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ASSESSMENT OF AWARENESS, ATTITUDE AND PRACTICE OF PLAQUE ASSESSMENT AND CONTROL MEASURES IN PATIENTS AMONG DENTISTS IN INDIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: Caries and periodontal disease are plaque induced and preventable. Prevention and management of periodontal disease can be adequately achieved if patient acts a co-therapist with early participation which can be reinforced when the dentist and the auxiliaries are convinced of the value of effective plaque control. **Background:** This study aims to assess the awareness, attitude and practice of plaque assessment and control measures in patients among the dentists in India. **Methodology:** A pre-tested questionnaire of 25 questions was circulated through online mode to assess demography, awareness and practice of plaque evaluation and control by the dentists. Comparison and analysis was based on area of practice and years of experience. **Results:** 96.4% study population evaluated the level of plaque in patient during first appointment while 88.8% evaluated oral hygiene practices. Chemical plaque control was always recommended by 26.4%. **Conclusion:** There is variation in practices of plaque evaluation, recommendation and acceptance of patients with years and area of practice.

KEYWORDS: Assessment, Awareness, Evaluation, Feasibility, Motivation, Training.

INTRODUCTION

It is widely accepted that the most common and important diseases of the oral cavity (gingivitis and periodontitis, dental caries, and oral cancer) are preventable. A number of preventive strategies have emerged on basis of scientific evidence that will prevent these diseases in most individuals if routinely implemented. Unfortunately, despite most preventive strategies being theoretically simple to understand, difficulty often lies in implementing these in practice at individual and public health levels. The difficulty in prevention of these diseases can be attributed to many complex reasons especially in certain vulnerable populations.[1]

Appropriate behaviours such as regularly self-performed plaque control can sufficiently support periodontal health. Inadequate oral hygiene, on the other hand, has a destructive impact on periodontal tissues. The prevention and control of periodontal disease needs to be addressed at the population level as well as the individual level. An understanding of the health effects of inappropriate behaviours should be gained by the dental community involved with oral health in order to successfully target prevention and disease control. Thus, the services for primary and secondary prevention at an individual level oriented towards the change of inappropriate behaviour are a professional responsibility for all oral healthcare providers.

There is growing evidence supporting patient's individual behaviour to influence or even play a critical role for the success of periodontal therapy as the results appear to be limited in patients lacking appropriate behaviour. Therefore, it appears to be reasonable in clinical concepts for periodontal care for (1) inclusion of assessments of patient behaviour, and, if necessary, (2) application of effective behaviour change counselling methods.

Unlike the patients in other areas of dentistry, it is necessary that the periodontal patients must be active, knowledgeable partners or co-therapists to treat their own disease.[2] Greene has stated that "Perhaps the most important and difficult problem that remains to be solved before much progress can be made in the prevention of periodontal disease is how to motivate the individual to

follow a prescribed effective oral health care program throughout his life."[3]

Once the diagnosis and prognosis have been established, treatment planning is carried out which should encompass immediate, intermediate, and long-term goals. The long-term goal includes the maintenance of health through prevention and professional supportive therapy. Once the long-term goal is set, both the patient and the clinician should work towards it from the very first visit. After control of active disease and elimination of all infectious and inflammatory processes, the health that has been attained, should be maintainable for the rest of the patient's life. Maintenance of health requires patient education to prevent disease and maintain oral hygiene at the onset of treatment, meticulous daily home care by the patient, and adherence of patient to professional recall maintenance.[4]

Plaque control by the patient should be initiated in the treatment plan at the earliest to emphasize its importance. The desired behaviour and thereby change in patient attitude positively towards dental care can be effective through early participation by the patient. All aspects of the treatment plan performed by the dentist should be related to and emphasize on oral hygiene. To achieve this, the dentists and the auxiliaries must be absolutely convinced of the value of periodontal therapy coupled with adequate plaque control.[2]

The present study aims to assess the awareness, attitude and practice of plaque assessment and control measures in patients among dentists in India.

MATERIALS AND METHODS

Ethical clearance for the study was obtained from the ethics review and research board of Vasantdada Patil Dental College and Hospital, Sangli, Maharashtra, India. The present study was a cross-sectional study in which data were collected from October to December 2020.

A pre-tested questionnaire of 25 questions was circulated through online mode for the study. The questions were grouped into different categories and subcategories as follows:

- Six questioned assessed the demographic data, area and experience of practice.
- Four questions assessed the awareness of plaque control measures.
- Seven questions assessed the frequency of patient motivation and recommendation of plaque control measures.
- Four questions assessed the practice of plaque control measures carried out.
- Three questions assessed the attitude of the clinicians regarding the importance, feasibility and ease of patient motivation.
- One question assessed the frequency of referral to a specialist for improved plaque control.

The sample size was set at 250 with confidence limits at 95%.

An introduction explaining the rationale of study, informed consent form, and a 25-item structured questionnaire was circulated through online mode among the faculty, post-graduates, interns, undergraduates (third and final year undergoing clinical training) and dental practitioners. The anonymity of the respondents was maintained

Statistical analysis

Data entries were done in Microsoft Office Excel 2010 and analyses of results were done using Statistical product and service solution (SPSS) version 21 software. Descriptive statistics such as frequencies and percentage/proportion were calculated. Pearson Chi-square test was used to find out the difference between variables with respect to years of experience and area of practice of study subjects. The p value was fixed at 0.05.

RESULTS

Characteristics of study population:	Number	Percentage
Age :		
21-30 years	219	87.6
31-40 years	21	8.4
>40 years	10	4
Gender distribution:		
Males	40	16
females	210	84
Qualification distribution :		
UG student	32	12.8
Intern	23	9.2
PG student	114	45.6
General practitioner	53	21.2
Speciality practitioner	28	11.2
Speciality distribution:		
Prosthodontics	9	3.6
Periodontics	80	32

Oral and maxillofacial surgery	1	4
Endodontics	23	9.2
Pedodontics	6	2.4
Orthodontics	13	5.2
Oral medicine and radiology	4	1.6
Oral pathology	2	0.8
Public health dentist	8	3.2
General practitioner	104	41.6
Area of practice :		
Rural	35	14
Semi-Urban	100	40
Urban	115	46
Years of experience:		
<5 years	205	82 %
5-10 years	30	12 %
>10 years	15	6 %

Evaluation of the level of plaque in patient during first appointment:
96.4% study population evaluated the level of plaque in patient during first appointment. Plaque evaluation in the first appointment was always carried out by 60.8%, often by 20.8%, sometimes by 13.2% and rarely by 5.2%.

Use of plaque disclosing agents for patient awareness:
95.2% used plaque disclosing agents for patient awareness while 4.8% did not. 25.2% always made use of plaque disclosing agents for patient awareness, 27.6% often, 24.4% sometimes, 15.6% rarely and 7.2% never made use of plaque disclosing agents for patient awareness.

Evaluation of the oral hygiene practices of the patient:
88.8% evaluated the oral hygiene practices of the patient while 11.2% did not. 44.4% always evaluated the oral hygiene practices of the patient, 34.8% often, 20% sometimes and 0.8% rarely evaluated the oral hygiene practices of the patient.

Customization of oral hygiene practices to suit patient needs after the treatment:
27.9% always customized oral hygiene practices to suit patient needs after the treatment whereas it was carried out by often by 47.6%, sometimes by 22.8% and rarely by 2% of the subjects.

Recommendation of interdental aids for routine oral hygiene practice:
Recommendation of interdental aids for routine oral hygiene practice was always done by 27.6%, often by 32.4%, sometimes by 30.8% and rarely by 9.2%.

Patient training in use of the mechanical plaque-control measures:
Patient training in use of the mechanical plaque-control measures was always carried out by 30.8%, often by 35.6%, sometimes by 26.4% and rarely by 7.2%.

Recommendation of chemical measures like mouthwashes for plaque control:
Only 26.4% always recommended chemical measures for plaque control, 29.6% recommended it often, 41. 6% sometimes, and 2.4% rarely recommended chemical measures for plaque control.

Evaluation of the plaque control in patient after every appointment:
Plaque evaluation after every appointment was always carried out by 34.4%, often by 33.6%, sometimes by 23.6% and rarely by 8.4%.

Type of toothbrush you recommended:
96% recommended conventional manual toothbrushes and 4% recommended powered toothbrushes. 59.2% recommended soft bristled tooth brush, 35.6% recommended medium bristled toothbrush and 5.2% recommended ultrasonic toothbrush.

Referral of a patient to a specialist for plaque control in office and training of the patient:
Referral to a specialist was done always by 16.4%, often by 13.6%, sometimes by 42.8%, rarely by 17.6% and never by 9.6%.

Ease of patient motivation to use various aids for plaque control:
11.2% strongly agreed that it is easy to motivate patient to aids for plaque control, 38% agreed, 41.6% were neutral and 9.2% disagreed.

Importance of evaluating plaque control during treatment & maintenance:
10.8% considered that plaque control evaluation was not important during treatment & maintenance, 28% considered it to be slightly important, 24.4% considered it moderately important, 17.2% considered it important and 19.6% considered it to be very important.

Feasibility of evaluation of plaque control in each appointment:

11.2% strongly agreed that it is feasible to evaluate plaque control during each appointment, 48% agreed, 30% were neutral and 10.8% disagreed.

Awareness about importance of patient evaluation for plaque control during treatment and maintenance and recommendation of various plaque control measures depending on years of experience (Figure 1) and area of practice (Figure 2)

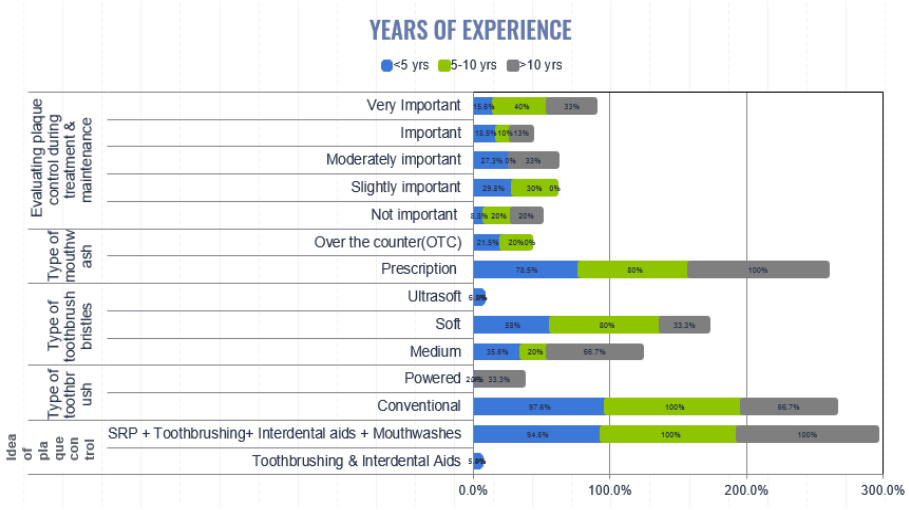

Figure 1

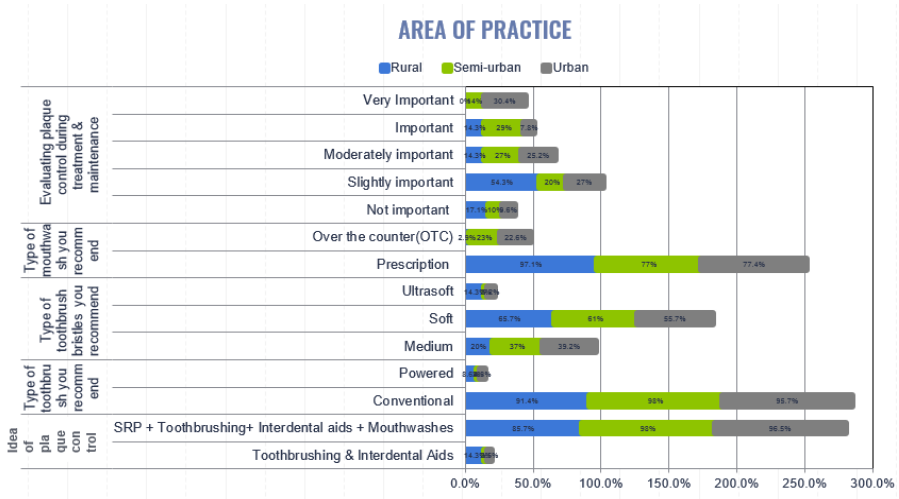

Figure 2

DISCUSSION

The crux for all preventive actions is that their effect is greatest when the risk of the development of disease is greatest. The aim of needs-related instruction in oral hygiene should therefore be to intensify mechanical plaque removal on those teeth and surfaces that are at risk. A well-motivated, well-informed, and well-instructed patient is thus a prerequisite for establishing needs-related tooth-cleaning habits.[5]

Active participation of the individual subject is essential for adequate mechanical plaque control. The process of establishing proper home oral care habits greatly involves and depends on behavioural changes. Implemention of behavioural changes should ensure that the patient recognizes his/her oral health status and the role of his/her personal oral hygiene procedures to prevent caries and periodontal diseases. The causal relationship that leads to the disease process should be informed and the patient should be encouraged to take responsibility for his/her own oral health.[5]

Almost 50 years ago, Loe *et al*. in 1965 estabilished a cause–effect relationship between the accumulation of bacterial plaque on teeth and the development of gingivitis. This relationship was also documented by the restoration of gingival health following plaque removal. As early as 1746, it was stated by Fauchard that “Little or no care as to the cleaning of teeth is ordinarily the cause of all diseases that destroy them”. Since bacterial plaque is by far the most important etiologic agent for the occurrence of periodontal diseases, the full-mouth assessment of the bacterial load plays a pivotal role in the determination of the risk for disease occurrence and recurrence.[5] 96.4% study population evaluated plaque in

the first appointment. Evaluation practices for plaque and oral hygiene measures were always carried out by 43.47% and never by 2.4%.

Plaque disclosing through tablets and liquids is a well-known tool that helps patients to visualize the oral plaque and improve their self-performed hygiene and compliance, both in a professional and home setting. A longitudinal study by Fasoulas et al in Greece over a period of one year showed that the use of disclosing agents qualifies as an auxiliary tool in oral hygiene improvement programs and thus can be implied for more effective guidance on the use of oral hygiene tools and for their evaluation.[6] In a randomized control trial, comparison of the application of a plaque disclosing agent to guide plaque removal (Guided Biofilm Therapy-GBT) versus non application of plaque disclosing agent for professional plaque removal showed that GBT led to better plaque removal, especially in areas of more difficult access.[7] In the present study, 95.2% of the subjects used disclosing agent at some point for evaluation practice. 27.6% often used the disclosing agent for patient awareness, 25.2% always used while 7.2% never used any. Aforementioned studies have highlighted the incorporation of disclosing agents in clinical practice for evaluation and guiding plaque removal and thus should be routinely used in clinical practice.

There is a general observation that a vast majority of toothbrush users who are self-taught begin by scrubbing the buccal surfaces, especially at the anterior region, and rarely proceed to the lingual surfaces. Interproximal cleaning is simply non-existent in the self-taught.[8] Correction of dental health facts and practices forms the first step in the motivation process (Wentz, 1972). A large percentage of the urban population in India has shown to have poor oral hygiene practices.[10] It is therefore necessary to evaluate the oral hygiene practices of the patient in the initial stages. In the present study, 88.8% evaluated the oral hygiene practices of the patient on the first visit. This evaluation was carried out always by 44.4% and rarely by 0.8%.

According to the 11th European workshop on periodontology of 2015, without high standards of daily patient-delivered oral hygiene, professional plaque removal is ineffective for long-term plaque control. The former is based on a patient centred approach to education, motivation and sustained behaviour change, as well as good knowledge of the most effective methods of plaque removal from the marginal, submarginal and interproximal areas of teeth and implants.[11] A study conducted by showed that lack of oral hygiene reinforcement after 1 hour full mouth debridement results in higher plaque and bleeding scores and numbers of *P. gingivali*s at three month.[12] A longitudinal study conducted by Ribeiro et al on removable partial denture users demonstrated that incorporation of a preventive programme enables the maintenance of a good standard of oral and denture hygiene in RPD wearers over a prolonged period of time and suggested frequent checking, re-motivation and re-instruction.[13] Another study conducted on orthodontic patients with multibracket appliances showed that reinforced oral hygiene instruction programme with or without professional prophylaxis leads to efficient control of plaque accumulation and improves gingival health of orthodontic patients wearing multibracket appliances.[14]

In the present study, 27.9% dentists always customized oral hygiene practices to suit patient needs after the treatment whereas it was carried out often by 47.6% and rarely by 2%. Patient training in use of the mechanical plaque-control measures was always carried out by 30.8%, often by 35.6% and rarely by 7.2%. There should therefore be an increased focus on patient motivation and need-based training for control of dental plaque for long-term success of dental therapy.

A study conducted among Swedish dentists showed that 61.9% dentists recommend use of interdental aids as adjunct to tooth brushing.[15] In the present study, interdental aids for routine oral hygiene practice were always recommended by 27.6%, often by 32.4% and rarely by 9.2%. A study by Madan et al showed that there was lack of adequate knowledge and recommendation of dental floss.[16] This emphasizes the need for education regarding use of interdental aids among dentists through academic and other learning platforms.

In the present study, 96% of the subjects recommended conventional manual toothbrushes and only 4% recommended powered toothbrushes. In a study by Kattan et al, among Saudi Arabian dentists, a total of 76.5% of dentists recommended powered toothbrush primarily to patients with manual dexterity issues and medical problems while 51.8% of the dentists suggested powered toothbrush to elderly patients.[17] This difference regarding recommendation of powered toothbrushes could be attributed to the socioeconomic status of the patients.

Chemical plaque control measures can be considered for biofilm control in support of mechanical plaque removal protocols. Among the present study population, 6.4% always recommended chemical measures like mouthwashes for plaque control and 2.4% rarely recommended chemical measures for plaque control. Maximum subjects (41. 6%) sometimes recommended mouthwashes. 80% subjects recommended prescription based mouth washes and 20% recommended over the counter mouthwashes. This is comparable to a finding by Pokala et al where 50% dental practitioners prescribed mouthwashes as a part of routine daily oral hygiene practice.[18] Another study by Niveda et al showed that 85% of the doctors prescribe mouthwashes and 50% opine that using mouthwashes can improve oral health.[19]

According to a study conducted by Chang et al in United States, non-periodontist dentist appeared to value periodontists in treating the natural dentition for their patients and also that periodontists assist in conserving patients' dentitions in health by emphasizing the patient's oral hygiene (plaque control).[20] According to a systematic review by Kraatz et al, geographical location, undergraduate training and continuing professional development, are factors which could be targeted to improve referral processes.[21] Another study conducted by Meers et al among Belgian dentists, concluded that patient referral is subjective and a personal decision must be made by general dentists based on an honest assessment of their own abilities and the needs of the patients.[22] In the present study, referral to a specialist for plaque control, training and motivation was done always by 16.4% and never by 9.6%. Majority of the subjects (42.8%) only sometimes referred the patients to a specialist. Therefore, there is a need to focus on the dental education systems and continued dental education programmes to guide and highlight the need for referral process.

Limitations

Since this is a self-reported questionnaire, the authenticity cannot be ascertained. Adding to limitations is the inadequate sample size. Also, the perception of area of practice, whether urban, semi-urban and rural is subjective and therefore could skew the results. The comparison was carried out within a time frame of years of experience which could have been done with a specified number of years of experience. The comparison of speciality practice would have thrown light on the perception of plaque evaluation and prevention practices among the professionals. Additional comparisons of exclusive private practitioners and those practicing within the dental schools could have been carried out. Further studies can be carried out to encompass the drawbacks which the present study did not attempt to cover.

CONCLUSION

It was seen that less than 50% of the subjects were involved in evaluation at first visit (43.47%), intervention practices (36.3%), evaluation at every appointment (34.4%), referral to a specialist (42.8%) and ease of patient motivation (43%). This highlights the need in training the dentists irrespective of the speciality with adequate plaque evaluation techniques in order to instil a preventive attitude. There should be a patient-centred, need-based approach for plaque control with a shift in focus on patient motivation and participation. Dental education systems and continued dental education programs should be carried out frequently for updated techniques and referral processes.

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