

# International Journal of Dental Science and Innovative Research (IJDSIR)

### IJDSIR : Dental Publication Service Available Online at: www.ijdsir.com

Volume – 3, Issue – 2, April - 2020, Page No. : 101 - 111

# Impact of Periodontal Health on the Quality of Life among HIV Patients - An Exploration

<sup>1</sup>Dr Jyoti I Pattanshetti, M.D.S., Periodontics, Professor, P.M.N.M. Dental College and Hospital, Bagalkot

<sup>2</sup>Dr Shivaraj B Warad , M.D.S., Periodontics, Professor, P.M.N.M. Dental College and Hospital, Bagalkot

<sup>3</sup>Dr Vani C Hunasikatti, Post graduate student, Periodontics, P.M.N.M. Dental College and Hospital, Bagalkot

<sup>4</sup>Dr Nagaraj B Kalburgi, M.D.S., Periodontics, Professor, Head of Department, P.M.N.M. Dental College and Hospital, Bagalkot

<sup>5</sup>Dr Arati C Koregol, M.D.S., Periodontics, Professor, P.M.N.M. Dental College and Hospital, Bagalkot

<sup>6</sup>Dr. Pushpa C Pattanshetti, Post graduate student, Periodontics, P.M.N.M. Dental College and Hospital, Bagalkot

Dr Nandini Shirigeri, Post graduate student, Periodontics, P.M.N.M. Dental College and Hospital, Bagalkot

**Corresponding author:** Dr Vani C Hunasikatti, Post graduate student, Periodontics, P.M.N.M. Dental College and Hospital, Bagalkot

**Citation of this Article:** Dr Jyoti I Pattanshetti, Dr Shivaraj B Warad, Dr Vani C Hunasikatti, Dr Nagaraj B Kalburgi, Dr Arati C Koregol, Dr. Pushpa C Pattanshetti, Dr Nandini Shirigeri, "Impact of Periodontal Health on the Quality of Life among HIV Patients - An Exploration", IJDSIR- April - 2020, Vol. – 3, Issue -2, P. No. 101 – 111.

**Copyright:** © 2020, Dr Vani C Hunasikatti, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Rearch Article

**Conflicts of Interest:** Nil

# Abstract

**Introduction:** Oral health problems, rarely a matter of life and death, may give rise to physical, functional and emotional discomfort which in turn affect the overall quality of life (QOL).There is devastating impact of HIV on individual patient, family, community and its concomitant oral manifestations especially in the form of periodontal disease. The current study is done to assess periodontal health and its impact on QOL among HIV patients.

**Objective**: To assess the impact of periodontal health on the quality of life among HIV patients.

**Methodology**: It is a cross sectional questionnaire study using Oral Health Impact Profile (OHIP-14) on 131 HIV patients in anti retroviral therapy (ART) centre, Bagalkot. Clinical parameters like gingival index (GI), pocket probing depth (PPD) and clinical attachment loss (CAL) were recorded.

**Results**: GI, PPD and CAL scores showed positive correlation with oral health impact score. Impact of oral health on quality of life was high with at least 10 of the 14 questionnaires showing a statistical significance.

**Conclusion:** This study demonstrates a significant impact of periodontal health on quality of life among HIV patients.

**Keywords:** impact, oral health, periodontal disease, quality of life

#### Introduction

For decades, the importance of and need for periodontal care has largely been attributed to the high prevalence of periodontal disease in most societies. However, despite the dramatic improvements in other oral health states in recent decades such as dental caries, periodontal disease has remained prevalent and with little signs of improvement in the severity of the disease.[1] In recent times, the importance of periodontal care has also focused on associations between periodontal health and general health, such as cardiovascular disease, respiratory diseases and diabetes.[2,3,4] Greater understanding of the consequences of periodontal disease and the effects of therapy is important on many fronts: in understanding and embracing patient perceptions of the impact of their oral health on their lives, in planning periodontal care which addresses patient needs and key concerns, in evaluating outcomes from periodontal treatment from the patient's perspective and in drawing attention to the importance of periodontal care in society.[5] The impact of periodontal disease on an individual is usually characterized by clinical parameters such as probing depth and attachment level. However, periodontal disease, produces a wide range of clinical signs and symptoms, through inflammation and destruction of the periodontium, some of which may have a considerable impact on day to day life or life quality. [6] Quality of life is conceived as an eminently human notion that is a reflection of the degree of satisfaction found in one's family and social life.[7] Oral health has a direct influence on the quality of life.[8] Oral health related quality of life (OHRQL) was introduced in 1998 as a framework for examining the complex inter relationship between health and disease and its psychologic, and social consequences.[9] Individual perception of oral health has been identified as a further reason for prevention and seeking treatment. The identification of

© 2020 IJDSIR, All Rights Reserved

this perception may provide an opportunity for promoting more successful and appropriate actions to be employed as an important complement to normative criteria.[10,11] Acquired immunodeficiency syndrome (AIDS) has been one of the most destructive diseases since it's recognition in 1980s, that it not only robs a country of its economic and human resources in covering for the costs of HIV prevention and treatment, when young productive lives are affected. The impact of HIV/AIDS on individual patient, family, and community is distressing. [12] Studies have established that 40-50% of HIV positive individuals have fungal, bacterial or viral infections in the oral cavity causing pain that results in ineffective or infrequent tooth brushing. These oral lesions have physical, economic, social, and psychological consequences on the individuals and subsequently impair oral health related quality of life (OHRQoL). [13] Immunosuppression may allow the development of oral and periodontal lesions in patients with HIV infection.[14] Periodontal lesions associated with HIV infection include linear erythema (LGE) and necrotizing periodontal diseases, which are subclassified as necrotizing ulcerative gingivitis (NUG), necrotizing ulcerative periodontitis (NUP), and necrotizing ulcerative stomatitis (NUS/NS). NUP and NUS/NS may represent different stages of the same pathologic process, with NUP being a more advanced stage of NUG. [15,16]

population HIV As the with ages. due to immunosuppression patients may develop chronic conditions that can contribute to an exacerbated progression of chronic adult periodontitis.[17] HIVassociated periodontal diseases, along with oral infections, are considered serious complications of HIV infection. The interaction between bacteria and *Candida* may play a key role in the etiology of periodontal lesions; therefore, management of HIV-associated periodontal lesions involves treating fungi.Basic both bacteria and

.....

periodontal therapy like removal of local irritants from the root surfaces, mechanical debridement of necrotic tissues at regular periodic intervals can effectively reduce periodontal inflammation in HIV patients and appropriate use of local and systemic antibiotics remain important components in the management of HIV-associated gingival and periodontal diseases. [18.19]

Multiple factors affect response to treatment, including immune status and personal oral hygiene practices of keeping the mouth, gums, and teeth clean [20] The identification of periodontal diseases has significantly in patients receiving antiretroviral therapy reduced (ART), due to the introduction of ART .The occurrence of oral and periodontal infections despite ART may indicate the failure of ART or the development of viral resistance.[21] Finding low-cost and easily accessible and acceptable diagnostic and treatment approaches for both the microbiological and the inflammatory aspects of periodontal diseases in these populations are of particular importance, as the systemic spread of the local microbiota and inflammatory products of periodontal diseases may have adverse effects on both the progression of HIV infection and the effectiveness of antiretroviral therapy approaches. [16]

OHRQoL is derived from three related and equally valuable approaches: the oral cavity as the outcome; the impacts of the oral cavity on the rest of the body; and the effects of systemic health on OHRQoL. The psychological consequences of oral disease such as pain and/or discomfort have probably been recognised longer than the social consequences. Problems with teeth and gums affect quality of life in many ways, and can affect general well being both directly and indirectly. [22]

It is rather surprising to find that there is limited information documenting the "impact of periodontal health on the quality of life among HIV patients". The

© 2020 IJDSIR, All Rights Reserved

objective of this study was to assess the OHRQoL among HIV patients at the antiretroviral therapy (ART) center of government hospital, Bagalkot using the subjective Oral Health Impact Profile (OHIP) 14 and to evaluate this impact with regard to socioeconomic variables like sex, age and level of education.

### **Method and Materials**

The present cross-sectional questionnaire study was conducted to determine the impact of periodontal disease on the QoL among HIV patients. The sample size was calculated considering a 50% prevalence of impact on quality of life, a figure adopted to maximize the sample, as no studies were found on the impact caused by periodontal disease. The level of significance was set at 5%, the confidence interval at 95%. Ethical clearance to conduct the study was obtained from the Institutional Ethics Committee of PMNMDC, Bagalkot.

A total of 150 patients who attended out patient department of ART ( anti retroviral therapy) center of government district hospital, Bagalkot were asked to participate, out of which 131 agreed to participate and met the criteria for AIDS case definition.[23]All participants had already undergone counseling before testing for HIV infection. Participation was voluntary and all subjects signed informed consent prior to dental examination. Data was recorded anonymously, and strict confidentiality was ensured at all stages of the research. The subjects were requested to complete self-administered questionnaire, the short-form version of the Oral Health Impact Profile (OHIP-14) [24] The first part of the questionnaire filled in by the patients was composed of items regarding demographic data (age, sex, living area, education), behavioral data (smoking, alcohol consumption, drug consumption), data on oral hygiene habits (number of daily dental brushings) and data on the main oral symptoms experiences in the last month. The second part

 $_{age}10$ 

of the questionnaire was made of the 14 items pertaining to the OHIP-14 questionnaire which was used to test the impact of periodontal disease on quality of life [24]

This self-completed questionnaire consisted of 14 items subdivided into seven subscales: functional limitation, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability and handicap.

• Functional limitation: The restriction of function usually expected of the body or its organs or constituent systems, such as limitation in the movement of the mandible.

• Discomfort (physical pain and psychologic discomfort): Biomedical measurements for subjective assessment of well-being. This is the reaction to disease, such as selfreported pain and discomfort or other physical and psychologic symptoms.

• Impairment: Loss or abnormality of structure or psychologic, physical, or anatomical function present at birth or arising from a disease or injury, such as edentulism, periodontal disease, and malocclusion.

• Disability: Any limitation or lack of ability (resulting from some impairment) to perform

a task in a normal manner or within a range regarded as normal for a human being.

• Deficiency: Includes broader social effects and is defined as the disadvantage ascribed to weakened or incapable individuals who have been unable to adjust to the expectations of society or the social groups to which they belong.

All these subscales contained two questions each which define the OHR-QoL. [6]Responses to the questions were made on a Likert scale indicating if the problem had been experienced - "very often" (code=4), "fairly often" (code=3), "sometimes" (code =2), 'hardly ever" (code=1) or "never/don't know" (code=0). The minimum score is 0; by multiplying the maximum value that each impact can cause by the number of questions, a maximum score of 56 points is obtained. The scores were also grouped: Patients with scores of 0 to 2 comprised the group with the lowest impact scores (when their answer for questions not shown scored lower than 2), and those with scores of 3 and 4 comprised the group with the highest impact scores (when answers were scored 3 or 4). Higher total OHIP-14 scores denote greater oral health problems perceived by the patient and the repercussions of these problems on quality of life. [11]

Clinical examination: Each patient then underwent a comprehensive periodontal examination by a trained examiner using mouth mirrors and periodontal probes and a portable light source, in a private consulting room. With the patient sitting on chair with their head tilted slightly. The examination included the clinical parameters like Gingival index (GI) by Loe and Silness, probing pocket depth (PPD) of  $\geq 5$  mm along with attachment loss  $\geq 3$ mm at more than 30% of all sites in the mouth. [25] were recorded to assess the periodontal status. Infection control was achieved by making sure that only one mouth mirror per patient was used, along with disposable gloves and a facemask. After the examinations, those patients with periodontal diseases were referred to the dental clinic of the hospital for usual treatment. The patients examined had already known their HIV status and had been counseled before testing for HIV infection.

### **Inclusion criteria**

- Patients diagnosed with HIV
- CD4 cell count should be <500 cells/mm3</p>
- ➢ HIV duration should be 4-5 years.

### **Exclusion criteria**

Patients who were psychologically compromised.

Patients who were not willing to participate

The Statistical Package of Social Sciences 13.0 (SPSS) was used to determine the frequency distributions, means,

and medians. The chi-square test was employed. For the value of impact in points, the analyses were performed using the median values as a bench mark (significance level 5%).

### Results

In total of 131 patients ranging in age from 18 to 56 years (mean  $36.08 \pm 8.445$ ) completed the questionnaire, of them 86 were females and 45 were males. The education level of the subjects ranged from primary schooling to professional qualification. All participants had gingivitis. The severity of gingivitis varied from mild to severe, but the difference was not statistically significant. Periodontal parameters, such as GI, PPD and CAL were recorded.

**Table 1** shows the perceived ratings given by the subjectsregarding their oral health. Majority ofsubjects felt thattheir oral health was excellent whereas less than 50%perceived their oral health as good to fair.

When the responses of the subjects were elicited regarding the items of the Oral Health Impact Profile, we found that most of the subjects very often had trouble pronouncing words, whereas very few subjects felt that their sense of taste had worsened because of problems with their teeth and gums.. This was not found to be statistically significant. Many subjects found it uncomfortable to eat any food and often had an unsatisfactory diet due to problems with their teeth and gums. Majority of subjects had to often interrupt their meals,few subjects often found it difficult to relax, were embarrassed and reported often being irritable with other people. The impact of periodontal health on the quality of life was not significant. (P< 0.05)

# Correlation between periodontal status and impact scores

**Table 2** displays the distribution of the individuals who presented an impact detected by the OHIP-14 (impact could be singular or multiple). Functional limitation was the impact most commonly perceived by the patients with periodontal disease, represented by difficulty in pronouncing words and changes noticed in the sense of taste. The lowest percentage was for social disability, which includes becoming irritated with other people and difficulty in performing daily tasks. There was a significant association between age, probing pocket depth and impact as evaluated by the OHIP-14 ( p<0.05) statistically significant,

Comparison of OHIP and periodontal parameters between the age groups revealed that patients with periodontal diseases achieved scores that was not statistically significant (p>0.05 Non Significant, NS) when individual domains like functional limitation (0.93), Physical pain( 0.61), Psychological discomfort(0.94), Physical disability(0.18), Psychological disability(0.08), Social disability(0.82) and Handicap(0.85) were compared.

Higher percentages of impact were observed among females. Patients who lived alone (single, separated, or widowed) achieved slightly higher percentages in their perception of impact in comparison to those living with someone (married or cohabiting), but this difference was not statistically significant. Table 1:- Descriptive statistics

	N	Mean	SD	Min	Max	Percentiles		
						Q1	Median	Q3
AGE	131	36.08	8.445	18	56	30	35	41
Q1	131	4.24	0.851	1	5	4	4	5
Q2	131	2.78	0.871	1	5	2	3	3
Q3	131	4.37	0.852	2	5	4	5	5
Q4	131	4.14	1.128	1	5	4	5	5
Q5	131	4.18	0.991	1	5	4	4	5
Q6	131	2.65	0.952	1	5	2	3	3
Q7	131	3.02	1.202	1	5	2	3	4
Q8	131	3.64	1.197	1	5	3	4	5
Q9	131	2.75	0.871	1	5	2	3	3
Q10	131	2.79	0.982	1	5	2	3	3
Q11	131	2.57	1.089	1	5	2	2	3
Q12	131	3.02	1.411	1	5	2	3	4
Q13	131	2.35	1.283	1	5	1	2	3
Q14	131	1.88	1.116	1	5	1	2	2
Functional limitation	131	7.02	1.212	4	9	6	7	8
Physical pain	131	12.69	1.71	8	15	12	13	14
Psychological discomfort	131	5.66	1.512	2	8	5	6	7
Physical disability	131	3.64	1.197	1	5	3	4	5
Psychological disability	131	5.54	1.326	2	9	5	6	6
Social disability	131	5.6	1.792	2	10	4	6	7
Handicap	131	4.23	1.562	2	9	3	4	5
Total OHIP	131	44.38	3.728	34	52	41	45	47
GI	131	1.61	0.6605	0.3	3	1.1	1.6	2.1
PPD	131	5.98	1.398	4	9	5	6	7
CAL	131	6	1.75	4	11	5	5	7

		AGE	GI	PPD	CAL
Functional limitation	Correlation Coefficient	-0.02	-0.13	-0.14	-0.16
i unetional miniation	p-value	0.85(NS)	0.16(NS)	0.11(NS)	0.07(NS)
Physical pain	Correlation Coefficient	-0.01	0.11	0.01	-0.08
	p-value	0.89(NS)	0.22(NS)	0.94(NS)	0.37(NS)
Psychological discomfort	Correlation Coefficient	-0.16	-0.17	-0.07	-0.03
	p-value	0.06(NS)	0.05(NS)	0.46(NS)	0.72(NS)
Physical disability	Correlation Coefficient	-0.10	0.19	0.23	0.11
	p-value	0.26(NS)	0.04*	0.008*	0.21(NS)
Psychological disability	Correlation Coefficient	-0.19	-0.11	-0.05	-0.06
	p-value	0.03*	0.20(NS)	0.57(NS)	0.47(NS)
Social disability	Correlation Coefficient	0.03	0.20	0.23	0.03
	p-value	0.75(NS)	0.02*	0.01*	0.72(NS)
Handicap	Correlation Coefficient	0.02	0.12	0.16	0.22
	p-value	0.78(NS)	0.16(NS)	0.07(NS)	0.01*
Total OHIP	Correlation Coefficient	-0.19	0.15	0.21	0.04
	p-value	0.03*	0.10(NS)	0.02*	0.62(NS)

Table 2:-correlation between periodontal parameters and the OHIP-14 score

### Discussion

The findings of this study revealed that periodontal health had negative impact on quality of life among HIV patients. Patients were unaware of relation of HIV and oral manifestations of the disease and few patients showed negative attitudes toward oral health care and reported various measures to manage oral lesions rather than seeking professional care.[13] However, majority of them were unaware of functional limitations, social, and psychological consequences of poor oral health among these patients.[26]

Many researches have been undertaken by number of authors on the impact of oral health status on quality of life particularly in the fields of cariology, oral rehabilitation, and to some extent in oral surgery and oral medicine, although less so in periodontology [27, 28,29] without taking periodontal diseases into account. OHIP-14 was developed Slade G D in 1997 is been used in a large number of studies.[24] It is a form for evaluating the impact of the condition of the mouth on quality of life, Many authors who have used this subjective index, [11,30] stress its ease of interpretation and reliability in identifying perceived impact when oral health problems are involved. [31] Several studies have demonstrated that quality of life is directly related to oral health .[32,33]

The results of the present study are in agreement with those of the above mentioned authors. That is periodontal disease had impact on impairing the quality of life among HIV patients. However, other factors such as dental caries and pain, which can have a negative influence on quality of life were not considered in the convenience sample as they could influence the results of the present study.

Regarding factors associated to the impact of oral disease on quality of life, most studies describe merely its extent without correlating it with other variables. [8, 6, 32, 33] In these studies, the most frequently reported variables were caries and socioeconomic status. In the present study, the impact of periodontal disease on quality of life was correlated with age, sex and clinical diagnosis of periodontal disease. Considering the total sample, functional limitation was the most affected dimension, achieving the highest percentages of perceived impact, which is in agreement with other studies. [8, 11] With regard to physical pain, the greatest impact was observed in eating. The impact of oral health status has also been associated with reported pain in a number of studies. [8, 24, 34]

The assessment of the total sample revealed that psychologic discomfort occurred (fairly often or very often) for both questions evaluated. (felt self-conscious of one's oral health status and feeling nervous or tense). Regarding physical limitation caused by an unsatisfactory diet or interrupted meals, the scores never, hardly ever, and occasionally were found to be the most prevalent for both questions evaluated. As for the relationship between a diagnosis of periodontal disease and physical limitation, patients with periodontal disease scored higher than those with other conditions. Unsatisfactory food consumption due to difficulty with mastication was the item causing the greatest impact. The analysis of psychologic discomfort as perceived by patients with periodontal disease revealed more embarrassment than those with other conditions. This finding has been discussed by a number of authors [ 24,32] who found that oral diseases cause psychologic discomfort, correlating the present study. However, another study [35] showed that relaxation and a feeling of embarrassment were the dimensions causing the least impact. The most frequent score of fairly often for both dimensions was reported when social disability was evaluated on the OHIP-14 as irritability with others and difficulty in performing one's usual tasks because of oral health problems.

Another dimension that had least impact on quality of life of HIV patients with periodontal disease was their total inability to perform functions and dissatisfaction with life. In the present study , physical pain was the most affected dimension because patients indicated pain as the cause of this maximum limitation. The least affected dimension in the present study was social disability. The functional limitation was the most affected dimension in this study, including difficulty in speaking properly and diminished sense of taste. The presence of frequent bleeding and unpleasant taste in the mouth are present because of periodontal disease, and this is an important factor when the need for periodontal treatment and consequent improvement in quality of life are considered.

The interaction between periodontal disease and HIV is recognized as an important attribute used to assess the outcomes of oral health services, to assist in cost benefit analysis, and to monitor individual patient care. These findings suggest that comprehensive management of periodontal disease and its maintenance among HIV patients who are already at higher risk to develop severe periodontal disease. Although to date, studies on the OHR-QoL among HIV-infected individuals are not many, the current available evidence suggested that the impact is significant. At times, this leads to shunning by family and near and dear ones, broken homes, loss of employment, restricted options for marriage, employment, and may even lead to divorce even though the treatment is provided for free. It goes a long way in improving the OoL and adherence to the treatment for a lifetime of the patients.

Finally, the population studied was a highly selected one. How these relate to wider patient groups is not known and

is a limitation to the generalisability of these results. Conducting similar studies in other settings would be helpful in addressing this issue.

## Conclusion

The findings of this study revealed that periodontal disease impacted the quality of life of HIV individuals, as assessed using the OHIP-14. Periodontal health and perceived OHRQoL were poorer among HIV patients. Periodontal disease had a negative impact on quality of life, and this impact was greater among HIV patients. The interaction between periodontal disease and HIV makes it essential to ensure optimum oral health care for HIV patients. Functional limitation was the most affected dimension, and impact was significantly associated with age, income, and diagnosis of periodontal disease.

These findings suggest that comprehensive management of the periodontal disease and its successive maintainance among HIV patients who are already at higher risk to develop severe periodontal disease is very essential.

### Recommendations

1. There is a need to develop oral-health-related educational materials for those that are already infected with HIV or have developed AIDS. These should be simple, concise, and translated into all major languages in South Africa. The aim of these information booklets/pamphlets should be, firstly, to allow people to recognise oral manifestations of the disease and, secondly, to inform the patients of the simplest treatment options for these conditions.

2. Medical practitioners should be trained to recognise common oral manifestations of HIV/AIDS, since most patients tend to choose medical practitioners for oral problems.

3. There is a need to enlist a more active involvement of private dental practitioners as they were more often consulted.

4. The community needs to be made aware of the fact that dentists can do more than just extractions and should be exposed to the full range of promotive and preventive services.

Limitations: In addition, the study group corresponds to one hospital and cannot be considered to be representative of a patient with AIDS. Therefore, this study strongly advocates the realization of further studies on OHR -QoL, with broader, and more representative samples of patients with AIDS.

Acknowledgement: We are grateful to all the staff in anti retroviral therapy centre at district hospital, Bagalkot for their enthusiasm in helping with this study.

### References

- Downer, M. C. (1998) The changing pattern of dental disease over 50 years. British Dental Journal 185, 36– 41.
- Hujoel, P. P., Drangsholt, M., Spiekerman, C. & DeRouen, T. A. (2000) Periodontal disease and coronary heart disease risk. Journal of the American Medical Association 284, 1406–1410.
- Scannapieco, F. A. & Ho, A. W. (2001) Potential associations between chronic respiratory disease and periodontal disease: analysis of National Health and Nutrition Examination Survey III. Journal of Periodontology 72, 50–56.
- Soskolne, W. A. & Klinger, A. (2001) The relationship between periodontal diseases and diabetes: an overview. Annals of Periodontology 6, 91–98.
- McGrath, C. & Bedi, R. (1999) The value and use of "quality of life" measures in the primary dental care setting. Primary Dental Care 6, 53–57.
- 6. LOCKER, D., & ALLEN, F., What do measures of oral health related quality of life measure?

Community Dent Oral Epidemiol. 2007;35(6):401-11.

- Minayo MCS, Hartz ZMA, Buss PM. Qualidade de,vida e saúde: Um debate necessário. Cien Saude Colet 2000;5:7–18.
- Leão ATT, Sheiham A. The dental impact on daily living. In: Slade GD (ed). Measuring Oral Health and Quality of Life. Chapel Hill, NC: University of North Carolina, 1997.
- Williams KB, Gadbury-Amyot CC, Krust-Bray K, Manne D, Collins P. Oral health- related quality of life: A model for dental hygiene. J Dent Hyg 1998;72:19-26.
- Gift HC, Reisine ST, Larach DC. The social impact of dental problems and visits. Am J Public Health 1997;82:1663–1668.
- Silva PSB. Saúde Bucal e qualidade de um grupo de idosos de Araçatuba-SP: Utilização Oral Health Impact Profile (OHIP-14), e caracterização do perfil sócio–econômico dos entrevistados. Araçatuba [dissertação de mestrado]. Araçatuba: UNESP, 2000.
- Saddki N, Mohamad WM. Oral health-related quality of life among people living with HIV/AIDS. Trans R Soc Trop Med Hyg 1997:91-6.
- Bajomo AS. The impact of oral manifestations of HIV/AIDS on quality of life of patients living with HIV/AIDS: South African division, IADR. J Dent Res 2004;83:20-24.
- Baccaglini L, Atkinson JC, Patton LL, et al. Management of oral lesions in HIV-positive patients. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2007:103 Suppl:S 50.e1–23.
- 15. Kaplan JE, Benson C, Holmes KK, et al. Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents: Recommendations from CDC, the National Institutes

Periodontal disease in HIV/AIDS. *Periodontol 2000* 2012; 60(1):78–97.

of Health, and the HIV Medicine Association of the

- Stabholz A, Soskolne WA, Shapira L. Genetic and environmental risk factors for chronic periodontitis and aggressive periodontitis. *Periodontol 2000* 2010; 53:138–53.
- Valentine J, Saladyanant T, Ramsey K, et al. Impact of periodontal intervention on local inflammation, periodontitis, and HIV outcomes. *Oral Dis* 2016;22 Suppl 1:87–97.
- 19. Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. *Lancet*2005;366(9499):1809–20.
- Alpagot T, Duzgunes N, Wolff LF, et al. Risk factors for periodontitis in HIV patients. J Periodontal Res 2004;39(3):149–57.
- Mataftsi M, Skoura L, Sakellari D. HIV infection and periodontal diseases: an overview of the post-HAART era. *Oral Dis* 2011;17(1):13-25.
- 22. Malele Y (2005). Impact of palliation on Oral Lesions in HIV/AIDS patients. A research report presented in partial fulfillment of the degree MPH in Community Health at the University of Witwatersrand, South Africa.
- 23. Centers for Disease Control and Prevention. Revised classification system for human immunodeficiency virus infection in children less than 13 years of age. MMWR Morb Mortal Wkly Rep 1994;43:1.
- Slade GD. Derivation and validation of a short form oral health impact profile Community Dent Oral Epidemiol 1997: 25: 284-90.
- 25. American Academy of Periodontology Task Force Report on the Update to the 1999 Classification of

Page

Periodontal Diseases and Conditions. J Periodontol. 2015; 86(7):835-38.

- 26. Fine DH, Tofsky N, Nelson EM, Schoen D, Barasch A. Clinical implications of the oral manifestations of HIV infection in children. Dent Clin North Am 2003;47:159-74.
- Low, W., Tan, S. & Shwartz, S. (1999) The effect of severe caries on the quality of life in young children. Pediatric Dentistry 21, 325–326.
- Award, A. M., Locker, D., Korner-Bitensky, N. & Feine, J. S. (2000) Measuring the effect of intra-oral implant rehabilitation on healthrelated quality of life in a randomized controlled clinical trial. Journal of Dental Research 79, 1659–1663.
- Goodey, R. B., Brickley, M. R., Armstrong, R. A. & Shepherd, J. P. (2000) The minor oral surgery outcome scale: a multi-attribute patient-derived outcome measure. Journal of Oral and Maxillofacial Surgery 58, 1096–1101.
- Oliveira BH, Nadanovsky P. Psychometric properties of the Brazilian version of the Oral Health Impact Profile–short form. Community Dent Oral Epidemiol 2005;33:307–314.
- Maupomé G, Borges A, Ramírez LE, Díez-de-Bonilla J. Perceptions of tooth loss and periodontal problems in an independent elderly population: Content-analysis of interview discourse. J Cross Cult Gerontol 1999;14:43–63.
- 32. Allen PF, Locker D. A modified version of the oral health impact profile for assessing health-related quality of life in edentulous adults. Int J Prosthodont 2002;15:446–450.
- Hegarty AM, McGrath C, Hodgson TA, Porter SR. Patient outcome measures in oral medicine: Are they valid and reliable? Int J Oral Maxillofacial Surg 2002;31:670–674.

- 34. Robinson PG, Gibson B, Khan FA, Birbaum W. A comparison of OHIP 14 and OIDP as interviews and questionnaires. Community Dent Health 2001;18: 144–149.
- 35. Sheiham A, Steele JG, Marcenes W, et al. The relationship among dental status, nutrient intake, and nutritional status in older people. J Dent Res 2001; 80:408–415.

© 2020 IJDSIR, All Rights Reserved

rage 11