

# Self- Perception of Malocclusion and Perception towards Orthodontic Treatment according to Age in Indian Population: A Questionnaire Study

Sharath Kumar Shetty, Vijayananda Kumara M., Visakh G Panicker  
Professor & HOD, Reader, Post Graduate Student  
Department of Orthodontics & Dentofacial Orthopaedics,  
K.V.G Dental College & Hospital , Sullia , Karnataka, India

## Abstract:-

**Introduction:** This questionnaire study aimed to estimate the overall frequencies of positive perception towards malocclusion and orthodontic treatment among adults categorized according to age, sex, and area of living, and to identify barriers or negative perceptions preventing them from receiving orthodontic treatment.

**Methods:** The participants included 380 adults aged over 20 years who visited KVG Dental College and Hospital, Sullia. The participants' opinions regarding their consideration of receiving orthodontic treatment and about malocclusion were recorded using a specially designed questionnaire.

**Results:** The overall rate of positive perception towards orthodontic treatment was 48.5% and perception towards malocclusion was 74.2%. Compared to adults in their 20s (63.2%), those in their 40s and 50s had a lower percentage of interest in orthodontic treatment (46.2% and 45.1%, respectively;  $p < 0.05$ ). Overall, women (52.2%) had a higher rate of interest than men (42.6%;  $p < 0.05$ ). The area of living had no effect on the percentage of interest. The order of priority of chief complaints differed according to age: protrusion for those in the 20s and 30s, and spacing for those in the 40s to 60s. Overall, the main reason for not seeking treatment was the treatment fee. Respondents aged over 40 considered themselves "too old" for orthodontic treatment.

**Conclusions:** The middle-aged had a relatively high percentage of interest (above 45%) in orthodontic treatment and All age group people(74.2%) are well aware about the malocclusion and its causes. However, demographic characteristics were not significantly associated with the positive interest. These results highlight the need for educating the middle-aged about the limitations and possibilities of orthodontic treatment to increase its acceptance.

**Keywords:** Perception, Orthodontic treatment, Age, Questionnaire.

## I. INTRODUCTION

Physical appearance, including the dentition, is an important aspect of human activity, as one aims to be liked, respected or accepted by those around him/her. The uptake of orthodontic treatment is influenced by the desire to look attractive, the self-perception of dental appearance, self-esteem, gender, age and peer group norms. The increase in average life expectancy and national income has led to an increase in the number of middle aged or old adult patients receiving orthodontic treatment. Traditionally, the "so-called" adult orthodontic treatment has implied the treatment of adult patients in their 20s and early 30s, rather than adolescents. This notion of "adult patients" has been gradually changing to include middle-aged or old adult patients<sup>2,4</sup>. These changes have been reported worldwide<sup>4,6</sup>. The main reasons behind this change in perception are the improved capacity of the profession to treat problems and the patients' desire to maintain their natural teeth and improve their function as well as appearance. Gender, socio-economic background and age have been suggested as factors affecting the self-perception of dental appearance, with high social class individuals considered to be more critical and younger children less aware of their dental appearance. Middle-aged and old adult patients are more likely to have periodontal problems, as well as bone turnover rates and psychological profiles that differ from younger patients<sup>8,12</sup>. Information about the limitations and possibilities of orthodontic treatment, which may differ from those of younger patients, should be provided to these patients. This, in turn, requires accurate estimation of the patients' perceptions toward treatment and about malocclusion. Data concerning the self-perception of malocclusion and the uptake of orthodontic treatment are available for many populations.

The rate of starting orthodontic treatment may be decided not only by the severity or prevalence of malocclusion, but also by other background factors, such as age, sex, and socioeconomic status. Therefore, this questionnaire study aimed to assess the overall frequencies of positive perception towards orthodontic treatment and malocclusion among adults categorized according to age, sex, and area of living, and to identify barriers or negative perceptions preventing them from receiving orthodontic treatment.

## II. MATERIALS AND METHODS

The participants of this questionnaire-based study were 380 adults aged over 20 years (150 men and 230 women) who visited the kvg dental hospital, sullia. They included patients, or those accompanying them, with no prior history of orthodontic treatment. Participants who visited the Department of Orthodontics and Department of Oral and Maxillofacial Surgery were excluded because their perception towards orthodontic treatment would be affected by direct or indirect experiences of orthodontic treatment they have already undergone, which may bias their perception.

## III. SAMPLE SIZE CALCULATION

The participants' opinions regarding their consideration of receiving orthodontic treatment were recorded using a specially designed questionnaire. The questionnaires were completed by 380 participants. Among the participants who had considered receiving orthodontic treatment, the chief complaints were inquired and their reasons for not receiving orthodontic treatment yet were surveyed. The final section of the questionnaire collected demographic data regarding the participants' age, sex, and area of living. Statistical analyses, including chi-square test, were performed using a standard statistical software package (SAS version 9.3, Cary, NC, USA). The  $p < 0.05$  level of significance was chosen for all tests.

### Following were the components of the questionnaire

- SEX:
  1. MALE
  2. FEMALE
- DO YOU THINK MALOCCLUSION CAN MAKE DENTAL BRUSHING DIFFICULT?
  1. YES
  2. NO
  3. DON'T KNOW
- DO YOU THINK MALOCCLUSION CAN CAUSE DENTAL CARIES?
  1. YES
  2. NO
  3. DON'T KNOW
- DO YOU THINK MALOCCLUSION CAN CAUSE GINGIVITIS?
  1. YES
  2. NO
  3. DON'T KNOW
- ARE YOU AWARE ABOUT THE IMPORTANCE OF ALIGNED TEETH?
  1. YES
  2. NO
  3. DON'T KNOW
- DO YOU THINK ALIGNED TEETH ARE IMPORTANT FOR FACIAL APPEARANCE?
  1. YES
  2. NO
  3. DON'T KNOW
- DO YOU FEEL THAT YOU NEED ORTHODONTIC TREATMENT?
  1. YES
  2. NO
  3. DON'T KNOW
- DID YOU VISIT AN ORTHODONTIST BEFORE?
  1. YES
  2. NO
  3. DON'T KNOW
- DO YOU THINK THUMBSUCKING CAN CAUSE MALOCCLUSION?
  1. YES
  2. NO
  3. DON'T KNOW
- DO YOU THINK EARLY EXTRACTION PRIMARY TEETH CAN CAUSE MALOCCLUSION?
  1. YES
  2. NO
  3. DON'T KNOW
- HAVE YOU EVER THOUGHT OF RECEIVING ORTHODONTIC TREATMENT?
  1. YES
  2. NO
  3. DON'T KNOW
- REASON FOR SEEKING ORTHODONTIC TREATMENT IN ADULT AGE
  1. LACK OF PRIOR FINANCES
  2. NOT AWARE THAT ORTHODONTIST WILL RESOLVE THE PROBLEM
  3. INDICATED BY THE DENTIST
  4. THE NEED WAS REALIZED IN ADULT AGE
  5. OTHERS
- PERCEPTION OF PATIENT REGARDING THEIR SMILE BEFORE TREATMENT
  1. POOR ESTHETICS
  2. DIFFICULTY IN MASTICATION
  3. EDENTULOUS SPACES
  4. SPEECH PROBLEMS
  5. GINGIVAL PROBLEMS
- MAIN CONCERN REGARDING ORTHODONTIC TREATMENT
  1. LONG DURATION OF THE TREATMENT
  2. DOUBTS REGARDING EFFICIENCY OF THE TREATMENT
  3. FEAR OF PAIN DURING TREATMENT
  4. UNAESTHETIC APPEARANCE OF THE TREATMENT
  5. NONE
- REASON WHY YOU HAVE NOT RECEIVED ORTHODONTIC TREATMENT YET
  1. TREATMENT FEE
  2. PAIN
  3. PERIODONTAL COMPLICATIONS
  4. DRAWS ATTENTION
  5. ALREADY TREATMENT TAKEN
- DECIDING REASON TO START THE TREATMENT
  1. DENTIST ORIENTATION
  2. MOTIVATED TO RECEIVE THE TREATMENT
  3. VIEW POINT AND SUPPORT FROM FAMILY

4. DISCUSSION WITH THE ORTHODONTIST
5. ALREADY TREATMENT TAKEN
6. OTHERS

#### IV. RESULTS

Among the 380 participants, 230 (61.5%) were women and 150 (38.5%) were men. The percentage of participants in their 20s, 30s, 40s, and 50s was 22.7%, 16.1%, 22.1%, and 23.7%, respectively. The rate of positive perception towards orthodontic treatment was 48.5% within the total sampled population. Compared to participants in their 20s (63.2%), those in their 40s and 50s had a significantly lower percentage of interest (46.2% and 45.1%, respectively;  $p < 0.05$ ). In the total sampled population adjusted according to age, women (52.2%) had a higher rate of interest than did men (42.6%;  $p < 0.05$ ). No statistically significant differences were observed between the sexes in any of the age groups. The respondents were also categorized according to the area of living. No significant difference was observed in the percentage of interest in orthodontic treatment among the major cities (50.7%) and other areas (45.6%). The order of priority of chief complaints showed definite differences according to age. Protrusion was the first chief complaint for those in their 20s and 30s, and spacing was the one for those in their 40s to 60s. Secondary crowding indicated the aggravation of existing crowding due to periodontitis and/or missing tooth. The frequency of spacing and secondary crowding as chief complaints increased steadily with advancing age. The main reasons for not receiving orthodontic treatment were primarily the treatment fee and long treatment time in all age groups. Respondents aged over 40 years thought they were “too old” for orthodontic treatment.

#### V. DISCUSSION

In this “aging society,” orthodontists are witnessing a recent increase in the number of middle-aged or older patients visiting their practices<sup>1</sup>. These patient groups may have different subjective needs for orthodontic treatment than do younger patients, because they are concerned not only about their dental esthetics but also functional ability to maintain their teeth longer. They have a different status of dentition the so-called “mature” dentition with signs of aging, periodontal disease, multiple old dental restorations, and other medical problems. The majority of studies on the need for orthodontic treatment and perception towards malocclusion have been conducted on children and adolescents. In this questionnaire-centered studies, adults self-perceived a higher treatment need which was professionally assessed on esthetic grounds<sup>5</sup>. The demand for orthodontic treatment, however, is difficult to assess in children and it will considerably change with increasing age. Moreover, the self-perception of treatment need in older adults may be different from the treatment need evaluated by orthodontic experts. In a practice survey conducted in 2010 by Lim, 56.2% of respondents considered that less than 5% of total patients was accounted for orthodontic patients aged over 40 years, followed by 5–10% in 26.5% of respondents<sup>10</sup>. This meant that in most orthodontic clinics, patients aged over 40 years accounted for less than 10% of

the total number of patients. However, surprisingly, the result of this study demonstrated that even respondents in their 40s and 50s showed considerably high interest towards orthodontic treatment (46.2% and 45.1%, respectively). Among the younger patients in their 20s, over half of the respondents (63.2%) had a positive interest. Although the need for and interest towards orthodontic treatment and perception towards malocclusion may be different among adults, this finding indicated that older adults have a high interest towards and subjective need for orthodontic treatment<sup>15</sup>.

This study showed that women (52.2%) has a significantly higher rate of interest than did men (42.6%) in the total sampled population. However, no statistically significant differences were observed between the sexes in any of the age groups, indicating that participants of both sexes even over the age of 40 years had the same level of interest towards orthodontic treatment. This result may explain the recent increase in the number of middle-aged male patients visiting orthodontic clinics. The chief complaint is a patient's self-reported primary reason for presenting for medical care. Chief complaints may be used to quantify, analyze, and plan for emergency care and provide valuable information on acute care needs where there are crucial data gaps<sup>12-16</sup>. The need for standardization of chief complaint data in orthodontics has not yet been raised. The results of this study indicated that the order of priority of chief complaints had a definite trend in the different age groups. In younger adult patients in their 20s and 30s, protrusion, crowding, and asymmetry had higher priorities. However, in older patients, spacing and secondary crowding had higher priorities. Spacing and secondary crowding may be the consequence of the reduced support provided by the affected periodontium<sup>5-8</sup>. This may also indicate that older patients are more concerned about malocclusion due to oral diseases. The important point is that they may be aware of the malalignment of their teeth, but are unaware of the status of the periodontium and their treatment need in terms of periodontal and other diseases. In the Korea National Health and Nutrition Examination Survey of 2015, the prevalence rate of periodontitis among participants in their 50s was approximately 54% in males and 31% in females, and the percentage increased with age. These results may emphasize the importance of disease control during orthodontic treatment in middle-aged patients. Among the barriers that prevent the middle-aged patients from starting orthodontic treatment, treatment fee and long treatment time had high priorities<sup>18,21</sup>. In addition, the result of this study demonstrated that patients aged over 40 years tend to think that they are too old for orthodontic treatment and that treatment may do more harm than good. Therefore more information should be provided to the public that proper orthodontic treatment accompanied with oral and systemic disease control do more good than harm. Despite its interesting findings, the study has some limitations. It would have been better if this study had been conducted with a larger number of participants with more equal sex distribution. In addition, it would have been better if this study had been conducted outside the dental hospital. However, this study aimed to maintain a common background of the respondents (i.e., patients and

accompanying guests) to form a group that was aware of the importance of dental health. Moreover, the study center is located in the dakshinakannada region and in an affluent neighborhood. A future study combining multicentre surveys would be helpful in understanding the demands of older adults and their misunderstandings regarding orthodontic treatment. Data from such larger surveys would be required in the future to ensure orthodontists remain updated about adult orthodontic treatment and the use of interdisciplinary treatment approaches<sup>25</sup>.

## VI. CONCLUSION

- The rate of positive perception towards orthodontic treatment was 48.5% within the total sampled population. Compared to participants in their 20s (63.2%), those in their 40s and 50s had a lower percentage of interest in treatment (46.2% and 45.1%, respectively;  $p < 0.05$ ).
- No statistically significant differences were observed between the sexes in any of the age groups.
- Demographic characteristics were not significantly associated with the positive interests.
- The order of priority of chief complaints showed distinct differences according to age: protrusion was the first chief complaint for the participants in their 20s and 30s, and spacing was the one for those in their 40s to 60s.
- These results may highlight the need for providing more scientific information to the middle-aged about the limitations and possibilities of orthodontic treatment in order to increase its acceptance.

## REFERENCES

- [1.] Tsihklaki A, Chin SY, Pandis N, Fleming PS. How long does treatment with fixed orthodontic appliances last? A systematic review. *Am J Orthod Dentofacial Orthop* 2016;149:308-18.
- [2.] Uribe F, Padala S, Allareddy V, Nanda R. Patients', parents', and orthodontists' perceptions of the need for and costs of additional procedures to reduce treatment time. *Am J Orthod Dentofacial Orthop* 2014;145(4 Suppl):S65-73.
- [3.] Talic NF. Adverse effects of orthodontic treatment: a clinical perspective. *Saudi Dent J* 2011;23:55-9.
- [4.] Soma S, Matsumoto S, Higuchi Y, Takano-Yamamoto T, Yamashita K, Kurisu K, et al. Local and chronic application of PTH accelerates tooth movement in rats. *J Dent Res* 2000;79:1717-24.
- [5.] Nishimura M, Chiba M, Ohashi T, Sato M, Shimizu Y, Igarashi K, et al. Periodontal tissue activation by vibration: intermittent stimulation by resonance vibration accelerates experimental tooth movement in rats. *Am J Orthod Dentofacial Orthop* 2008;133:572-83.
- [6.] Yavuz MC, Sunar O, Buyuk SK, Kantarcı A. Comparison of piezocision and discision methods in orthodontic treatment. *Prog Orthod* 2018;19:44.
- [7.] Alikhani M, Alansari S, Sangsuwon C, Alikhani M, Chou MY, Alyami B, et al. Microosteoperforations: minimally invasive accelerated tooth movement. *Semin Orthod* 2015;21:162-9.
- [8.] Teixeira CC, Khoo E, Tran J, Chartres I, Liu Y, Thant LM, et al. Cytokine expression and accelerated tooth movement. *J Dent Res* 2010;89:1135-41.
- [9.] Alikhani M, Raptis M, Zoldan B, Sangsuwon C, Lee YB, Alyami B, et al. Effect of microosteoperforations on the rate of tooth movement. *Am J Orthod Dentofacial Orthop* 2013;144:639-48.
- [10.] Nicozisis JL. Accelerated orthodontics through microosteoperforation. *Orthod Pract* 2013;4:56-7.
- [11.] Feizbakhsh M, Zandian D, Heidarpoor M, Farhad SZ, Fallahi HR. The use of microosteoperforation concept for accelerating differential tooth movement. *J World Fed Orthod* 2018;7:56-60.
- [12.] Schulz KF, Altman DG, Moher D; CONSORT Group. CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. *BMC Med* 2010;8:18.
- [13.] Galvao MCS, Sato JR, Coelho EC. Dahlberg formula: a novel approach for its evaluation. *Dental Press J Orthod* 2012;17:115-24.
- [14.] Alkebsi A, Al-Maaitah E, Al-Shorman H, Abu Alhaja E. Three-dimensional assessment of the effect of micro-osteoperforations on the rate of tooth movement during canine retraction in adults with Class II malocclusion: a randomized controlled clinical trial. *Am J Orthod Dentofacial Orthop* 2018;153:771-85.
- [15.] George D, Mallery P. SPSS for Windows step by step: a simple guide and reference, 17.0 update. Boston: Pearson; 2010.
- [16.] Aboalnaga AA, Salah Fayed MM, El-Ashmawi NA, Soliman SA. Effect of microosteoperforation on the rate of canine retraction: a split-mouth randomized controlled trial. *Prog Orthod* 2019;20:21.
- [17.] Cheung T, Park J, Lee D, Kim C, Olson J, Javadi S, et al. Ability of mini-implant-facilitated microosteoperforations to accelerate tooth movement in rats. *Am J Orthod Dentofacial Orthop* 2016;150:958-67.
- [18.] Haliloglu-Ozkan T, Arici N, Arici S. In-vivo effects of flapless osteopuncture-facilitated tooth movement in the maxilla and the mandible. *J Clin Exp Dent* 2018;10:e761-7.
- [19.] Azeem M, Ul Haq A, Ilyas M, Ul Hamid W, Hayat MB, Jamal F, et al. Bacteremia after microosteoperforation. *Int Orthod* 2018;16:463-9.
- [20.] Lee JW, Cha JY, Park KH, Kang YG, Kim SJ. Effect of flapless osteoperforation-assisted tooth movement on atrophic alveolar ridge: histomorphometric and gene-enrichment analysis. *Angle Orthod* 2018;88:82-90.
- [21.] Sivarajan S, Doss JG, Papageorgiou SN, Cobourne MT, Wey MC. Mini-implant supported canine retraction with micro-osteoperforation: a split-mouth randomized clinical trial. *Angle Orthod* 2019;89:183-9.
- [22.] Cramer CL, Campbell PM, Opperman LA, Tadlock LP, Buschang PH. Effects of microosteoperforations on tooth movement and bone in the



- beagle maxilla. *Am J Orthod Dentofacial Orthop* 2019;155:681-92.
- [23.] Andrade I Jr, Sousa AB, da Silva GG. New therapeutic modalities to modulate orthodontic tooth movement. *Dental Press J Orthod* 2014;19:123-33.
- [24.] Shahabee M, Shafae H, Abtahi M, Rangrazi A, Bardideh E. Effect of micro-osteoperforation on the rate of orthodontic tooth movement—a systematic review and a meta-analysis. *Eur J Orthod* 2020;42:211-21.
- [25.] Kundi I, Alam MK, Shaheed S. Micro-osteoperforation effects as an intervention on canine retraction. *Saudi Dent J* 2020;32:15-20.
- [26.] Attri S, Mittal R, Batra P, Sonar S, Sharma K, Raghavan S, et al. Comparison of rate of tooth movement and pain perception during accelerated tooth movement associated with conventional fixed appliances with micro-osteoperforations—a randomised controlled trial. *J Orthod* 2018;45:225-33.
- [27.] Alikhani M. *Clinical guide to accelerated orthodontics with a focus on micro-osteoperforations*. Cham: Springer; 2017.
- [28.] Kolte R, Kolte A, Mahajan A. Assessment of gingival thickness with regards to age, gender and arch location. *J Indian Soc Periodontol* 2014;18:478-81.
- [29.] Müller HP, Könönen E. Variance components of gingival thickness. *J Periodontal Res* 2005;40:239-44.