

Research Article

Validity of CPITN Index Applied by Undergraduate Dental Students

Dler A. Khursheed¹, Faraedon M. Zardawi¹, Shokhan A. Karim¹, Adham A. Abdulrahman², Sarhang S. Gul¹, Rishwan O. Salih³

Abstract

Objective: The goal of the community periodontal index of treatment needs (CPITN) is to determine the periodontal conditions and treatment needs in populations. It can also be used for preliminary diagnostic tool in the dental clinic. Therefore, the aim of this study was to evaluate the relation of patients' narration of oral hygiene measures on the plaque, bleeding and CPITN indices and validity of records performed by undergraduate students.

Methods: Data of 405 patients were retrieved in this study. It was composed of patient's narrations records of oral hygiene measures (type and frequency) plus plaque, bleeding and CPITN indices, and the number of cigarettes per day. Ramfjord's teeth were used for plaque and bleeding indices, while all teeth in the sextants examined in the CPITN index system. Chi-square test used to determine the relationship between oral hygiene maneuver and dental plaque, bleeding and CPITN sextant scores.

Results: Toothbrushing, type, and frequency showed significant relations with dental plaque scores. However, neither smoking nor other oral hygiene measures were shown to be related to bleeding scores. Smoking, toothbrushing techniques and mouthwashes had shown significant relations with mean CPITN index, whereas the other variables had shown non-significant relations with CPITN. Score 2 form the highest percentages, followed by score 3 and score 1, respectively.

Conclusions: The study did not show a positive association with the level of oral hygiene measures as narrated by the patients and their oral health status. Furthermore, the records of CPITN were consistent with many previous studies.

Keywords: CPITN, Gingivitis, Periodontitis.

Submitted: October 30, 2019, Accepted: November 24, 2019, Published: December 29, 2019.

Cite this article as: Khursheed DA, Zardawi FM, Karim SA, Abdulrahman AA, Gul SS, Salih RO. Validity of CPITN Index Applied by Undergraduate Dental Students. Sulaimani Dent J. 2019;6(2):69-75.

DOI: <https://doi.org/10.17656/sdj.10099>

1. Department of Periodontics, College of Dentistry, Sulaimani University, Sulaimani, Iraq.
2. Department of Preventive Dentistry, Orthodontics, and Pedodontics, College of Dentistry, Sulaimani University, Sulaimani, Iraq.
3. Shorsh Teaching Center, Sulaimani, Iraq.

* Corresponding Author: faraedon.mostafa@univsul.edu.iq

Published by College of Dentistry, University of Sulaimani

Introduction

The community periodontal index of treatment needs (CPITN) was initially intended to evaluate chronic inflammatory periodontal disease in epidemiological surveys⁽¹⁾. Many studies have adopted the CPITN system for assessment of subjects at different age groups, socioeconomic status, and geographic areas^(2,3). The CPITN index has also been implemented to plan and monitor the effectiveness of the periodontal care program and it was also applied as a very useful diagnostic tool in private dental practice^(4,5). Periodontal diseases are common conditions ranging from mild gingival inflammation to advanced periodontal destruction. Early detection and diagnosis are fundamental steps in the prevention and treatment of this oral condition⁽⁶⁾.

Gingivitis and periodontitis are both microbial infectious disease that influences people's oral health, and if they left without treatment condition may end up with tooth loss⁽⁷⁾. Thus, early detection and prevention of periodontal diseases are very important to maintain oral health. Although conventional periodontal evaluations to provide a detailed image of any patients' conditions, they are time-consuming and require the assessment of several parameters. The CPITN is a quick examination method that provides a brief record of patients' periodontal condition.

Daily plaque control provides the opportunity to maintain the entire dentition in a healthy condition and function throughout the lifetime, reduces the risk of periodontal disease, keeps the esthetic appearance and maintains fresh breath of the mouth; furthermore, daily plaque control procedure saves the patient the high cost required for professional therapy. This is usually achieved by comprehensive home care methods and using tools such as manual or powered toothbrushing combined with interdental cleaning⁽⁸⁾. Nevertheless, CPITN is hierarchical assessment procedure, the higher score will pass over the lower score, but the proposed treatment in all codes starts with oral hygiene motivation and instruction, thus demonstrating the advantages and the effectiveness of daily oral care on the periodontal status and CPITN scores.

The aim of this study was to determine the effect of homecare dental cleaning on dental plaque, gingival bleeding, and the validity of CPITN index scores among patients examined by dental students at Periodontics Department Clinics at College of Dentistry, University of Sulaimani.

Patients and methods

This cross-sectional study was conducted between September 2017 and June 2018 on patients who attended Periodontal Clinics of the College of Dentistry, the University of Sulaimani at the City of Sulaimani. The study composed of two parts; the questionnaire, which was based on the patient's general information such as age, gender, sociodemographic level, and geographical location. It also included information related to the patient's general health and the presence of any systemic condition. Furthermore, the questionnaire form included questions about the patient's oral and periodontal status, methods of oral hygiene measures. Patients interviewed by dental students and questioned about the presence or absence of smoking habit and daily oral care such as toothbrush (hardness degree, duration and frequency of tooth brushing per day). Students also asked questions regarding the use of interdental cleaning aids and hygiene tools such as dental floss, interdental brushes, stimulent and using mouthwashes after daily mechanical plaque control methods (Table 1). Moreover, the questionnaire form included questions about any uncommon methods such as oral hygiene measures or materials used for cleaning teeth according to some patient's believe such as brushing with salt or powder of charcoal.

The second part of this study was the clinical examination that was also performed by the students under the supervision of seniors with higher qualifications and a high academic degree in periodontology at the department of periodontics. Periodontal examination for plaque detection and recording bleeding on probing was performed on Ramfjord's teeth⁽⁹⁾. Means of the dental plaque and bleeding of 24 tooth surfaces were recorded for each patient. In case of having a missing Ramfjord's tooth, the adjacent tooth was examined. The CPITN was conducted for the six sextants of the patient's entire dentition using the WHO periodontal probe (Table 2). Each patient was examined for bleeding, dental calculus and over-hanged restorations.

Furthermore, pocket depths were measured using the WHO probe by passing the probe through gingival sulci with light force and walking movement around the tooth through mesial, distal, facial and lingual surfaces of all teeth present in all sextants. Third molars are not included and not recorded unless first or second molars were extracted. Sextant with less than two teeth with the exception for the third molars was regarded as a missing sextant. At least two functional teeth should be recorded for each sextant. In case when there was a single

functional tooth in a sextant, the sextant was neglected and the tooth was added and recorded with the adjacent sextant.

CPITN index was applied and in this study as being a part of undergraduates teaching system at the Department of Periodontics: according to CPITN, Code 0: indicates no any clinical sign of inflammation such as bleeding or redness, with absence of calculus and overhanged restoration, and the black band of the WHO probe is totally visible. Whereas, code 1, indicates the presence of bleeding or clinical sign of inflammation in the sextant with no calculus and defected restoration, and the black band is still totally visible. Code 2, used to indicate the presence of supra or subgingival calculus and the black band of the probe is still completely visible. Furthermore, Codes 3, was considered while the black band was partially invisible and code 4, when the black band was completely invisible⁽¹⁰⁾. Fagerstrom Test for Nicotine Dependence (FTND) index⁽¹¹⁾ was used.

The proposal of this study was submitted to the ethical and scientific committee of the College of Dentistry, University of Sulaimani, and ethical approval was obtained accordingly for conducting the present study.

Statistical analysis

The results of the current study were presented and analyzed using descriptive statistical analysis (mean, percentage, table, and histogram). Furthermore, an inferential statistical method was applied using the Chi-square test to determine the statistical relation between oral hygiene maneuver and dental plaque, bleeding and CPITN sextant scores. Statistical significance was defined as $p\text{-value} \leq 0.05$ and calculations were conducted using the SPSS software package (version 21; SPSS Inc., Chicago. II, USA)

Results

Four hundred and five patients involved in this study. The mean age was 26.63 ± 11.2 years old. Male to female ratio was 39.3% and 60.7%, respectively, and the mean patient's plaque index was 0.64 and the mean bleeding index recorded 0.4 as shown in Table 1.

Regarding smoking, 86.7% were nonsmoker, and according to FTND) index: 5.9%, 5.7 and 1.7 were light, moderate and heavy smokers, respectively. The relation of smoking to the sum of the CPITN index was significantly higher $p\text{-value} \leq 0.05$. However, the study showed a non-significant relation between CPITN and both plaque and bleeding index ($p > 0.05$), as shown in Table 2.

Table 1: Questionnaire regarding sociodemographic, smoking and oral hygiene controls.

Variables		Percentage
Sex	Male	39.3
	Female	60.7
Address	1	1.7
	2	73.8
	3	24.4
Smoking Status	No smoking	86.7
	Light smokers	5.9
	Moderate smokers	5.7
	Heavy smokers	1.7
Tooth Brush type	Not brushing	7.9
	Soft toothbrush	48.4
	Medium toothbrush	32.8
	Hard toothbrush	9.4
	Not know	1.2
Toothbrush technique	Not brushing	4
	Horizontal	18.3
	Vertical	36.8
	H and V	36.8
	Rotary	3.5
	Unknown	0.2
Tooth brushing frequency	Not brushing	4
	1time	50.9
	Two times	33.3
	Three times	3.7
	Four and more	7.2
Tooth brushing duration	Unknown	5
	0	13.8
	1	25.4
	2	36
	3	22.5
	4	1.2
Flossing	5	2
	0	74.3
	1	25.2
Toothpicks	2	0.2
	0	91.6
	1	8.1
Mouth wash	2	0.2
	0	89.4
	1	10.6

Table 2: The relation between smoking and OH maneuvers with plaque, bleeding, and CPITN index. UPRP: Upper right posterior sextant, UPA: Upper anterior sextant, UPLP: Upper left posterior sextant, LORP: Lower right posterior sextant, LOA, Lower anterior sextant, LOLP: Lower posterior sextant, PI: Plaque index and BI, Bleeding index.

Variables	Screen mean	Screen UPRP	Screen UPA	Screen UPLP	Screen LORP	Screen LOA	Screen LOLP	PI	BI
Smoking	0.0001**	0.01*	0.28	0.002*	0.022*	0.0001*	0.4	0.26	0.81
Tooth brush type	0.51	0.77	0.67	0.49	0.52	0.48	0.96	0.001*	0.4
TB technique	0.0001**	0.004**	0.2	0.03*	0.05*	0.0001**	0.7	0.3	0.25
TB frequency	0.64	0.67	0.44	0.42	0.55	0.11	0.58	0.0001**	0.13
TB duration	0.61	0.7	0.42	0.96	0.98	0.29	0.91	0.6	0.55
Flossing	0.81	0.45	0.99	0.94	0.79	0.98	0.79	0.51	0.5
Tooth picks	0.99	0.63	0.8	0.24	0.47	0.93	0.95	0.43	0.58
Mouth wash	0.0001**	0.059	0.33	0.0001**	0.07	0.4	0.89	0.24	0.144

*: significant, **: highly significant

The patients were questioned about the type of toothbrush they use, about 8% of the patients did not use the toothbrush. Whereas 48.4% of the patient examined by our students were using a soft toothbrush, and 32.8 of the patients were using the medium type of toothbrush and 9.4% were using hard type toothbrushes; only 1.2% did not know which type they are using. Type of toothbrushes showed significantly higher relation to plaque index (p -value < 0.05); however, the type of toothbrush showed non-significant relation with bleeding index and CPITN scores in all sextants on the other hand. The patients were questioned about tooth brushing technique, and it was as follows; 36.8% of the patients were using vertical and similarly, 36.8% of the sample were using combined vertical and horizontal technique of tooth brushing, followed by 18.3% and few other unknown methods. Tooth brushing techniques showed a highly significant relation with periodontal screening and recording PSR mean and specifically with upper right posterior, upper left posterior and lower anterior sextants. About half of the patients 50.9% brushed once a day, 33.3% brushed two times a day and, those brushing three times and more are constituted more than 10%. Tooth brushing frequency showed a significant relation with the plaque index. Tooth brushing durations were 36% for two minutes among the study sample was 25.4%, for 1 minute and 22.5% for 3 minutes. Tooth brushing durations showed non-significant statistical relation with neither PSR sextants nor the plaque and bleeding scores. The only small percentage among the total sample is applying flossing as part of oral hygiene measures and more than half the sample are not using dental floss at all. Furthermore, about 90% of the patients apply neither toothpicks nor mouth wash as part of their daily oral hygiene methods. However, daily mouthwash performance recorded a significant relation with PSR scores.

Regarding CPITN codes of individual sextants, codes 4 and code 0 recorded the least percentage in all sextants; 3.5% and 1.2% respectively (Table 3). On the other hand, codes 1 and 2 recorded the highest scores among all individual sextants, 52.8% and 30.6% respectively. Code 3 which refers to 3.5-5.5 mm probing depth, constituted approximately 11% of the total scores of CPITN. For CPITN index scores, the study showed 0.49% of the individuals were healthy, 10.6% had gingivitis, 18.7% had mild to moderate periodontitis and 4.19% has advanced periodontitis. While the highest score 65.9% was recorded for calculus deposits (Figure 1).

Discussion

Smoking is usually associated with lower gingival bleeding but greater plaque deposition and periodontal destruction^(12,13). This study did not show a significant relationship between smoking and neither plaque nor bleeding scores. The current study showed a significant relationship between smoking and mean CPITN codes and with the lower anterior sextant, which was dominated by high calculus deposition. This indicates that smoking is closely related to the severity of supra- and subgingival calculus depositions^(14,15).

The toothbrush is a common oral hygiene tool used to control dental plaque, which is the major cause of periodontal diseases and dental caries⁽¹⁶⁻¹⁸⁾. The effect of toothbrush design and hardness on plaque control is still researchers' and patients' dilemma, and "there is no best toothbrush" for all individuals^(19,20). Every individual special consideration should be applied when choosing the type of toothbrush and technique such as a patient's mentality, dexterity, teeth alignment, salivary and other oral factors.

The current study showed a significant relation between toothbrush types and plaque control but non-significant relation with bleeding scores. The result is consistent with a systematic review conducted by Van Der Weijden and Hioe (2005)⁽²¹⁾. They also concluded that the quality of mechanical plaque control is not satisfactory and should be improved. Tooth brushing techniques and duration did not show any significant relation neither with plaque nor bleeding index while the frequency of tooth brushing showed a highly significant relation with dental plaque and non-significant relation to gingival bleeding. This could be attributed to improper brushing technique and time applied by the patient to perform a daily plaque control program, while frequency increases the exposure of teeth to more plaque control.

A systematic review concluded that tooth brushing once a day is sufficient to maintain oral health, but most patients do not devote sufficient time for tooth brushing. Therefore, Thus it is recommended to conduct tooth brushing more than once a day to compensate for the tooth brushing duration⁽²²⁾. Among tooth brushing techniques, only the tooth brushing technique showed a significant relation with the CPITN index means. It has to justify that all tooth brushing factors narrated by the patients did not reflect the fact that they manipulated it properly. Therefore, self-report does not a perfect tool without clinical examination⁽²³⁾.

Furthermore, flossing showed no significant relations with dental plaque and gingival bleeding. Although 80% of dental plaque can be removed by flossing teeth⁽²⁴⁾, a meta-analysis has shown that flossing did not have significant effects on dental plaque and bleeding scores. This is most likely the consequence of the plaque not being removed as proficiently as can be⁽²⁵⁾.

The CPITN was widely used as it contains preliminary diagnosis and recognition of periodontal treatment needs for the patients⁽¹⁾. This method of periodontal disease determination and condition evaluation is applied regularly by undergraduate students for every patient attends department of periodontics in the College of Dentistry, University of Sulaimani. CPITN is applied as a patient screening method when codes 3 and 4 were found in one or more sextants, which determine the treatment required for the patient⁽²⁶⁾. The CPITN has been applied to estimate the prevalence and severity of periodontitis by many researchers⁽²⁷⁻²⁹⁾, and applied in longitudinal evaluations for periodontitis patients⁽³⁰⁾. Some of these studies not accurately determined the prevalence and severity of periodontitis; however, other

studies considered CPITN a useful tool to monitor periodontitis patients.

The routine periodontal examination requires more time, skills and costs in addition to keeping patients on the dental chair for a long time. This complicated procedure may not always be appreciated by the patients. Choosing the CPITN index for dental students is mainly due to the simplicity of the index measurement and gives the students and patients a general idea of the periodontal conditions of the patients. In cases of scores 3 and 4, complete periodontal examination for the sextants and entire dentition are recommended respectively. In this study, we took the effect of oral hygiene measurements on dental plaque, bleeding and CPITN indices among patients who attended Periodontal Department that recorded by undergraduate dental students.

Results of twenty-eight studies using the CPITN index in 24 countries, the most frequent scores were scored two and score 3 (calculus and shallow pockets respectively)⁽³¹⁾. The current study showed similar results. Regarding the comparison between sextant scores and individual CPITN scores, the study showed approximate results with some other studies^(27,29,32). The percentage of healthy periodontal patients was two, and deep pockets recorded the least percentages after. The previous studies showed the vast majority of populations suffer from gingivitis not periodontitis.

Similarly, the current study showed the highest scores one and two (gingival bleeding and calculus, respectively) among the population. It is also very obvious that the healthy sextants percentages are higher than healthy periodontal patients. This indicates that the risks for periodontal diseases are area specific in periodontally diseased patients.

Only smoking and mouthwash showed a significant relation with mean CPITN. These two variables constituted the lesser percentage of the study population. The entire dental hygiene maneuver showed no significant relation with mean CPITN. The majority of the population used soft and medium type toothbrushes, respectively with vertical and horizontal and vertical tooth brushing techniques. In addition to these, the majority also took more than two minutes duration on tooth brushing. Although these measurements narrated by the patients that they use these dental hygiene tools properly, yet all showed non-significant relation to mean CPITN.

Yet this cross-sectional study conducted by 88 dental students, the measurements are variable to some extent and seem very difficult for the students to reproduce the measurements accurately as they did not have sufficient experience with this index system. It is worthy of mentioning that each of these records was checked and fixed by student's supervisors. The patients' narrations regarding oral hygiene controls and the results are found to be very controversial. Furthermore, few other factors must be considered while interviewing the patients and discussing oral hygiene performance, such as patients' compliances to the techniques, tools used for plaque controls and patient's regular periodic visits to the dentist for professional care. The current study involved patients from the different educational and socioeconomic status of different age groups. Therefore, it might be difficult to find and record the direct impact of oral hygiene methods and tools on the patients' oral hygiene status. Case-control studies may help to show properly the direct effects of the oral health hygiene maneuver and periodontal health conditions. Nevertheless, the students have yielded approximately close records of the CPITN index of previous studies⁽³²⁾.

Conclusions

Within the limitation of this study and according to the results, it is noticed that the study was not able to show a positive effect of the level of oral hygiene measures described and recorded by the participants and their oral health status. Furthermore, the results of CPITN were consistent with most previous studies. It was concluded that the severity of CPITN scores are higher in patients than in sextants; this indicates that risks of periodontal diseases differ from one individual to another. The CPITN index result of this study was approximately similar to the previous conducted studies.

References

1. Ainamo J. Development of the World Health Organization (WHO) community periodontal index of treatment needs (CPITN). *Int Dent J.* 1982;32(3): 281-291.
2. Ainamo J, Ainamo A. Partial indices as indicators of the severity and prevalence of periodontal disease. *Int Dent J.* 1985;35(4):322-326.
3. Cutress TW. Periodontal health and periodontal disease in young people: global epidemiology. *Int Dent J.* 1986;36(3):146-52.
4. Croxson LJ. A simplified periodontal screening examination: The Community Periodontal Index of Treatment Needs (WHO) in general practice. *Int Dent J.* 1984;34(1):28-34.
5. Miyazaki H, Yamashita Y, Shirahama R, Goto-Kimura K, Shimada N, Sogame A, Takehara T. Periodontal condition of pregnant women assessed by CPITN. *J Clin Periodontol.* 1991;18(10):751-754.
6. Landry RG, Jean M. Periodontal Screening and Recording (PSR) Index: precursors, utility and limitations in a clinical setting. *Int Dent J.* 2002;52(1):35-40.
7. Karlsson E, Lymer UB, Hakeberg M. Periodontitis from the patient's perspective, a qualitative study. *Int J Dent Hyg.* 2009;7(1):23-30.
8. Claydon NC. Current concepts in toothbrushing and interdental cleaning. *Periodontol* 2000. 2008;48(1):10-22.
9. Ramfjord SP. Indices for prevalence and incidence of periodontal disease. *J Periodontol.* 1959;30(1):51-9.
10. World Health Organization. Oral health surveys: basic methods. World Health Organization; 2013.
11. Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom Ko. The Fagerström test for nicotine dependence: a revision of the Fagerstrom Tolerance Questionnaire. *Br J Addict.* 1991;86(9):1119-27.
12. Sreedevi M, Ramesh A, Dwarakanath C. Periodontal status in smokers and nonsmokers: a clinical, microbiological, and histopathological study. *Int J Dent.* 2012;2012:571590.
13. Luzzi LI, Greggi SL, Passanezi E, Sant'Ana AC, Lauris JR, Cestari TM. Evaluation of clinical periodontal conditions in smokers and non-smokers. *J Appl Oral Sci.* 2007;15(6):512-7.
14. Bergström J. Tobacco smoking and supragingival dental calculus. *J Clin Periodontol.* 1999;26(8):541-7.
15. Bergström J. Tobacco smoking and subgingival dental calculus. *J Clin Periodontol.* 2005;32(1):81-8.
16. Turgut MD, Keceli TI, Tezel B, Cehreli ZC, Dolgun A, Tekcecek M. Number, length and end-rounding quality of bristles in manual child and adult toothbrushes. *Int J Paediatr Dent.* 2011;21(1):232-9.

17. Kyoizumi H, Yamada J, Suzuki T, Kanehira M, Finger WJ, Sasaki K. Effects of toothbrush hardness on in-vitro wear and roughness of composite resins. *J Contemp Dent Pract.* 2013;14(6):1137-44.
18. Axelsson P, Nyström B, Lindhe J. The long-term effect of a plaque control program on tooth caries and periodontal disease in adults: results after 30 years of maintenance. *J Clin Periodontol.* 2004;31(9):749-57.
19. Wolf HF, Hassell TM. *Color atlas of dental hygiene.* Thieme; 2006.
20. Sasan D, Thomas B, Bhat MK, Aithal KS, Ramesh PR. Toothbrush selection: A dilemma. *Indian J Dent Res.* 2006;17(4):167-70.
21. Van der Weijden GA, Hioe KP. A systematic review of the effectiveness of self-performed mechanical plaque removal in adults with gingivitis using a manual toothbrush. *J Clin Periodontol.* 2005;32(Suppl 6):214-28.
22. Attin T, Hornecker E. Tooth brushing and oral health: how frequently and when should tooth brushing be performed? *Oral Health Prev Dent* 2005;3(3):135-40.
23. Kawamura M, Sasahara H, Kawabata K3, Iwamoto Y, Konishi K, Wright FA. Relationship between CPITN and oral health behavior in Japanese adults. *Aust Dent J.* 1993;38(5):381-8.
24. American Dental Association. Council on Dental Therapeutics. Accepted dental therapeutics. Council on Dental Therapeutics of the American Dental Association; 1984.
25. Berchier CE, Slot DE, Haps S, Van der Weijden GA. The efficacy of dental floss in addition to a toothbrush on plaque and parameters of gingival inflammation: a systematic review. *Int J Dent Hyg.* 2008;6(4):265-79.
26. Allen G. Producing guidance for the management of patients with chronic periodontal disease in general dental practice. *Brit Dent J.* 2015;218(8):461-6.
27. Baelum V, Manji E, Wanzala P, Eeferskov O. Relationship between CPITN and periodontal attachment loss findings in an adult population. *J Clin Periodontol.* 1995;22(2):146-52.
28. Bassani DG, Silva CMD, Oppermann RV. Validity of the Community Periodontal Index of Treatment Needs'(CPITN) for population periodontitis screening. *Cad Saude Publica.* 2006;22(2):277-83.
29. Lewis JM, Morgan MV, Clive Wright FA. The validity of the CPITN scoring and presentation method for measuring periodontal conditions. *J Clin Periodontol* 1994;21(1):1-6.
30. Persson R, Svendsen J, Daubert K. A longitudinal evaluation of periodontal therapy using the CPITN index. *J Clin Periodontol.* 1989;16(9):569-74.
31. Pilot T, Barmes DE, Leclercq MH, McCombie BJ, Infirri JS. Periodontal conditions in adults, 35–44 years of age: an overview of CPITN data in the WHO Global Oral Data Bank. *Commun Dent Oral Epidemiol.* 1986;14(6):310-2.
32. Miyazaki H, Hanada N, Andoh MI, Yamashita Y, Saito T, Sogame A, Goto K, Shirahama R, Takehara T. Periodontal disease prevalence in different age groups in Japan as assessed according to the CPITN. *Community Dent Oral Epidemiol.* 1989;17(2):71-4.