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IP Indian Journal of Orthodontics and Dentofacial Research

Journal homepage: <https://www.ijodr.com/>

## Original Research Article

## Psychological evaluation of self-esteem among individuals before and after orthodontic treatment

Rajakumar Premkumar<sup>1</sup>, Vinoth Kumar<sup>1</sup>, Vivekanadhan Umapathy<sup>1</sup>, Harshitha Suresh<sup>1\*</sup><sup>1</sup>Dr.MGR Educational and Research Institute, Chennai, Tamil Nadu, India

## ARTICLE INFO

## Article history:

Received 16-06-2024

Accepted 13-07-2024

Available online 02-09-2024

## Keywords:

Malocclusion

Psychology

Health

Orthodontic treatment

Rpsenberg selfesteem scale

## ABSTRACT

**Background:** Facial esthetics plays a pivotal role in orthodontics. Orthodontics can alter a patient's appearance. Various factors related to malocclusion have strong influences on perceptions of facial esthetics  
**Objectives:** The aim of the study is to assess the self-esteem of patients before and after orthodontic treatment.

**Materials and Methods:** A questionnaire consisting of 10 multiple choice questions were given to 33 patients with moderate to severe malocclusion seeking orthodontic treatment and the subjects had to mark "strongly agree", "agree", "disagree", "strongly disagree" aged 19-25 years and statistical analysis(Chi-square test) was carried out.

**Results:** The results of the study showed improved self-esteem.

**Conclusion:** Mal-alignment is contemplated not as a dental issue, but is also related to healthy living. The self-esteem of the patients was significantly improved after orthodontic treatment because a smile plays an important part in facial expressions.

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## 1. Introduction

Biological, mental, and social dimensions are of great vitality in the field of dentistry.<sup>1,2</sup> The complications of oral diseases can have their own psychological aspects in dentistry. The most important effect of a mal-alignment is the psychological health of the patient.<sup>3</sup>

Malocclusion is an unsuitable condition, perceived by many people as a divergence from being beautiful.<sup>4</sup> Although, the size and shape of the teeth and face can have an impact on a person's psycho-social health.

Research shows that Orthodontics can enhance oral health. Orthodontics can alter a patient's appearance. Orthodontists must note the psychosocial health of the patient.<sup>5</sup> People are known to be more confident after

orthodontic treatment with high self-esteem.

According to a study, the psychological health of children is not changed even with poor oral health. Adults are less impacted by peer perceptions and are firmer about getting an orthodontic treatment. Possibly facial aesthetics plays a pivotal role in self-esteem therefore more awareness about the relationship between orthodontic treatment and facial esthetics should be published.

The objective of the study was carried out to establish the extent of psychological problems among patients who require orthodontic treatment and to establish if it influences the patient's psychological status.

\* Corresponding author.

E-mail address: [harshithasuresh7204@gmail.com](mailto:harshithasuresh7204@gmail.com) (H. Suresh).

## 2. Materials and Methods

### 2.1. Study design

The prospective cohort study was conducted among 33 patients attending the Orthodontics outpatient department of a private dental college in Chennai city, Tamil Nadu, India. It was a three years follow-up study conducted between 20<sup>th</sup> November 2017 and 6<sup>th</sup> September 2020. The study protocol describing the nature and purpose of the study was presented to the Institutional Review Board of Dr. MGR Educational and Research Institute and approval was obtained (Ref:Dr.MGRDU/TMDCH/2017-2018/26917001)

### 2.2. Participants' recruitment

The participants for the current study were selected using a purposive sampling methodology which included patients undergoing fixed orthodontic treatment in the department of orthodontics. They were selected based upon the following inclusion and exclusion criteria.

### 2.3. Inclusion criteria

1. Individuals with dental malocclusion requiring fixed orthodontic treatment.
2. Willingness to participate in the study.

### 2.4. Exclusion criteria

1. Presence of any systemic diseases.
2. Individuals with skeletal malocclusion.
3. Individuals not willing to provide informed consent.

The fixed appliance at the time of bonding was 0.022 inch slot pre-adjusted MBT prescription stainless steel brackets. The archwires consisted of 0.016 inch nickel-titanium wires to 21x25 stainless steel wires.

### 2.5. Development and validation of the study instrument

The self-esteem of the study participants before and after the orthodontic treatment was evaluated using the modified Rosenberg self-esteem scale. It is a Uni-dimensional 10-item scale that measures self-worth by measuring both positive and negative feelings.<sup>6</sup> The scale was modified to include dental components and redesigned to measure self-esteem among orthodontic patients. All items were answered utilizing a 4-point Likert scale format ranging from strongly agree to strongly disagree. The questionnaire consisting 10 multiple choice questions involving the psychosocial aspects of the patient including dental awareness, and dental satisfaction psychological status of patients before and after orthodontic treatment.

The questions are:

1. On the whole, I am satisfied with my smile and teeth alignment.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree.

2. At times, I think my teeth alignment and smile is not good at all.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree

3. I feel that I have a good personality.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree

4. I am able to do things, confidently as most other people.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree

5. I feel, I don't have much to be proud of my smile.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree

6. I certainly feel depressed at times.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree

7. I feel my smile is worth at least on an equal plane with others.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree

8. Wish I could have more attraction to my smile.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree

9. All in all, I am very unhappy with my smile.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree.

10. I take a positive attitude towards myself.

(i) Strongly agree (ii) Agree (iii) Disagree (iv) Strongly disagree

For questions 1,3,4,7 and 10, the scoring is given as 1 point for strongly agree and 4 points for strongly disagree. Questions 2,5,6,8 and 9 are reverse scored. The recording scores are kept on a continuous scale. The overall self-esteem is calculated by adding the points for all the questions and a higher score indicates higher self-esteem. The instrument was validated during the pilot study among 10 samples. The internal consistency of the questionnaire was adequate with a Cronbach's alpha of 0.70. The reliability of the tool was assessed by the test-retest method, in which the participants were given the questionnaire on two occasions separated by a week (Kappa value 0.85). A panel of experts was constituted to check the content validity of the questionnaire. The experts assessed whether the items are satisfactorily measuring the proposed construct and are adequate to measure the field of interest. Training and calibration of the investigator was done in the department of orthodontics.

## 2.6. Data collection

The study participants were involved in a one-to-one interview with the principal investigator before the start of the treatment and after obtaining informed consent. The questions were read by the investigator and the respondents were asked to provide appropriate answers. They were guaranteed confidentiality of the data. The information was stored securely and the same procedure was repeated once they completed the treatment. The responses of the participants before and after the treatment were analyzed and compared. The initial sample size of the study was 35 and two patients didn't report after completion of the treatment. Therefore, the final data analysis was done with 33 participants.

## 2.7. Statistical analysis

The data were analyzed using IBM Corporation, SPSS Inc., Chicago, IL, USA version 26 software package. Descriptive statistics with frequency, percentage, mean and standard deviation were calculated. Pearson's Chi-square test and Fisher's Exact test were used to assess the statistical significance of count data. The mean self-esteem scores before and after treatment were compared using paired t-test since the data followed a normal distribution as assessed by the Shapiro-Wilk test. The level of significance was measured at  $p < 0.05$ .

## 3. Results

Individuals who were not satisfied with their smile and teeth alignment in pre-treatment got satisfied in post-treatment as the percentage indicates in the above data. The differences were not statistically significant ( $p=0.340$ ). When asked about their teeth alignment, patients were not satisfied at all in pre-treatment. However, after orthodontic treatment, they were satisfied with the results of orthodontic treatment. The differences were not statistically significant ( $p=0.131$ ). Individuals who felt they did not have a good personality in pre-treatment were significantly improved in the post-treatment. The differences were not statistically significant ( $p=0.618$ ). The confidence levels were low in pre-treatment, it was improved after orthodontic treatment. The differences were not statistically significant ( $p=0.619$ ). Individuals who were not satisfied with their smiles in pre-treatment got satisfied in post-treatment. The differences were statistically significant ( $p=0.000$ ). Individuals who were depressed in pre-treatment got improved in post-treatment. The differences were statistically significant ( $p=0.000$ ). Individuals who felt their smile and teeth alignment is not on an equal plane with others were improved after treatment as the percentage indicates in the above data. The differences were statistically significant ( $p=0.000$ ). When asked if they could be more attracted to their smile, the results were not satisfactory. However,

the results improved post-treatment as the percentage indicates in the above data. The differences were statistically significant ( $p=0.000$ ). Individuals who were unhappy with their smiles in pre-treatment got satisfied in post-treatment. The differences were not statistically significant ( $p=0.935$ ). When asked if they could take a more positive attitude towards themselves, the results were satisfactory after orthodontic treatment as the percentage indicates in the above data. The differences were not statistically significant ( $p=0.135$ ). The results of the study show that the self-esteem of the patients significantly improved after orthodontic treatment.

## 4. Discussion

Significant variations in self-esteem were seen in patients before and after orthodontic treatment. The large inter-individual variations seen in the study are due to the patient's improved confidence and esthetics after orthodontic treatment. Numerous studies have assessed the psychological effects of orthodontic treatment in some patients.<sup>7-9</sup>

"Smile is an index of mind". In the modern era, greater self-esteem is positively correlated with happy and healthy living. Many people have issues with their smiles, which affects their self-esteem and confidence.

Few studies have correlated the psychological study of people seeking orthodontic treatment. Minnesota multiphasic personality inventory questionnaire containing 71 questions were given to 100 subjects with moderate to severe mal-alignment who were undergoing orthodontic treatment.<sup>10</sup> The results were evaluated using the Independent T-test and it was proved both treated and untreated subjects were psychologically normal before and after orthodontic treatment.

Some studies that highlighted the psychological influences and timing of orthodontic treatment conducted a study on 75 children.<sup>11</sup> They were given a questionnaire regarding the psychological development during the preadolescent and adolescent stages and it was proven that self-consciousness is greatly improved after orthodontic treatment.

Studies on the impact of orthodontics on the psychological profile of adult patients have conducted a study on 40 patients with moderate to severe mal-alignment who underwent orthodontic treatment.<sup>12</sup> They were given a questionnaire on regular intervals and it was concluded that self-esteem and body image is greatly enhanced after orthodontic treatment

Research done on Attitude towards orthodontic treatment between treated and untreated subjects conducted a study on 446 subjects (untreated individuals-220 and treated individuals-246), they were given a questionnaire on the general attitude of subjects after orthodontic treatment, it was proved that the treated individuals were more inclined

towards orthodontic treatment.<sup>13</sup>

Studies on Self-perceived and attitude towards orthodontic treatment among adolescents in Sweden proved that Swedish girls seem to be the least content with appearance, self-regard and are more aware of orthodontic treatment.<sup>14</sup> They conducted a study on 508 students and were divided into different groups based on nationality and it was proved that orthodontic treatment need is less in immigrant students compared to other nationalities. One of the main limitations of this study is the small sample size and lack of awareness on this topic.

Study done on to evaluate the effect of dental crowding and lip protrusion on self-esteem and quality of life (QOL) in female orthodontic patients with Class I malocclusion, consisting of 201 patients (mean age  $22.6 \pm 3.0$  years) proved that patients with mild crowding or protrusion had significantly bettered self-esteem and QOL scores than severe crowding or protrusion patients.<sup>15</sup>

## 5. Conclusion

“Face is an index of mind”. As the proverb suggests, we found that the self-esteem of the patients was significantly improved after orthodontic treatment because a smile plays an important part in facial expressions. Only a few studies have correlated the psychological health of the patients with orthodontic treatment. More research on this field should be emphasized.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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## Author biography

**Rajakumar Premkumar**, Professor  <https://orcid.org/0009-0007-0561-6145>

**Vinoth Kumar**, Reader  <https://orcid.org/0000-0003-2448-0988>

**Vivekanadhan Umopathy**, Reader  <https://orcid.org/0009-0008-3240-5316>

**Harshitha Suresh**, Post Graduate Student  <https://orcid.org/0009-0004-5683-2452>

**Cite this article:** Premkumar R, Kumar V, Umopathy V, Suresh H. Psychological evaluation of self-esteem among individuals before and after orthodontic treatment. *IP Indian J Orthod Dentofacial Res* 2024;10(3):185-188.