

Accuracy of Periodontal Screening and Recording as a Screening Tool for Assessing Periodontal Status and Estimation of Periodontal Treatment Needs and Its Comparison with Routine Periodontal Examination

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ABSTRACT

Aims: Conventional periodontal examination methods used for the determination of periodontal disease and assessment of disease severity, though precise and effective for diagnostic purposes, are time-consuming. The current study is aimed at checking the accuracy of periodontal screening and recording (PSR) as a diagnostic index in assessing periodontal diseases and to compare it with routine periodontal examination.

Materials and methods: Study population consisted of 100 subjects in which both PSR and routine periodontal examination and recording are carried out.

Results: It was observed that lesser time was required to record PSR index (mean: 2.20 minutes) when compared to routine periodontal examination (mean: 15.28 minutes). Also the probing depth and bleeding on probing had similar findings in all subjects examined (100%), whereas a 10 and 7% difference was seen with respect to presence of calculus and/or defective margins.

Conclusion: It can be concluded that PSR is accurate enough as a diagnostic index and can be used as a time saving screening tool for periodontal examination.

Keywords: Community periodontal index of treatment needs probe, Periodontal screening and recording, Periodontal screening tool.

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INTRODUCTION

Periodontal disease is a widespread condition ranging from simple gingival inflammation to severe periodontal breakdown. It is considered as one of the major causes

for tooth loss and also as a risk factor for certain systemic diseases, such as diabetes and coronary heart disease, while in pregnant women periodontitis appears to be a contributing factor in premature births.¹⁻³

In the presence of these problems, early detection and prevention of periodontal disease prove to be crucial. Though conventional periodontal evaluations provide a detailed picture of patients' conditions, they are time-consuming and require the assessment of several parameters.

Hence, instead of routine periodontal examinations, other diagnostic indices can be used that would provide very rapid estimates of the periodontal health of the patients, such as the periodontal screening and recording (PSR) index. The PSR index was the modification of the simplified periodontal examination (SPE) used in New Zealand. Later, in 1992, the American Academy of Periodontology (AAP) and the American Dental Association (ADA) adopted the PSR system with the sponsorship of the Procter & Gamble Company.⁴ Periodontal screening and recording is a quick, reliable, and reproducible method for identifying patients that may require a more complete evaluation of their periodontal health status.⁵

This early detection of diseases allows for appropriate treatment to be provided at the earliest. The speed and simplicity of examination was found to be advantageous over conventional periodontal examination, though it does not replace the need for a comprehensive periodontal examination. Also, it acts as a time-saving screening tool to indicate when a partial or full-mouth examination is required. In an earlier study by Khocht et al,⁶ it was reported that PSR scores had a greater correlation with probing depths (PDs) and clinical attachment levels than either bitewing or periapical radiographs.

Overall, there are only a limited number of studies done involving the use of PSR index. Hence, this study was designed to (1) Check the accuracy of PSR as a diagnostic index to assess periodontal status and estimation of periodontal treatment needs in a clinical setup/at a dental institute and (2) to compare its adequacy and findings with that of routine periodontal examination.

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MATERIALS AND METHODS

Hundred subjects (61 males and 39 females) were randomly selected from patients attending the Department of Periodontology, RajaRajeswari Dental College & Hospital, Bengaluru. All examinations were conducted under the same conditions, in a dental chair by a single examiner using necessary diagnostic instruments.

All subjects who were willing to undergo the periodontal screening examination were included in the study with no specific exclusion criteria.

Method of Examination

Routine periodontal examination and PSR index were recorded by a calibrated examiner (S.A.) in all subjects and time taken to record was noted with the help of a timer. The examinations were cross verified by another examiner (A.P.).

For PSR index, the patient mouth is divided into sextants and each tooth is examined at six sites using the ball end of the Community Periodontal Index of Treatment Needs (CPITN) probe (Fig. 1).

Six measurements for each tooth are obtained. The probe is inserted into the sulcus or base of the pocket and walked around the circumference of each tooth. The position of the color-coded band in relation to the gingival margin is observed and is checked for bleeding response, presence of calculus and/or defective margins, and pocket depth. The presence of furcation involvement, mobility, mucogingival problems, or recession should also be noted. After each tooth in the sextant has been examined, only the highest code obtained is recorded and only one score is recorded for each sextant. If a sextant is edentulous, an "X" is placed. Measurements are recorded in a special box chart.⁷

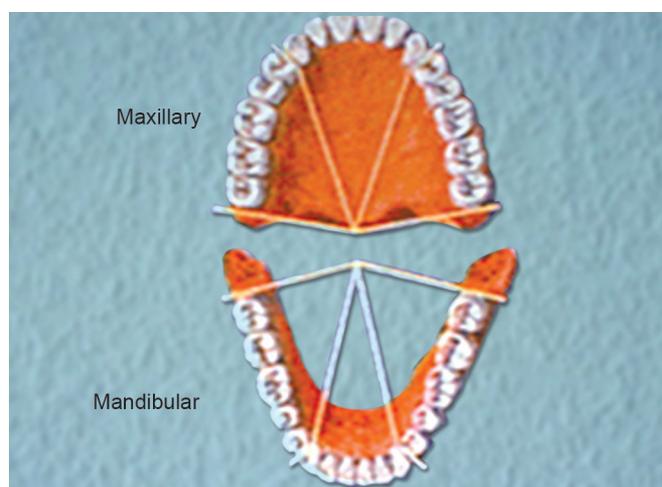


Fig. 1: Sextant-wise division of oral cavity for PSR examination (Adapted from Mitchell TV. Periodontal screening and recording: Early detection of periodontal diseases)

Table 1: Implication for PSR code

Code	Implications of PSR codes
	Further clinical documentation
Code 0, 1, or 2 in all sextants	No further documentation needed
Code 3 in one sextant	Comprehensive periodontal assessment of sextant with 3 code
Code 3 in two or more sextants	Comprehensive periodontal assessment of entire mouth
Code 4 in one or more sextants	Comprehensive periodontal assessment of entire mouth

Adapted from Nield-Gehrig JS. Fundamentals of Periodontal Instrumentation & Advanced Root Instrumentation. 5th ed. Baltimore (MD): Lippincott Williams & Wilkins; 2004

Criteria for Assessing PSR⁸ (Table 1)

Code 0: Color-coded reference mark is completely visible in the deepest sulcus or in the pocket of the sextant. No calculus or defective margins on restorations are present. Gingival tissues are healthy with no bleeding evident on gentle probing.

Code 1: Color-coded reference mark is completely visible in the deepest sulcus or in the pocket of the sextant. No calculus or defective margins on restorations are present. Bleeding is present on probing.

Code 2: Color-coded reference mark is completely visible in the deepest sulcus or in the pocket of the sextant. Supragingival or subgingival calculus and/or defective margins are detected.

Code 3: Color-coded reference mark is partially visible in the deepest sulcus or in the pocket of the sextant. This code indicates a probing depth between 3.5 and 5.5 mm.

Code 4: Color-coded reference mark is not visible in the deepest sulcus or in the pocket of the sextant. This code indicates a probing depth of greater than 5.5 mm.

Code *: The * symbol is added to the code of a sextant exhibiting any of the following abnormalities: Furcation involvement, mobility, mucogingival problems, or recession extending into the colored area of the probe.

In routine periodontal examination, the important clinical parameters like calculus and/or defective margins, bleeding on probing (BOP), clinical attachment level (CAL), and probing depth were recorded. Other abnormalities like recession, furcation involvement, mobility, along with hard tissue findings were also noted.

After examination, each patient was given an appropriate treatment in accordance with PSR findings. The time taken and data recorded in each method were compared and analyzed.

RESULTS

The sample population consists of 61 males and 39 females. Age group ranged from 18 to 62 years (26–45 years) (Table 2).

Table 2: Demographic data

Patient characteristic	Sample size (n) = 100
Male:Female	61:39
Age (years)	18–62

When the comparison between time taken to record PSR index and routine periodontal examination was done, it was observed that lesser time was required to record PSR index (mean: 2.20 minutes) when compared to routine periodontal examination (mean: 15.28 minutes) where the latter showed a more fluctuating curve (Graph 1).

A comparative analysis of the recorded clinical parameters like presence of calculus and/or defective margins, BOP, and other abnormalities including mucogingival problems, mobility, furcation involvement, and recession were done (Graph 2).

It was observed that PD and BOP had similar findings in all subjects examined (100%), whereas a 10 and 7% difference was seen with respect to presence of calculus and/or defective margins and presence of other abnormalities (recession) respectively (Graph 2).

DISCUSSION

This study was done to estimate the efficacy of PSR as a diagnostic tool for assessing the periodontal health status and to compare the results obtained by conventional periodontal evaluation as well as the time taken for examination. A single examiner performed all examinations so that inter-examiner bias can be eliminated.

When comparing the time taken to record findings in both the methods, longer time was required for routine evaluation (13.55–22.15 minutes) in contrast with the PSR index which gave quicker results (1.51–3.45 minutes).

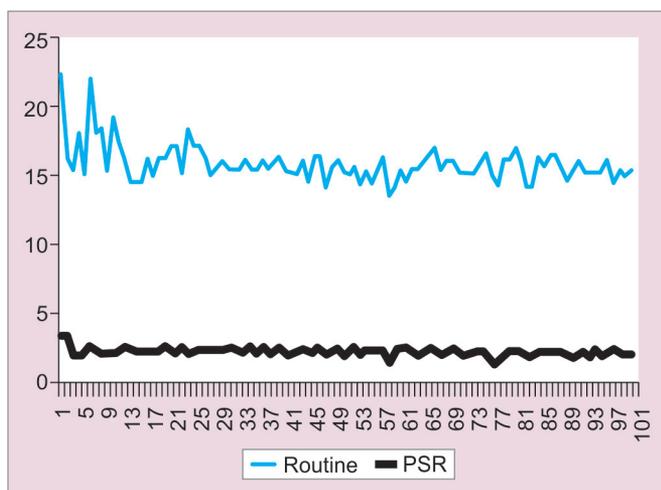
This can be explained with the more extensive time-consuming examinations and recording of information in conventional technique compared to the PSR index. In an earlier study by Piazzini,⁹ PSR was found to be effective in estimating disease and is on approximately, nine times faster than a conventional examination.

In the current study, clinical parameters including PD and BOP showed similar correlation in both methods. This was in accordance with another study done by Khocht et al¹⁰ who compared PSR outcomes with computed PSR scores generated from conventional examinations.

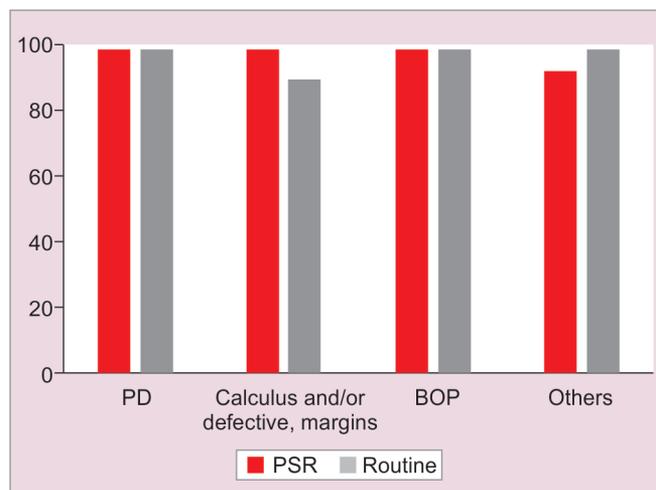
A 10% difference was noted with respect to the presence of calculus and/or defective margins between the two methods wherein some calculus scores were undetected in routine evaluation. In PSR all six sites of each tooth were examined whereas in routine evaluation, only index teeth were included in calculus detection, depending on the indices used that might explain the reason for the dissimilarity.

It was observed that PSR was not sensitive enough in recording parameters like mobility, furcation involvement, recession, and other mucogingival problems. A 7% difference was observed when compared between the two methods and was found that in seven subjects, recession was undetected in PSR index since only recessions extending beyond the color-coded area of the CPITN probe were included in PSR index. This was in accordance with the study done by Khocht et al,¹⁰ where it was reported that tooth mobility remained undetected using PSR, while only 25% of furcation involvement and 40% of gingival recessions were recorded.

As observed from the current study, PSR index results reflect periodontal status of an individual so that the need for a detailed periodontal evaluation can be eliminated unless required. Another advantage is the inclusion of calculus detection which is an important diagnostic factor



Graph 1: Comparative analysis between time taken in recording PSR index and routine periodontal examination



Graph 2: Comparative analysis of clinical parameters PD, calculus and/or defective margins, BOP, and other abnormalities

for treatment, whereas in the conventional method, it is recorded as a separate index, which is time-consuming. Periodontal screening and recording which proved to be a quick, simple, and cost-effective screening index was also found to be useful in the early detection of periodontal disease if any and in recording a patient's periodontal status for legal requirements.¹¹

Underestimation of the level of periodontal involvement was found to be a limitation of this index. In a study done by Landry and Jean,¹¹ it was observed that 19% of sextants graded Code 1 and 2 by PSR, and which do not require further examination prior to treatment, were shown to have more periodontal involvement when diagnosed by a conventional examination. They have suggested that the noninvolvement of epithelial attachment measure, which proves to be the gold standard for measuring periodontal disease progress in PSR index, might favor the reason for this underestimation.

CONCLUSION

The PSR system proves to be a valuable screening tool in the early detection of periodontal disease. This system can indicate when a more comprehensive periodontal examination should be performed.

CLINICAL SIGNIFICANCE

The simplicity with which the examination is performed and faster results make it easy to incorporate into every patient's appointment, suggesting it can be included as a screening tool for the examination of periodontal status

and estimation of periodontal treatment needs in a clinical setup/at a dental institute.

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