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Survey on Evaluation of Awareness of Periodontal Health Among Subjects Undergoing Orthodontic Treatment and Trainee Orthodontists'

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ABSTRACT

Introduction: The present study aims at surveying orthodontists and the patients undergoing orthodontic treatment to assess awareness about periodontal health care. The objectives were to assess the awareness about periodontal health care among orthodontists and to assess the patient's perception regarding the importance of periodontal health in orthodontic treatment.

Materials and Methods: 100 participants including 50 orthodontists and 50 orthodontic patients were included in the survey. The orthodontist included in the study were postgraduate trainee orthodontists in the second and final years of their courses and patients undergoing orthodontic treatment at least for 6 months. Dentists other than orthodontists, having orthodontic practices were excluded from the study. Patients who have started orthodontic treatment within 6 months and those who have completed were also excluded from the study.

Results: The data were analyzed statistically using the Chi-square test. 90% of orthodontists accepted the importance of oral hygiene and periodontists' approval before orthodontic treatment; 30% were convinced enough for continuous monitoring of periodontal health by periodontists. However, 90% of patients concurred with the above. Also, above 80% of patients experienced difficulty in brushing due to braces and required modification in brushing technique. 34% gave importance to periodontal health over esthetics for seeking the orthodontic correction.

Conclusion: Inadequate periodontal health care is either due to lack of knowledge or negligence by the doctors and patients themselves. So, to achieve an optimum and long term benefit, constant motivation of patients is required.

Key Words: Oral hygiene, Orthodontic correction, Orthodontists, Brushing, Periodontal health, Awareness

INTRODUCTION

Orthodontic treatment provides a promising result to the dentofacial complex and thereby has got vast acceptance in routine dental practice. Fixed appliance mechanotherapy improves the patients' oral health and aesthetics and establishes good functional occlusion. It is seen that any deviation from an ideal arrangement and position of teeth, in the form of dental malocclusion (open bite/ deep bite/ cross-bite/ tooth rotation) is not a primary but an auxiliary factor that facilitates more dental plaque accumulation. By correcting the dentoalveolar complex, orthodontic procedures indirectly

give positive effects on periodontal health and thereby increase the longevity of teeth.¹ Importance of oral hygiene in orthodontic patients is always intensified to prevent any further periodontal disease and any iatrogenic damage. Fixed orthodontic appliances, such as orthodontic braces, arches and bands increase the number of retention places which makes plaque removal difficult.^{2,3} Self-cleaning is also more difficult because of the reduced effect of mechanical chewing and rinsing the food residues off by saliva. Active cooperation of orthodontic patients is essential over a prolonged treatment and involves keeping appointments and maintenance of the adequate level of oral hygiene and

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refraining from hard and sticky foods.^{2,4}The choice of patients, education, and training about regular and correct oral hygiene, together with preventive and prophylactic measures contributes to the functional and aesthetic success of orthodontic therapy. Regular oral hygiene maintenance is of great importance for the preservation of gingival health until the completion of orthodontic therapy as well as post-orthodontically. Due to inadequacy of knowledge regarding gingival health, the majority of orthodontic patients do not maintain their oral hygiene adequately and thereby it remains one of the major reasons for non-compliance among the orthodontic patients.⁵So, to achieve optimum and long term benefits constant motivation of patients is required. Ortho-Perio relationship has always been two branches working in mutual benefits to the patients.

Worldwide Orthodontic treatment is practised, by Orthodontists and is making dentistry proud every day, by giving extraordinary profile changes to the patients. In contrast, as we say the base of a building should always be strong enough to bear the load, hence periodontal treatment has successfully proven itself, by providing strong bone support for any kind of dental treatment to commence. Bacterial pathogens have always played an important part in periodontal treatments. Problems of gingival recession, bone defects, and maintenance of oral hygiene are the major challenges faced by Periodontists.

Various programmes at school levels to international levels are being held, to educate society about the need for good oral hygiene. Since a patient will never know what is going inside the oral cavity, masses are being taught about the regular visits to the dentists for a dental check-up. As students or trainees, the dentists are bound to work in a symbiotic relationship, by referring and consulting every department, so that the treatment is appropriate and goes perfectly. The basics are being taught at the college level, but the point is how many of the daily practitioners are practising it in their daily lives. None would be the answer. The survey has been conducted to evaluate and come to a conclusion, about the prevailing scenario. Brushing and the importance of oral hygiene if being taught to a patient at every orthodontic treatment visit, the results would be much more enhanced and the treatment would finish up much faster.

MATERIALS AND METHODS

The present survey was conducted by a simple random sampling method. Among 100 samples, 50 were orthodontic patients and 50 postgraduate students in the branch of orthodontics. After taking the approval from the Institutional Ethics and Review Board, Kothiwal Dental College & Research Centre, two questionnaires, each comprising of a set of 10 questions (Annexure I & II) were filled by both orthodontists and orthodontic pa-

tients, separately designed for them. The identity of the participants was confidential.

Both open- and closed-ended questions were included in the questionnaire survey. To assess the awareness regarding oral hygiene and that brushing played an important role during orthodontic treatment, questions were given with answer choices that were easily understandable and brief in manner. The questionnaire was given to all the selected patients to complete the answers, with prior explanation to fill the questionnaire. One investigator was available while filling the questions, and participants were encouraged to approach the investigator for any clarification. All answers were kept confidential, and no individual patient was identified. Patients who completed a minimum of 6 months of orthodontic treatment were included in the survey.

The study was conducted from December 2016 to January 2017, with a questionnaire with open-and closed-ended questions, which consisted of 10 questions assessing the awareness of gingival and oral health and the attitude of orthodontic correction-seeking individuals and orthodontists treating in Kothiwal dental college and research centre. The inclusion criteria were:

1. Patientstreatingfororthodonticmalocclusionmorethan6months.
2. Postgraduate trainee orthodontists in the second and final year of their courses.
3. Patients undergoing orthodontic treatment at least for 6 months.

Exclusion Criteria:

1. Dentists other than orthodontists, though they might be having orthodontic practices.
2. Patients who have started orthodontic treatment within 6 months.
3. Patients who have completed orthodontic treatment.

Ethical clearance was obtained from the Institutional Ethics and Review Board, Kothiwal Dental College & Research Centre, Moradabad. All answers were collected and recorded. All recorded data were statistically analyzed using SPSS version 15 data analyzer (IBM company, Armonk, NewYork). Chi-square test was done, and the level ofsignificancewasp<0.05 as described in Tables 1 & 2.

RESULTS

The questionnaire was divided into two types, annexure 1 and annexure 2. Annexure 1 evaluated the response of Orthodontists, whereas Annexure 2 calculated the patient's opinion.

Analyzing the results of Annexure 1, the first question was whether periodontal health played a role in orthodontic treatment or not, and to the surprise, 100% of Orthodontists gave a positive response and agreed to the above-asked question.

ANNEXURE- I**Questionnaire for orthodontists**

1. Periodontal health plays role in orthodontic treatment.
 Strongly agree Agree Disagree Strongly disagree
2. Gingiva should be taken care of while cementing braces and bands.
 Strongly agree Agree Disagree Strongly disagree
3. Not only toothbrush should be prescribed but proper brushing technique should be demonstrated to the patient.
 Strongly agree Agree Disagree Strongly disagree
4. Bleeding and enlargement of gums present during orthodontic treatment is usual.
 Strongly agree Agree Disagree Strongly disagree
5. Orthodontic treatment should be started after obtaining approval from periodontist regarding periodontal status.
 Strongly agree Agree Disagree Strongly disagree
6. Brushing technique should be reinforced at every appointment.
 Strongly agree Agree Disagree Strongly disagree
7. Bleeding present during orthodontic treatment will subside by itself after braces removal.
 Strongly agree Agree Disagree Strongly disagree
8. After routine periodontal treatment a time period is required before institution of orthodontic treatment.
 Strongly agree Agree Disagree Strongly disagree
9. Esthetics improvement rather than functional occlusal correction have got the priority in the orthodontic treatment.
 Strongly agree Agree Disagree Strongly disagree
10. At each orthodontic visit, evaluation of periodontal status with periodontist is must.
 Strongly agree Agree Disagree Strongly disagree

ANNEXURE- II**Questionnaire for patients**

1. Modification in your brushing technique required after placement of orthodontic braces.
 Strongly agree Agree Disagree Strongly disagree
2. Before commencement of orthodontic treatment, oral hygiene care should be assessed.
 Strongly agree Agree Disagree Strongly disagree
3. Oral hygiene procedures become difficult during placement of braces.
 Strongly agree Agree Disagree Strongly disagree
4. Brushing technique should be reinforced at every appointment by your orthodontist.
 Strongly agree Agree Disagree Strongly disagree
5. Enlargement and bleeding of gums during orthodontic procedure is not normal.
 Strongly agree Agree Disagree Strongly disagree
6. Periodontal evaluation at each recall visits are as important as orthodontic procedures.
 Strongly agree Agree Disagree Strongly disagree
7. Esthetic improvement is more important over chewing efficiency in orthodontic treatment.
 Strongly agree Agree Disagree Strongly disagree
8. Despite good orthodontic results, poor oral hygiene maintenance can lead to compromised teeth, hence, weak dentition.
 Strongly agree Agree Disagree Strongly disagree
9. Gum bleeding and swelling during orthodontic treatment are not a matter of concern because they may subside at completion of treatment.
 Strongly agree Agree Disagree Strongly disagree
10. Which oral hygiene aids do you use?
 Toothbrush
 Toothbrush with proxabrush
 Toothbrush and mouthwash
 Any of the above

The second question to the practitioners was, whether gingiva should be taken care of while cementing braces and bands or not, and again to surprise 96% believed that yes gingiva should be handled very softly while cementing braces or bands.

The third question of the survey was whether the toothbrush should only be prescribed rather a proper brushing technique should be demonstrated to the patient. Here even to the surveyors' utter surprise, 100% of orthodontists believed that yes teaching the right technique is very important rather than merely giving the patient a toothbrush. The fourth question which followed the line was, that whether bleeding and enlargement of gums present during orthodontic treatment was a usual finding or not. Almost 64% of orthodontists agreed to the question, supporting that bleeding and gum enlargement was a usual finding indeed. The fifth question was an interesting one, that whether orthodontic treatment should be started after obtaining approval from periodontists regarding periodontal status or not. Surprisingly 90% of orthodontists agreed and gave a green signal keeping the periodontists' opinion above them.

The sixth question compromised stating, whether the brushing technique should be reinforced at every appointment or not. A contrast answer was received, where only 46% of Orthodontists believed in teaching brushing at every appointment. The seventh question was whether bleeding present during orthodontic treatment would subside by itself after braces removal or not. Only 22% of Orthodontists agreed that yes the bleeding would subside, rest favoured for further treatment. The eighth question asked by the surveyor was, that after routine periodontal treatment a period is required before the institution of orthodontic treatment or not. 56% of orthodontists gave their approval by agreeing to commence the orthodontic treatment only after giving a time gap after periodontal treatment. The ninth question asked was, whether esthetics improvement rather than functional occlusal correction, was the priority in the orthodontic treatment. 58% agreed to prioritize aesthetics improvement rather than functional occlusal stability. Last but not the least, question forwarded was, whether, during each orthodontic visit, evaluation of periodontal status with periodontist was a must or not. Again a contradictory answer was received, where only 30% of orthodontists believed that a Periodontist opinion is a must at every requirement, the rest of them did not agree with the concept of a periodontists opinion.

Discussing the Second Annexure which is annexure 2, which was having patient's opinion undergoing orthodontic treatment. The first question presented in the survey was, that modification in the patient brushing technique was required after the placement of orthodontic braces or not. 96% of patients agreed to the fact that yes different brushing techniques should be taught to them for maintenance of better oral hygiene after bracket placement. The second question asked was, that before the commencement of orthodontic treatment, oral hygiene care should be assessed or not. Again 96% of patients agreed that yes oral hygiene status should be assessed. The third question was whether oral hygiene procedures became difficult during the place-

Table 1: Test Statistics for Orthodontists

Test Statistics for Orthodontists										
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Chi-Square	35.280 ^a	11.520 ^a	15.680 ^a	31.120 ^b	34.120 ^c	21.840 ^b	20.880 ^b	19.840 ^c	21.840 ^b	10.000 ^b
df	1	1	1	3	2	3	3	2	3	3
p-value	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.019

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12.5.

c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 16.7.

ment of braces or remained the same. 82% of patients nodded a yes, to oral hygiene procedures getting difficult with the placement of orthodontic brackets. The fourth question was whether the brushing technique should be reinforced at every appointment by your orthodontist or not. 84% of patients agreed where to contrary only 64% of orthodontists agreed with reinforcing brushing at every visit. The fifth question asked by the surveyor was a common question asked by both the orthodontists and the patient, that whether enlargement and bleeding of gums during the orthodontic procedure is not normal or not. Where 90% of orthodontists agreed only 74% of patients, could agree that orthodontic treatment did cause bleeding and enlarged gums. The sixth question was again a common question, whether periodontal evaluation at each recall visit was as important as orthodontic procedures or not. To a surprise, 90% of patients agreed to the fact of having a periodontal evaluation at every visit, where only 30% of orthodontists agreed to have a periodontal evaluation at each visit. The seventh question the surveyor was curious about, was again

a common question that whether esthetics improvement was more important over chewing efficiency in orthodontic treatment or not. 56% of patients strongly agreed giving priority to esthetics considerations rather they could eat food properly or not. The eighth question was that despite good orthodontic results, poor oral hygiene maintenance could lead to compromised teeth, and hence, weak dentition, or not. 88% of patients agreed to it. The ninth question asked was, whether gum bleeding and swelling during orthodontic treatment are a matter of concern or not, because they might subside after completion of treatment. Surprisingly 46% of patients voted in favour of showing concern for gum bleeding and swelling during orthodontic treatment.

The last question asked was, which oral hygiene aids did the patients use amongst, toothbrush, a toothbrush with proxa-brush, toothbrush and mouthwash or anyone amongst these. 40% of patients agreed to use the only toothbrush, whereas 60% of patients agreed using a toothbrush with proxa-brush and a mouthwash.

Table 2: Test Statistics for Patients

Test Statistics for Patients										
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Chi-Square	61.680 ^a	37.960 ^b	56.080 ^a	41.440 ^b	45.520 ^a	31.000 ^b	24.560 ^a	24.760 ^b	16.840 ^b	26.480 ^a
Df	3	2	3	2	3	2	3	2	2	3
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12.5.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 16.7.

DISCUSSION

Periodontal health and maintaining the structural integrity of the periodontium has always been a major concern in the dental world. The majority of practitioners fail in their treatment plans because they deny accepting the truth that a healthy periodontium would lead to the path of successful dental treatment. Be it placing implants, or maxillofacial surgeries, or a simple root canal, or restoration the as we say goes the base or the core should always remain strong to

build up a strong building. Similarly, alveolar bone, gingiva, periodontal ligament and cementum are the building blocks of the periodontium. The alveolar bone provides the bed for the tooth to embed in and provides the tooth with the main bony support. Any bone loss will lead to tooth mobility and hence destruction.

The widening of the periodontal ligament will always be a matter of downfall for the treatment, to commence. The thin cementum layer covering the complete root surface is

an important tissue for the maintenance of periodontal health as it serves as an attachment of fibres of the periodontal ligament to the tooth.⁶ Gingiva which protects and nourishes the tooth in every manner is the most important part of the oral cavity.

This survey was done to evaluate the awareness of periodontal health among subjects undergoing orthodontic treatment and trainee Orthodontists. The emphasis should be made to conduct the various preventive programs for the orthodontic patients whose purpose should be to educate the patients regarding oral hygiene and to encourage them to undergo routine dental check-ups. At the same time, emphasis on gingival and periodontal health should be given and the patients should be educated for the same. The demonstration of the proper tooth brushing techniques and the various oral hygiene aids should be done as a part of these preventive programs.⁴

The periodontal status of the patient receiving orthodontic treatment has been the focus of attention, both by orthodontists and periodontists. It is believed that the greater plaque retentive nature of orthodontic appliance is said in plaque accumulation at the gingival margins, contributing to gingival inflammation.⁷⁻¹¹ Monitoring of gingival status and periodontal status by orthodontists throughout the treatment period and enforcement of an acceptable oral hygiene program have become an integral part of orthodontic treatment.^{7,8}

Most young patients are referred for orthodontic treatment and they often suffer from plaque-related gingivitis. Anobvious sign of periodontal disease in adults is a hindrance to being referred for orthodontic treatment. Almost every fixed orthodontic patient develops gingival disease at some time during the treatment period.⁹ Gingival enlargement and inflammation are often transient and resolve within weeks of hygiene standards, which may be conducive to excellent orthodontic treatment outcome.¹⁸ Proper brushing is ideal for good gingival health while prolonged brushing may distort the gingival tissues. Wasting diseases such as abrasion is mainly caused by improper brushing. A study by Dr. Elanchezhian et al.¹⁰ showed that the effects of prolonged brushing were known by only 8.5% while 91.5% were not aware of the effects of prolonged brushing as shown in the survey. Nearly 5.7% felt halitosis in the study. In this study, the effects of prolonged brushing were known by only 7% while most of them (93%) were not aware of the effects of prolonged brushing as depicted in the survey. Also, nearly 33% felt halitosis in the study. On awareness of gingival health, very few comparatively had awareness while most of them were not aware of it.

In the current survey, the evaluation was about, knowing how much are the orthodontists and the patients undergoing orthodontic treatment are aware of periodontal health and problems, and also how often do the orthodontists focus on brushing techniques. Since majorly a successful orthodontic

treatment would only be possible if the patient follows good oral hygiene.

To the surprise, 90% of orthodontists believed that before commencing orthodontic treatment periodontist consent is a must, and 100% agreed that Orthodontic treatment does affect the periodontium. Also, 100% of orthodontists believed in demonstrating brushing technique to the patient at all visits. Contrast results were also seen in the survey, where, only 30% of orthodontists believed in having periodontal evaluation at every visit. The reason behind this statement could be because the inference from the survey also concluded that almost 22% of orthodontists agreed in subsidence of bleeding on its own after completion of the orthodontic treatment. 88% of patients believed that Orthodontic treatment is affected by poor oral hygiene. 90% of patients agreed that at each ortho recall, periodontal evaluation is a must. 96% of patients also agreed that brushing techniques should be changed during orthodontic treatment. 66% of patients were more inclined towards esthetics importance rather than chewing efficacy.

CONCLUSION

Multiple factors might be responsible for the non-maintenance of gingival health practices. The understanding, mind frame, and practice of oral hygiene amongst orthodontic patients reflects the necessity for healthier education and motivation. There is a need to assimilate and assess more passionate oral hygiene programs in the coming future. Supplemental heed should be given in educating and motivating the patients on oral hygiene practices during orthodontic treatment in a proper manner, which will be helpful to the patients in maintaining their gingival health and oral hygiene.

Although 100% and 90% of orthodontists accepted the importance of oral hygiene and periodontists' approval before orthodontic treatment, respectively; only 30% were convinced enough for continuous monitoring of periodontal health by the periodontist. However, 90% of patients concurred with the above. Also, above 80% of patients experienced difficulty in brushing due to braces and required modification in brushing technique. Surprisingly, contrary to belief, 34% gave importance to periodontal health over esthetics for seeking the orthodontic correction.

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4. Drafting of the manuscript: Dr. Sakshi Tiwari
5. Critical revision: Dr. Parv Agrawal, Dr. Aartika Singh

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