

Impact of Metallic Brackets on Self-Perception of Orthodontic Patients

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Abstract: Background: The field of orthodontics has seen a drastic increase in patients demanding esthetic brackets. Metallic brackets have a negative impact on smile esthetics but their effects on orthodontic patients in terms of change in their self-perception, social interaction, confidence, experience of getting bullied have not been studied before.

Objective: This study aims to see the patients' real social and psychological experiences while undergoing orthodontic treatment with metallic brackets.

Materials and Methods: This was a descriptive, cross-sectional study conducted for eight months at Dow International Dental College, utilized 200 printed questionnaires that recorded data related to patients' demographics, change in confidence, anxiety, experience of getting bullied, self-perception and social interaction after getting metallic brackets. Convenience sampling technique was used and patients who consented and had metallic brackets for at least 6 months were included. Data was analyzed by Statistical Package for the Social Sciences (Version 16.0) and reported in percentages.

Result: The age range of the patients who participated was 12-40 (mean=26) years. The patients who felt shy were 64 (33.7%) while, 57 (30%) had their smile esthetics affected, 37 (19.4%) were bullied and 46 (24.2%) experienced negative impact on their self-perception after getting metallic brackets. However, 103 (54.2%) of the patients would have selected esthetic brackets if had a choice.

Conclusion: Most of the patients felt good after having metallic brackets and their self-perception, confidence, and social standing did not get affected adversely. Though, most of them showed inclination towards esthetic brackets over metallic ones if given a choice.

Keywords: Metallic brackets, Self-perception, Impact, Esthetic brackets, Orthodontic patients, Bully, Social interaction, Mental health.

INTRODUCTION

Smile esthetics plays a pivotal role in developing personality traits and impacts social interaction. With rise in awareness and overwhelming influence of social media, demand for esthetics, well-aligned teeth and inconspicuous treatment modalities has shown a sharp increase. The field of orthodontics has also seen an increasing demand for invisible/less visible braces with obvious inclination of patients towards clear removable braces/aligners, lingual braces, ceramic brackets and less so towards conventional metallic and self-ligating brackets [1-4].

Previously reported studies gave an insight into the general preference of patients for appliances by having them rate digitally modified pictures of different appliances-clear trays, lingual brackets, ceramic brackets, metallic brackets, esthetic, and metallic orthodontic wires [1, 5]. Moreover, the quality of life of patients was compared, of those wearing fixed metallic appliances with the ones being treated with removable appliances [6]. Quality of life of patients wearing clear removable appliances was also compared with those wearing fixed metallic brackets and a number of studies proved that the impact on the patients'

quality of life also depended on the type of therapy received [7, 8]. A study reported patients' avoidance in going out after having separators and brackets [9]. Another study reported change in certain domains of quality of life 24 hours after placement of orthodontic brackets [10].

To date, none of the reported studies assessed patients' personal experiences after getting metallic braces for a considerable period of time. This study reports patients' personal experiences in terms of impact of metallic brackets on their smile esthetics, self-perception, self-esteem, bullying experiences and change in social standing, at least 6 months after commencement of their treatment.

MATERIALS AND METHODS

This cross-sectional study was conducted for 8 months, from May '2022 to January'2023 on patients undergoing orthodontic treatment in the department of orthodontics at Dow International Dental College who had metallic braces on their teeth for at least 6 months. The ethical approval to conduct the study was taken from the Institutional Review Board of Dow University of Health Sciences, Karachi (IRB-2456/DUHS/Approval/2022/823). Sample of 200, was collected by convenience sampling. Sample size was calculated using online sample size calculator of mean

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difference available at www.openepi.com after inserting mean and standard deviation of beauty self-evaluation of metallic braces (5.15 ± 2.25) and esthetic braces (6.20 ± 1.63) at 95% confidence interval we required at least $n=110$ samples for this study [11]. Printed questionnaires were distributed amongst patients who gave written consent to participate in the study. Confidentiality of the data was assured by making the personal details of the participants anonymous. The questionnaire was in English language and was verbally translated by the working house officers if needed, to ensure comprehension of the questions by the patients. The filled questionnaires were collected by the house officers working in the department. The questionnaire used in this study was designed to give an insight into the personal experiences of the patients who were undergoing orthodontic treatment with metallic braces. It comprised two sections, first one collected demographical data of the patients like, age, sex and treatment duration, while the second section comprised ten questions that aimed to gather information regarding patients' personal and psychological experiences after getting metallic braces including, self-confidence, anxiety, self-perception, bullying and preference for esthetic braces. Its validity was ensured by getting it checked from subject specialists in the fields of orthodontics and psychology (kappa score=0.81; crohn bach alpha=0.78). Moreover, a pilot study was performed to ensure clarity and then minor changes were made to maintain consistency in administration.

1. Data of the Participant (no personal information was collected so confidentiality of personal identification was ensured).
2. Change in patients' confidence, self-perception, and social interaction since the placement of metallic braces on their teeth.
3. Experience of bullying, if faced after placement of braces.
4. Patients' preference for esthetic braces based on their (braces') pictures.

STATISTICAL ANALYSIS

Data was entered in Excel sheet, analyzed by Statistical Package for the Social Sciences (SPSS, version 16.0) and results were reported in percentages.

Inclusion Criteria

1. Patients undergoing orthodontic treatment with fixed metallic braces at Dow International Dental College.
2. Patients consenting to participate in the study.
3. Patients who fully comprehend English language to fill the questionnaire.
4. Patients in the age range, 12-40 years.

5. Patients who have had metallic braces for at least 6 months.

Exclusion Criteria

1. Patients who do not consent to participate in the study.
2. Patients being treated with removable appliances.
3. Patients with a previous history of orthodontic treatment.

RESULT

Data was collected by questionnaires which were filled by 200 patients, drop out being 10 incompletely filled questionnaires. Thus, the final results were taken from a total of 190 completely filled questionnaires, response rate being 95%. Patients were in the age range of 12-40 years, undergoing orthodontic treatment and at least 6 months into treatment. Most of the patients were females, 143 (75%) (Table1), (Fig. 1).

Table 1. Demographic Data of the Research Participants.

Parameter	Number of Participants	Percentage
Age: 12-40 years (mean age= 26 years)	190	95%
Sex		
Male:	47	24.70%
Female:	143	75.30%
At least 6 months into treatment:	190	95%

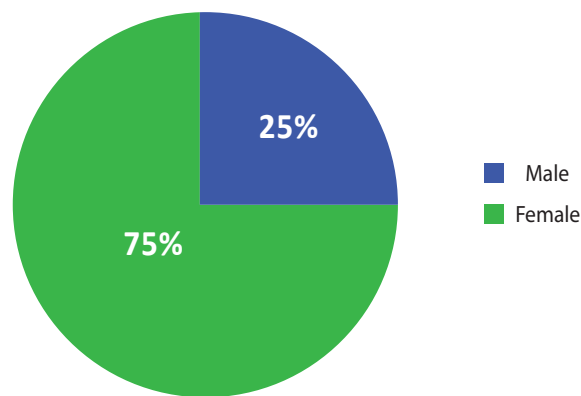


Fig. (1). Shows distribution of the Patients who Participated in the Research on the Basis of their Sex.

Results (Table 2) showed less than half of the participants, 64 (33.7%) of the orthodontic patients started feeling shy after getting metallic brackets. Similarly, less than half of the study participants, 57 (30%) were not content with their smiles with braces. A small percentage of the participants, 37 (19.4%) reported being bullied after placement of metallic braces. Nearly a quarter of the participants, 45 (23.7%) and 46 (24.2%) felt anxious showing braces while smiling and suffered a compromise

in self-perception, respectively.

A good majority of the participants, 159 (83.7%) of the patients, however, started feeling good after getting metallic braces. On the contrary, 173 (91.1%) of the study participants felt their confidence would improve after removal of braces. Nearly half of the participants, 103 (54.2%) would have selected esthetic braces if given a choice; and 63 (33.2%) of the patients would have done the same despite knowing its higher cost. Majority of the patients 180 (94.7%) would have gone against their dentist’s advice and selected esthetic braces even if their case demanded metallic ones.

Table 3 shows gender-wise comparison of the respondents with regard to the impact of metallic brackets on their psychological health and their preference for esthetic appliances. Pearson chi square test was used to check the association. None of the variables gave significant association with gender ($p>0.05$). Hence, there was no statistically significant difference reported in the responses and preferences shown by both the genders with regard to their experience after getting metallic brackets and also their preference for esthetic brackets if they had a choice.

Table 2. Findings of the Data Recorded from the Orthodontic Patients with regard to the Impact of Metallic Brackets on their Psychological Health and their Preference for Esthetic Appliances (n=190).

Parameter Tested	n (%)
Patients who started feeling shy after getting metallic brackets	
Yes	64 (33.7)
No	126 (66.3)
Patients who think their smile looks bad after getting metallic brackets	
Yes	57 (30.0)
No	133 (70.0)
Patients who were bullied after getting metallic brackets	
Yes	37 (19.4)
No	154 (81.1)
Patients who felt more anxious showing their metallic brackets	
Yes	45 (23.7)
No	144 (75.8)
Patients whose self-perception/acceptance got adversely affected after getting metallic brackets	
Yes	46 (24.2)
No	143 (75.3)
Patients who felt good after getting metallic brackets	
Yes	159 (83.7)
No	30 (15.8)
Patients who felt they would become more confident after removal of their braces	

Yes	173 (91.1)
No	16 (8.4)
Patients who would have selected esthetic brackets, had given a choice	
Yes	103 (54.2)
No	86 (45.3)
Patients who would have selected esthetic braces over metallic, despite knowing the former’s higher cost	
Yes	63 (33.2)
No	129 (67.9)
Patients who would have selected esthetic braces despite knowing their dentist’s recommendation for metallic braces in their particular case	
Yes	180 (94.7)
No	11 (5.8)

Table 3. Gender-wise Comparison of the Respondents with regard to the Impact of Metallic Brackets on their Psychological Health and their Preference for Esthetic Appliances (n=190).

Parameter Tested	n (%)	Male n (%)	Female n (%)	X ²	p
Patients who started feeling shy after getting metallic brackets					
Yes	64(33.7)	16(34.0)	45(31.5)	0.10	0.74
No	126(66.3)	31(66.0)	98(68.5)		
Patients who think their smile looks bad after getting metallic brackets					
Yes	57(30.0)	17(36.2)	39(27.3)	1.34	0.24
No	133(70.0)	30(63.8)	104(72.7)		
Patients who were bullied after getting metallic brackets					
Yes	37(19.4)	12(25.5)	25(17.5)	1.46	0.22
No	154(81.1)	35(74.5)	118(82.5)		
Patients who felt more anxious showing their metallic brackets					
Yes	45(23.7)	13(27.7)	30(21.0)	0.90	0.34
No	144(75.8)	34(72.3)	113(79.0)		
Patients whose self-perception/acceptance got adversely affected after getting metallic brackets					
Yes	46(24.2)	13(27.7)	33(23.1)	0.405	0.52
No	143(75.3)	34(72.3)	110(76.9)		
Patients who felt good after getting metallic brackets					
Yes	159(83.7)	39(83.0)	118(82.5)	0.005	0.94
No	30(15.8)	8(17.0)	25(17.5)		
Patients who felt they would become more confident after removal of their braces					
Yes	173(91.1)	43(91.5)	132(92.3)	0.03	0.85
No	16(8.4)	4(8.5)	11(7.7)		

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Patients who would have selected esthetic brackets, had given a choice					
Yes	103(54.2)	26(55.3)	78(54.5)	0.009	0.92
No	86(45.3)	21(44.7)	65(45.5)		
Patients who would have selected esthetic braces over metallic, despite knowing the former's higher cost					
Yes	63(33.2)	17(36.2)	46(32.2)	0.256	0.61
No	129(67.9)	30(63.8)	97(67.8)		
Patients who would have selected esthetic braces despite knowing their dentist's recommendation for metallic braces in their particular case					
Yes	180(94.7)	45(95.7)	134(93.7)	0.26	0.60
No	11(5.8)	2(4.3)	9(6.3)		

DISCUSSION

Dental esthetics has been proved to be a significant factor that affects one's self-perception and also how one is perceived by society [12, 13]. Not only the esthetics but the overall dental health counts significantly towards quality of life of an individual [14]. The results of this study showed that most of the orthodontic patients undergoing orthodontic treatment with metallic brackets did not get affected by the compromised esthetics and high visibility of the appliances that come as a part and parcel with such a treatment modality. Less than half of the total patients studied felt shy while smiling with braces (Fig. 2) or were dissatisfied with their smile esthetics.

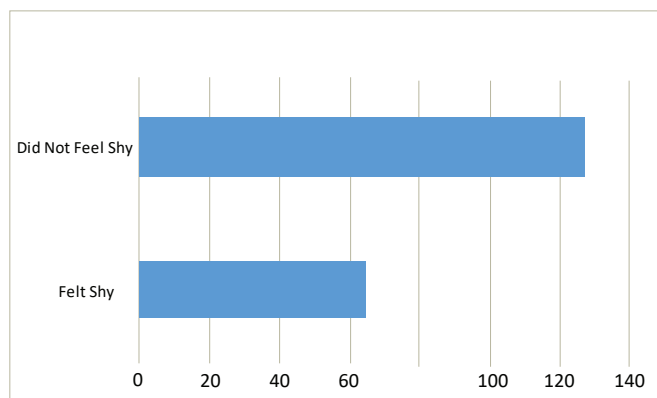


Fig. (2). Shows Percentage of Orthodontic Patients Who Felt/Did Not Feel Shy after Getting Metallic Brackets.

This was in line with another research where all the domains of oral health related quality of life were affected by metallic braces except, social embarrassment and ability to smile confidently in public [7]. A few of the patients, 19.4%, in this study were being bullied by their peers after starting treatment with metallic braces (Fig. 3), which was a positive outcome, given the conspicuousness and visibility of the appliance. This correlated well with results of other studies where hardly any bullying was faced by orthodontic patients due to visible appliances and only one case was reported where the functional appliance became the cause of bullying [15-17]. Moreover, other studies reported

better patient attitude towards treatment as it became a source of empowerment and coping mechanism in the face of bullying that they had experienced due to their malocclusion before seeking treatment [18].

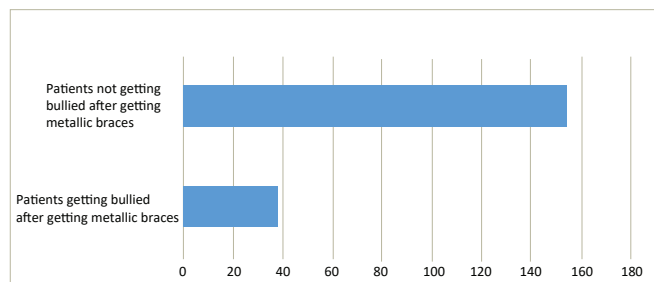


Fig. (3). Shows Percentage of Orthodontic Patients Who Were/Were Not Bullied after Getting Metallic Brackets.

In this study, less than half the patients experienced negative impact on their self-perception due to having metallic brackets (Fig. 4), which means majority of the patients in the study population accepted it without having their self-esteem affected. This was in contrast to another study where fixed appliances had adverse impact on psychosocial health of patients than those of removable appliances which could be removed at socially sensitive situations [6]. On the other hand, our study reports most of the patients, 83.7%, actually felt well after getting braces (Fig. 5). This can be supported by a number of studies, which accounted for this unusual finding [19]. The patients must have developed acceptance for the appliance, in the hope of getting their malocclusion corrected and seeing the progress of treatment their attitude must have become more tolerant towards the appliance [18, 20]. Not only theirs, but their peers' too who previously brought their attention towards their impaired dental esthetics which is an established cause of disturbance of psychosocial health [17, 21, 22]. This further emphasizes the fact that patients should be counselled before starting their treatment and discussion related to their possible selves before and after treatment should be done to avoid negative consequences and gain confidence of the patients [23]. However, most of the patients in our study also reported an anticipation of improvement in confidence after removal of their braces. This result could not be compared with any prior study as it has not been reported before.

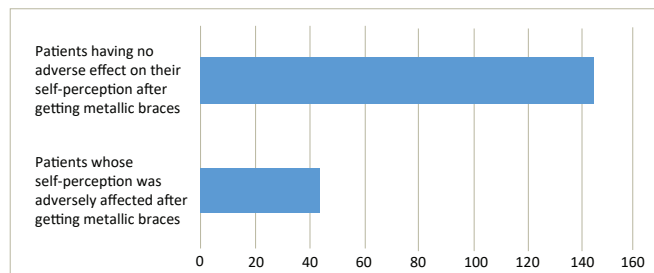


Fig. (4). Shows Percentage of Orthodontic Patients Whose Self-Perception Was/Was Not Adversely Affected after Getting Metallic Brackets.

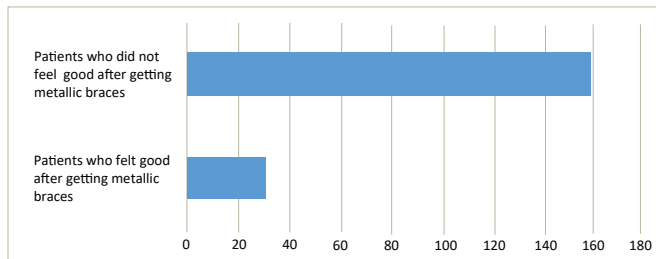


Fig. (5). Shows Percentage of Orthodontic Patients Who Felt/ Did Not Feel Good after Getting Metallic Brackets.

More than half of the patients in this study, 54.2%, opined that they would have gone for esthetic braces instead of metallic ones, had given a choice (Fig. 6) and most of them would have done the same and against their dentists' advice despite knowing suitability of their particular case for metallic braces. This is in line with other studies where research participants were shown pictures of different appliances and they showed an overwhelming inclination towards esthetic braces over metallic ones [1, 3, 5, 24-27]. The results of this study also showed statistically similar experience of female patients with metallic braces when compared with the male patients in the study. However, no such data was found in the previously reported literature on the matter with which the results could be compared.

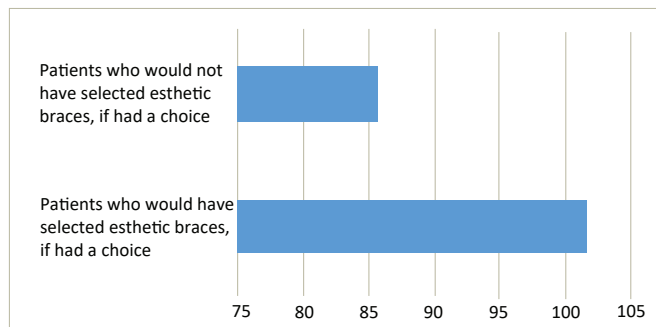


Fig. (6). Shows Percentage of Orthodontic Patients Who Would/ Would Not Have Selected Esthetic Brackets over Metallic Brackets if Given a Choice.

Metallic brackets, nevertheless, are conspicuous and affect smile esthetics negatively where the patients are seeking esthetic options, more so in today's day and age. But they are superior in durability and are indicated in certain cases where the esthetic options do not work well [28, 29]. Moreover, a recent study also reported a good majority of the patients choosing metallic braces over esthetic ones, proving that they have still not gone out of fashion [30]. Patients' preference and concerns should be given importance when planning treatment strategies and this study will help in giving an insight into their experiences. Clinicians should also try to give all the treatment options in terms of appliances and make the patient aware of their risks and benefits to help them decide; esthetics should not always be the overriding factor. Clinicians can also instill motivation in their patients towards acceptance of metallic brackets by making them anticipate good treatment results and providing them with constant support and positive reinforcement throughout treatment.

LIMITATION

Limitation of this study include inability to include other variables that affect the patients' choice of the appliances. This study was limited to one center which was a public sector organization catering to patients belonging to lower to middle class strata. Inclusion of private sector organizations would have given a broader perspective. Moreover, the study population was predominantly of females who are more conscious about their social appearance. Since self-perception is also affected by age, exposure and social standing, these factors should be accounted for and correlated with patients' experiences in future studies.

CONCLUSION

Metallic brackets did not affect the self-perception, confidence, and smile esthetics of most of the patients showing a fair acceptance by patients of metallic brackets, but patients nevertheless would have chosen esthetic braces if given a choice. Moreover, most of the patients felt good after having metallic braces but expected to become more confident after their removal.

Most of the patients did not feel shy showing off metallic braces on smiling and a very few reported getting bullied showing good acceptance of the orthodontic patients wearing metallic braces amongst their peers too.

AUTHORS' CONTRIBUTION

- **Hareem Sultan:** Concept, Design, Data collection, Manuscript writing and Supervision of the entire project.
- **Ramal Jawaid:** Design, data collection, Statistical analysis, Manuscript writing.
- **Hana Pervez:** Design, Data collection, Manuscript writing, Compilation of results and Supervision of manuscript writing.
- **Sara Shah, Sadia Shabbir and Ujala Kumari:** Design, Data collection, Manuscript writing.

CONFLICT OF INTEREST

Declared none.

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