Evaluation of Oral Hygiene Self Efficacy, Periodontal Knowledge, and Motivation among Young Patients Visiting Government Dental College and Hospital, Srinagar

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ABSTRACT

Introduction: Health behaviour related to oral hygiene is of significant consequence with regard to periodontal disease prevention and management. As such, assessment, interception and modulation of oral hygiene self-efficacy at an early age may be of benefit in overall maintenance of the patient, as well as development of favourable health attitudes. Moreover, as ethnic and cultural features have a great bearing on health beliefs and awareness, a population specific evaluation of the self-efficacy of oral hygiene and its relation to motivation is highly relevant. This study reports the self-efficacy of oral hygiene in the young patient population visiting Government Dental College and Hospital, Srinagar, as related to their periodontal knowledge and as influenced by periodontal health education and motivation.

Material and Methods: 100 patients in the age group of 18-26 years were subjected to a questionnaire regarding their awareness and concern for oral hygiene and gum disease. Thereafter, baseline periodontal parameters were evaluated (Modified Quigley Hein plaque index, Gingival Index, Modified Papillary Bleeding Index) and thorough professional scaling and root planning was performed. The patients were then educated regarding gum disease and its prevention based on the "Health Belief Model" and regarding oral hygiene maintenance based on the "Tell-Show-Do" technique. At 3 month recall, periodontal parameters were re-recorded.

Results: Gingival index and Modified Papillary bleeding index were found to correlate significantly with the questionnaire scores. At 3 months, significant improvement was noted in periodontal parameters, reflecting a positive influence of oral hygiene education and motivation on the self-efficacy of the young patients.

Conclusion: Empathetic and "Health-Belief" based approach to periodontal and oral hygiene-related education and motivation was found to have a positive impact on the periodontal status of the young patient population. These results indicate the need for assessment and optimization of oral health behaviours and knowledge in the present community and encourage longer follow up to evaluate the sustainability of the results.

Keywords: Gingival Index; Health Belief Model; Motivation; Periodontal Knowledge; Self-Efficacy

INTRODUCTION

With regard to oral self-care, it is known that a causal link exists between health behaviour and periodontal disease.[1] The prevention of periodontal disease, as well as the result of all periodontal therapy depends on the ability of the patient to maintain a plaque free oral environment. In this regard, the role of self-efficacy of oral hygiene is of decisive importance. Self - efficacy refers to the personal belief regarding ones' abilities to perform specific behaviours.[2] It is the cognitive process underlying all attitudes, and an important predictor of a wide range of health behaviours including smoking cessation, weight control, and exercise. Translation of the theory of self-efficacy into the field of oral hygiene was described with positive associations to periodontal outcomes such as plaque levels, brushing frequency and loss to periodontal follow-up.[3,4] Hence, it is foreseeable, that an evaluation of oral hygiene self-efficacy of a patient population may be of benefit in the overall treatment planning and approach. Moreover, as self-efficacy and perceived importance of oral hygiene depend greatly upon the periodontal health knowledge[5], a concomitant appraisal of oral health awareness is highly relevant. Further, it has been shown that the limiting factor in this context is not the technical difficulty of oral self-care behaviour, but rather the regular performance as an integral part of daily life which is not easy for some people.[1] These facts highlight the importance of an integrated education-motivation approach that may be exercised at all levels of patient interaction to favour the change towards desired health behaviours.

In this regard, Renz et al.[6] conducted a systematic review of psychological interventions to improve adherence to oral health instructions, concluding that there is a lack of well-conducted investigations and task-specific theoretical background in the field. Moreover, as health beliefs and behaviours stem largely from cultural/religious/ethic beliefs, a population specific evaluation of oral hygiene self-efficacy as related to periodontal health awareness is certainly pertinent. Concurrently, the modification of health beliefs may be achieved by proper education and motivation, and

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the resultant effect on self-efficacy may be reflected by evaluation of periodontal outcome measures. Furthermore, it is foreseeable that such assessment and intervention will be more prudent if undertaken at an early age, as empowering and motivating the young budding community, with proper emphasis on health education with individual oral health plan, may definitely prevent many of the oral diseases.[6,7]

With this background, the present study was designed with the aim to assess the periodontal knowledge and self-efficacy of oral hygiene in relation to positive motivation and reinforcement as reflected by clinical periodontal status, in young patients visiting Government Dental College and Hospital, Srinagar.

MATERIALS AND METHODS

A total of 100 young adult patients visiting Out Patient Department, Dept. of Periodontology, Government Dental College and Hospital, Srinagar were selected after fulfilling the inclusion criteria and giving informed and written consent.

Inclusion Criteria
- Age group 18-26 years
- Systemically healthy
- Physically and mentally capable to perform tooth brushing and interdental cleaning.

Exclusion Criteria
- Patients who have undergone any active systematic periodontal treatment in past six months
- Any systemic disease, pregnant or lactating women
- History of any drug intake within last six months which may exert its effects on gingival health and bleeding

Methodology
The study design and protocol was approved by the institutional ethical committee. Each selected patient was given a pre-validated questionnaire to fill based on the oral hygiene related knowledge.[5] The answered questionnaires were returned back to the investigator in a closed envelope. Now the selected baseline indices were measured. Basic professional tooth cleaning was done in all the participants. They were given a complete standardized motivation about oral hygiene by the trained dental professionals. The patients were then recalled after 3 months. During the second visit, again the selected indices and the final oral hygiene outcome was measured and correlated with the patient's questionnaire knowledge.

Questionnaires
Questions were framed and modified from the subscales by Balasuppramanium et al[5], and Woelber et al.[8] All the questions were framed in the English/Urdu language, for better understanding and rapport with the study population. For the assessment of task specific self-efficacy, knowledge on certain oral inflammatory conditions, oral hygiene planning questions were framed mainly under three main categories:
- Category 1: Self-efficacy of oral hygiene practice. Included questions on perceived self-efficacy of

brushing & interdental cleaning, knowledge on plaque and method of tooth brushing.
- Category 2: Analysis of knowledge on gingival changes. Included questions on knowledge of visible changes in gingival health (color, contour, consistency, and size of gingiva),symptoms of halitosis.
- Category 3: Knowledge on gingival bleeding. Included questions on bleeding gums and provoking factors and measures taken by patients to overcome it.

Patients rated their confidence on to a 3-point Likert scale. The most appropriate answer was scored as 3 and the least one scored as 1. Each patient was given 10 min time for completing the questionnaire [Figure 1]. The filled out questionnaires were returned back in a closed envelope and given to the investigator.

Oral hygiene indices
Patient's dental plaque levels were evaluated using Modified Quigley Hein Plaque Index (mQHP)[9] with a disclosing solution of Erythrosine dye. Gingival inflammation was determined using gingival Index (GI)[10] at four sites. Modified Papillary Bleeding Index (mPBI)[11] was used to determine the gingival bleeding at four different sites.

All the three indices were assessed by a single investigator who was trained and evaluated for accuracy and reliability until the reproducibility was over 90%.[12]

Motivation and reinforcement of the patient
After the measurement of oral hygiene indices, professional scaling and root planing was delivered to each patient by a trained dental professional. Factual education and rapport were made by face-to-face training on proper oral hygiene measures and maintenance, along with practical training to improve motor skills by using the "Tell-Show-Do" approach. Motivation was done based on "Health Belief Model" which includes the identification of susceptible patients under oral disease, understanding the asymptomatic nature of disease, its severity and negative outcomes along with behavioural changes for the prevention and control of disease.

Participants were educated on proper duration, frequency, and method of tooth brushing on models and repeated on their teeth using mirrors. A detailed explanation on the usage of interdental aids, mouthwashes, and tongue scrappers was clearly explained and provided to the participants by the trainer. The areas more prone to plaque accumulation, clinical characteristics of gingiva in inflamed region, and frequency of recall visits were clearly explained. They were highly motivated to improve their self-efficacy in implementing oral hygiene practices. Later, all the patients were motivated once through a telephone call.

Reinforcement was done by encouraging the patients after they performed their oral hygiene routine. Emphasis was made on the importance of maintenance program scheduled after 3 months.

STATISTICAL ANALYSIS

Statistical analysis was done using SPSS software (SPSS Statistics for Windows, Version 22.0). The questionnaire

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QUESTIONNAIRE PROFORMA

Name-   Age/Sex-

1. Mention your daily oral hygiene practice

a. Tooth brushing   b. Tooth brushing and dental flossing
c. Tooth brushing, dental flossing with mouth rinses

2. How many times do you brush daily?

a. Once a day, but not regularly   b. Once a day, regularly   c. Twice a day regularly

3. Do you feel any deposits in your teeth even after tooth brushing?

a. Yes, often   b. Only after taking foods   c. Not at all

4. Do you feel bad breath?

a. Yes, always   b. Yes, but only after taking foods   c. Never

5. How often do you change your tooth brush?

a. I never use tooth brush   b. No specific time limit   c. Once in three months

6. Do you find any redness or colour changes in your gums?

a. Yes, all over my gums   b. Yes, in specific areas of my gums   c. No changes

7. Do you find any swelling or glossiness in your gums?

a. Yes, all over my gums   b. Yes, in specific areas of my gums   c. No changes

8. Do you have any pain in gums?

a. Yes pains without any provocation   b. Yes, pains sometimes   c. No pain

9. Do you find any lowering of gums?

a. Yes, in many teeth   b. Yes, in some teeth only   c. Not at all

10. Do you feel sensitivity in any teeth?

a. Yes, more often   b. Yes, at times   c. Never

11. Have you ever noticed bleeding in your gums?

a. Yes, more often   b. Yes, but only at times   c. Never

12. Do you find bleeding in your gums after brushing?

a. Yes, always after brushing   b. Yes, but only at times   c. Never

13. How long did you find bleeding in your gums?

a. More than a week   b. Just after a sharp injury   c. Not at all

14. How often do you find bleeding in your gums?

a. Bleeding from gums spontaneously   b. Bleeding from gums after chewing or brushing   c. No bleeding

15. What measures have you taken to control bleeding gums?

a. No measures   b. self medication like natural remedies   c. Consulted dentist
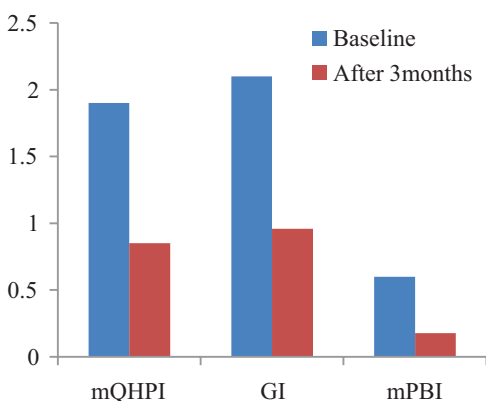
Figure-1: Questionnaire format

Figure-2: Changes in modified Quigley Hein plaque index scores, gingival index scores, and modified papillary bleeding index scores at baseline and during follow-up after 6 months

results were correlated with the clinical score. Pearson correlation was used to find the correlation between questionnaire score and the clinical index score. Wilcoxon signed-ranks test was used to compare the differences in index scores at baseline and follow-up.

RESULTS

A total of 100 patients completed the study (47 males and 53 females) aged between 18-26 years. Majority of the patients belonged to the upper middle class, had graduate level education, and were unemployed (Table 1).

Table 2 shows the correlation between questionnaire data and periodontal parameters at baseline. Modified Quigley Hein Plaque index was found to correlate positively, albeit with a lower correlation and a non-significant *P*-value. Conversely, gingival index was found to correlative strongly with the questionnaire scores, with a significant *P* value. Similarly, a significant *P*-value was also obtained for Modified papillary

	Male (%)	Female (%)	Total (%)
Education			
Uneducated	5(10.6)	6(11.3)	11(11)
Primary school	10(21.2)	8(15.1)	18(18)
High school	21(44.6)	24(45.2)	45(45)
Graduate	11(23.4)	15(28.3)	26 (26)
Total	47 (100)	53(100)	100(100)
Occupation			
Unemployed	14(25.4)	10(22.2)	24(8)
Unskilled worker	18(32.7)	2(4.4)	20(20)
Skilled worker	13((23.6)	20(44.4)	33(33)
Professional	10(18.1)	13(28.8)	23(23)
Total	55 (100)	45(100)	100(100)
Socio-economic status			
Lower class	8(15.1)	7(14.8)	15(15)
Lower middle class	18(33.9)	10(21.2)	28(28)
Upper middle class	15(28.3)	17(36.1)	32(32)
Upper class	12(22.6)	13(27.6)	25(25)
Total	53(100)	47(100)	(100)
Table-1: Socio-demographic details of the patients			

Index	n	Correlation score	P-value
mQH Plaque Index	100	0.128	0.212
GI	100	0.210	0.030*
mPBI	100	0.204	0.041*
Table-2: Correlation between questionnaire score and Modified Quigley Hein plaque index score (mQH), gingival index score (GI), and modified papillary bleeding index (mPBI) score. (* Significance at p<0.05)			

bleeding index, with a higher correlation.

The changes in periodontal parameters between baseline and 3 months are reflected in figure 1. A considerable significant

decrease (P < 0.001) (Wilcoxon signed-ranks test) was noted for all the three indices after patient education and motivation.

DISCUSSION

The present study evaluated the self-efficacy of oral hygiene and its relation to periodontal knowledge and motivation in the young population visiting Government Dental College and Hospital Srinagar. As this institution is the central reference institute of the state, patients visiting the hospital were considered to be representative of the general population. To the best of our knowledge, this is the first such report for the present community.

Upon correlation of the baseline plaque parameters with gingival health related knowledge, non-significant relation was observed (Table 2). Apparently, patients were unable to 'feel' unclean tooth surfaces. On the contrary, significant correlation was found for gingival and bleeding indices, which reflects the relative awareness among the present population regarding gum discomfort/bleeding. Balasubramanium et al[5] reported a similar study in which significance was observed only for bleeding index and not for plaque or gingival index, which shows the tendency for patients in developing countries to seek professional dental care only on the onset of obvious discomfort. This highlights the importance of imparting periodontal health education to the general population, in order to increase their awareness and sensitivity regarding gum health.

Concurrently, changes in self-efficiency after education and motivation based on the health belief model reflected in terms of changes in periodontal parameters at 3 month evaluation. It was found that periodontal health (GI and mPBI) had significantly improved as was the self-efficacy of plaque removal (mQHPI) (Fig 2). The Health Belief Model is a framework for motivating people to take positive health actions that uses the desire to avoid a negative health consequence as the prime motivation.[13] By demonstrating patients the esthetic and functional disfigurement resulting from periodontal disease, it was possible to motivate the present population to perform regular and conscious plaque control. Similar results were reported for the rural Tamil population by Balasubramium et al.[5] These findings validate the use of the HBM for preventive education of a patient population primarily motivated to seek treatment in the face of acute disease.

Health beliefs, reinforcement of health behavior and training learnt in young adult lifehood are deeply ingrained in the minds of the society, and quite resistant to change. As an important finding of this study was short-term improvement in oral hygiene practices after health belief based motivation, this indicates the proper knowledge enforcement of the young patients. Though the results reported herein are short term, the positive effect of periodontal health is encouraging and indicates the feasibility for a longer follow up. Regular follow-ups and constant communication with the study group may yield better and sustainable results. Pertinently, Albandar et al.[14] made a similar program educating oral health

and found reduction of plaque and gingival inflammation in adolescents on a long-term basis.

In the light of the factors effecting patient compliance of the present study population, it was found that education, baseline oral health awareness, and treatment satisfaction had a major impact on compliance of patients to hygiene instructions and recall appointments.[15] Integrating these findings with those of the present study, practical guidelines and recommendations can be formulated to ensure population-specific education and motivation programs, preferably aimed at a younger, more receptive and 'mouldable' population.

CONCLUSION

Within the limits of this short term study, the following conclusions can be made:
- Periodontal health awareness is scarce in the present study population and needs to be optimized by vigorous and enthusiastic health education.
- The health belief model may be used as an effective oral hygiene motivational tool for in developing societies.
- The young patient population responds favourably to periodontal health education and oral hygiene motivation, and hence may be preferably targeted for preventive and interceptive health counselling.

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