

Perception of Laypersons to Appearance of Orthodontic Appliances their Acceptance and Value for Money: A Questionnaire Study

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ABSTRACT

Introduction: Orthodontic market has experienced remarkable evolution in the development and creation of orthodontic appliances that are designed to appeal the patients. With the advent of newer technology like invention of CAD-CAM the brackets travelled its life from a bulky metal appliance, to aesthetic brackets (ceramics and plastic brackets), lingual bracket systems and finally bracket-less approach (Invisalign and Clear Path). This, although enhanced the aesthetic aspect, but lost its dexterity to the common man due the increasing treatment cost (Value). Study aimed at evaluation of Perception of Laypersons to Appearance of Orthodontic Appliances, their Acceptance and value for money.

Material and methods: A sample of 200 laypersons were selected by simple random sampling. A questionnaire was framed for evaluation of attractiveness, acceptability and value of orthodontic appliances as grouped from group 1 to group 6 and distributed amongst laypersons. The statistical analysis was done using the Statistical Package for the Social Science (SPSS version 22, Armonk, NY: IBM Corp) and Descriptive statistics were performed.

Result: The attractiveness and acceptability of appliances go in favour of ceramic brackets with aesthetic arch wire and aesthetic ligature ties.

Conclusion: But the practical acceptability of appliances based on three parameters conclusively favour ceramic brackets with standard arch wire and metal ligature ties which fulfils both the aesthetics and cost effectiveness.

Keywords: Perception, Laypersons, Appearance, Orthodontic Appliances, Acceptance, Value for Money.

extra-oral appliance in daily life due to the possibility of being the object of curiosity, comments, and jokes.¹²

Orthodontic treatment, thus can lead to negative social impact, particularly with the use of extra-oral appliances that make the patient less attractive to treat the malocclusion. Orthodontic treatments result in aesthetic dental and skeletal improvement, increasing the social acceptance and self-concept of patients¹³, at the end of the treatment; but what of the facial aesthetic of the patient during the treatment and the effects of it on the psychosocial status of children and their parents?

Previous studies have reported psychosocial consequences and post-operative anxiety in patients after fixed orthodontic treatment and orthognathic surgery. The results of the studies showed that adult patients were less keen to accept treatment with metal appliances as they consider them to be unaesthetic.^{14,15} Similarly, other study showed that 67% of Sweden young adults would probably not or definitely not wear visible appliances in spite of a functional treatment indication and there was also a refusal rate of 33% to conventional orthodontic treatment. Same study revealed that 84% would definitely wear visible braces during adolescence.¹⁶ Additional aspect is the social perceptions of adults wearing orthodontic appliances, since the judgments concerning their personal characteristics are influenced by dental appearance and orthodontic appliance design.¹⁷ All of the studies were projecting the data from the western population.

So no study was done in Indian population (developing countries) to study the perception of layperson to various orthodontic appliance. Thereby the aim of the study was to determine the acceptability, attractiveness and treatment values of various orthodontic appliances among the lay persons.

INTRODUCTION

Orthodontic speciality has travelled its path since Angle's era¹ to the present one, ranging from obnoxious banded appliances² that lacked the three dimensional control over the tooth, to the present day's bracket less approach.^{3,4} In the past, the choices for bracket style or appliance design were substantially limited for both the patient and clinician. At present the patients undergoing orthodontic treatment have a choice for orthodontic appliances ranging from traditional stainless steel appliance to ceramic, lingual and clear aligners.

Extra-oral appliances are a vital part of traditional orthodontic treatment protocols. Positional changes produced by orthodontic extra-oral appliances in the maxilla, the mandible, and the cranial base have been reported by many investigators⁵⁻¹¹ Considering the psychological characteristics of children, it is not easy for them to use an

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MATERIAL AND METHODS

Current study was done in VSPM’s Dental College and Research Centre, Nagpur after ethical clearance. Initially a chart consisting of 6 photographs of different combination of fixed appliances was prepared. The chart was later added with the individual cost of the fixed appliance at the bottom (fig 1). A datasheet was prepared which consisted of 3 questions based on that the attractiveness, acceptance and value for money of the 6 different combination of fixed appliances with the rating scale was prepared (table 1). Later a sample of 200 laypersons were selected as 1st and 2nd BDS students from VSPM’s Dental College and Research Centre, Nagpur by simple random sampling. A questionnaire (table-1) was framed for evaluation of attractiveness, acceptability and value of orthodontic appliances as grouped from group 1 to group 6 was distributed among the sample population and the images were displayed sequentially on the laptop without the cost and they were initially asked to mark their views on the first two parameters (attractiveness and acceptability) of 6 groups and later the same images were displayed with

the cost and were asked to mark their views on the third parameter (value) (fig. 1).

Coloured photographs of patients were taken into considerations and grouped as follows:

- Group 1.**
Metal bracket with standard arch wire and clear modules – 20,000
- Group 2.**
Metal bracket with standard arch wire and coloured modules – 20,000
- Group 3.**
Ceramic brackets with aesthetic arch wire and aesthetic ligature ties – 50,000
- Group 4.**
Ceramic brackets with standard arch wire and metal ligature ties – 30,000
- Group 5.**
Upper ceramic brackets with aesthetic arch wire and clear modules

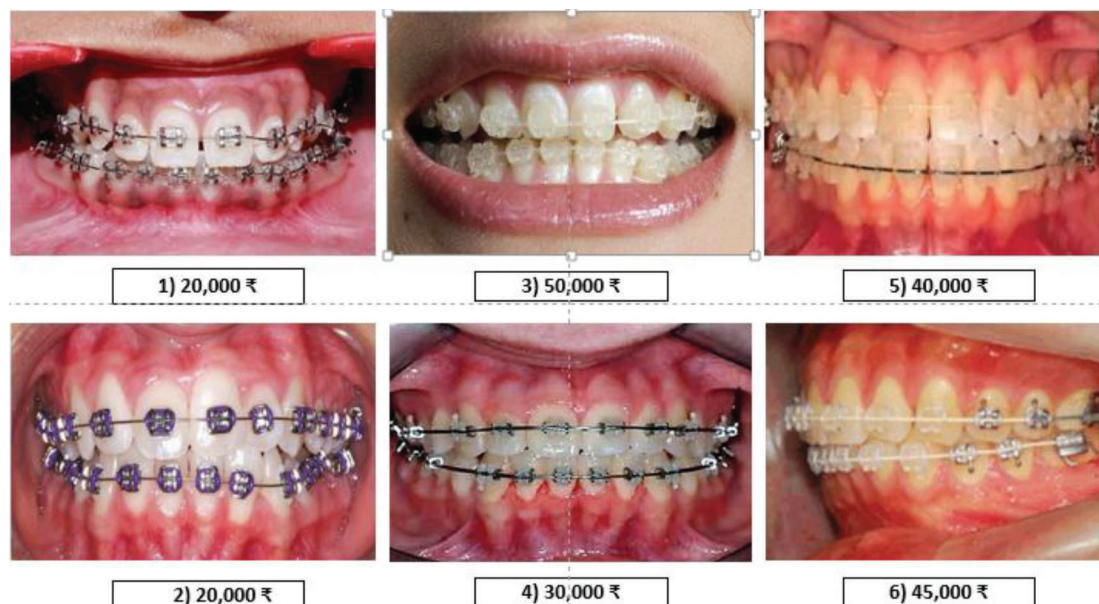


Figure-1: Images displayed sequentially on the laptop

Data sheet						
Name: _____		Age: _____			Sex: Male/Female	
Sample no	Q1. On the basis of attractiveness, rate the above displayed orthodontic appliances				Q2. If you are in need of orthodontic treatment, will you accept the same appliance on the teeth?	
	Attractiveness				Acceptability	
	Excellent	Good	Fair	Poor	Yes	No
1.						
2.						
3.						
4.						
5.						
Q3. Of the 6 appliances which appliance you prefer according to the rate chart?						
	1	2	3	4	5	6

Table-1: Questionnaire for evaluation of attractiveness, acceptability and value of orthodontic appliances as grouped from group 1 to group 6

Lower ceramic brackets with standard arch wire and clear modules – 40,000

Group 6.

Anterior upper and lower ceramic brackets with aesthetic arch wire and clear modules

Posterior upper and lower metal brackets with aesthetic arch wire and clear modules - 45,000

STATISTICAL ANALYSIS

The statistical analysis was done using the Statistical Package for the Social Science (SPSS version 22, Armonk, NY: IBM Corp). Descriptive statistics were performed for all the three variables namely appearance, acceptance and preference for orthodontic appliance based on value for money. The six types of orthodontic appliances that were compared across the study population included:

Group 1: Metal bracket with standard arch wire and clear modules

Group 2: Metal bracket with standard arch wire and coloured modules

Group 3: Ceramic brackets with aesthetic arch wire and aesthetic ligature ties

Group 4: Ceramic brackets with standard arch wire and metal ligature ties

Group 5: Upper ceramic brackets with aesthetic arch wire and clear modules

Lower ceramic brackets with standard arch wire and clear modules

Group 6: Anterior upper and lower ceramic brackets with aesthetic arch wire and clear modules

Posterior upper and lower metal brackets with aesthetic arch wire and clear modules

RESULTS

Attractiveness

Table-2 & Fig 2 depicts the proportion of laypersons’ perception towards orthodontic appliances belonging to all the six groups based on appearance or attractiveness. It revealed that appliance in group 1 was attractive for half (50%) of the population as rated good by them (n=50), whereas 34% (n=68) of them rated it as fair, followed by 16% (n=32) who rated it as poor. The appliance in group with metallic display of brackets as well as coloured modules was found to be attractive only by 3.5% (n=7) who rated

it as good whereas 49% (n=98) and 47.5% (n=95) rated it as poor and fair respectively. The appliance in group 3 was perceived to be very attractive by 80.5% (n=161) of study population who rated it as excellent followed by 19.5% (n=39) who rated it as good. There were mixed perceptions of attractiveness for appliance in group 4 rated as good by 42.5% (n=85) followed by 48% (n=96) and 9.5% (n=19) who rated it as fair and poor respectively. The appliances in groups 5 and 6 were perceived to be more attractive rated as good and excellent by almost more than half of the study population. The ranking for attractiveness can be projected in the following order:

Group 3> Group 6> Group 5> Group 4> Group 1> Group 2

Acceptability

Table-3 & Fig 3 represents proportion of laypersons’ acceptance of orthodontic appliance if in need of orthodontic treatment. It showed that majority of laypersons accepted appliance in group 3 followed by group 6, group 4, group 1, group 5 and group 2 as projected in the following order for the acceptance:

Group 3> Group 6> Group 4> Group 1> Group 5> Group 2

Preference based on Value for money

Table-4 & Fig 4 represents the data for the preference of appliance based on value for money. It was seen than laypersons preferred appliance in group 4 followed by group 1, group 5, group 6, group 3 and least preference was given to group 2 which can be projected in following order as follows:

Group 4> Group 1> Group 5> Group 6> Group 3> Group 2

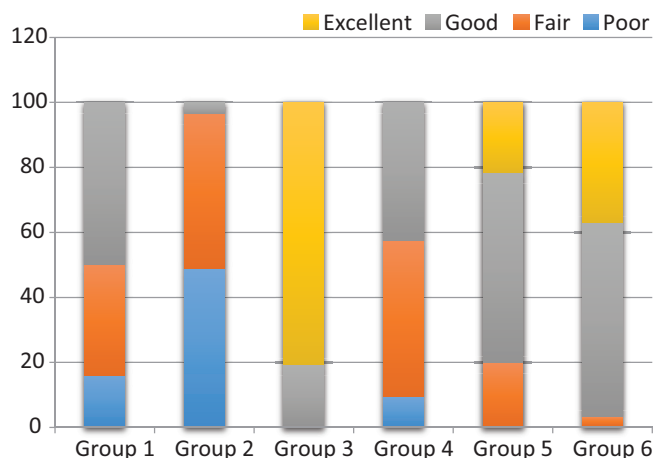


Figure-2: Perception of Laypersons for Orthodontic Appliances based on the Appearance

Appliances	Perception based on appearance			
	Poor n (%)	Fair n (%)	Good n (%)	Excellent n (%)
Group 1	32 (16)	68 (34)	50 (50)	0
Group 2	98 (49)	95 (47.5)	7 (3.5)	0
Group 3	0	0	39 (19.5)	161 (80.5)
Group 4	19 (9.5)	96 (48)	85 (42.5)	0
Group 5	0	40 (20)	117 (58.5)	43 (21.5)
Group 6	1 (0.5)	6 (3)	119 (59.5)	74 (37)

Table-2: Perception of Laypersons’ for Orthodontic Appliances based on the Appearance

Appliances	Proportion of acceptance	
	Yes n (%)	No n (%)
Group 1	128 (64)	72 (36)
Group 2	6 (3)	194 (97)
Group 3	194 (97)	6 (3)
Group 4	152 (76)	48 (24)
Group 5	126 (63)	74 (37)
Group 6	175 (87.5)	25 (12.5)

Table-3: Proportion of laypersons' acceptance of orthodontic appliance if in need of orthodontic treatment

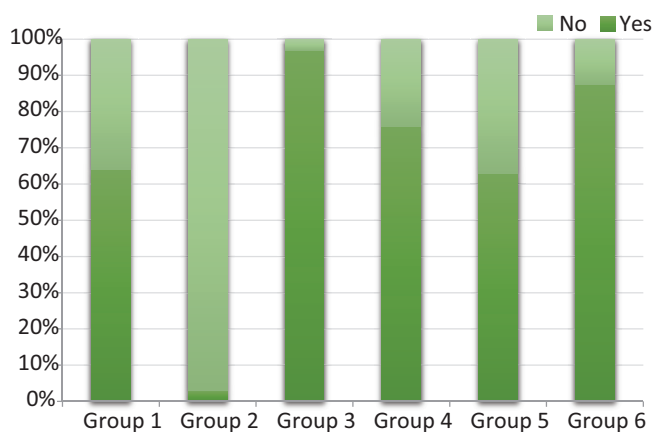


Figure-3: Proportion of laypersons' acceptance of orthodontic appliance if in need of orthodontic treatment

Appliances	Frequency n (%)
Group 1	55 (27.5)
Group 2	7 (3.5)
Group 3	13 (6.5)
Group 4	77 (38.5)
Group 5	31 (15.5)
Group 6	17 (8.5)

Table-4: Proportion of laypersons' preference for the appliance based on value for money

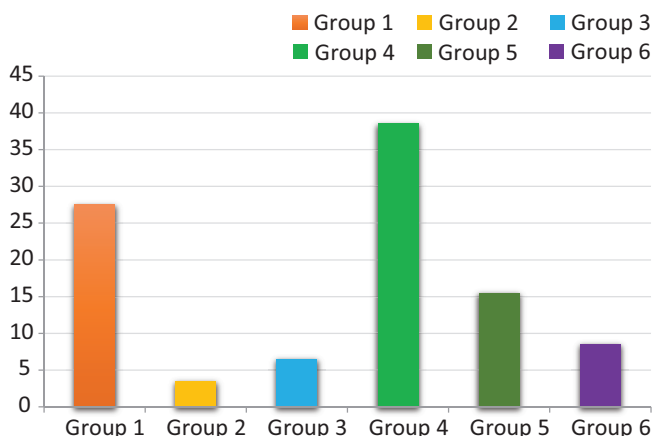


Figure-4: Proportion of laypersons' preference for the appliance based on value for money

DISCUSSION

The demand of orthodontic treatment in adults appears to be increasing (Salonen et al., 1992).¹⁸ This is because of the

result of improved dental and orthodontic awareness, as well as increased social acceptance of appliance therapy (Breece and Nieberg, 1986).¹⁹

Advancement in the aesthetics of appliances may also be a major factor in the increase in acceptability of orthodontic treatment for adults. Dental appearance with good aesthetic is believed to be a requirement of prestigious occupations among some professional groups (Jenny and Proshok, 1986).²⁰ Extreme deviations for dental and facial appearance from normal are viewed as unacceptable (Cons et al., 1983).²¹ Poor aesthetics may produces a negative perceptions of personal characteristics.

The judgement of society based on what is beautiful or acceptable has been ever changing throughout history (Peck and Peck, 1970).²² This is likely true for orthodontic appliances where many factors influence the appearance of an orthodontic appliance which includes the type of material used to fabricate the appliance, type of ligation technique, visibility of the appliance and oral hygiene maintenance.

In this era of 21st century, there is increase in the number of adult patients seeking orthodontic treatment where fixed orthodontic appliances have been considered to be the backbone of orthodontic biomechanical technique. However, adult patients are motivated by aesthetic considerations seeking orthodontic treatment, which provides a viable option for the orthodontist as well as to the patient.

Along with increasing modernization the aesthetic demand is ever increasing in common population. At the same time with increasing cost of living shortens the range of appliances preferred by population based on cost. Various appliance design with respect to biomechanical approach and materials are available which gives many options but along with that it creates confusion regarding the selection of appliances both for patient and the clinician.

The impact of orthodontic appliance aesthetics, acceptance and value for money depending upon the perceptions of personal characteristics may vary according to cultural traditions and social background. So there arises an urge to study further, which will evaluate and compare the same criteria's among the town and city population.

CONCLUSION

The proportion of laypersons' perception towards orthodontic appliances belonging to all the six groups based on appearance or attractiveness can be projected in the following order: Group 3> Group 6> Group 5> Group 4> Group 1> Group 2.

The proportion of laypersons' acceptance of orthodontic appliance if in need of orthodontic treatment showed that majority of laypersons accepted appliance in group 3 followed by group 6, group 4, group1, group 5 and group 2 as projected in the following order for the acceptance:

Group 3> Group 6> Group 4> Group 1> Group 5> Group 2. The proportion of laypersons' preference for appliance based on value for money in group 4 followed by group 1, group 5, group 6, group 3 and least preference was given to group 2 which can be projected in following order as follows:

Group 4> Group 1> Group 5> Group 6> Group 3> Group 2. Although the attractiveness and acceptability of appliances go in favour of ceramic brackets with aesthetic arch wire and aesthetic ligature ties. But the practical acceptability of appliances based on three parameters conclusively favour ceramic brackets with standard arch wire and metal ligature ties which fulfils both the aesthetics and cost effectiveness.

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