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Assessing the impact of verbal and written oral hygiene instructions on orthodontic patient outcomes

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ABSTRACT

BACKGROUND & OBJECTIVE: Due to increasing trends in orthodontic treatment to improve occlusal relationships and smile esthetic, maintenance of oral hygiene should be the first priority of the patient. Different methods were used for oral hygiene instructions (OHI) which included chair-side education, message reminders, and behavioral modification. The objective of this study was to compare the oral hygiene status of patients given verbal instructions and written instructions.
METHODOLOGY: The comparative study includes 50 orthodontic patients selected from the age group 12-30 years from the orthodontic department of Azra Naheed Dental College Lahore. They divided into two groups: group one was given verbal instructions and group two was given written. Plaque disclosing agent was applied to the upper anterior teeth and the color displayed in response was recorded. After a month the status and results of oral hygiene were again evaluated for both groups.
RESULTS: The results showed that the patients who were given written oral hygiene instructions showed better maintenance of oral hygiene with p-value ≤ 0.001 showing significant results when compared with those who were given verbal instructions with p-value = 1.00 showing non-significant results. Plaque index as disclosing agents didn't show any blue pigmentation in written OHI, while blue pigmentation was observed in verbal OHI.
CONCLUSION: The patients given written oral hygiene instructions responded better as compared to the patients given verbal instructions which also enhanced patient cooperation.
KEYWORDS: Disclosing Agents, Fixed Orthodontic Patients, Instructional Materials, Oral Hygiene, Patient's Education, Plaque.

INTRODUCTION

A stable occlusal connection, a beautiful smile, and appropriate masticatory function are the main goals of orthodontic therapy. A perfectly aligned set of teeth makes maintaining home dental hygiene easier, which should lower the risk of cavities and periodontal disease [1]. The number of orthodontic patients is ever-increasing, as adults are more interested in the betterment of their esthetic[2].

When orthodontic appliances are in place, it can be challenging to maintain good oral hygiene, making one more vulnerable to dental cavities and gingivitis, which can result in the loss of periodontal attachment. It was mentioned in a study that orthodontic appliances may contribute to gingival inflammation by increasing microbial load due to poor oral hygiene [3]. It is a challenging task for orthodontic patients to maintain an optimum level of oral hygiene. Orthodontic patients have two to three times higher dental plaque levels as compared to patients without appliances as the fixed appliances lead to increased accumulation of bacteria on decalcified enamel the composition of plaque is modified and pH is decreased [4].To maintain good oral hygiene and to avoid plaque accumulation and gingival inflammation a patient should be well motivated. It is of utmost importance to inform patients about the importance of maintaining oral hygiene [3].

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Maintaining good oral hygiene is essential for maintaining periodontal health because it reduces the amount of microbial plaque that builds up on teeth and gingiva [5]. It is well-known how patient self-care practices like brushing and flossing contribute to the prevention of periodontal diseases [6]. It has been shown that there are certain psychological models for behavior control connected to dental hygiene [7]. It is well known that following dental professionals' recommendations for good oral hygiene greatly improves patients' levels of oral hygiene [8].

Furthermore, it has been demonstrated that poor oral hygiene might lengthen treatment times and lead to unfavorable treatment results [9]. Five to ten percent of orthodontic procedures are unsuccessful due to poor oral hygiene brought on by noncompliance from the patient [10]. For these reasons, maintaining good dental hygiene during the nearly two-year treatment period is crucial. The only way to attain oral hygiene is patient compliance, which is developed through verbal and written educational material exchanged between the orthodontist, the patient, and the family [11]. The patients' regular orthodontist instructions about oral hygiene may be insufficient to promote good oral hygiene [12].

The pros and cons of the treatment plan should be discussed with the patient and it should be explained to the patient that their compliance will be of utmost importance for the success of the treatment plan. Patients should be informed in advance of their involvement in maintaining good oral hygiene as a necessary part of their treatment [3].

In general, clinicians provide routine oral hygiene instruction (OHI) to orthodontic patients but the efficacy of OHI might be limited. Therefore, patients' motivation plays a crucial and decisive role in maintaining favored oral hygiene [13]. Our study aimed to compare the oral hygiene status of patients who were given written and verbal instructions.

METHODOLOGY

In this comparative Study sampling was done through Systematic-Random Sampling technique. First, 25 patients were chosen from a total of 50 patients to represent each second patient in group 1.The remaining 25 patients were chosen randomly after the first 25 were finished and added to group 2 in the orthodontic department of Azra Naheed Dental College and got ethical approval under reference no. ANDC/RAC/2023/16. The study was conducted from June 2023 till November 2023 for 6 months in the orthodontic department of Azra Naheed Dental College, Lahore including the 12-30-year-old age group.

Inclusion criteria were patients receiving orthodontic treatment without any significant medical history and who can read instructions and understand verbal instructions. Informed consent was taken from all enrolled participants for this research and their treatment is due for a minimum period of six months were included in this study.

Patients who are receiving orthodontic treatment with removable appliances and patients with severe periodontal problems, trauma, systemic illness, mental disabilities, or craniofacial abnormalities were excluded from the study.

Fifty patients who satisfied the requirements for inclusion and were undergoing fixed orthodontic treatment were split into two groups. After applying a plaque-disclosing agent to the upper anterior teeth, the colour that appeared in the reaction was noted. Written instructions were given to Group A, and Group B was given spoken instructions based on models. The patient was instructed to use the same brand of mouthwash, toothpaste, dental floss, and orthodontic toothbrush, as well as mouthwash toothpaste, and dental floss. Bass method [14] of tooth brushing and interdental cleaning was instructed to the patients using models with fixed orthodontic appliances. A month later, the results of a reevaluation of hygiene status using a plaque-disclosing agent were recorded. The sample size was calculated by the website https://www.calculator.net/sample-size-calculator.html?type=1&cl=95&ci=5&pp=50&ps=57&x=Calculate. The confidence level of 95% that the real value is within ±5% of the measured/surveyed value.

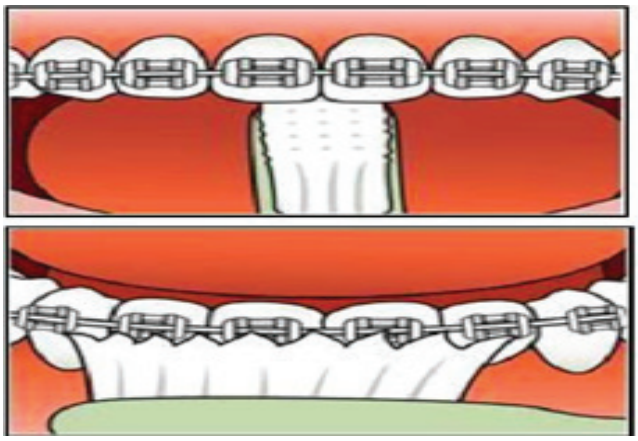

Figure- I: Brushing on Palatal / Lingual surfaces of each tooth.
Figure-II: Brush from gum line to occlusal surface.

Using the Fisher exact test and SPSS statistical software, version 23, data was statistically analyzed; a p-value of less than 0.05 was deemed statistically significant. McNemar's Test was used to analyze the difference in plaque in 1st and 2nd visits among all enrolled patients. The significant level was set as $p < 0.05$ for tests.

RESULTS

Table-I: Colour coding according to Plaque distribution.

New Plaque Pink/Red	Old plaque Blue/Purple	Extra high risk plaque Light blue
When the plaque biofilm is sparse, the blue pigment is easily washed off	When the plaque biofilm is matured that is at least 48 hours old, its structure is dense, so both the blue and red pigments are trapped.	The sucrose in GC Tri plaque ID Gel will be mentioned by any acidogenic bacteria within the plaque biofilm. The resulting acid produced lowers the plaque pH (<Ph4.5) and this makes the red pigment disappear

The resulting color which is displayed after applying the disclosing agent is shown in the Table-I. Table-I is collected to chromeextension://efaidnbmnnnibpcajpcglclefindmkaj/ https://www.gc.dental/australasia/sites/australasia.gc.dental/files/products/downloads/gctriplaqueidgel/brochure/brochure-tri-plaque-id-gel.pdf.

Table-II: Comparison of patient's oral hygiene based on verbal instructions.

Pre-instruction 1st visit	Post-instruction (2nd visit)		Total n(%)	P-value
	Purple / Blue n(%)	Pink/red n(%)		
Purple / Blue	16(0.64)	4(16)	20(80)	1.00
Pink/red	5(0.20)	0(0)	5(20)	
Total	21(84)	4(16)	25(100)	

*** P < 0.05 significant Difference**

Table-III: Comparison of patient's oral hygiene based on written instructions.

Pre-instruction 1st visit	Post-instruction (2nd visit)		Total n(%)	P-value
	Purple / Blue n(%)	Pink/red n(%)		
Purple / Blue	4(0.64)	20(16)	24(80)	≤0.001
Pink/red	1(0.20)	0(0)	1(20)	
Total	5(84)	20(16)	25(!00)	

*** P < 0.005 significant Difference**

According to the study 50 participants were selected. Study participants were given written and verbal oral hygiene instructions. After a one-month follow-up all enrolled participants were again observed and color coding was recorded with disclosing tablets.

According to Table-II, 25 study participants were given Verbal instructions, and results showed that on the first visit, 20 patients showed purple / Blue code that indicated old plaque that was raised on 2nd visit as in 21 patients after only verbal instructions, while with pink/red plaque that is new, it was 5 and turned to decrease in 4 patients showed that only verbal instructions were not sufficient to maintain oral hygiene instructions. P-value =1.00 shows a non-significant result.

To results showed that on the first visit, 24 were given written instructions for maintaining oral hygiene patients showed purple/blue code indicating old plaque that was decreasing on 2nd visit as in 5 patients, while with a pink plaque that is new, it was 1 and turned to 20. So according to the above-mentioned results, the written instructions were more effective for orthodontic fixed braces patients, and a p-value ≤0.001 shows a significant result in Table -III.

In conclusion, by comparing two or more groups, this comparative study aims to determine the approach or treatment that works best. In the instance of "comparison of verbal and written oral hygiene instructions in orthodontic patients," this type of study contributes to the identification of the most efficient approach for improving oral health problems.

DISCUSSION

The study's findings showed that orthodontists' or dentists' efforts and motivation could help orthodontic patients become more motivated and maintain better oral hygiene. The motivational strategies that have been employed in past research can be categorized into four categories: behavioral modification, chairside education, message reminders, and the Hawthorne effect.

The most popular technique for increasing orthodontic patients' motivation to practice good oral hygiene was the chair-side modified OHI. Hygienists and orthodontists were the main professionals who carried out the improved and modified OHI [15]. During the four-week trial, patients who received active reminders through mobile applications demonstrated lower PI and GI.

The present study compared the effectiveness of these reminders with verbal oral hygiene instructions. In the current study, it was found that patients who received written instructions on oral hygiene maintained their oral health better than those who received verbal instructions, these results matched with previously reported studies [16]. Patients who received written OHI were found to have a lower plaque index because the revealing agents had no blue coloring. Conversely, those who received verbal OHI showed signs of blue pigmentation. Because blue pigmentation indicates that the plaque is older than 48 hours, [17,18] likely, that the patient is not keeping good oral hygiene because they are not adhering to the recommended hygiene instructions.

Therefore, the Present study found that providing patients with written instructions from dentists or orthodontists increases their compliance in practicing improved dental hygiene.

These findings are consistent with those of Addy and Edmunds, who, while working with 9 to 10-year-old children rather than adults, showed that oral teaching methods had advantages over written teaching methods when it comes to dental hygiene education. However, it has to be determined standardized instruction is a more effective means of achieving other educational goals, like knowledge acquisition [19].

LIMITATIONS

1) Increase sample size to improve generalizability and precision. 2) Replicate the study in diverse populations.3) Conduct multicentre studies.

CONCLUSION

The patients given written oral hygiene instructions responded well as compared to patients given verbal instructions. This showed that patients follow written instructions more and additional text messages can enhance patient cooperation.

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Authors' Contribution:

Umer Farooq: Substantial contributions to the conception and design of the work.
Mariyah Javed: The acquisition of data for the work.
Zartashia Arooj: Analysis and interpretation of data for the work.
Kashif Haroon: Drafting the work.
Mamoona Luqman: Reviewing it critically for important intellectual content.
Sadia Manzoor: Final approval of the version to be published.