framed. The responses obtained from the participants were compiled, processed further, and analyzed. Various studies were referred to gain more knowledge to improvise the study. **Results:** On analyzing the results and comparing with recent similar studies, knowledge about awareness on functional orthodontic treatment is inadequate among dental students. **Conclusion:** This study concludes that the knowledge about awareness on functional orthodontic treatment among dental students in Chennai city is inadequate. Hence, vigorous dental awareness programs or lectures should be arranged to address this concern.

KEY WORDS: Awareness, orthodontic, treatment, students

INTRODUCTION

In 1922, the British Society for the Study of Orthodontics has defined the specialty as “Orthodontics” includes the study of growth and development of jaws and face, particularly, and body generally as influencing position of teeth; study of action and reaction of internal and external influences on the development; and prevention and correction of arrested and perverted development.

The aims and the objectives of orthodontics have been summarized by Jackson as Jackson’s triad comprising three components, namely functional efficiency, structural balance, and esthetic harmony. Orthodontic treatment can be done by means of fixed or removable appliance, functional appliance, etc.

A functional appliance is a removable or fixed appliance that alters the posture of the mandible and transmits the forces created by the resulting stretch of

the muscles and soft tissues and by the change of the neuromuscular environment to the dental and skeletal tissues to produce movement of teeth and modification of growth.^[1] Functional appliances are used for growth modification procedures that are aimed at intercepting and treating jaw discrepancies.

Certain studies reveal that there is a lack of knowledge among dental students on functional orthodontic therapy. This study aims to assess the awareness on functional orthodontic therapy among dental students in Chennai city.

MATERIALS AND METHODS

The study was conducted as a cross-sectional survey among 50 dental students pursuing final year and internship in Chennai city. 15 questions eliciting information about the knowledge about awareness on functional orthodontic treatment were framed with “yes” or “no” options. The questionnaire was pilot tested for its feasibility and validity.

After testing, it was distributed as a self-assessed questionnaire to the participants. The responses

Access this article online

Website: jprsolutions.info

ISSN: 0975-7619

Department of Prosthodontics, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

*Corresponding author: Dr. Dhanraj Ganapathy, Department of Prosthodontics, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, 162, Poonamallee High Road, Chennai - 600 077, Tamil Nadu, India. E-mail: ghanrajmaganapathy@yahoo.co.in

Received on: 05-12-2018; Revised on: 08-01-2019; Accepted on: 11-02-2019

obtained from the participants were compiled, processed further, and analyzed by entering the obtained data in Microsoft Excel 2007 version and a graph was made to represent them. The bar graph with relevant and irrelevant response was designed [Figure 1]. Each bar was coded using a number and the representation legend for it is given in Table 1.

Various studies were referred to gain more knowledge to improvise the study.

Questionnaire

Year of the study: IV/CRI

1. Do you believe that straightening the teeth makes better smile, helps in mastication, better oral hygiene, easier to speak, healthy lifestyle? (Yes/No)
2. Can orthodontic treatment be started at any age? (Yes/No)
3. Can malocclusions be treated during mixed dentition stage? (Yes/No)
4. Do you consider that well-aligned teeth are important for overall facial appearance? (Yes/No)

5. Do you aware of functional therapy? (Yes/No)
6. Do you know that functional appliance gives a better result when advised during the prepubertal growth spurt period? (Yes/No)
7. Do you consider skeletal malocclusions when patients report to you with a complaint of incompetent lips and proclined teeth? (Yes/No)
8. Are you aware that few teeth may have to be removed for aligning irregular teeth? (Yes/No)
9. Does orthodontic treatment always require extraction? (Yes/No)
10. Do habits such as mouth breathing or thumb sucking has an effect on the front teeth alignment? (Yes/No)
11. Do you know that temporomandibular joint disorders can be corrected by functional orthodontic treatment? (Yes/No)
12. Do you know the types of functional appliances? (Yes/No)
13. Do you consider functional appliance therapy in practice without an opinion of orthodontist? (Yes/No)
14. Are you theoretically strong on functional appliance therapy? (Yes/No)
15. Would you like to attend learning programs on functional orthodontic therapy? (Yes/No)

Table 1: Representation legend for Figure 1

Number	Representation
1	Importance of orthodontic treatment
2	Age at which orthodontic treatment can be started
3	Treatment of malocclusions in mixed dentition stage
4	Knowledge on functional therapy
5	Functional therapy before prepubertal growth spurt
6	Consideration of skeletal malocclusions
7	Extraction during orthodontic treatment
8	Habits and malocclusion
9	Correction of TMJ disorders using functional therapy
10	Types of functional appliances
11	Taking orthodontist opinion for functional therapy
12	Theory knowledge about functional therapy
13	Need for learning programs on functional orthodontic treatment

TMJ: Temporomandibular joint

RESULTS

Figure 2 represents the participants in the survey, of which 37% belong to CRI and 63% are pursuing 4th year of undergraduation in dental colleges of Chennai city.

Figure 1 represents the knowledge on functional orthodontic treatment among dental students. The numbers 1–13 represent various responses from the questionnaire distributed. The representation legend for Figure 1 is given in Table 1. No. 9, i.e., knowledge about temporomandibular joint disorders and parafunctional habits, has been widely acknowledged as the causative factor for temporomandibular disorders which can be treated using functional appliances.^[2]

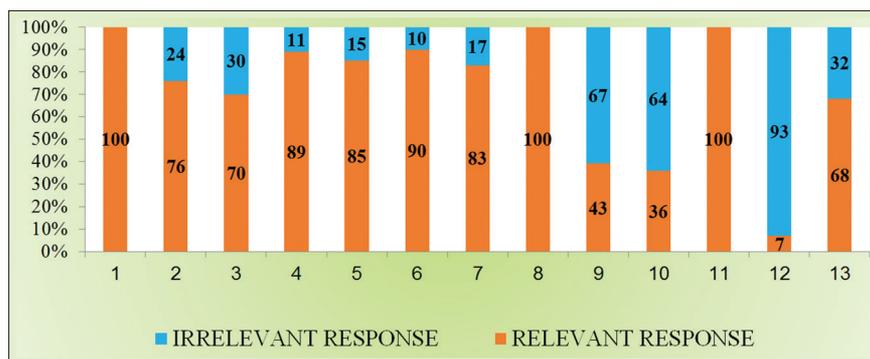


Figure 1: Functional orthodontic treatment (refer Table 1 for legend).

DISCUSSION

For successful completion of functional appliance therapy, patient’s compliance is of utmost importance. The functional appliance can be fixed or removable.

Various classifications are available for orthodontic functional appliances. Figure 3 represents Proffit classification.

Few commonly practiced appliances include the following.^[3-5]

Frankel Appliance (Function Regulator)

Group of functional appliances developed by R. Frankel to treat malocclusions aided in the maturation, training, and reprogramming of the orofacial neuromuscular system. The appliances consist of acrylic buccal shields and lip pads, connected by wires, to restrain and retrain aberrant musculature and to prevent the effects of restricting muscle forces on the dentition. The extension of the buccal shields into the full depth of the vestibule is supposed to stimulate the periosteum to achieve a skeletal expansion of the apical bases. Lingual shields also are included to accomplish a gradual, stepwise advancement of the mandible.

Activator

The first removable functional appliance was developed by V. Andresen. Historically, the term

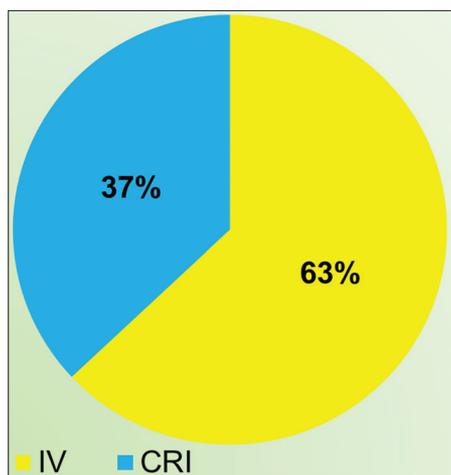


Figure 2: Participants

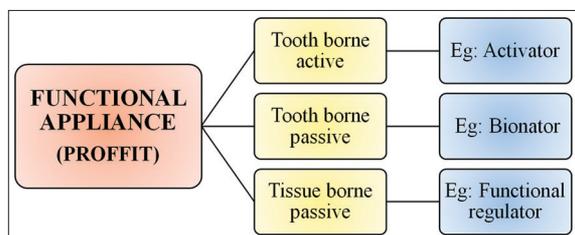


Figure 3: Proffit classification of functional appliances

“activator” was introduced to describe “activation of mandibular growth.” These appliances position the mandible forward, promoting a new mandibular postural position. The reactive forces from the stretch of the muscles and soft tissues are transmitted to the maxillary dentition and through that to the maxilla.

Oral Screen

A removable appliance was placed in the anterior vestibular region to improve lip position and reduce the overjet.

Vestibular Shield (Vestibular Screen)

A simple removable appliance made of 2–3-mm thick acrylic material, occupying the vestibule and extending posteriorly to the distal margin of the last erupted molar.

Bite plane

A posterior bite plate commonly is used to disocclude the anterior teeth and thus facilitate correction of an anterior crossbite. Anterior bite plates can be used to increase the lower anterior face height, to facilitate tooth movement, and to correct a deep bite by extrusion of posterior teeth.

Lip bumper

Lip bumpers commonly are worn on a full-time basis and occasionally may be ligated in place. They are used to control or increase the mandibular dental arch length, to upright mesially or lingually tipped mandibular molars, and to prevent the interposition of the lower lip between the maxillary and mandibular incisors.

They can bring about the following changes:

- An increase or decrease in jaw size.
- A change in the spatial relationship of the jaws.
- Change in direction of growth of the jaws.
- Acceleration of desirable growth.

Advantages of Functional Appliances

- It is possible to eliminate abnormal perioral muscle functions which interfere with normal bone growth.
- Treatment can be started as early as in mixed dentition stage.
- It requires less chair side time with less frequent adjustments.
- It is easier to maintain oral hygiene.
- It is acceptable to many patients because it is generally worn at night time.
- Frequency of the patient’s visits is less.
- Economically affordable.

Limitations of Functional Appliances

- They can be used to correct basal bone/arch relationship and cannot be used for correcting dental malocclusion.

- It is not useful in managing adult patients where the active growth is completed.
- It requires a final phase of fixed appliance therapy to achieve final detailing or final alignment of tooth position.
- The result of treatment is totally dependent on the patient's cooperation.
- They have a tendency to increase the lower facial height, and hence, they cannot be used in patients with backward rotating mandible.

According to Nivedha *et al.*, a study conducted among non-orthodontic specialists, it was observed that most of the general dentists and non-orthodontic specialists were aware of the basic concepts of orthodontics such as age criteria for orthodontic treatment, diagnosis of malocclusion, and the need for orthodontic treatment.^[6]

According to Prateek *et al.*, removable functional appliances are effective but rely heavily at the mercy of patient cooperation for achieving predictable results in a reasonable time frame. The study was concluded that patient cooperation is variable and is not always forthcoming, with appliances such as headgear or removable functional appliances.^[7]

According to Sastri MR *et al.*, the study, conducted among dental practitioners, added more focus on the facts of existing condition and scenario of the knowledge and attitude of the general dental practitioners and other practicing specialties of dentistry toward the principles and practice of the orthodontic treatment. Therefore, the study concluded that there is a need for increased clinically oriented education of practice and concepts of orthodontic treatment.^[8]

According to a study conducted among practitioners by Mohammed Odhayd Alnusayri *et al.*, results of the study were satisfactory and suggested a need for more clinically oriented teaching and training in terms of orthodontic principles and practice.^[9]

CONCLUSION

The students are not aware of due to the lack of adequate practice and familiarity. All students should be aware of all the treatment options so as to ease their practices and pave more comfort for their patient. Knowledge on various orthodontic needs was adequate, while functional orthodontics need more attention. This study concludes that the awareness on functional orthodontic treatment among dental students in Chennai city is inadequate. Hence, vigorous awareness program or lectures need to be initiated to address this concern.

REFERENCES

1. Marsico E, Gatto E, Burrascano M, Matarese G, Cordasco G. Effectiveness of orthodontic treatment with functional appliances on mandibular growth in the short term. *American Journal of Orthodontics and Dentofacial Orthopedics*. 2011;139:24-36.
2. Sam P, Dhanraj M, Ashish J. Treatment of temporomandibular disorders-knowledge, attitude, and practice among general practicing dentists a survey. *Drug Invent Today* 2018;10:707-10.
3. Bhalajhi SI. *Orthodontics the Art and Science*. 4th ed. St. Louis: Mosby Inc.; 2009.
4. Singh G. *Textbook of Orthodontics*. 2nd ed. New Delhi: Jaypee; 2007.
5. Houston S, Tulley WJ. *Textbook of Orthodontics*. 2nd ed. Bristol: Wright; 1992.
6. Niveda S, Dinesh S. A survey of the knowledge, attitude and awareness of principles and practices in orthodontics among general dentists and nonorthodontic specialists. *IOSR J Dent Med Sci* 2014;13:44-6.
7. Shami P. Fixed functional appliances: An overview. *Int J Curr Res* 2017;9:47407-14.
8. Sastri MR, Tanpure VR, Palagi FB, Shinde SK, Ladhe K, Polepalle T, *et al.* Study of the knowledge and attitude about principles and practices of orthodontic treatment among general dental practitioners and non-orthodontic specialties. *J Int Oral Health* 2015;7:44-8.
9. Alnusayri MO, Alenazi KK, Patil SR, Aileni KR, Rao KA. Knowledge and attitude regarding principles and practices of orthodontic treatment among general dental practitioners and nonorthodontic specialists of Saudi Arabia: A preliminary study. *J Res Med Dent Sci* 2017;5:59-62.

Source of support: Nil; Conflict of interest: None Declared