



## Original Research Article

# Experience, oral hygiene practices, and perception of the patients undergoing fixed orthodontic treatment: A cross-sectional study

Harsimran S Kapoor<sup>1\*</sup>, Ajit K Jaiswal<sup>1</sup>, Jasmeet K Ryait<sup>1</sup>, Jagriti Setia<sup>1</sup>

<sup>1</sup>Dept. of Orthodontics and Dentofacial Orthopaedics, Baba Jaswant Singh Dental College, Hospital and Research Institute, Ludhiana, Punjab, India



## ARTICLE INFO

## Article history:

Received 03-03-2023

Accepted 04-04-2023

Available online 16-06-2023

## Keywords:

Fixed orthodontic treatment

Experience

Pain

Oral hygiene practices

Perception

Difficulties

Braces

## ABSTRACT

**Aim:** The aim of the study is to highlight the common difficulties faced and experiences of the patients while undergoing fixed orthodontic treatment, along with their oral hygiene practices and perception of the treatment.

**Materials and Methods:** The study was conducted to survey the patients undergoing fixed orthodontic treatment using an online questionnaire via Google forms, with four sections. An informed consent was taken from the patients. The questionnaire was divided into 4 sections.

Section 1: Demographic details and Informed consent

Section 2: Difficulties and Experience of the patient during Orthodontic treatment

Section 3: Oral Hygiene Practices during Orthodontic treatment

Section 4: Patient's perception of the treatment

**Results:** The most common difficulty found to be faced by the patients undergoing fixed orthodontic treatment is pain due to activation of wire after an orthodontic appointment (63.5%), followed by ulcers on cheeks/lips (44.3%) and swollen gums (30.5%). It was also found that majority of participants (79.8%) used an orthodontic toothbrush and 66% of them brushed twice daily to maintain their oral hygiene. As per patient's perception, 61.6% of participants were bothered by longer duration of the treatment.

**Conclusion:** The study concluded that patients undergoing fixed orthodontic treatment face a number of difficulties. Although pain due to wire activation was the most often reported issue, quite few participants sought any medication for pain alleviation, suggesting that the pain was not particularly intense. The majority of participants used an orthodontic brush, while only a few used floss to maintain oral hygiene. Around half of the total participants were conscious of their appearance due to visible braces.

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## 1. Introduction

The goal of orthodontic therapy is to enhance dental occlusion, which could also lead to a healthy, aesthetically pleasing dentition that blends well with the face.<sup>1</sup> Since fixed appliance orthodontic treatment gives adults a functional and aesthetically pleasing dentition, its use has increased over the past few decades. Yet, several factors

such as pain, length of treatment, aesthetics, difficulties with oral hygiene, etc. cause people to reject orthodontic treatment.

Patients who are undergoing orthodontic treatment may perceive it to be an uncomfortable process. The oral cavity is a sensitive area of the body, and orthodontic appliances are foreign materials or devices that are implanted there, causing both physical and emotional discomfort which may have a detrimental effect on the patient's willingness to receive treatment, their level of compliance, and ultimately

\* Corresponding author.

E-mail address: [dr.hskapoorldh@gmail.com](mailto:dr.hskapoorldh@gmail.com) (H. S. Kapoor).

the quality of the treatment services.<sup>2,3</sup>

Orthodontic therapy is more time consuming and is frequently accompanied by several issues that make patients' daily lives more uncomfortable.<sup>4</sup> Patients receiving orthodontic treatment feel pain and discomfort during various periods of treatment.<sup>5</sup> Pain is chiefly caused by the movement of the teeth and may impair the patient's quality of life, cause uneasiness, and interfere with everyday activities such as mastication and speech.<sup>6</sup> In 2002, a study by Kluemper et al. suggested that pain is a major reason for discontinuing the treatment.<sup>7</sup> Most of the patients undergoing fixed appliance treatment complain about pain, discomfort, oral ulceration, tongue soreness, and functional limitations (BERGIUS et al., 2000).<sup>8</sup>

Apart from pain, the long duration of treatment, esthetics, difficulty maintaining oral hygiene, etc., there are a few factors that can lead to rejection of the treatment by the patients. Patients' self-confidence and morale are adversely affected by their speech impairment and the visibility of the appliance, especially during social interactions and gatherings when the attention from the face and eyes gets focused on the braces in the mouth.<sup>9</sup> In order to determine what variables lead to initial rejections for orthodontic treatment, Langlade conducted a study in 2003, where prolonged treatment duration, discomfort due to appliances, poor esthetics of brackets, pain, and fear of disappointment with the outcome of treatment were found to be the main reasons .

While many studies concentrate on the dentist's viewpoint, patients' perspectives and experience while undergoing fixed orthodontic treatment have received little consideration.<sup>10</sup> During the treatment, orthodontic patients frequently endure many functional complaints and are anxious about their appearance.<sup>11</sup> Zhang et al. claimed that patients who are aware of the discomfort they may experience during treatment establish more realistic expectations of the procedure, which may allow them to keep their confidence throughout the procedure. Therefore, it becomes crucial and valuable for orthodontists to investigate and comprehend the prospects and problems of the patients receiving treatment.<sup>12</sup>

This study aims to highlight the difficulties faced and experiences of the patients while undergoing fixed orthodontic treatment, along with their oral hygiene practices and perception of the treatment.

## 2. Material and Methods

The present study was carried out among the patients undergoing fixed orthodontic treatment for more than 6 months in an orthodontic setup in Ludhiana. All the participants who consented for the study were included, their participation in the study was confidential and on voluntary basis.

### 2.1. Exclusion criteria

1. Patients undergoing removable appliance orthodontic treatment.
2. Patients who had completed fixed orthodontic treatment.
3. Patients who are about to start fixed orthodontic treatment or started for less than 6 months.

Data was collected using a questionnaire via Google forms which was administered to the participants by the author with proper instructions. The questionnaire consisted of four sections. The Section-1 belonged to the demographic profile of the participants. The Section-2 assessed the difficulties faced and experience of the patients regarding fixed orthodontic treatment (12 questions). The next 3 questions (Section-3) assessed their oral hygiene practices. Section-4 (7 questions) was regarding their perception of the treatment.

The data was tabulated in MS- Excel and grouped according to the age and gender of the participants. The participants were divided into two age groups:  $\leq 19$  years and  $> 19$  years. The participants were also divided into males and females. The data was statistically analysed using unpaired student t test.

## 3. Results

The study included 203 participants undergoing fixed orthodontic treatment: 71 males (35%), 132 females (65%), with a mean age of  $19.6 \pm 4.35$  SD. The participants were also divided into two age groups:  $\leq 19$  years (101, 49.7%) and  $> 19$  years (102, 50.2%).

The most common problem faced by the patients is pain due to wire activation after an orthodontic appointment (63.5%), followed by ulcers on cheeks / lips (44.3%) and swollen gums (30.5%). The least difficulty faced by the patients was in speech (11.8%) and sleep (12.8%). [Table 1] When questions were asked about oral hygiene, it was seen that the majority of the participants were using an orthodontic brush (79.8%), and 66% of them brushed twice daily to maintain their oral hygiene. [Table 2] Based on the participant's perception, the long duration of fixed orthodontic treatment bothered more than half of them (61.6%), whereas the least percentage (34%) were bothered by the dietary restrictions. [Table 3] 38.4% of the participants became comfortable with braces within first week of the placement, while 18.7% took more than a month. [Figure 4] No significant difference was observed in relation to age and gender based on difficulties, oral hygiene, and the patient's perception of the treatment. [Figure 1, 2 and 3]

**Table 1:** Difficulties experienced by the patients during fixed orthodontic treatment

Difficulties	Response	Total N (%)	Males N (%)	Females N (%)	p-value
Difficulty in speech	Yes	24 (11.8%)	11 (15.5%)	13 (9.8%)	0.53 <sup>NS</sup>
	No	141 (69.5%)	46 (64.8%)	95 (72%)	
	At times	38 (18.7%)	14 (19.7%)	24 (18.2%)	
Difficulty in mastication	Yes	52 (25.6%)	22 (31%)	30 (22.7%)	0.27 <sup>NS</sup>
	No	102 (50.2%)	31 (43.7%)	71 (53.8%)	
	At times	49 (24.1%)	18 (25.4%)	31 (23.5%)	
Difficulty in maintaining oral hygiene	Yes	59 (29.1%)	23 (32.4%)	36 (27.3%)	0.35 <sup>NS</sup>
	No	111 (54.7%)	35 (49.3%)	76 (57.6%)	
	At times	33 (16.3%)	13 (18.3%)	20 (15.2%)	
Difficulty in sleeping	Yes	26 (12.8%)	10 (14.1%)	16 (12.1%)	0.54 <sup>NS</sup>
	No	148 (72.9%)	52 (73.2%)	96 (72.7%)	
	At times	29 (14.3%)	9 (12.7%)	20 (15.2%)	
Increased salivation	Yes	55 (27.1%)	21 (29.6%)	34 (25.8%)	0.44 <sup>NS</sup>
	No	128 (63.1%)	45 (63.4%)	83 (62.9%)	
	At times	20 (9.9%)	5 (7%)	15 (11.4%)	
Sensitivity in teeth	Yes	46 (22.7%)	18 (25.4%)	28 (21.2%)	0.4 <sup>NS</sup>
	No	122 (60.1%)	41 (57.7%)	81 (61.4%)	
	At times	35 (17.2%)	12 (16.9%)	23 (17.4%)	
White spots on teeth	Yes	36 (17.7%)	13 (18.3%)	23 (17.4%)	0.61 <sup>NS</sup>
	No	167 (82.3%)	58 (81.7%)	109 (82.6%)	
	Yes	62 (30.5%)	25 (35.2%)	37 (28%)	
Swollen gums	No	92 (45.3%)	31 (43.7%)	61 (46.2%)	0.13 <sup>NS</sup>
	At times	49 (24.1%)	15 (21.1%)	34 (25.8%)	
	Yes	61 (30%)	24 (33.8%)	37 (28%)	
Discomfort due to breakage of bonded attachment	No	119 (58.6%)	38 (53.5%)	81 (61.4%)	0.42 <sup>NS</sup>
	At times	23 (11.3%)	9 (12.7%)	14 (10.6%)	
	Yes	90 (44.3%)	31 (43.7%)	59 (44.7%)	
Ulcers on cheeks or lips	No	58 (28.6%)	19 (26.8%)	39 (28.5%)	0.1 <sup>NS</sup>
	At times	55 (27.1%)	21 (29.6%)	34 (25.8%)	
	Yes	129 (63.5%)	43 (60.6%)	86 (65.2%)	
Pain after activation of wire	No	44 (21.7%)	15 (21.1%)	29 (22%)	0.45 <sup>NS</sup>
	At times	30 (14.8%)	13 (18.3%)	17 (12.9%)	
	Yes	43 (21.2%)	14 (19.7%)	29 (22%)	
Medication for pain relief	No	136 (67%)	52 (73.2%)	84 (63.6%)	0.46 <sup>NS</sup>
	At times	24 (11.8%)	5 (7%)	19 (14.4%)	

p≥0.05 non-significant (NS)

**Table 2:** Oral hygiene practices during orthodontic treatment

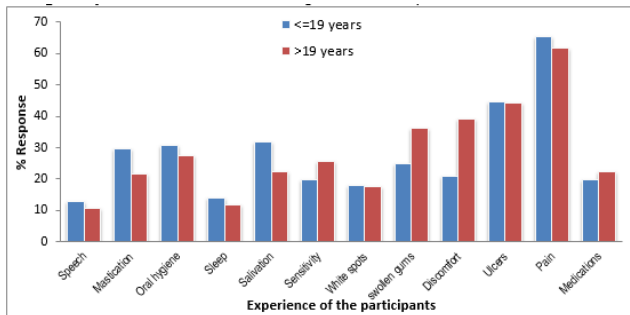
Oral Hygiene Practices	Response	Total N(%)	Males N (%)	Females N(%)	P-value
Use of orthodontic brush	Yes	162 (79.8%)	53 (74.6%)	109 (82.6%)	0.61 <sup>NS</sup>
	No	29 (14.3%)	15 (21.1%)	14 (10.6%)	
	At times	12 (5.9%)	3 (4.2%)	9 (6.8%)	
Frequency of brushing (per day)	Once	33 (16.3%)	16 (22.5%)	17 (12.9%)	0.5 <sup>NS</sup>
	Twice	134 (66%)	46 (64.8%)	88 (66.7%)	
	> Twice	13 (6.4%)	4 (5.6%)	9 (6.8%)	
Other modes of plaque control	After every meal	23 (11.3%)	5 (7%)	18 (13.6%)	0.29 <sup>NS</sup>
	Floss	18 (8.9%)	6 (8.5%)	12 (9.1%)	
	Mouthwash	94 (46.3%)	40 (56.3%)	54 (40.9%)	
	Interdental brush	24 (11.8%)	5 (7%)	19 (14.4%)	
	None	67 (33%)	20 (28.2%)	47 (35.6%)	

p≥0.05 non-significant (NS)

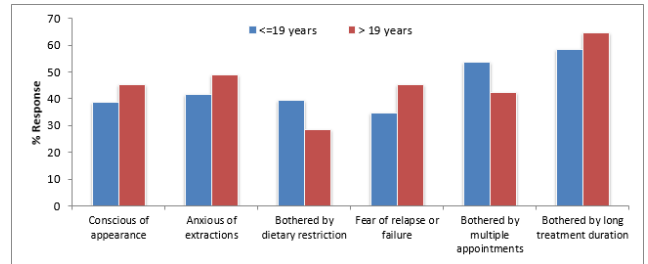
**Table 3:** Patient’s perception of the treatment

Perception	Response	Total N (%)	Males N (%)	Females N (%)	P-value
Conscious of appearance	Yes	85 (41.9%)	29 (40.8%)	56 (42.4%)	0.37 <sup>NS</sup>
	No	100 (49.3%)	34 (47.9%)	66 (50%)	
	At times	18 (8.9%)	8 (11.3%)	10 (7.6%)	
Anxious of extraction	Yes	92 (45.3%)	25 (35.2%)	67 (50.8%)	0.21 <sup>NS</sup>
	No	111 (54.7%)	46 (64.8%)	65 (49.2%)	
Bothered by dietary restrictions	Yes	69 (34%)	21 (29.6%)	48 (36.4%)	0.41 <sup>NS</sup>
	No	108 (53.2%)	32 (45.1%)	76 (57.6%)	
	At times	26 (12.8%)	18 (25.4%)	8 (6.1%)	
Fear of relapse or failure	Yes	81 (39.9%)	29 (40.8%)	52 (39.4%)	0.24 <sup>NS</sup>
	No	122 (60.1%)	42 (59.2%)	80 (60.6%)	
Bothered by multiple appointments	Yes	97 (47.8%)	31 (43.7%)	66 (50%)	0.09 <sup>NS</sup>
	No	106 (52.2%)	40 (56.3%)	66 (50%)	
Bothered by long treatment duration	Yes	125 (61.6%)	40 (56.3%)	85 (64.4%)	0.34 <sup>NS</sup>
	No	78 (38.4%)	31 (43.7%)	47 (35.6%)	

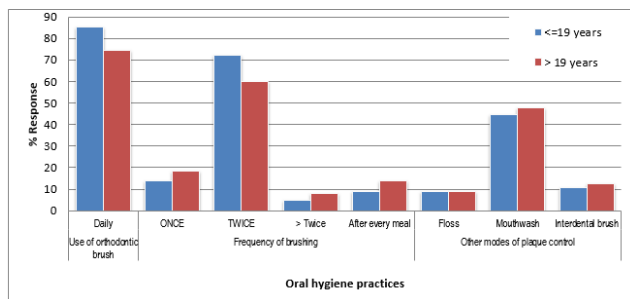
p ≥ 0.05 non-significant (NS)



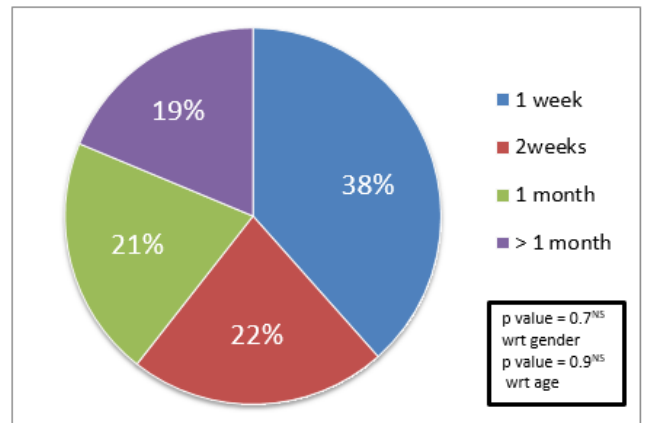
**Figure 1:** Experience and difficulties faced by the participants grouped according to age (<=19 and >19 years) during their fixed orthodontic treatment (p value = 0.9 NS)



**Figure 3:** Perception of the participants grouped according to age (<=19 and >19 years) regarding fixed orthodontic treatment (p value = 0.9 NS)



**Figure 2:** Oral hygiene practices adopted by the participants grouped according to age (<=19 and >19 years) while undergoing fixed orthodontic treatment (p value = 0.9 NS)



**Figure 4:** Time taken by the participants to become comfortable with braces after their initial placement

**4. Discussion**

The goal of orthodontic treatment is to improve dental occlusion, which can lead to a healthy, pleasant, and aesthetically pleasing dentition and face. Over the past few decades, there has been an upsurge in the number of people demanding orthodontic therapy. However, some

factors cause people to deny orthodontic therapy, such as its longer duration, the maintenance of oral hygiene, difficulty in speech or mastication, pain, swollen gums, etc.

The current study aims to highlight the various difficulties faced by the patients, their oral hygiene practices, and their experience with fixed orthodontic

therapy. In this study, 203 participants were taken, out of whom 71 were males (35%), and 132 were females (65%). The participants were also divided into two age groups:  $\leq 19$  years (101) and  $> 19$  years (102). No significant difference was observed in relation to age and gender based on difficulties, oral hygiene practices, and the patient's perception of the treatment.

The result of the study showed that more than half of the participants (63.5%) reported having pain due to wire activation after an orthodontic appointment. 21.7% of participants responded "No" to pain, and only 14.8% responded "At times" to pain, whereas in another study done by Priyanka Rai et al., 35% of participants responded "At times" to pain.<sup>13</sup> In the present study, among all participants, 67% didn't take any medication for pain relief, which signified that the pain was not very severe in intensity and tolerable in nature. 10 to 30% of participants reported difficulty in speech, mastication, maintaining oral hygiene, and sleeping. Our result followed another study done by Priyanka Rai et al. in 2019, which showed 20–40% of the participants found similar difficulties.<sup>13</sup>

Some of the participants were also facing other problems like tooth sensitivity, swollen gums, discomfort due to breakage of bonded attachment, and ulcers on the cheeks and lips (22.7%, 30.5%, 30%, and 44.3%, respectively). Although 27.1% of participants showed increased salivation during orthodontic treatment, a study conducted by Sepideh Arab et al. revealed that there is no significant change in salivary flow during orthodontic therapy, but there is a change in salivary pH.<sup>14</sup>

Out of the total number of participants, around 80% of them used an orthodontic brush. 66% of participants brushed their teeth twice daily to maintain their oral hygiene. Various participants also followed other modes of oral hygiene: 8.9% of people used floss, 46.3% used mouthwash, and 11.8% used an interdental brush. In another study done by Jin Han Lee in Malaysia in 2016, it was found that 30 percent of participants were using floss, 64.4% were using mouthwash, and 68.6% were using an interdental brush.<sup>15</sup>

When the questionnaire section based on the perception of fixed orthodontic treatment was given to participants, it was observed that around half of them were anxious about extractions during the treatment and multiple appointments. About 60% of them were bothered by the longer duration of treatment. 41.9% of participants were conscious of their appearance due to visible braces. According to a similar study conducted by Saibel Farisht, only 23.3% of patients were bothered by the longer treatment duration, and 19.5% were conscious due to the unaesthetic appearance of braces.<sup>16</sup>

Diet restrictions and relapse after treatment bothered 34% and 39.9% of respondents, respectively. When asked about the time taken to become comfortable with braces, it was observed that 38.4% took 1 week, 22.2% took 2

weeks, 20.7% took 1 month, and 18.7% took more than a month to be comfortable with braces. In another similar study by Priyanka Rai et al., it was found that 34% of patients became comfortable with braces within a week of their initial placement.<sup>13</sup>

## 5. Conclusion

This study concluded that 63.5% of participants experienced pain due to wire activation after an orthodontic appointment, while only 21.2% of the participants took any medications for the pain management. Majority of the participants maintained their oral hygiene by using an orthodontic brush, whereas a smaller number of participants were using other modes of plaque control, especially floss (8.9%) and an interdental brush (11.8%). Around half of the participants were conscious of their appearance and anxious about extractions while undergoing fixed orthodontic treatment. Age and gender have no effect on the difficulties experienced and perception of the treatment by participants undergoing fixed orthodontic treatment.

## 6. Source of Funding

None.

## 7. Conflict of Interest


None.

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### Author biography

**Harsimran S Kapoor**, Junior Resident  <https://orcid.org/0000-0003-2036-2941>

**Ajit K Jaiswal**, Professor and Head

**Jasmeet K Ryait**, Reader

**Jagriti Setia**, Post Graduate

**Cite this article:** Kapoor HS, Jaiswal AK, Ryait JK, Setia J. Experience, oral hygiene practices, and perception of the patients undergoing fixed orthodontic treatment: A cross-sectional study. *J Contemp Orthod* 2023;7(2):101-106.