

# Assessment of Oral Hygiene Complications and Status in Orthodontic Patients: A Prospective Observational Study

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**Abstract:** *This prospective observational study was carried out at Sai Ganesh Multi Speciality Dental Hospital in Nainnagar, Hanamakonda, spanning a 6-month period. The study aimed to assess oral hygiene complications and status in orthodontic patients, identifying factors contributing to poor oral hygiene. Findings revealed a prevalence of gingival bleeding and high plaque scores in patients with high sugar consumption, infrequent or improper brushing, and low usage of cleaning aids. Plaque index scores were determined using the teeth whitening shade guide and plaque control record, indicating a correlation between high plaque scores and gingival bleeding. The study underscores the suboptimal oral hygiene status among orthodontic patients and emphasizes the necessity of patient education to enhance oral hygiene practices and prevent potential orthodontic complications.*

**Keywords:** Orthodontic patients, Oral hygiene complications, Plaque score, Gingival bleed, Cleaning aids

## 1. Introduction

Oral hygiene is greatly complicated in orthodontic patients; the purpose of orthodontics is to place the tooth in a ideal occlusion. It functions by applying pressure to the tooth in order to gradually move in the desired direction. Depending upon the severity of the malocclusion, the condition of the tooth, gums and supporting bone and how strictly the patient was adheres to instructions, the length of time needed for braces differs from person to person. Some most common types of cleaning aids are dental flosses, inter-dental cleaners, mouth rinses, oral irrigates, rubber tip simulators and tongue cleaners .The complications include pain associated with orthodontic treatment and periodontal diseases.

## 2. Materials and Methods

**Study Site:** Sai Ganesh Multispecialist Dental Hospital, GMR & Complex, Nainnagar, Hanamakonda.

**Study Type:** Prospective observational study.

**Study Period:** Six months

### Study Criteria:

Inclusion criteria: All age groups of orthodontic patients  
Exclusion criteria: Except orthodontic patients other dental patients are excluded.

**Source of Data:** All the relevant data was collected through questionnaire form and it includes Teeth whitening shade guide; plaque control record and gingival bleed index

### Forms included in the study

Questionnaire form  
Teeth whitening shade guide  
Plaque control record  
Gingival bleed index

## Study procedure

The study was conducted through direct interaction with patients. The patients teeth were examined through teeth whitening shade guide.

Responses were collected and their plaque score and gingival bleed score were analyzed.

Percent with plaque =  $\frac{\text{The number of surface with plaque}}{\text{number of tooth surface examined}} \times 100$

Low plaque score – 0-10%

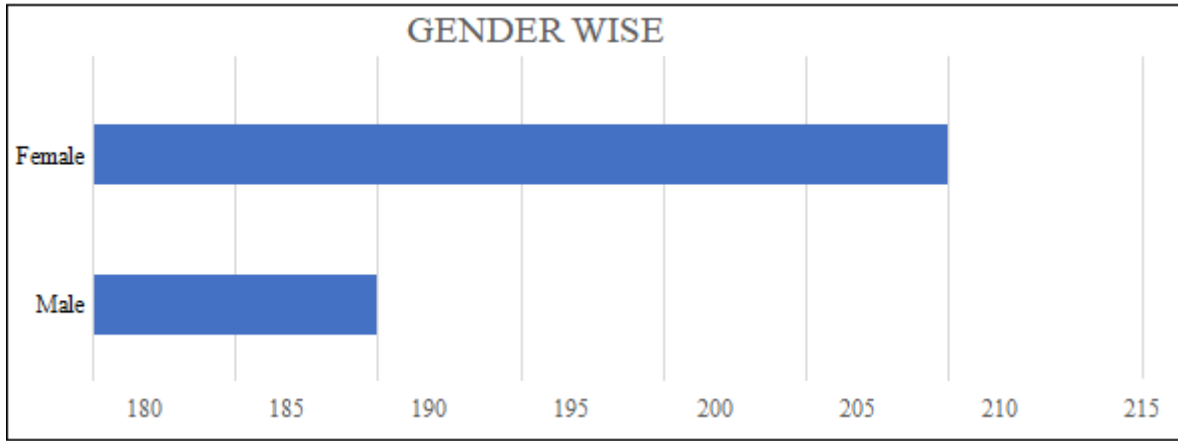
Moderate plaque score – 10-20% High plaque score – more than 20%

Percent with gingival bleed =  $\frac{\text{number of bleeding sites}}{\text{total number of sites}} \times 100$  The data was collected throughout 6 months from 400 patients and analyzed. Total summarized data were collected and results are interpreted through graph pad prism.

## 3. Results and Discussion

### Gender wise distribution

Gender	Total number of population
Male	190
Female	210

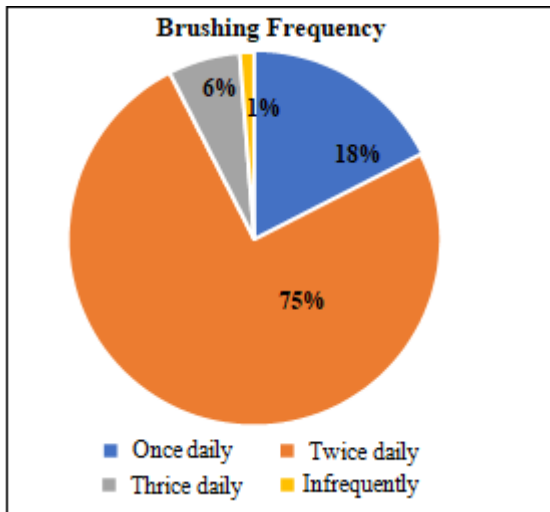


**Gender – wise distribution.**

Among the total study population, 190 (47%) are Male and 210 (53%) are Females.

**Brushing frequency**

Frequency	Number
Once daily	70
Twice daily	300
Thrice daily	25
Infrequently	5

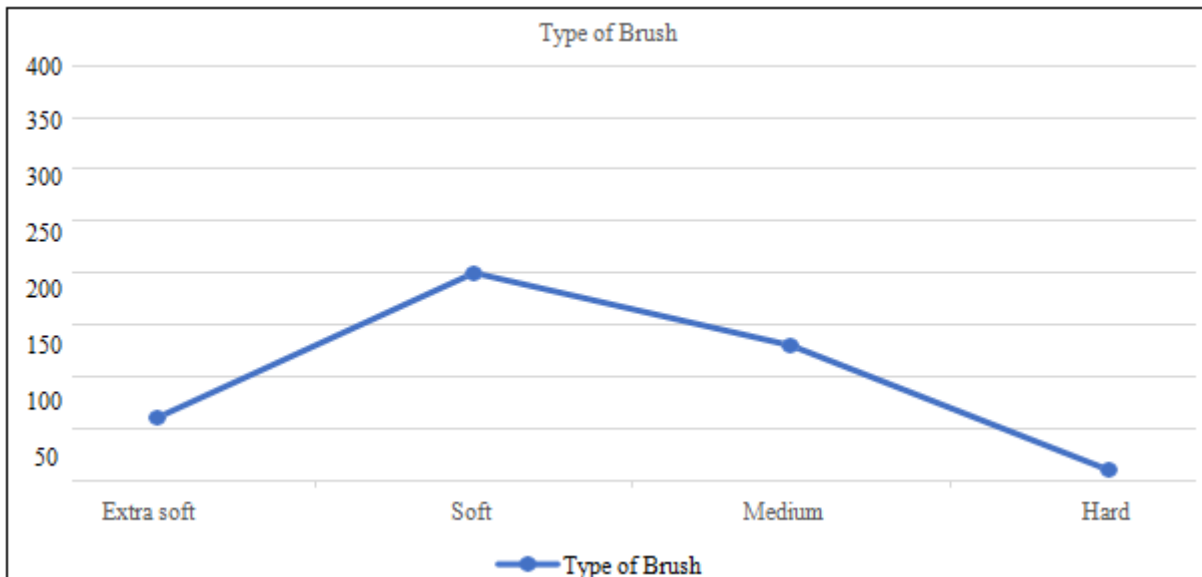


**Brushing frequency**

Among the total study population, 400 (18%) of them brush once daily, whereas 300 (75%) of them brush twice daily, 25 (6%) of them brush thrice daily and 5 (1%) of them brush infrequently.

**Type of Brush**

Type	Number
Extra soft	60
Soft	200
Medium	130
Hard	10

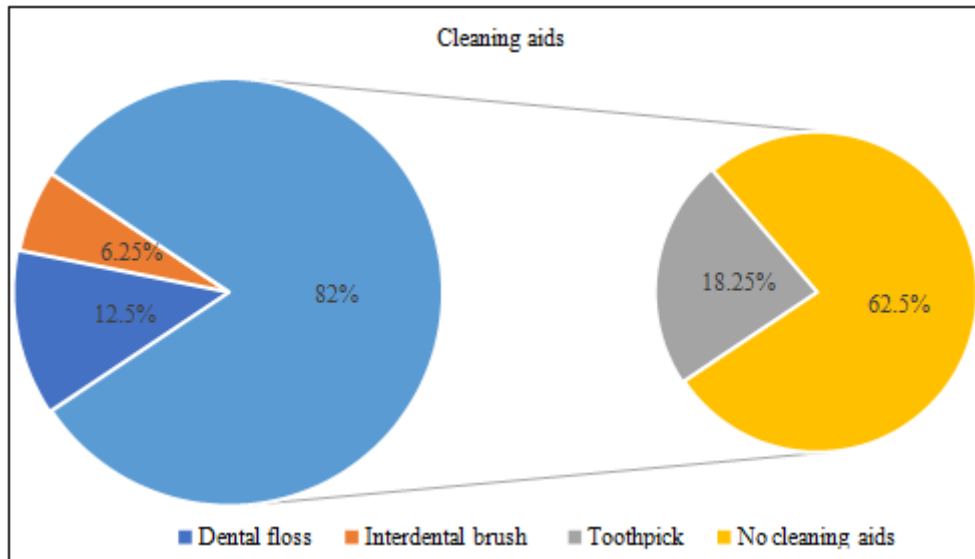


**Types of Brush**

Among the total study population, 60 (15%) use extra soft brush, 200 (50%) use soft brush, 130 (31.5%) use medium brush and 10 (2.5%) use hard brush.

**Cleaning Aids**

Cleaning aids	Individual
Dental floss	50
Interdental brush	25
Toothpick	75
No cleaning aids	250

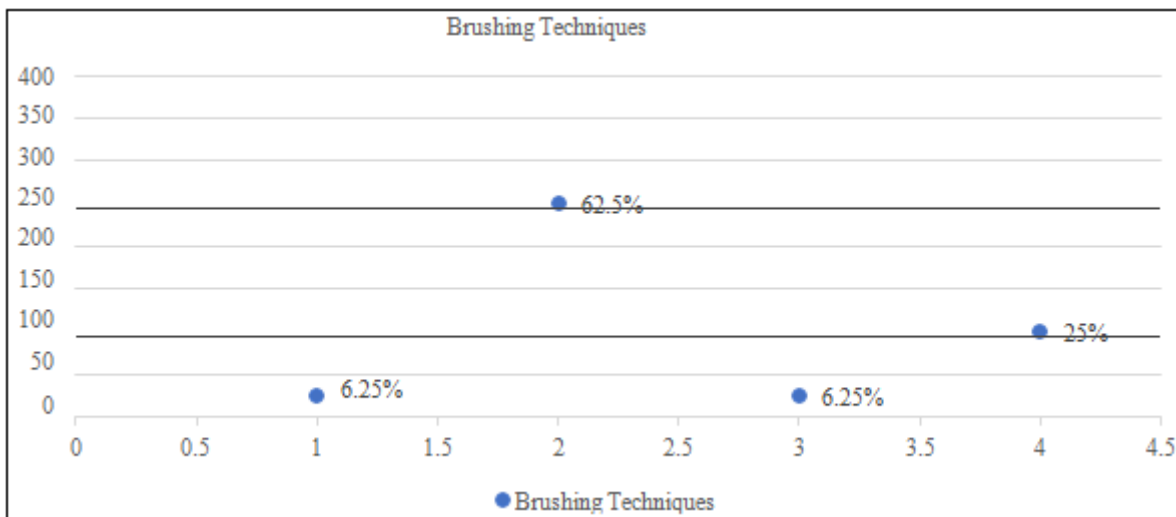


**Cleaning aids**

Among the total study population, 50 (12.5%) of individuals using dental floss, Whereas 25 (6.25%) of individuals using interdental brush, 75 (18.25%) of individuals using toothpick and majority of individuals 250 (62.5%) are not using any cleaning aids.

**Brushing Techniques**

Brushing techniques	Individuals
Circular movements	25
Horizontal movements	250
Vertical movements	25
Unable to describe	100

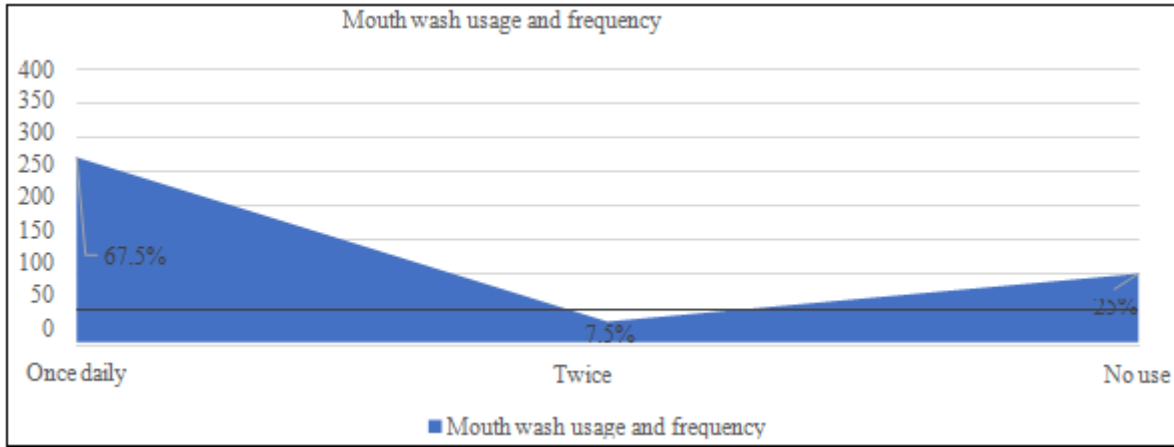


**Brushing techniques**

Among the total study population, 25 (6.25%) circular movement, whereas 25 (6.25%) vertical movement, majority of individuals 250 (62.5%) horizontal movement and 100(25%) are unable to describe.

**Mouth wash usage and frequency**

Frequency	Individuals
Once daily	270
Twice daily	30
No use	100



**Mouth wash usage and frequency**

Among total study population, 270 (67.5%) use mouth wash once daily, 30 (7.5%) use twice daily and 100 (25%) no usage of any mouth washes.

**Plaque score vs Cleaning aids**

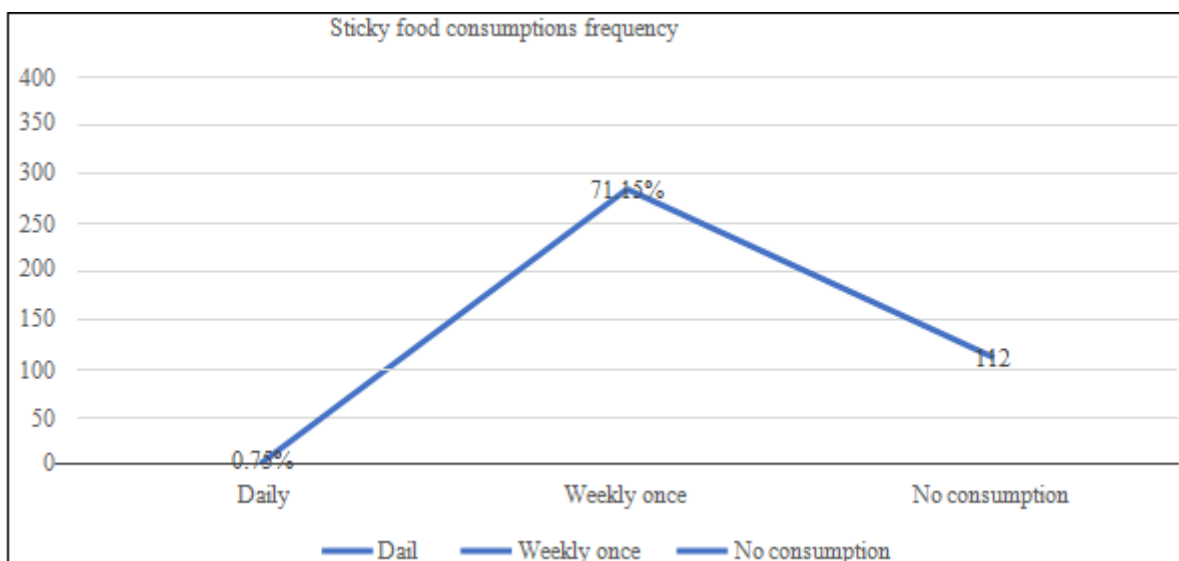
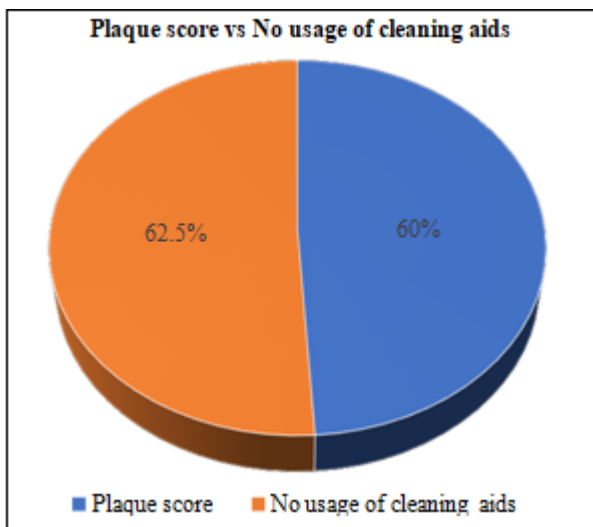
From the above pie chat it was found that most of the individuals i.e., 240 (60%) are having Moderate to high plaque score among 250 (62.5%) subjects are no usage of cleaning aids.

**Plaque score vs No usage of Cleaning aids**

Type	Number of individuals
Plaque score (moderate + high)	240
No usage of Cleaning aids	250

**Sticky food consumptions frequency**

Frequency	Individuals
Daily	3
Weekly once	285
No consumption	112

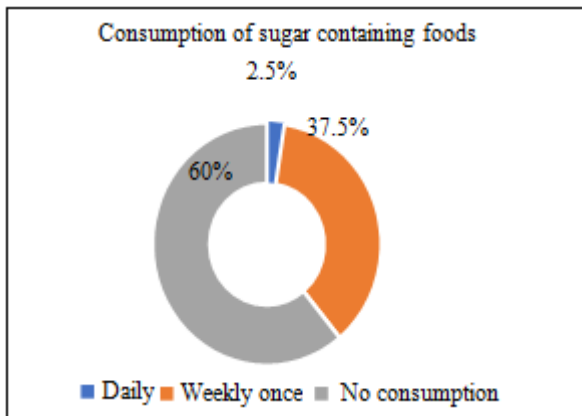


**Sticky food consumption frequency**

Among total study population, 3 (0.75%) take daily, 285 (71.15%) individuals take sticky food weekly once and 112 (28%) individuals with no sticky food consumption.

**Consumption of sugar containing foods**

Frequency	Individuals
Daily	10
Weekly once	150
No consumption	240

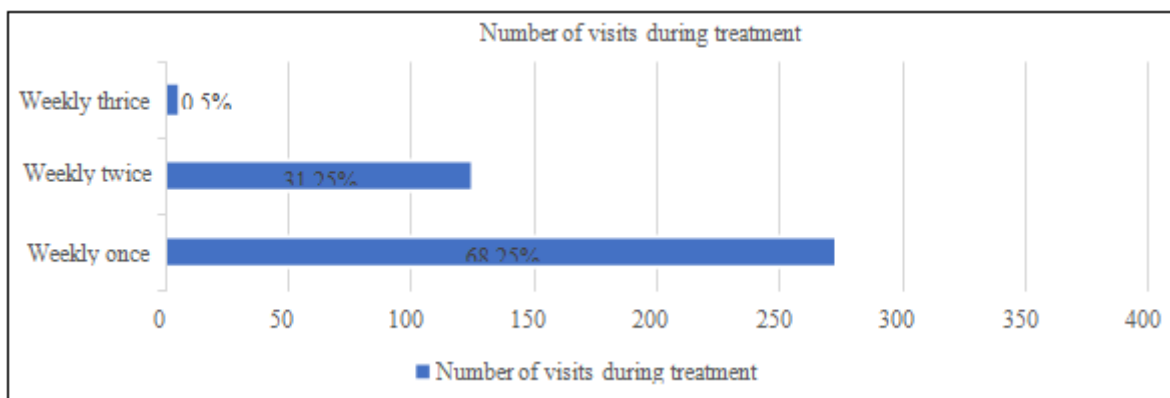


**Consumption of sugar containing foods**

From the above pie chart, 10 (2.5%) consume sugar containing foods daily, 150 (37.5%) individuals consume sugar containing foods weekly once and 240 (60%) individuals with no consumption.

**Number of visits during treatment**

Frequency	Weekly once	Weekly twice	Weekly thrice
Individuals	273	125	2

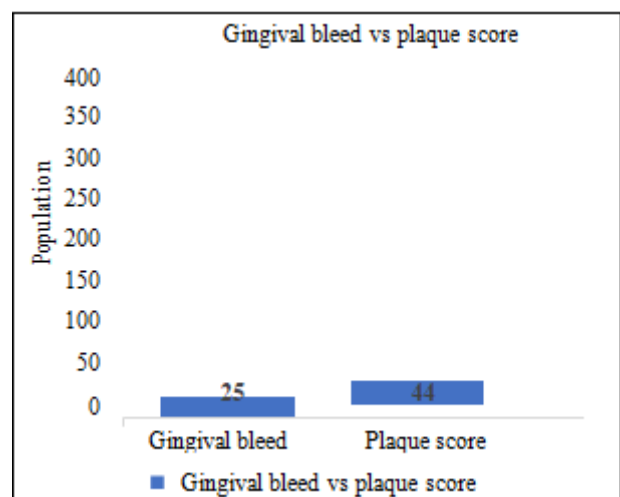


**Number of visits during treatment**

Among the total study population, 273 (68.25%) individuals visit weekly once during treatment, 125 (31.25%) individuals visit weekly twice and 2 (0.5%) visit weekly thrice.

**Gingival bleed vs plaque score**

Complication types	Gingival bleed	Plaque score
Individuals	25	44

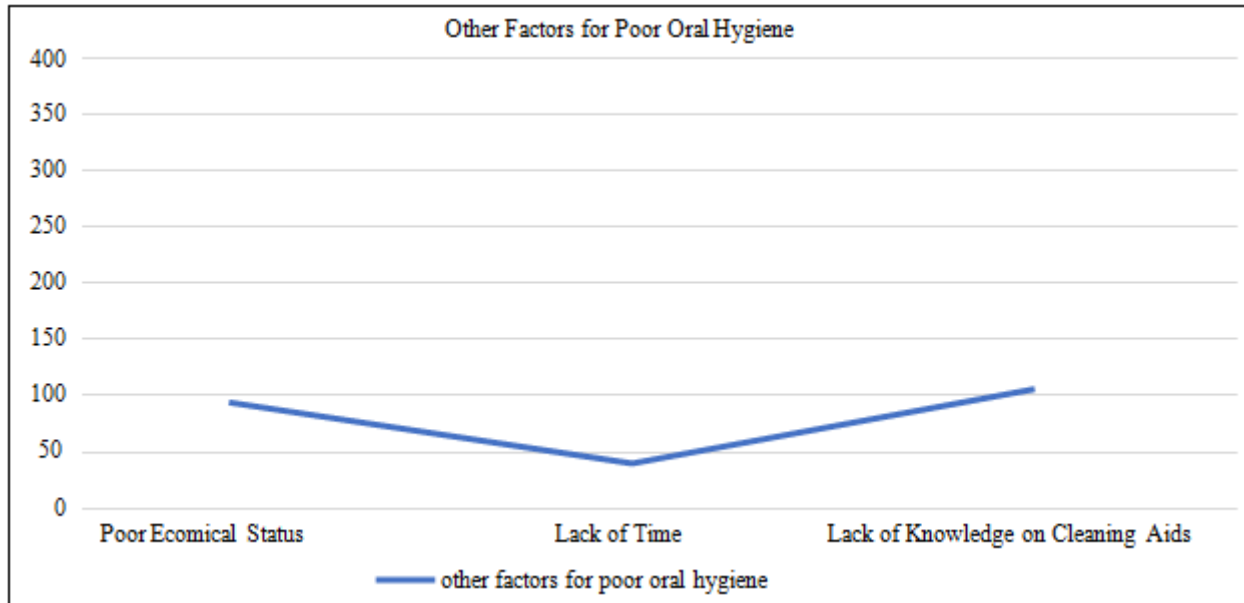


**Gingival bleed vs plaque score**

From the above pie chart, It was found that the individuals with 25 (6.25%) are having gingival bleed among which 44(11%) subjects with high plaque score.

**Other factors for poor oral hygiene**

Factors	Poor economical status	Lack of time	Lack of knowledge on cleaning aids
Individuals	94	40	106

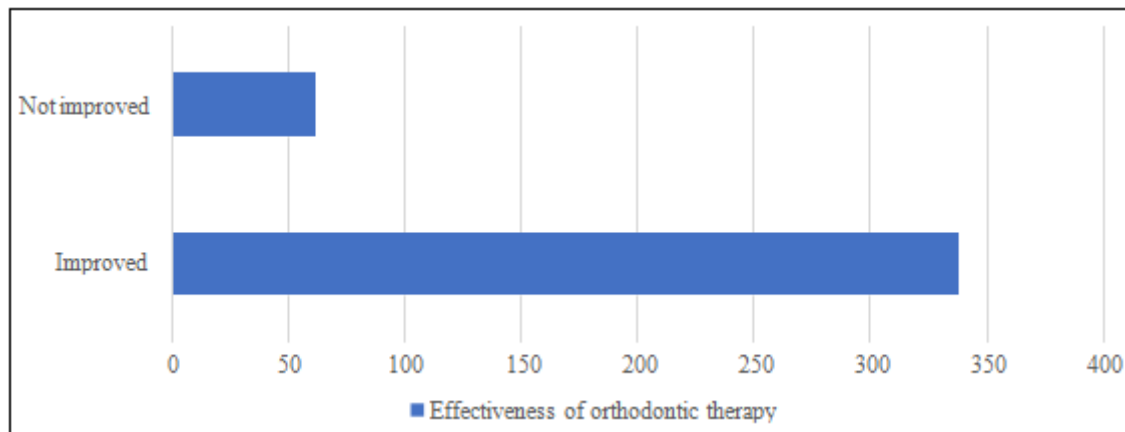


**Other factors for poor oral hygiene**

From the above graph, 94 (23.5%) with poor economical status , 40 (10%) with lack of time and 106(26.5%) with lack of knowledge on cleaning aids.

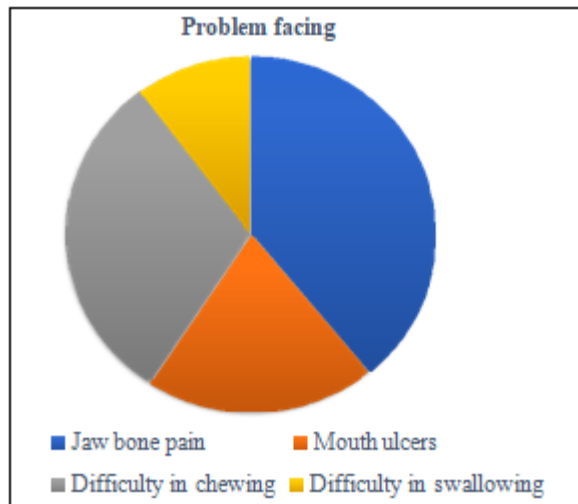
**Effectiveness of orthodontic therapy**

Effectiveness	Individuals
Improved	338
Not improved	62



**Effectiveness of orthodontic therapy**

From the study population , 338(84.5%) individuals improved effectiveness and 62 (15.5%)are not improved.



Among study population, 386(96.5%) individuals are facing jaw bone pain, 200 (50%) with mouth ulcers, 302 (75.5%) are facing difficulty including and 101(25.25%) with difficulty in swallowing.

#### 4. Discussion

The study was conducted through direct interaction with the patient during the treatment and 400 individual responses were collected. The data included in the study were teeth whitening shade guide, plaque control record, gingival bleed index and questionnaire form.

From the data we collected 240 (60%) individuals were found with plaque and 160 (40%) individuals without plaque. The patients with plaque were experiencing gingival bleed 25 (6.25%). The plaque score was very high in patients who are consuming high sugar, patients with poor oral hygiene, infrequent brushing and improper (or) no usage of cleaning aids.

In oral hygiene maintenance, The brushing frequency will play the major role. Out of 400 orthodontic patients 300 (75%) members brush twice daily, 70(18%) members brush once daily, 25(6%) members brush thrice daily and 5 (1%) members brush infrequently. Based on these data the chances of plaque formation was very high in infrequent brushing patients.

The type of brush will also effect on tooth condition, out of 400 members 200(50%) patients are using soft brush, 60 (15%) members are using extra soft 130 (31.5%) patients are using medium soft brush, 10(2.5%) patients are using hard brush. Based on our analysis hard brush may cause gingivitis and plaque formation. soft brush and extra soft brushes are better for orthodontic patients.

The frequency of sugar consumption were collected and analysed, it was found that 10 (2.5%) members are consuming high sugar and carbonated beverages daily and 150 (37.5%) members are consuming weekly once. Based on this data high sugar intake results in formation of acid in mouth which may cause tooth decay, plaque formation damages the patients braces and erode enamel of tooth.

Here the plaque index score were calculated in individual subject. According to teeth whitening shade guide and plaque control record whereas 0-10% score is considered as low plaque, 10-20 % score considered as moderate plaque, more than 20% is considered as high plaque.

Among 400 individuals, 160(40%) were have low plaque score, 196(49%) were having moderate plaque score and 44(11%) were with high plaque score. From the data collected, it was found that most of the study population are having moderate plaque score 196 (49%). The persons not using any cleaning aids are prone for plaque formation tooth.

A graph was interpreted with a correlation of Plaque score vs cleaning aids. it was found that most of the individuals i.e., 240(60%) are having moderate and high plaque score among which 250 (62.5%) subjects are no usage of cleaning aids. These cleaning aids are the tools used to clean your teeth to prevent from plaque formation, bad breath and dental decay. our study findings showed that the possibility of plaque formation in individuals with no usage of cleaning aids.

A graph was interpreted with a correlation of gingival bleed vs Plaque score. It was found that the individuals 25 (6.25%) are having gingival bleed among which 44 (11%) subjects with high plaque score. The main cause of bleeding gums is buildup of plaque at gum line. Our study findings showed that the possibility of gingival bleed in individuals with high plaque score.

Orthodontic patients are facing lot of problems during there therapy, jaw bone pain 386(96.5%), the patients with mouth ulcers, individuals difficulty in chewing 302(75.5%) and individuals with difficulty in swallowing.

Some factors may also effect on poor oral hygiene. according to our study poor economical status were 95 (23.5%), lack of time 40(10%) and lack of knowledge on cleaning aids 106 (26.5%) will cause poor oral hygiene. we counselled regarding complications associated with poor oral hygiene.

Effectiveness of orthodontic treatment was analysed out of 400 population 338 (84.5%) individual were improved, 62 (15.5%) members were not improved due to poor oral hygiene.

#### 5. Conclusion

The conclusion of the study is poor oral hygiene will cause the plaque in orthodontic patients. It leads to failure of treatment. Based on our study findings most of the patients had poor oral hygiene. The underline cause for poor oral hygiene is high sugar intake, no usage of cleaning aids and type of brush they are using will cause plaque formation and gingivitis.

To prevent orthodontic complications we have to educate the patients reading cleaning aids to improve oral hygiene.

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