



## Pain Perception and Attitude towards Orthodontic Treatment of Treated & Untreated subjects

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### Abstract

**Introduction and Objective of study:** Orthodontic treatment involves alignment of the teeth and correction of jaw asymmetry. Pain and discomfort are the common problems noticed during the treatment. This study was designed to evaluate the relationship of pain perception and attitude towards orthodontic treatment of treated and untreated patients.

**Methodology:** The sample contained of two groups: Group 1 contained of 50 untreated subjects (25 males, 25 females; average age  $22.7 \pm 1.4$  years), and Group 2 consisted of 50 treated subjects (25 males, 25 females; average age,  $23.07 \pm 1.3$  years). Data collection was done in questionnaire form that included an assessment of pain experience for treated subjects, pain expectation for untreated subjects, and attitude toward orthodontic treatment. An analysis of variance was done between the groups to test for statistical significance. Categorical variables were evaluated with independent t-test with level of significance  $P<0.05$ .

**Results:** Treatment status affects pain perception and attitude of a person toward orthodontic treatment. Pain perception of untreated patients was high compared to treated patients. Attitude of untreated patients was more negative than treated patients. It was statistically significant.

**Conclusion:** Lack of awareness towards the orthodontic treatment was noticed in untreated patients. Pain perception and attitude of treated patients may vary by operator's skills and practice. Patients with better attitude experienced less pain.

**Keywords:** Pain perception, attitude, Orthodontic treatment.

### Introduction

A successful orthodontic treatment is largely dependent on the knowledge and skills of the clinician and the cooperation of patients. Major considerations regarding patient cooperation are regularity in keeping appointments, compliance in wearing elastics, headgear or wearing removable appliances, refraining from chewing hard and

tenacious substances that are likely to distort the arch wires, and remove bonded brackets and maintenance of oral hygiene. Laxity in following these instructions may lead not only to compromised treatment but also to slow progress of treatment, loss of chair time, increased number of visits to the orthodontist and frustration for the clinician, patient, and parents.<sup>1</sup>

Gender and age of subjects were correlated with general attitude toward orthodontic treatment.<sup>2</sup> Females had a greater desire to accept, undergo, and to be satisfied with orthodontic treatment than males.<sup>3</sup>

Discomfort and pain are common during orthodontic treatment. Approximately, 90% to 95% of orthodontic patients are reported to experience pain during the course of orthodontic treatment.<sup>4</sup> In the orthodontics, the main cause of pain is the application of forces to induce tooth movement. Pain is also influenced by motivation, gender, and personality factors.<sup>5</sup> Pain and discomfort can be one of the important discouraging factors for orthodontic treatment.

So the aim of the study was to investigate the relationship between pain perception and attitude towards orthodontic treatment.

## Material and Methods

The questionnaire-based cross-sectional study was conducted on 100 patients between the ages of 20 to 25 years who reported to the dental outpatient department at the division of Orthodontics and Dentofacial Orthopedics.

The research protocols were reviewed and approved by the Institutional Ethical Committee. The subjects participating in the study were verbally explained in detail the scope and nature of the study and their informed consent was obtained.

The study sample was divided into two groups. Group 1 consisted of 50 untreated subjects. Group 2 consisted of 50 subjects who either had completed their orthodontic treatment or had completed a minimum of 6 months of their scheduled orthodontic treatment. Each of the two groups had 50 males and 50 females. Syndromic cases, cases treated with removable appliances, functional appliances and orthognathic surgery, or cases treated with appliance systems other than PEA were excluded. The instrument for data collection for the study was a questionnaire consisting of two parts.

The first part of the questionnaire contained a series of questions about the pain perception. Pain expectation for untreated subjects and pain

experience for the treated subjects was assessed using a visual analogue scale (VAS) based on a line marked at 10 mm intervals whose ends were anchored and defined with verbal descriptors such as "extremely likely" and "extremely unlikely." This questionnaire consisted of eight questions with two subdivision regarding pain [Appendix 1]. Each patient was asked to place a mark on the line nearest to his or her expectation or experience. The scores for the eight questions were averaged to get one score referred to as the average pain perception score. On the VAS line, the lowest scores indicate less pain experienced/expected from orthodontic treatment and the highest scores indicate more pain experienced/expected.

## Appendix 1

### Instructions:

1. Give the scoring between 1-10 scale.
  2. For a and b subdivision, give the individual rating.
  3. The lowest scores indicate less pain experienced/expected from orthodontic treatment and the highest scores indicate more pain experienced/expected.

**Remarks, if any:**

The second part of the questionnaire contained a series of questions about attitude. Attitude toward orthodontic treatment for participants in this study was assessed using a VAS marked at 10 mm intervals. A questionnaire consisting of 7 questions, mainly about the attitude toward orthodontic treatment was given to each subject [Appendix 2]. Subjects were asked to answer questions by placing a mark on the line nearest to

their attitude toward the treatment. On the VAS line, the lowest scores indicate a more positive attitude toward orthodontic treatment and the

highest scores indicate a more negative attitude toward orthodontic treatment.

## Appendix 2

| QUESTIONNAIRE STUDY   |                    |
|---|--------------------|
| Name:   | Age/Sex:           |
| Date:   | Treated/ Untreated |
| <b>Attitude:</b>  |                    |
| 1. Was / will orthodontic treatment comfortable?<br>Extremely Unlikely  _ _ _ _ _ _ _ _  extremely likely   |                    |
| 2. Was / will change in the food habits necessary?<br>Extremely Unlikely  _  _  _  _  _   extremely likely  |                    |
| 3. Was / will maintenance of the oral hygiene difficult during orthodontic treatment?<br>Extremely Unlikely  _  _ _  _ _  _  extremely likely   |                    |
| 4. Was / will wearing of braces shameful?<br>Extremely Unlikely  _  _ _  _ _  _  extremely likely   |                    |
| 5. Was /will visiting of orthodontist after debonding necessary?<br>Extremely Unlikely  _  _ _  _ _  _  extremely likely  |                    |
| 6. Was / will wearing of elastics during orthodontic treatment have any use?<br>Extremely Unlikely  _  _ _  _ _  _  extremely likely  |                    |
| 7. Was / will change in the looks after orthodontic treatment?<br>Extremely Unlikely  _  _ _  _ _  _  extremely likely  |                    |
| <b>Mean:</b>  |                    |
| <b>Instructions:</b>  |                    |
| 1. Give the scoring between 1-10 scale.<br>2. The lowest scores indicate a more positive attitude toward orthodontic treatment and the highest scores indicate a more negative attitude toward orthodontic treatment. |                    |
| <b>Remarks, if any:</b>   |                    |

A brief explanation about the scope of this study and clarification of questions included in the questionnaire and how to score them were given to all subjects. Patients were encouraged to ask for help or further explanation if they encountered any difficulty in understanding or scoring the questionnaire.

## Results

Each group consisted of 25 males and 25 females of the age group of 21-25 years. The data suggests that both the groups were well matched for age and gender with a mean age of  $22.7 \pm 1.4$  in untreated group and  $23.07 \pm 1.3$  in treated group [Table 1 & chart 1].

The mean pain perception for the Group 1 (untreated group) was  $4.09 \pm 0.89$  and similarly for Group 2 (treated group) was  $3.33 \pm 0.53$ . The comparison of pain perception of untreated and treated group [Table 1] indicated that there was difference between the two groups, that is, orthodontic treatment had effect on pain perception ( $P < 0.001$ ).

The mean attitude for untreated group was  $4.19 \pm 0.97$  and  $3.65 \pm 0.78$  for treated group. There was statistically significant difference ( $P = 0.003$ ) in the attitude of untreated and treated groups [Table 1 & chart 1].

The mean pain perception of the males in untreated group was  $4.15 \pm 0.92$  and  $4.03 \pm 0.87$  for females and in the treated group it was  $3.42 \pm 0.56$  for males

and  $3.24 \pm 0.21$  for females. A two-sample t-test revealed, there was no statistically significant difference in pain perception of males and females in the untreated group ( $P = 0.64$ ) and treated group ( $P = 0.23$ ). Thus, there was no effect of gender on pain perception [Table 2 & chart 2].

The mean attitude of males in untreated group was  $4.05 \pm 1.03$  and  $4.33 \pm 0.91$  for females and in

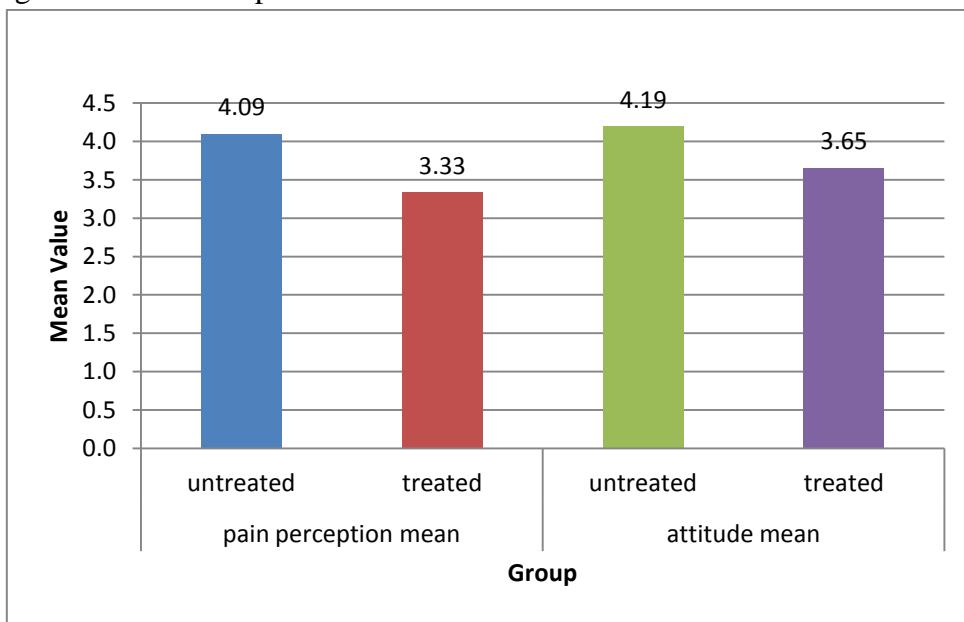
treated group it was  $3.57 \pm 0.82$  for males and  $3.73 \pm 0.76$  for females. A two-sample t-test revealed there was no significant difference in attitude of males and females in untreated group ( $P = 0.31$ ) and in the treated group ( $P = 0.49$ ), suggesting that there was no effect of gender on attitude of the patient [Table 3 & chart 3].

**Table 1:** Showing the result of independent t-test

| GROUP                |           | N  | Mean | Std. Deviation | Std. Error Mean | Mean Difference | P Value |
|----------------------|-----------|----|------|----------------|-----------------|-----------------|---------|
| pain perception mean | untreated | 50 | 4.09 | .89            | .125            | .76             | <0.001* |
|                      | treated   | 50 | 3.33 | .53            | .076            |                 |         |
| attitude mean        | untreated | 50 | 4.19 | .97            | .138            | .54             | .003*   |
|                      | treated   | 50 | 3.65 | .78            | .111            |                 |         |

Where \* shows statistically significant

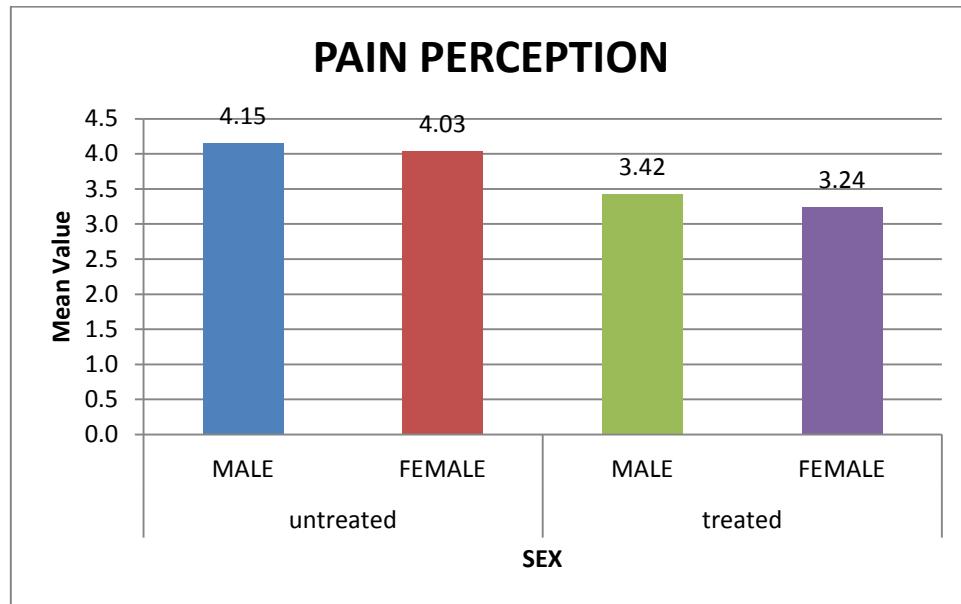
**Chart 1:** Showing the result of independent t-test



**Table 2:** Showing the result of pain perception towards the orthodontic treatment

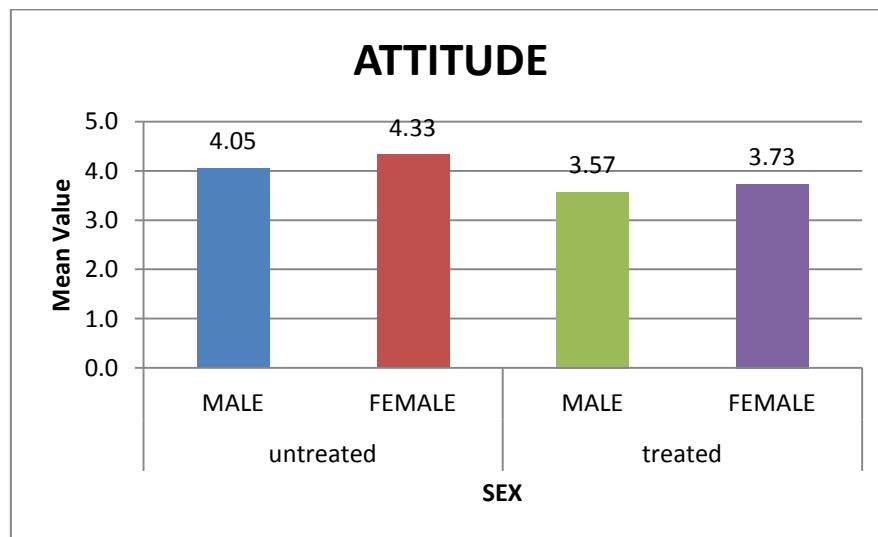
| SEX       |        | N  | Mean | Std. Deviation | Std. Error Mean | Mean Difference | P Value |
|-----------|--------|----|------|----------------|-----------------|-----------------|---------|
| untreated | MALE   | 25 | 4.15 | .92            | .184            | .12             | .644    |
|           | FEMALE | 25 | 4.03 | .87            | .174            |                 |         |
| treated   | MALE   | 25 | 3.42 | .56            | .111            | .18             | .231    |
|           | FEMALE | 25 | 3.24 | .51            | .101            |                 |         |

Where \* shows statistically significant

**Chart 2:** Showing the result of pain perception towards the orthodontic treatment**Table 3:** Showing the result of attitude towards the orthodontic treatment

| SEX       |        | N  | Mean | Std. Deviation | Std. Error Mean | Mean Difference | P Value |
|-----------|--------|----|------|----------------|-----------------|-----------------|---------|
| untreated | MALE   | 25 | 4.05 | 1.03           | .206            | -.28            | .314    |
|           | FEMALE | 25 | 4.33 | .91            | .183            |                 |         |
| treated   | MALE   | 25 | 3.57 | .82            | .163            | -.15            | .492    |
|           | FEMALE | 25 | 3.73 | .76            | .152            |                 |         |

Where \* shows statistically significant

**Chart 3:** Showing the result of attitude towards the orthodontic treatment

## Discussion

Optimum clinical management of patients seeking orthodontic treatment requires patient motivation and cooperation, which may be affected by their attitude toward orthodontic treatment and pain perception.<sup>5</sup> Knowing the patient's attitude would

aid the orthodontist to understand the patient better in terms of their compliance which is one of the most important factors for successful treatment. Today, when the patient has paramount importance in decision making and treatment planning, knowing the relationship between pain perception

and his/her attitude toward treatment should help to improve patient satisfaction.

The results of the present study have shown that the treatment had a positive effect on pain perception and treated patients showed less pain and discomfort, and positive attitude towards the orthodontic treatment [Table 1]. Using a questionnaire based model, Zhang et al.<sup>7</sup> also obtained similar results.

Contrary to the findings of the present study, Firestone et al.<sup>5</sup> stated that the pain perception was similar for treated and untreated groups and there was no effect of treatment on pain perception. Abu Alhaija et al.<sup>6</sup> also obtained similar result.

Patient compliance and attitude of the patient toward treatment are important factors for successful treatment. In the present study, there was statistically significant difference ( $P = 0.03$ ) in attitude of treated and untreated patients [Table 1].

Many other studies have shown better attitude in treated patients compared to untreated patients with greater dental awareness, internal control, and improvement in self-image than those who hadn't been treated previously.<sup>8,9,10,11,12</sup>

In this study, the gender did not have any effect on pain perception [Table 1]. Similarly, in a study by Ngan et al.<sup>13</sup> pain perception didn't show any gender variation over a period of 7 days into the treatment after placement of arch wires. Similar results were also shown Jones and Chan.<sup>14</sup> and Erdinç and Dincer<sup>15</sup> in their studies.

Many other studies revealed greater pain perception in females than in male subjects.<sup>16,17</sup> In a similar questionnaire based study done by Abu Alhaija et al.<sup>2</sup> showed gender as the only factor that affects subject's average pain perception and females had greater pain perception than males. The possible causes for variation of results of the present study from the aforementioned published studies could be due to racial differences, difference in a sample size of the studies and socioeconomic status of the patients.

It was hypothesized that female subjects would have a more positive attitude toward orthodontics than male subjects.<sup>9</sup> In this study, there was no

effect of the gender on attitude of the patient toward orthodontic treatment in treated and untreated subjects [Table 3]. Similar results were shown in the studies by Bos et al.<sup>9</sup> and Abu Alhaija et al.<sup>2</sup> where the gender of patients did not show any effect on attitude toward orthodontic treatment.

In the present study, there was a strong correlation between pain perception and attitude of the patients. Similarly a study by Sergl et al.<sup>18</sup> showed poor attitude with increased pain perception. Pain was one of the most important discouraging factors for taking up orthodontic treatment and most important negative motives for taking up orthodontic treatment.<sup>2,17,19,20</sup>

The present study indicates that patients' attitude affect pain perception toward orthodontic treatment. Knowing the attitude of the patient before commencing, during and after the treatment may be beneficial for the patient and for the orthodontist.

It is recommended that psychological assessment of the patient should be given due importance pretreatment, during treatment and post treatment to elicit maximum compliance of the patient and improve patient satisfaction.

## Conclusion

- Lack of awareness towards the orthodontic treatment was noticed in the untreated patients.
- Pain perception and attitude of treated patients may vary by operator's skills and practice.
- Gender had no effect on pain perception or attitude of the patients toward treatment.

A more positive attitude was found in patients who experienced less pain during orthodontic treatment.

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