

Original Research Article


Assessment of oral self-care in patients with periodontitis attending Government Dental College Srinagar: A questionnaire based study

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Abstract

Background: Oral hygiene education is the corner stone of the periodontal treatment. Successful management of periodontal disease apart from its timely management also depends greatly on the patient's capacity to maintain oral self-care. In the present study, the oral self-care and perceptions of patients with periodontitis was assessed using a short questionnaire.

Materials and methods: A cross-sectional study design was used. The study population consisted of hundred patients (age range 26-68 years) with chronic periodontitis. The pre-tested 19-item questionnaire comprised 3 domains; 1) oral hygiene, 2) dietary habits and 3) perception of oral condition. The questionnaire was used as a part of the comprehensive assessment.

Results: Analyses of the assessment data revealed that most of the respondents acknowledged the importance of prevention of dental caries and periodontal diseases, but less than one third of them were regular users of the dental care system. Ninety-nine percent of the respondents however were willing to take new challenges and change their routine and 28% respondents had doubts about the impact of their own actions on oral health.

Conclusion: Oral health conceptual models are an effective tool to impart oral hygiene education and they play an important role in patient motivation in developing societies. Periodontal health awareness is scarce in the present study population and needs to be optimized by vigorous and enthusiastic

health education. Also, there seems to be much room for improvement of oral hygiene and self-care among individuals presenting for an initial periodontal examination.

Key words

Periodontitis, Oral health model, Self-care, Oral hygiene, Dietary habits.

Introduction

Periodontal disease is one of the most common chronic inflammatory diseases. In older adults it may increase patient's risk of developing systemic diseases such as diabetes mellitus, lung disease, heart disease and stroke [1]. Severe periodontitis, is considered as a public health problem and affects about 11% of humans, may lead to disability and thus may impair quality of life [2].

Studies done worldwide in various populations have shown high prevalence rates of periodontitis in developing countries as compared to developed countries. In a Brazilian rural population, it ranged between 24.4% and 83% [3, 4], and in a Thai population, it ranged from 92% to 100% [5]. About 100% of a Vietnamese study population exhibited at least one site with attachment loss, and 90% of the adult participants in a Guatemalan population exhibited at least one site with clinical attachment level ≥ 6 mm [6].

One of the landmark reports about periodontitis prevalence in the Indian population by Shah, et al., 2007, is the multicentric study carried out by the Government of India in collaboration with the World Health Organization. A total of 22,400 participants from both rural and urban districts of seven different states of India were examined for their periodontal status. A prevalence of 100% for periodontal disease was reported for the states of Orissa and Rajasthan. In addition, a varied prevalence of attachment loss >3 mm was observed in different states [7].

The prevalence rates for periodontitis observed in most of the studies in the Indian population are high (ranging from 27% to 100%) [7]. A previous study done in 2016 reported the

prevalence of periodontitis to be 31.82% in the patients visiting government dental college Srinagar [8].

When left untreated, periodontitis often causes tooth loss that can place significant burden on individuals [9]. Good oral hygiene has always been considered a mainstay of periodontal health [10] which is usually achieved by a combination of good personal oral hygiene and regular professional care [11, 12]. So, successful management of periodontal disease depends on the capacity of patient's oral self-care as well [13, 14].

A change in patient's attitude and behavior is often desirable when periodontitis is treated [15]. A conceptual model is useful to demonstrate and encourage patients in improving oral care, most often associated with oral health are the Health Belief Model, Locus of Control, Self-Efficacy, Stages of Change, and Theory of Reasoned Action. Instruments based on these models have been clinically examined for their abilities to explain oral health habits, oral hygiene and periodontal parameters [16].

Collection of basic information regarding self-care behavior and perception is important in order to plan effective intervention encouraging patient to perform optimal self-care. Also, currently there is no universally accepted or recommended assessment tool for oral health behavior of periodontitis patients. Due to time restraint clinically with the patient there is a need for concise assessment of such data. So, the Client Self-care Commitment model (CSCCM) [17] and the New Century model of oral health promotion [18] were used as theoretical frameworks for the assessment of the patients here.

The aim of this study was to assess oral self-care and perceptions of patients with periodontitis, by incorporating the essence of the oral health conceptual models in a short questionnaire.

Materials and methods

Subjects

A cross-sectional study design was used. Subjects were recruited from patients who visited the Government Dental College, Srinagar for initial assessment and treatment of periodontitis. Ethics approval was granted by the institutional ethics committee, and the patients gave written informed consent to participate in this study.

Subjects were asked to participate willingly if they were clinically diagnosed with mild to moderate chronic periodontitis. 100 subjects were taken for the study. Inclusion/ exclusion criteria consisted of the presence of a minimum of four ≥ 4 mm probing depth in different quadrants with radiographic evidence of bone loss, the presence of ≥ 20 teeth with a minimum of 4 molars, no extensive periodontal therapy in the previous 6 months, and good general health (as assessed by the recruiting clinician).

Data collection

Before commencement of initial periodontal therapy, data regarding behavior and perception of self-care were collected by means of clinical oral examination and a self administered questionnaire.

Clinical oral examination

After collection of full medical and dental histories, a periodontal examination was carried out. A total of 5 clinicians (5 dentists) performed the initial examination. Before the clinicians took part in the study, they were given detailed instructions and underwent comparative examinations with result assessments.

The following periodontal parameters were recorded at six sites for each tooth. Probing depth (PD) was measured using a Williams probe with a force of 0.3 N by the examiner rounding up to

the nearest millimeter. Full-mouth bleeding scores were recorded as the presence or absence of bleeding following measurement of PD [19]. Several tooth-sites were excluded from the examination; impacted teeth, retained roots, grossly decayed teeth, teeth which were too inaccessible to examine satisfactorily.

The presence or absence of supragingival dental plaque was recorded by Plaque Control Record (PCR) of O'Leary et al. [20].

Questionnaire

The domains and items of the questionnaire were taken from a previous study [16] and applied to the patients visiting Government Dental College, Srinagar. They have framed the questionnaire from various reviews of the literature. Behavior and attitude related questions were developed based mainly on the conceptual models of CSCCM [17] and the New Century model of oral health promotion [18]. They have tested for a content validity and a peer-focus group of one periodontist and two dental hygienists with extensive clinical experiences further refined the instrument. The final, refined version was composed of 3 domains; 1) oral hygiene, 2) dietary habits and 3) perception of oral condition, with a total of 19- item questions (annexure 1). Each question is provided with various levels of agreement or categorical options for the patient to choose from. The clinicians supervised the patients during the completion of the questionnaires to ensure that all questions were understood.

Data Management and Statistical Analysis

In preparation for analyses, data were entered into an Excel spreadsheet and proofed for data-entry errors. The responses to questionnaire items were dichotomized based mainly on the frequency of responses.

The Fisher's exact test was used to assess the relationship between frequencies of the response variables and oral hygiene status. For all statistical calculations, the In Stat 3.0 software package (GraphPad, La Jolla, CA) was used. All

reported *P*-values were two-tailed, and *P*-values less than 0.05 were considered statistically significant.

Results

A total of 100 patients (66 males and 34 females; 26 to 68 years of age; mean age: 47 ± 21 years) agreed to participate and responded to the questionnaire. Approximate time required for a participant to fill out the questionnaire ranged from 10 to 15 min. Clinical and demographic characteristics of the subjects are shown in **Table - 1**. The participants had an average of 25 remaining teeth.

Table - 1: Demographic characteristics and clinical parameters of subjects at baseline (Total $n = 100$).

| Gender | |
|------------------------------|-----------------|
| Male (n) | 66 |
| Female (n) | 34 |
| Age† | 47 ± 21 |
| Age distribution | 26-68 |
| No. of teeth† | 25 ± 4 |
| PD† | 3.6 ± 0.90 |
| % sites with bleeding† | 36.8 ± 20.5 |
| % sites with PD ≥ 4 mm† | 30.8 ± 25.2 |

Oral hygiene

Under the domain of oral hygiene, the questionnaire asked about frequency of tooth brushing, use of dentifrice, approximal cleaning, and use of mouth rinse and other adjunct products (**Table - 2**). Altogether, seventy six percent of respondents indicated brushing once a day, while 8% brushed twice a day. A majority of respondents were using dentifrice. Most of the respondents didn't clean proximal surfaces and only a few of them (4%) were using mouth rinse or other adjunct oral care products.

Dietary habits

In general, no apparent problems with dietary habits were identified in this population of

patients. As for frequency of meals, a majority of respondents (80%) reported eating four meals a day with the rest eating three meals a day (**Table - 3**). Over two thirds of respondents reported no snacking between meals. As for respondents' self evaluation of their dietary status, 98% rated their own habits as good, while 2% rated them as fair and none rated it bad. None of the items showed a significant association with plaque scores (**Table - 3**).

Table - 2: Summary of responses to "Oral hygiene" and their relationship with plaque score.

| Oral hygiene Items | Responses and binarization† | Relationship with plaque score |
|---|-----------------------------|--------------------------------|
| 1. Frequency of brushing (per day) | | $P < 0.05$ |
| none | 16 | |
| 1x | 76 | |
| 2x | 8 | |
| 3x | 0 | |
| 4x or more | 0 | |
| 2. Use of tooth paste | | ND |
| Yes | 86 | |
| No | 14 | |
| 3. Approximal cleaning (use of dental floss or interdental brush) | | $P < 0.05$ |
| Yes | 2 | |
| No | 98 | |
| 4. Use of mouthwash or other products | | NS |
| Yes | 4 | |
| No | 96 | |

Values are expressed in n and same is the percentage (%).

† Responses were grouped into two and *P*-values less than 0.05 were considered statistically significant.

NS: not significant, ND: not determined

Table - 3: Summary of responses to "Dietary habits" and their relationship with plaque score.

| Dietary habits Items | Responses and binarization† | Relationship with plaque score |
|--|-----------------------------|--------------------------------|
| 1. Frequency of meals (per day) none 1x 2x 3x 4x or more | 0 0 2 18 80 | NS |
| 2. Self-evaluation of diet Good Fair Bad | 98 2 0 | NS |
| 3. Frequency of between-meal snacks (sweets) none 1x 2x 3x 4x or more | 72 24 4 | NS |

Values are expressed in n and same is the percentage (%). Items subjected to the statistical analysis were shown. †Responses were grouped into two. *P*-values less than 0.05 were considered statistically significant. NS: not significant

Table - 4: Summary of responses to item 1 to 6 of "Perception of oral condition" and their relationship with plaque score.

| Perception of oral condition Items | Responses and binarization† | Relationship with plaque score |
|--|-----------------------------|--------------------------------|
| 1. How often do you check your teeth or mouth in a mirror? everyday a few times/week a few times/month almost never | 50 32 4 14 | NS |
| 2. How would you rate your desire to keep your teeth? Very strong Strong Fair Weak Very weak | 46 43 8 2 1 | NS |
| 4. How much are you willing to do to improve your oral health? Anything necessary I am willing to take some action. Not very much | 72 26 2 | NS |
| 6. Have you been maintaining regular dental check-ups? Yes No | 86 14 | $P \leq 0.05$ |

Values are expressed in n and same is the percentage (%). Items subjected to the statistical analysis were shown. †Responses were grouped into two. *P*-values less than 0.05 were considered statistically significant. NS: not significant

Table - 5: Summary of responses to item 7 to 11 of "Perception of oral condition" and their relationship with plaque score.

| Perception of oral condition Items | Responses and binarization† | Relationship with plaque score |
|--|-----------------------------|--------------------------------|
| 7. How much do you follow your dentist's or dental hygienist's advice on oral hygiene care? Always Sometimes Not very much Never | 99 1 0 0 | $P = < 0.05$ |
| 8. How important is the prevention of cavities or gum diseases for you? Very important Somewhat important Not at all important | 100 0 0 | NS |
| 10. Are you willing to take on new challenges and/or change your daily routine? Yes No | 99 1 | NS |
| 11. To what degree do you feel that the actions you take have an impact on your own oral health? My actions play a significant role Not sure either way I cannot do much about it | 72 2 26 | $P = < 0.05$ |

Values are expressed in n and same is the percentage (%). Items subjected to the statistical analysis were shown.

† Responses were grouped as shown. *P*-values less than 0.05 were considered statistically significant. NS; not significant

Perception of oral condition

A summary of the responses is shown in **Table - 4** and **Table - 5**. When asked to indicate the frequency of oral self-examination (looking into one's own mouth), 50% of respondents reported doing so once daily (**Table - 4**). A majority (89%) of respondents indicated a very strong or a strong desire to keep their teeth for as long as possible. More than two thirds of respondents indicated that they would do anything to improve their oral conditions. About 86% respondents were regular users of the dental care system (i.e., they had at least one dental visit within 1 year). And almost everyone acknowledged the

importance of prevention (**Table - 5**) with all of them indicating that they would like to receive professional advice on oral care products.

All of the respondents wish to take on new challenges or change their daily routines. Seventy two percent of them believed that their actions would influence their oral health, while 28% felt that it played no role.

Discussion

In the modern era where accountability and awareness is rapidly growing, the field of periodontics could benefit by adopting models

that emphasize the multidimensional nature of oral problems and improved the compliance and oral self-care behaviors by considering patient behaviors and perceptions on oral health [21].

A questionnaire from a previous study was chosen for this study since it was simple and could be completed quickly, yet it would provide information relevant to the planning of periodontal treatment. Also, this questionnaire imposed very little burden on the patients as they had little difficulty in completing it [16].

According to the latest consensus on brushing, it is recommended for adults and children that tooth brushing should be undertaken/ supported at least twice a day and clean interdentally at least once a day [22, 23]. In the present study, 76% participants reported that they brush their teeth once daily and 8% reported brushing at least twice a day, and only 2% reported that they clean interdentally and only 4% reported using a mouth wash. Studies on tooth brushing frequency within the Indian population reveal almost a similar pattern. A study from Kancheepuram District, Tamil Nadu, reported that 56% of the urban population brushed once daily, while 44% brushed twice daily, whereas 86% of the rural population brushed once daily, and only 13% brushed twice daily [24]. A study focusing on oral health awareness in Chennai found that 37.62% of participants brushed twice daily, while the remaining participants brushed only once a day [25]. Thus, in Indian in general and Kashmir in particular it may be necessary to further emphasize interdental cleaning in the development of periodontal care plans and so any program or oral hygiene instruction intended to reduce periodontal disease must focus on proximal and interdental areas as well [13].

Two conceptual models to study the determinants of oral self-care were taken into consideration. The CSCCM implies that the dental hygienist works in dialogue with the patient in order to increase empowerment [17]. The dialogue results in a commitment where the patients set goals for themselves. The New

Century model of oral health promotion [18] can be summarized as follows: oral health promotion is a function of oral health-related affect, behavior and cognition, time and situation. In this study, about 86% participants reported dental visits for a regular check-up within the last year. Also in this study, 14% reported that they never followed professional advice on oral care. This is much higher than the overall pooled estimate of dental care utilization in Indian adult population, which was estimated as 23.96% [26]. However, that those who maintained regular check-ups and had closer perceived compliance with advice from dentists or dental hygienists had significantly better oral hygiene. These findings emphasize the importance of patient commitment in selfcare [16].

The next step was to plan interventions based on the conceptual models, for the purpose of effectively assisting periodontal patients' self-care. Attempts have been made to introduce behavioral cognitive approaches into patient care. Those efforts have shown some promising results in the oral health outcomes of patients with periodontitis [27, 28]. This already has been shown in a Cochrane systematic review demonstrating that psychological approaches to behavior management can improve oral hygiene related behaviors [29]. Recently, Syrjälä, et al. [30] found that self-efficacy was associated with oral health habits and diabetes adherence. The use of this questionnaire allows clinicians to incorporate the essence of oral health models in a clinical setting [16].

The application of oral health models to clinical situations has educational implications as well. Understanding the significance of preventing oral diseases and the basics of oral health promotion through biopsychosocial paradigm has become a primary concern of all dental and dental hygiene curricula [18, 31, 32]. Government Dental College and Hospital Srinagar, is a dental school as well as a hospital, and it is crucial to educate dental and dental hygiene students as well as young clinicians about the importance of patients' oral health behaviors and perceptions.

One limitation of this study would be the probable bias of the population, which is small in size and not necessarily represents the whole population with chronic periodontitis in Kashmir. Validity and reliability of the questionnaire should be further examined. Additionally, the study only sought associations between self-care related behaviors and perceptions, and oral hygiene status at the pre-treatment stage. Another possible limitation is that patients may be hesitant or inconsistent in expressing their personal views about their health when self-reports are utilized [33].

Conclusion

In summary, the questionnaire facilitates the inclusion of multiple aspects of patient information, before initiation of periodontal treatment. Within the limits of this 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.
- Oral health conceptual models are an effective tool to impart oral hygiene education and they play an important role in patient motivational in developing societies.
- There seems to be much room for improvement of oral hygiene and self-care among individuals presenting for an initial periodontal examination.

Within the limits of the present study, the significant associations that were found between some of the self-care behaviors and oral hygiene levels document the important role of patient-centered oral health assessment in periodontal care.

Abbreviations

CSCCM: Client Self-care commitment model;
PD: probing depth

Annexure 1

A) Oral hygiene

1. Frequency of tooth brushing
2. Use of toothpaste
3. Approximal cleaning
4. Use of mouthwash or other products

B) Dietary habit

1. Frequency of meal
2. Self evaluation of diet
3. Frequency of between-meal snacks
4. Types of snacks

C) Perception of oral condition

1. How often do you check your teeth or mouth inside in a mirror?
2. How would you rate your desire to keep your teeth?
3. What are your hopes for your oral health?
4. How much are you willing to do to improve your oral health?
5. What actions you are likely to take to improve your oral health?
6. Have you been maintaining regular dental check-ups?
7. How much do you follow your dentist's or dental hygienist's advice on oral hygiene care?
8. How important is the prevention of cavities or gum diseases for you?
9. Would you like your dentist or dental hygienist to recommend oral care products?
10. Are you willing to take new challenges and/or change your daily routine?
11. How do you perceive consequences of your actions on oral health?

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