Influence of various factors on patient compliance after periodontal therapy: A pilot study

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Abstract:

Background: Patient compliance is an important predictor of periodontal prognosis, therapy, and maintenance. Limited studies concentrate on the factors which affect patient compliance. Thus, the aim of the study is to determine the relationship between sociodemographic data, patient’s oral health awareness (OHA) and treatment satisfaction (TS) to patient compliance. Materials and Methods: A total of 150 patients were subjected to a prevalidated questionnaire comprising of thirty questions. Questions covered different aspects such as sociodemographic data, OHA, and level of patient TS. Statistical analysis was done using mean, percentages, and Spearman’s correlation coefficient. Results: A sample of 150 people was included into the study of which 93 were females and 67 males with a mean age of 38 years. The total OHA scores when divided into three categories such as 5–7, 8–9, and >10 and plotted against number of missed appointments; the difference found was statistically significant (P < 0.001). The mean TS was divided into four subgroups of score >24, 25–27, 28–30, and >31 and then plotted against the average number of missed appointments, and the difference was found to be statistically significant (P < 0.001). The correlation between the OHA score and number of missed appointments was −0.59 (P < 0.001) and TS score and number of missed appointments was −0.40 (P < 0.001). Conclusion: Within the limitations of the study, it can be concluded that patient education, OHA, and TS are the variables that influence the patient compliance.

Key words: Oral health awareness, patient compliance, periodontal disease, periodontal treatment

INTRODUCTION

Periodontitis is a multifactorial inflammatory disease caused by microorganisms leading to irreparable periodontal tissue damage progressing to tooth loss and impaired masticatory function. The current diagnosis of periodontitis is mainly based on clinical examination and alveolar bone changes which are visible radiographically only after an evident amount of bone loss and tissue destruction.[1] It causes relative edentulism which affects the mastication and compromised esthetics causing functional, psychological disturbances which, in turn, distress the general health and quality of life. The consensus of European Workshop on Periodontal Education 2010 said that “preservation of periodontal health disease is a key component of oral health and overall health and is a fundamental human right.”[2]

Compliance is the extent to which persons’ behavior coincides with medical or other health-related advice.[3] The success of nonsurgical, surgical, and supportive periodontal therapy is associated with patient compliance. The prognosis of patients is critically dependent on patients’ attitude, desire to retain natural teeth, willingness, and ability to maintain good oral hygiene.[4] Unlike endodontic lesions, periodontal lesions are primarily painless.[5] Thus, painless nature of disease along with the lack of awareness and knowledge leads to the perceived unimportance of periodontal therapy which may hinder the patient compliance. A study by Miyamoto et al. in 505 patients over 15–53 years demonstrated that there is a reduction in bleeding on probing and plaque index in complete compliers as compared to erratic compliers.[6] Another study stressed the importance of compliance to periodontal therapy by relating it to improve dental prognosis and reduction in tooth loss.[7] A recent systematic review by Lee et al. said that regular compliers have less risk of tooth loss as compared to erratic compliers.

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compilers. According to Costa et al., regular compliance patients presented a lower progression of periodontist and tooth loss compared to erratic compliance patients. Thus, these studies highlight the importance of patient compliance on the success of periodontal therapy. Patience compliance can be improved by providing more information about the development and consequences of periodontal diseases and by institution of a recall system supported by electronic data processing Annen et al.

There are limited studies on compliance of patients after active periodontal therapy. There is a paucity of literature on factors which affect the compliance of patients and the role of periodontist on improving the compliance of patients. Furthermore, the systematic review by Lee and et al. said that the factors affecting patient compliance to periodontal supportive periodontal therapy remain largely unidentified. Thus, this study aims to determine the relationship between sociodemographic data, patient’s oral health awareness (OHA) and treatment satisfaction (TS) to patient compliance.

MATERIALS AND METHODS

A total of 150 patients with mild and moderate type of periodontitis involving more than 30% of teeth were selected from the Outpatient Department of Periodontics for the purpose of the study. Patients requiring minimum of three appointments for consecutive periodontal therapy within an age range of 22–55 years were included in the study. Smokers and patients not willing to participate in the study were excluded from the study. Written consents were obtained from the participants before the commencement of the study. Both consultation and treatment appointment were performed by same operator, i.e., Shah R. Treatment protocol included scaling in the first visit followed by root planing in the second and third visits. Patients were recalled 3–5 times for follow-ups every 15 days.

It was a cross-sectional survey. A prevalidated questionnaire comprising of 30 questions was designed based on the dental visit satisfaction scale by Corah et al. The study protocol was reviewed and approved by the institutional review board.

The questionnaire comprising of thirty questions was divided into four sections. The first 4 questions concentrated upon the sociodemographic data and one enquiring the reason of visit, next 4 on the patients’ oral awareness, 15 on the level of patients’ TS, and last 5 on the reasons for noncompliance.

Questions on oral awareness had graded variables such as very important, moderately important, and not important. Scores of 3, 2, and 1 were given to every question according to the choices made. Sum of values secured by every patient at the end of five questions was calculated. Any patient could obtain a score minimum of 3 and maximum of 15. This was recorded as OHA score.

From the questions on level of satisfaction achieved by the patients after undergoing periodontal treatment, 12 had graded variables from never, most of the times, sometimes, and always. Scores of 1, 2, 3, and 4 were given to those questions according to the choices made. Total sum of values scored at the end of 15 questions was minimum of 4 and maximum of 16. The score obtained was recorded as TS score.

Two out of five questions on noncompliance concentrated upon whether any appointments were missed by the patient and third question had variables such as never, sometimes, and always. Scores of 1, 2, and 3 were allotted as per the choices made. Maximum score of 9 and minimum score 3 could be gained by patient. Furthermore, the various reasons for noncompliance were acquired from the rest two questions.

The data were collected, tabulated, and analyzed using SPSS version 17.0. Statistical analysis was done using mean and percentages. The effect of OHA score and TS score with missed appointments was calculated using ANOVA. Correlation between OHA score and number of missed appointments and TS score and number of missed appointments was calculated using Spearman’s correlation coefficient.

RESULTS

A sample of 150 people was included into the study of which 93 were females and 67 were males with a mean age of 38 years. Out of 150 patients, 39 were uneducated, 59 with secondary education, and rest 52 were graduates. Table 1 presents the mean scores for individual question. Table 2 represents the OHA scores. The total OHA scores were then divided into three categories such as 5–7, 8–9, and >10. These three were then plotted against number of missed appointments in the Figure 1. The difference found was statistically significant (P < 0.001).

The mean TS values were presented in Table 3. They were divided into four subgroups of score >24, 25–27, 28–30, and >31. These groups were then plotted against the average number of missed appointments, and the difference was found to be statistically significant (P < 0.001) in Figure 2.

The correlation between the OHA score and number of missed appointments was −0.59 (P < 0.001) and TS score and number of missed appointments was −0.40 (P < 0.001).

Table 1: Patient sociodemographic data

| Education          | Number of people | Number of missed appointments |
|--------------------|------------------|------------------------------|
| Uneducated         | 39               | 2.9                          |
| Secondary education| 59               | 2.1                          |
| Graduate           | 52               | 1.6                          |

Table 2: Question-wise mean of oral health awareness scores

| Question number | Questions                        | Mean of OHA scores |
|-----------------|----------------------------------|--------------------|
| 1               | Importance of dental health to overall health | 2.1                |
| 2               | Importance of tooth brushing      | 2.5                |
| 3               | Importance of interdental space cleaning | 1.6                |
| 4               | Your concern level of gum disease | 2.2                |

OHA—Oral health awareness
The mean number of missed appointments in questions related to noncompliance was presented in Table 4. Various reasons of noncompliance are represented in Figure 3.

**DISCUSSION**

Periodontal diseases are chronic inflammatory diseases affecting the tissues around the tooth and primarily painless in nature. Initial signs and symptoms of periodontitis are not distressing enough to be considered alarming by patients.

For a successful treatment plan, the continuous and active cooperation of the patient is indispensable. After completion of stipulated periodontal therapy, the patient is subjected to the maintenance phase. There exists no universally accepted classification for patient compliance. The definition and classification of compilers has been described by various authors and greatly varies. Most commonly, the patients are classified as regular compilers (100% cooperation), erratic compilers (patients who missed but continued to attend irregularly), and noncompilers (did not come for any visits). Recent studies demonstrate better periodontal status including bleeding on probing, plaque index, and decreased tooth loss in compliant patients as compared to non/erratic compliances. In the study by Delatola et al., it was observed that the compliance of patients to nonsurgical and supportive periodontal therapy was generally low. Furthermore, smoking and periodontal disease act as modest modifiers of patient compliance. Another literature review identified psychological factors associated with patient compliance includes personality traits and emotional stressors. However, there are very limited studies to assess the factors affecting patient compliance. In our study, we investigated three factors, namely, sociodemographic data, OHA, and TS level and factors which can influence patient compliance.

Among the sociodemographic data, we recorded age, education, and gender. Out of which, the most important variable was patient education. The mean number of appointments missed by uneducated patients was 2.9 and educated was 1.6. This

| Question number | Questions | Mean of treatment satisfaction scores |
|-----------------|-----------|--------------------------------------|
| 1               | Was treatment atmosphere calm          | 2.9                                  |
| 2               | Understand your problem                | 2.7                                  |
| 3               | Sterilization followed                | 3.2                                  |
| 4               | Was dentist careful with instruments? | 3.1                                  |
| 5               | Did the dentist work gently           | 2.9                                  |
| 6               | Was main problem solved?              | 2.8                                  |
| 7               | Did you want more information regarding gum disease and treatment plan | 3.1 |
| 8               | Dentist was not in a hurry             | 2.8                                  |
| 9               | Did you understand instructions given? | 2.9                                  |
| 10              | Was it easy to get an appointment?     | 2.7                                  |
| 11              | Was the appointment time given         | 2.6                                  |
| 12              | Did dentist answer your questions satisfactorily? | 2.5 |

| Question number | Questions | Mean of missed appointments |
|-----------------|-----------|-----------------------------|
| 1               | How many appointments did you miss? (<2, 2, >2) | 2.1 |
| 2               | Have you missed any appointments? (yes/no) | 2.7 |
| 3               | Did you follow instructions given to you? | 1.9 |
represents that the compliance among the educated patients was better than the uneducated ones. In developing countries like India, still a majority of population are uneducated or do not complete primary education. Special emphasis should be given on these subgroups. These finding can be applied to enhance the clinical compliance of patients. Effects should be made on mass and individual level to educate these and make them aware of importance of oral health, oral systemic connection, and maintenance therapy.

For the scale of OHA, we asked about importance of oral health to overall health, importance of tooth brushing, interdental space cleaning, and concerns about gum diseases. It was seen to affect patient compliance in a positive way. Statistically significant relation was observed between oral hygiene awareness score and number of appointments missed by the patients and appointments. It indicated that more aware a patient, better was his compliance with dental treatment and appointments. These findings can be applied to enhance the clinical compliance of patients. Efforts should be maximized to increase public health awareness. Research data from various laboratories point to periodontal infections as a risk factor for chronic medical disorders, including atherosclerotic cardiovascular disease (ACVD), cerebrovascular accidents, and low-birth-weight infants. [10] Modifiable lifestyle-associated risk factors for periodontitis (and ACVD) should be addressed in the dental office. [17] Patients should be adequately educated about the periodontal disease and its effects on systemic health. Importance of oral health on overall health, effect of regular compliance on oral health and tooth loss, and awareness regarding decrease tooth loss rate should be spread. Effective use of camps, posters, networking audio-visual aids, and models should be made to educate people on a mass scale regarding the importance of oral health. The TS was found to be the most important determinant influencing patient compliance. We asked the patients regarding whether sterilization methods were followed, dentist spoke gently or not, whether dentist understood the problem and explained them properly or not, etc. Statistically significant correlation was seen between TS score and noncompliance among patients (P < 0.001). The criteria which had the maximum influence on patient satisfaction was found to be the practice of proper sterilization methods. The other significant variables were the understanding of the patient about periodontal disease and treatment plan as explained by the periodontists along with the working efficiency, comprehensiveness, and clarity of the operator.

The cause of noncompliance in patients to periodontal therapy is multifactorial in character. The most common reason for noncompliance stated by patients is lack of motivation or perceived unimportance toward the treatment. This is in agreement with findings by Jansson and Hagström who said that compliance seems to be more dependent upon patients’ attitude, beliefs, and personality. [15] Motivation is a key factor in improving the patient compliance. His/her apprehensions should be heard with at most care and resolved with appropriate scientific reasoning. Patient compliance can be continuously monitored through audio-visual aids or electronic data record.

Difficulty in assessment of the results of periodontal therapy due to the absence of tangible benefits for the patients is another common reason for low TS levels among patients. Better explanation to patients’ periodontal condition along with the suitable treatment plan should be incorporated by the periodontists. Reducing the complexity of the regimen and increasing patient’s involvement in the decision-making related to the treatment can be helpful in improving the patients’ attitude toward the therapy. Thus, the role as a periodontist is essential in improving the patient compliance.

Based on our findings, we present a compliance model which depicts the interrelation between the qualities of a periodontist and patient’s knowledge and other variable which affect patient compliance [Figure 4]. [19] This model is centralized around the idea of compliance. According to this model, relation between periodontist and patients has direct influence on compliance. The qualities of periodontist affecting compliance positively are his/her skills, communication abilities, and good patient management. For the patient, compliance is positively affected by treatment experience, TS, and OHA. However, intermediary variables, i.e., fixed factors such as personality traits, patients’ sociodemographic data, and family/peer influence affect compliance. On the other hand, fixed factors for operators include their personality traits, treatment complexity, and duration. Compliance to therapy is a result of complex care case-dependent interplay of these factors. Studies are required to assess the effect of these individual factors on patient compliance.

In future, we might see a more standardized and individualized compliance assessment model providing us with a “point of care” which can assess and predict compliance. This will help us modify and customize our approach to individual patients and result in more favorable and predictable treatment outcome. Research should focus on identifying modifiable and nonmodifiable factors which affect patient compliance. More studies with larger sample size are needed to verify results obtained in this study.

**CONCLUSION**

Hence, within the limitations of this study, we can conclude that patient education, OHA, and TS are the variables that may affect patient compliance.
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Conflicts of interest
There are no conflicts of interest.

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