



VALIDITY OF SELF REPORTED PERIODONTAL STATUS IN PATIENTS VISITING A DENTAL HOSPITAL IN CHENNAI-A PROSPECTIVE STUDY

Dental Science

Dr.Shruthi Chandrasekaran

Intern, BDS, Saveetha Dental College, Saveetha University.

Dr.Sheeja S Varghese

Professor and Head, Department of Periodontics Saveetha Dental college, Saveetha University

ABSTRACT

AIM: The aim of this study is to assess the extent of agreement between self-reported symptoms and clinically diagnosed periodontal health conditions.

MATERIALS AND METHODS: The study population comprised of 350 subjects, who arrived at the outpatient department in Saveetha dental College, Chennai. The study population was subjected to a periodontal status self-assessment questionnaire which comprised questions on bleeding gums, halitosis, mobility of teeth, followed by a brief habitual history and demographic details. Following the questionnaire, a clinical examination was carried out to assess the periodontal status to assess bleeding gums. Periodontal pockets, attachment loss and mobility. Each self reported symptom was subjected to sensitivity, specificity, positive and negative predictive value tests.

RESULTS: Most of the responses reported by the study population were found to have more specificity indicating that there was a clear understanding of the absence of a symptom when it was actually absent except for the question on bleeding gums which was found to be more sensitive than specific. This correlates with the statement that bleeding gums can be an early and definitive indicator of an underlying periodontal pathology.

CONCLUSION: Most of the self reported symptoms which are found to be more specific than sensitive hence can be used to 'rule out' periodontitis, and on the other the symptom on bleeding gums which has been found to have more sensitivity than specificity can be used to 'rule in' periodontitis.

KEYWORDS

periodontal health, self-reported questionnaire, clinical assessment, perception

INTRODUCTION

The periodontium is the fundamental component of the tooth which is the support provided for the actual function of the tooth. Gingivitis and periodontitis, which are the common sequelae in a periodontal disease are conditions which begin to eliminate the core integrity of the periodontium. Epidemiological studies have shown that periodontal diseases are widespread throughout the world and also increased incidence and severity seen as age increases. The main etiology which was frequently associated with these conditions is the presence of local factors, viz dental plaque and calculus. [1] And it also important for an individual to understand and maintain a good periodontal health, as increased concerns and studies have revealed the role of periodontal diseases affecting systemic health. [2]

The birth of the concept of self-assessment of the periodontium mainly arouse due to the hindrance posed by the laborious clinical examination process that could not be easily carried out during a large scale examination as in the case of an epidemiological survey. In addition, these techniques were found to be uncomfortable and little invasive for the individuals. There appears to be a large percentage of individuals who are willing to undergo a self-assessment questionnaire analysis than a clinical examination, which was reported in a study done in UK in 1988. [2]. On the other hand, self-reported measures can be seen as an economic alternative to direct clinical examination.[3]

Many studies have been attempted previously in order to formulate a precise questionnaire for the self-assessment by the subjects and for assessing the validity. Gilbert et al., compared questionnaires and did ample clinical assessments and the results sensitivity and specificity values less than 50%. [4] Kallio et al., advocated that self-reporting of gingivitis had less validity for assessment of a clinical case of gingivitis. [5]. Since the genesis till the current scenario, 19 studies have been attempted at self-reported measures for periodontal health assessment [6], but very few studies carried out in India.

To accomplish an adequate periodontal health, an individual must be made aware of the disease symptoms. Professional management options, following which self-health care measures that have to be undertaken. But on the contrary it has been reported that people tend to underestimate their dental treatment needs, especially in the field of periodontology. [7]. Hence the aim of this study is to assess the awareness regarding the periodontal health of an individual by means

of a self-assessment questionnaire in patients visiting the outpatient department of Saveetha dental college, Chennai

METHODOLOGY

The study population comprised of 350 individuals who attended the outpatient department in Saveetha Dental College. The population comprised of individuals more than 18 years of age and patients with a minimum of 20 teeth and individuals with high levels of illiteracy were eliminated. The patients were informed that they would be asked to fill a questionnaire, which was designed by Gilbert et al., in 1996, following which they will be subjected to a clinical analysis as a part of an experimental study.

The study population was handed over a periodontal self-assessment questionnaire [figure 1] which comprised of questions on self rating of their gum health, chewing efficacy and difficulty, bleeding gums, sensitivity, pain and mobility of teeth and previous gum therapies. Following the symptomatology, behaviour habits assessment questions such as brushing habits, flossing, usage of tobacco, tooth pick usage were being questioned upon and finally concluding with the demographic details assessment. The assessment of periodontal status was then carried out in a dental chair with adequate light conditions using mouth mirror, Williams probe and explorer to assess bleeding on probing, periodontal pocket, attachment loss and mobility and a clinical diagnosis was arrived.

The data was entered in the computer in Microsoft Excel 2010 and subjected to tests to determine percentage distributions. [tables 1-5] Following this, the results were tabulated and sensitivity, specificity positive and negative predictive values were calculated for each self reported symptom.

Figure 1: periodontal self assessment Questionnaire

VARIABLE	QUESTION	SCALE
SELF REPORTED SYMPTOMS		
Self rating of gum health	Compare to others of your age, how would you rate the present condition of your gums	Excellent/ very good/ good /fair/ poor
Loose tooth	Do you have a loose tooth	Yes/ No

Satisfaction with chewing ability	How satisfied are you with your ability to chew overall?	Very satisfied/satisfied/dissatisfied/very dissatisfied
Chewing difficulty	Are you able to chew or bite?	Reported difficulty/did not
Bleeding gums	Do you have bleeding gums	Yes/ no
Infected or sore gums	Do you have infected or sore gums?	Yes /no
Bad breath	Do you have a problem with bad breath?	Yes/ no
Sensitive teeth	Do you have a tooth that is sensitive to hot or cold food or sweets?	Yes/no
Tooth ache	Do you have tooth ache or painful teeth	Yes/no
Abcessed tooth	Do you have an abcessed tooth?	Yes/no
Ever had gum surgery	Have you ever had gum surgery for your gums?	Yes/no
SELF REPORTED BEHAVIOR		
Brushing	How often do you brush your teeth?	Daily or less/more than daily
Flossing	Do you ever use floss to clean your teeth?	Yes/ no
Current smoker	Do you smoke ciggarettes or cigar now?	Yes/no
Former smoker	How many years did you smoke?	Recoded to former smoker/not
Use of smokeless tobacco	Do you use chewing tobacco or snuff now?	Yes/no
Toothpick use	Do you ever use toothpicks to clean your teeth, other than just to remove food particles stuck between your teeth?	Yes/ no
SOCIODEMODEMOGRAPHIC VARIABLES		
Gender	Male/female	Male/female
Education	What is your educational status	Below SSLC SSLC Degree
Age group	How old are you?	18-25,26-35,36-55,>55
Diabetes	Has a doctor ever told you that you have diabetes, which some would call high blood sugar?	Yes/no

38.2% male patients. The age distribution comprised of 16.1% individuals belonging to 20-30 years of age, 18.2% in 30-40 years, 43.2% in 40-50 years of age, 11.9% in 50-60 years and 11.6% in 60-70 years of age, with age group 40-50 years recording highest percentage of periodontitis conditions [38.3%]. The education qualification statistics revealed 42.6% of periodontitis patients were qualified less than SSLC and 21.7% cases seen in degree holders. Diabetes as a medical condition was seen in 28.4% of individuals. [tables 1-4]

In the study population 69.99% of individuals were clinically diagnosed as having gingivitis and 29.9% individuals with periodontitis. The habitual history revealed 68% of individuals brushing less than once daily and they comprised of 42.6% of the diagnosed cases of periodontitis. 14.2% individuals reported using floss and 22.6% toothpick usage. Smoking was reported by 51.8% individuals and they comprised 31.4% of cases of periodontitis.

The self assessment answers reported by the study population were tabulated [table 5] to assess the true positive, true negative, false positive and false negative values. High true positive values were seen in the reports of bleeding gums, and false positive being highest in reports of abcessed tooth. Self assessment of gum health had the highest true negative values and abcessed tooth symptom had the increased false negative values. These values were subjected to sensitivity, specificity, positive and negative predictive value tests.

Most of the answers reported by the study population were found to have specificity, except for the report on self analysis of bleeding gums. These indicated that there was a clear understanding of the absence of a symptom when it was actually absent. Bleeding gums as a self reported symptom had the highest sensitivity, while infected gums has the lowest. The specificity was highest in gum health analysis and least in tooth ache reports. Increased positive predication was seen in gum health assessment and negativity seen highest in reporting bleeding gum symptom.

Male	Percentage of periodontitis	Female	Percentage of periodontitis
56.2%	38.2%	43.8%	37.8%

Table 1: Demographic data

Age distribution(years)	Gingivitis	Periodontitis(%)
20-30	92.9%	7.1%
30-40	71.8%	28.2%
40-50	61.7%	38.3%
50-60	62.3%	37.7%
60-70	77.4%	22.6%

Table 2: age distribution

Educational qualification	Percentage of periodontitis
Less than SSLC	46.2%
SSLC	22.1%
DEGREE	21.7%

Table 3: educational qualification

Clinical Diagnosis	Overall Percentage
Gingivitis	69.99%
periodontitis	29.9%

RESULTS:

The study comprised of 350 subjects, which involved 56.2% of male population and 43.8% female population and periodontitis was seen in

Table 4: disease distribution

SYMPTOM	TRUE POSITIVE(%)	FASLE POSITIVE(%)	FALSE NEGATIVE(%)	TRUE NEGATIVE(%)	SENSITIVITY	SPECIFICITY	POSITIVE PREDICTIVE VALUE	NEGATIVE PREDICIVE VALUE
Gum health	40.1	3.6	59.9	96.4	0.4	0.9	0.91	0.616
Loose tooth	31.8	11.1	68.2	88.9	0.31	0.8	0.74	0.56
Chewing difficulty	42.4	24.2	57.6	75.8	0.42	0.75	0.63	0.56
Bleeding gums	71.2	46.2	26.8	53.8	0.71	0.53	0.6	0.65
Infected/sore gums	13	7.1	77	93	0.1	0.7	0.64	0.54
Bad breath	32.6	31.1	67.4	68.9	0.32	0.68	0.51	0.50
Sensitive teeth	22.6	24.2	77.4	75.8	0.22	0.75	0.48	0.49
Tooth ache	16.2	49.2	83.8	50.8	0.16	0.5	0.24	0.317
Abcessed tooth	13.2	6.3	86.3	93.7	0.13	0.93	0.67	0.51

Table 5: symptomatology self-assessment analysis.**DISCUSSION**

Epidemiological research indicates that periodontal diseases are widespread throughout the world and evidence exists to show their extent and severity increases with age. [8] The maintenance of periodontal health requires an informed patient and a treatment will not fail, and not even start if individuals are not aware of difference between disease and health. The main aim of this study is to assess the extent of agreement between self-reported and clinically diagnosed periodontal health conditions among patients visiting the outpatient department of Saveetha Dental College, Chennai, India. A total of 350 patients were subjected to a periodontal self assessment questionnaire, followed by a clinical examination to assess their periodontal status.

The results of the study revealed that male patients reported with an increased incidence of periodontitis, and the age group 30-40 years had increased incidence of periodontitis. This was in agreement to the study done by Sripriya et al[8], which again showed an increased incidence of periodontitis in male population. The individual self reported symptom was tabulated and assessed for sensitivity and specificity.

Sensitivity also referred to as the true positive rate, measures the proportion of positives that are correctly identified as such. Specificity on the other hand, is a true negative rate, which measures the proportions of negatives that are identified as such. Hence, is sensitivity is negative, a disease option can be ruled out and if specificity is positive, the disease can be ruled in. The positive predictive value depicts the true positive results and vice versa by the negative predictive value. It is important that sensitivity and specificity should be studied together as it a combined measure of adequate validity.

The self-assessment of gum health gave a high specificity value of 0.9, which implies its increased importance in depicting a clinical scenario. On the other hand, a reduced sensitivity emphasises the need that a non reported case of a decreased gum health cannot possibly rule out the disease. These results are contrary to the study performed by Pitiphat et al[3] and Vered et al[9] which shows a high sensitivity value than specificity. Regarding the reports on loose tooth, it was again derived that the symptom was more specific than sensitive, which is concordant with the study done by Pitiphat et al[3] and Gilbert et al[4]. This can be interpreted that a loose tooth can be an indicator of compromised periodontal health, but the very absence of the symptom cannot be attributed to the absence of a disease.

Chewing difficulty as a symptom had a specificity of 0.75 which was of moderate values. The symptom of bleeding gums on the other hand had a high sensitivity value of 0.71 and a lower specificity of 0.53 which classically orients to the previous literature sources which explains bleeding gums as an important marker of depicting an underlying pathology and the absence of which can rule out a disease. These results are in agreement with the study by Gilbert et al[4] and Buhlin et al[10] which showed self reported bleeding gums having good validity. And in the contrast, studies done by Tervonen and Knuttila[7] and Kallio et al[5] have showed gum bleeding as a poorly perceived symptom by the patient.

Sore gums, bad breath and abscessed teeth had high specificity values and can be used as moderate indicators of periodontal health. These values are less specific than values arrived by a study conducted by Vered et al[9] {specificity-0.83} Sensitive and pain in tooth had a specificity of 0.75 and 0.50 which again was found to be less than in the study by Vered et al[9]. These symptoms are poor indicators of periodontal health condition.

In our study, it can be seen that questionnaires do have an adequate level of significant value in explaining levels of dental awareness, perception and self assessment but there is always a discrepancy in this process of self assessment and the gold standard of clinical assessment. Bleeding gums, abscessed teeth and self rating of periodontal health can act as important self reported indicators, but they can never express the actual clinical scenario. Self assessment questionnaires can be used for large population studies and can act as a demarcation for assessing and identifying severe cases that need urgent attention because in such cases the extreme destruction would have set in and would have been reported by the patient, but on the

contrary it cannot be used to identify early cases if gingival diseases.

CONCLUSION

In conclusion, most of the self reported symptoms which are found to be more specific than sensitive hence can be used to 'rule out' periodontitis, and on the other the symptom on bleeding gums which has been found to have more sensitivity than specificity can be used to 'rule in' periodontitis. Science may have shown increased trends of development in various fields for diagnosis, but it always the conventional clinical assessment that acts as the gold standard for the final diagnosis. It can substantiate the clinical examination, but never can express the actual result. Hence it important to understand the need of spreading awareness to the general population regarding the maintenance of a good oral hygiene and periodontal health, as treatment will fail and in fact not even start if individuals are not aware of the difference between a normal periodontal health and a disease condition.

REFERENCES

1. HELÖE LA. Comparison of dental health data obtained from questionnaires, interviews and clinical examination. *European Journal of Oral Sciences*. 1972 Dec 1;80(6):495-9.
2. Todd JE, Lader D. *Adult Dental Health 1988: United Kingdom*. HM Stationery Office; 1991.
3. Joshipura KJ, Pitiphat W, Douglass CW. Validation of Self-reported Periodontal Measures Among Health Professionals. *Journal of public health dentistry*. 2002 Jun 1;62(2):115-21.
4. Gilbert A, Nuttall N. Self-reporting of periodontal health status. *British dental journal*. 1999 Mar 13;186(5).
5. Kailio P, Nordblad A, Croucher R, Ainamo J. Self-reported gingivitis and bleeding gums among adolescents in Helsinki. *Community dentistry and oral epidemiology*. 1994 Oct 1;22(SPT1):277-82.
6. Ramos RQ, Bastos JL, Peres MA. Diagnostic validity of self-reported oral health outcomes in population surveys: literature review. *Revista Brasileira de Epidemiologia*. 2013 Sep;16(3):716-28.
7. Tervonen T, Knuuttila M. Awareness of dental disorders and discrepancy between "objective" and "subjective" dental treatment needs. *Community dentistry and oral epidemiology*. 1988 Dec 1;16(6):345-8.
8. Nagarajan S, Pushpanjali K. Self-assessed and clinically diagnosed periodontal health status among patients visiting the outpatient department of a dental school in Bangalore, India. *Indian Journal of Dental Research*. 2008 Jul 1;19(3):243.
9. Vered Y, Sgan-Cohen HD. Self-perceived and clinically diagnosed dental and periodontal health status among young adults and their implications for epidemiological surveys. *BMC Oral Health*. 2003 Jul 13;3(1):1.
10. Buhlin K, Gustafsson A, Andersson K, Håkansson J, Klinge B. Validity and limitations of self-reported periodontal health. *Community dentistry and oral epidemiology*. 2002 Dec 1;30(6):431-7.