IMPACT OF ORAL HEALTH CARE NEEDS ON HEALTH-RELATED QUALITY OF LIFE IN ADULT HIV+ PATIENTS

Gabriel A. Sánchez[1,2,3], Luciana R. D'Eramo[1,3], Rodolfo Lecumberri[1], Aldo F. Squassi[1,3,4]

[1] High Risk Patients Dental Care Unit (CLAPAR I), School of Dentistry, University of Buenos Aires. Argentina.

[2] Biophysics Department, School of Dentistry, University of Buenos Aires, Argentina.

[3] Institute for Public Health Research, University of Buenos Aires, Argentina.

[4] Community and Preventive Dentistry Department, School of Dentistry, University of Buenos Aires, Argentina.

ABSTRACT

The aim of this work was to determine the social impact of oral conditions on health-related quality of life in adult HIV+ patients and create a predictive model. The oral health impact profile questionnaire OHIP-49 was randomly administered to 200 HIV+ adults patients of any age and either sex at the High Risk Patients Dental Care Unit (CLAPAR I), School of Dentistry, University of Buenos Aires. Argentina. For each of the 49 items, participants indicated their responses on a five point Likert-type frequency scale ranging from "never" to "very often". Oral health needs were assessed through the CCITN (Community Caries Index of Treatment Need) and CPITN (Community Periodontal Index of Treatment Need). The Mann-Whitney test was used to compare the OHIP-49 score between male and female respondents. The Kruskal-Wallis test was used to assess score differences among the OHIP-49 domains. Altogether, 50% of the respondents were male and 50% were female, aged 36.45 ± 0.70 years and 38.03 ± 0.78 years respectively. The assessment of oral health care needs revealed a great need for treatment. Mean CCITN was 11.15 ± 0.35 and CPITN was 2.41 ± 0.12. The average total OHIP-49 score (83) revealed a high level of social impact, which was higher for female compared to male respondents ($Z_{(T)} = 2.08$, $p = 0.037$). The domains concerning functional limitation (domain 1), physical pain (domain 2) and psychological discomfort (domain 3) showed higher levels of social impact ($H = 395.06$, $p < 0.0001$). The social impact observed in these domains was higher for female compared to male patients. In the correlation analysis, oral conditions, age, gender and social impact were significantly associated. These results demonstrate that unmet oral health care need impairs the quality of life of HIV+ patients and suggest the need of comprehensive oral health care interventions.

Key words: HIV, oral health, social impact, quality of life, health behavior.

IMPACTO DE LA NECESIDAD DE TRATAMIENTO ODONTOLÓGICO SOBRE LA CALIDAD DE VIDA DE LOS PACIENTES ADULTOS VIH+

RESUMEN

El propósito de este trabajo fue determinar el impacto social del estado de la salud bucal sobre la calidad de vida de los pacientes VIH+ y establecer un modelo predictivo. El cuestionario correspondiente al perfil del impacto social de la salud bucal, OHIP-49, se administró aleatoriamente a 200 pacientes adultos VIH+ de ambos géneros en la Clínica para la Atención de Pacientes de Alto Riesgo I (CLAPAR I) de la Facultad de Odontología de la Universidad de Buenos Aires, Argentina. Los pacientes indicaron su respuesta a cada una de las 49 preguntas del cuestionario en una escala de frecuencia tipo Likert (nunca, casi nunca, a veces, casi siempre, siempre). La necesidad de tratamiento odontológico se determinó haciendo uso del Indice de Necesidad de Tratamiento de Caries (INTC) y del Indice de Necesidad de Tratamiento Periodontal (INTP). La prueba de Mann-Whitney se utilizó para analizar la diferencia del puntaje global del OHIP-49 entre hombres y mujeres. La prueba de Kruskal- Wallis se empleó para evaluar las diferencias de los puntajes observados entre los diferentes dominios del OHIP-49. La influencia de la necesidad de tratamiento odontológico, la edad y el género sobre la calidad de vida de los pacientes VHI+ se analizó a través de un modelo de regresión multivariado, donde el puntaje obtenido en el OHIP-49 fue la variable dependiente y la necesidad de tratamiento odontológico, la edad y el género se desempeñaron como variables independientes. El 50% de los pacientes fueron de sexo masculino con una edad promedio de 36.45 ± 0.70 años y el otro 50% correspondió a pacientes de sexo femenino con una edad promedio de 38.03 ± 0.78 años. La evaluación del estado bucodental evidenció una alta necesidad de tratamiento odontológico. El valor medio del INTC fue 11.15 ± 0.35 y el del INTPC fue 2.41 ± 0.12. La media del puntaje registrado en el OHIP-49 (83) reveló un alto nivel de impacto social de las condiciones de salud bucal, siendo dicho impacto mayor en mujeres que en hombres ($Z_{(T)} = 2.08$, $p = 0.037$). Los dominios relativos a la limitación funcional (dominio 1), al dolor físico

(dominio 2) y al disconfort psicológico (dominio 3) mostraron mayores niveles de impacto social (H = 395.06, p < 0.0001). El impacto observado en dichos dominios resultó incluso mayor para el caso de las mujeres. El análisis de correlación reveló que las necesidades de tratamiento odontológico, la edad, el género y el impacto social del componente bucal de la salud se encuentran asociados de manera significativa. Nuestros resultados indican que las necesidades de atención odontológica insatisfechas menoscaban la calidad de vida de los pacientes VIH+ y sugieren la necesidad de brindar atención de salud bucal integral a este grupo de pacientes.

Palabras clave: VIH, salud bucal, impacto social, calidad de vida, conducta de salud.

INTRODUCTION

HIV+ patients are considered a dental caries risk group[1,2]. Several authors have reported a significantly higher need for dental and periodontal treatment in HIV+ patients[3-6] and dental care has been described as the most frequently unmet health need[7]. The use of the highly aggressive antiretroviral therapy (HAART) has been effective enough in turning the viral infection into a chronic disease[8]. Consequently, the life expectancy of the infected patients has become longer[9]. In view of this background, public health policies should be addressed to provide optimal quality of life to these patients[10]. In this respect, surveys and questionnaire-based research of oral health are useful to provide valuable data of oral disease and its determinants, its effect on dental services utilization and the behaviors and attitudes that influence oral health[11,12]. We have recently reported on erroneous dental beliefs concerning oral self-care and its influence on the demand for dental treatment in Argentine HIV+ adult patients[13]. However, little is known about the social impact of their oral care needs.

The OHIP-49 (Oral health impact profile) questionnaire was developed by Slade & Spencer[14] to assess the social impact of oral disorders. Since then, multilingual versions[15-17], including Spanish[18], have been validated. The questionnaire contains 49 questions regarding impacts attributed to oral conditions. The 49 impact items are grouped in seven domains, namely: functional limitations (e.g., difficulty chewing foods), physical pain (e.g., toothache), psychological discomfort (e.g., uncomfortable appearance), physical disability (e.g., unclear speech), psychological disability (e.g., concentration affected), social disability (e.g., difficulty doing jobs) and handicap (e.g., life less satisfying). The dimensions were ranked to reflect increasingly complex impacts. The first three domains comprise impacts apparent primarily to the individual, while questions in the disability and handicap dimensions are more likely to represent impacts on everyday activities and social roles. Since research on the oral conditions and its impact on the quality of life of HIV+ patients will help improve the oral health care planning, we decided to undertake this study to provide new background in this field. The aim of this work was to determine the social impact of oral conditions on health-related quality of life in adult HIV+ patients and estimate the direction and strength of their association. We tested the hypothesis that poor oral condition impairs oral health-related quality of life.

MATERIALS AND METHODS

Study population

Participants were 200 HIV+ randomly selected adult patients of any age and either sex. Subjects were recruited from March 2007 through November 2010 at the High Risk Patients Dental Care Unit (CLAPAR I), School of Dentistry, University of Buenos Aires, Argentina. The research was conducted as a descriptive cross-sectional study. All of the patients had been diagnosed with positive serology for HIV at least 5 years prior to the study and were under antiretroviral drug therapy. Patients suffering from HIV-non-related systemic diseases were excluded. Each patient signed the informed written consent prior to enrollment.

Oral health care needs assessment

Dental and periodontal treatment needs were assessed through the CCITN[19] (Community Caries Index of Treatment Need) and CPITN[20] (Community Periodontal Index of Treatment Need) respectively. Oral examinations were performed by three previously calibrated dental examiners.

Social impact of oral conditions assessment

The Spanish validated version[18] of the OHIP-49 questionnaire was used. For each of the 49 questions, participants indicated their responses on a five point Likert-type frequency scale ranging from "never" to "very often". Patients who left 10 or more individual questions blank were excluded from the study. The questionnaire was administered to patients prior to oral examination.

Data analysis

Mean values and SEM were calculated for age, CCITN and CPITN and tested for statistical significance between female and male respondents by Student's t test. To analyze the overall levels of social impact, the responses to individual questions of the seven OHIP-49 domains were standardized and summed to produce a single summary score. The method has been described previously[14] and involved the multiplication of coded responses for individual questions (coded 0 for "never" through 4 for "very often"). A Mann-Whitney test was used to compare the OHIP-49 score between male and female respondents. A Kruskal-Wallis test, with Dunn's *post hoc* test for multiple comparisons, was used to assess score differences among the OHIP-49 domains. The level of significance used was $p < 0.05$. Multivariate non-parametric correlation was used to determine the association among OHIP-49, CCITN and CPITN scores, age and gender. A Rho Spearman coefficient was used to estimate the direction and strength of the associations.

RESULTS

Altogether, 50% of the respondents were male and 50% were female, aged 36.45 ± 0.70 y and 38.03 ± 0.78 y, respectively. The difference in age did not reach statistical significance ($t_{(198)} = 1.49$, $p = 0.13$). Oral health care needs assessment revealed a great need of treatment. Altogether 56% (CI 95% = 49.12 - 62.88) of the sample needed dental prosthetic treatment and 43 % (CI 95% =36.14 – 49.86) needed tooth removal or endodontic treatment. Mean CCITN was 11.15 ± 0.35. Differences in mean CCITN between male (11.48 ± 0.29) and female (10.82 ± 0.42) patients were not significant ($t_{(198)} = 1.29$, $p = 0.19$). Periodontal conditions revealed supragingival tartar in 69% (CI 95% = 62.59 – 75.41) of the sample, whereas 25% (CI 95% = 19.0 – 31.0) showed 4-5-mm periodontal pockets. The remaining 6% (CI 95% = 2.71 – 9.29) showed 6-mm pathological pockets. The mean CPITN was 2.41 ± 0.12. Differences in mean CPITN between male (2.48 ± 0.06) and female (2.34 ± 0.10) patients were not significant ($t_{(198)} = 1.20$, $p = 0.23$).

Fig. 1 shows the social impact of oral conditions. The average total OHIP-49 score was 83, i.e., 43% of the maximal recordable value (Fig. 1A). The Kruskal-Wallis test revealed statistically significant differences ($H = 395.06$, $p < 0.0001$) among domains (Fig. 1B). Dunn's *post hoc* test for multiple comparisons revealed higher social impact in domains 1, 2 and 3.

Fig. 2 shows the influence of gender on the social impact of oral conditions. The total score for male and female patients was 80 and 85 respectively. The Mann-Whitney test revealed a significantly higher ($Z_{(T)} = 2.08$, $p = 0.037$) social impact of oral conditions in

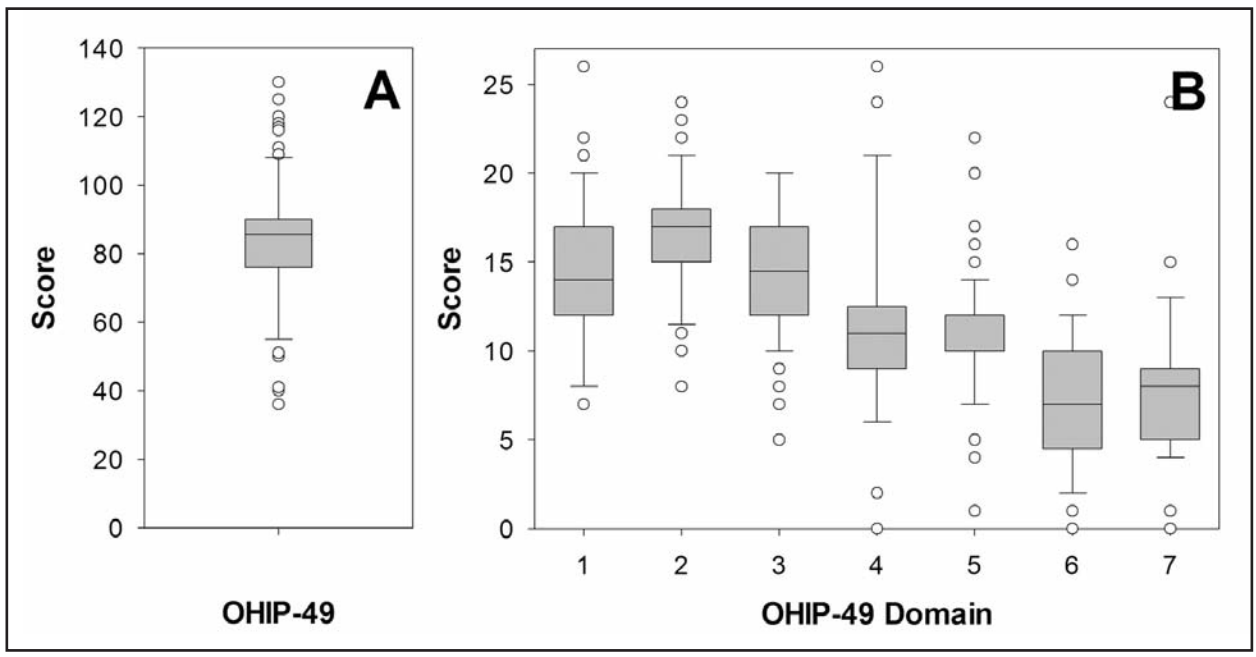

Fig. 1. Social impact of oral health. OHIP-49 scores recorded for each domain. OHIP-49 domains are 1: Functional limitation, 2: Physical pain, 3: Psychological discomfort, 4: Physical disability, 5: Psychological disability, 6: Social disability, 7: Handicap.

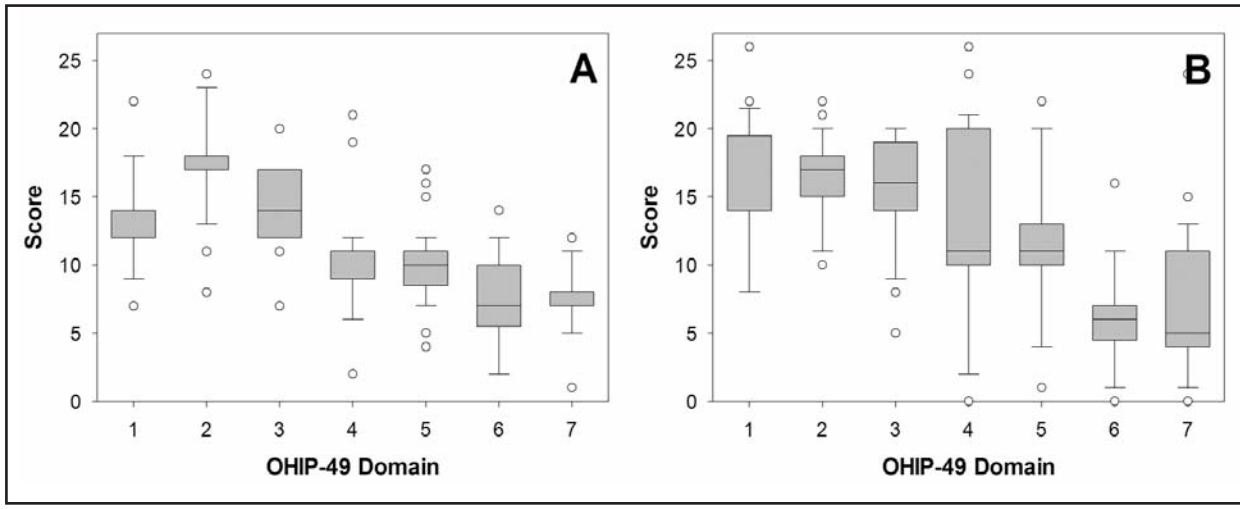

Fig. 2. Influence of gender on the social impact of oral health. OHIP-49 scores recorded for each domain in (A) male and (B) female respondents. OHIP-49 domains are 1: Functional limitation, 2: Physical pain, 3: Psychological discomfort, 4: Physical disability, 5: Psychological disability, 6: Social disability, 7: Handicap.

females. The domains 1, 2 and 3 showed significantly higher score values for both male ($H = 372.01$, $p < 0.0001$) and female ($H = 401.5$, $p < 0.0001$) respondents. For domains 1 and 3, the social impact was higher in females than in males (Domain 1: $Z_{(T)} = 2.35$, $p = 0.021$; Domain 3: $Z_{(T)} = 2.24$, $p = 0.027$).

Table 1 shows the matrix correlation for the multivariate non-parametric correlation analysis among oral conditions, age, gender and the social impact of oral health. The coefficient estimates were positive, indicating that higher levels of social impact were associated with higher CCITN and CPITN values, increasing age and female gender. The strength of the significant association of each studied variable with the perception of the social impact of oral health followed the order CCITN, age, gender, CPITN. The association found was moderate for CCITN, age and gender but low for CPITN.

DISCUSSION

Employing CCITN and CPITN, this study revealed a great unmet need for dental and periodontal treatment in HIV+ adult patients, as previously reported by several authors[3-6, 13, 21] and found evidence that poor oral conditions impaired their wellbeing. Few studies have demonstrated that oral health status affect the oral health-related quality of life in HIV+ patients[22-24]. Yengopal & Naidoo[24] reported that patients with oral lesions associated with HIV infection appeared to be more affected in terms of their functional limitation, physical pain and psychological discomfort. Our results agree with this previous report but in a larger HIV population. Moreover, we included the assessment of variables regarding dental and periodontal status.

Coates et al.[22] found a significant positive correlation between DMFT and CPITN with oral health-related

Table 1: Correlation among OHIP-49 score, oral health care needs, age and gender.

		OHIP-49 score	*CCITN*	*CPITN*	*Age (years)*	*Gender (0= male; 1= female)*
OHIP-49 score	Rho coefficient	---	0.74 *	0.52 *	0.69*	0.64*
CCITN	Rho coefficient	0.74 *	---	0.14	0.61*	0.18
CPITN	Rho coefficient	0.52 *	0.14	---	0.38	0.12
Age (years)	Rho coefficient	0.69 *	0.61*	0.38	---	0.11
Gender (0= male; 1= female)	Rho coefficient	0.64*	0.18	0.12	0.11	---

*Statistically significant ($p < 0.05$); n = 200.

quality of life. However, we believe that indices of need for oral treatment are more appropriate to assess the oral-health-related quality of life than the indicators of dental caries experience. Furthermore, the indices of need for treatment allow the assessment of the existence of barriers in the access to oral health care, another factor that could affect the social impact of oral health. In this respect, further studies should be conducted to identify those barriers.

Although OHIP has been used previously[23] to describe the social impact of oral condition in HIV+ patients, this is the first report of its kind in Argentine HIV+ populations. Moreover, not only is the social impact of oral health reported here, but it is also analyzed according to gender. The OHIP-14 Spanish validated version[25] has been reported as a useful tool to assess the impact of oral status on the quality of life. In this work, the OHIP-49 Spanish validated version was used because the Spanish version of the OHIP-14 was not available at the beginning of the study. In addition, in medically compromised patients it might be more appropriate to use the full OHIP version to guarantee greater accuracy in social impact self-reporting.

The study of the scores of the individual OHIP-49 domains allows the analysis of the partial contributions to the total score. Therefore, in this study we report score descriptive statistics for each domain. Participants reported high levels of social impact in domains regarding functional limitation, physical pain and psychological discomfort, while lower impact was reported for the remaining domains. This result could be explained on the basis that the later domains concern the dimensions most distal to the disease status in the Locker[26] model on which the OHIP instrument is based.

Research shows that oral health is a function of gender and that oral health-related quality of life depends on a person's gender[27]. Most of the studies do not report comparative results of the social impact of oral health between male and female HIV+ individuals[22, 23]. This study originally hypothesized that scores on OHIP-49 would be higher for female patients, which is why data from male and female patients were compared. As females might show different psychosocial and/ or emotional features able to improve the perception of the social impact of oral health, as previously reported[28], a higher OHIP-49 score was expected in this group. Our results showed a trend this direction.

Our findings suggest that oral health-related quality of life measurements can be useful in order to identify people with unmet needs for dental treatment, especially in non-dental environments, such as general hospitals or primary care centers. Therefore, developing and applying instruments able to measure the social impact of oral health would allow appropriate patient referral and improvement of resource planning. This assumption is in agreement with the conclusion reported by Santo et al.[29] who considered OHIP-14 as a risk indicator of dental caries. However, these authors suggested that oral health problems of HIV+ patients caused a mild impact on their wellbeing.

In conclusion, this study identified clinical indicators in which dental professionals should intervene to improve the oral health-related quality of life of HIV-infected patients. In this regard, the impact of oral health care programs on the oral health-related quality of life should be assessed, and oral health care should be included as one of the components of the medical health care programs for HIV+ patients.

ACKNOWLEDGEMENT

This work was supported by a grant from the University of Buenos Aires (Grant UBACyT 0800).

CORRESPONDENCE

Gabriel A. Sánchez,
CLAPAR 1, Facultad de Odontología
Universidad de Buenos Aires,
M T de Alvear 2142, 5º piso, Sector A
(C1122AAH) Buenos Aires
ARGENTINA
e-mail: gabriel@odon.uba.ar

REFERENCES

1. Phelan JA, Mulligan R, Nelson E, Brunelle J, Alves ME, Navazesh M, Greenspan D. Dental caries in HIV-seropositive women. J Dent Res 2004;83:869-873.
2. Guteta S, Feleke Y, Fekade D, Neway M, Diro E. Prevalence of oral and perioral manifestations in HIV positive adults at Tikur Anbessa Teaching Hospital Addis Ababa, Ethiopia. Ethiop Med J 2008;46:349-357.

3. Gelbier M, Lucas VS, Zervou NE, Roberts GJ, Novelli V. A preliminary investigation of dental disease in children with HIV infection. Int J Paediatr Dent 2000;10:13-18.
4. Ryder MI. An update on HIV and periodontal disease. J Periodontol 2002; 73:1071-1073.
5. Choromańska M, Waszkiel D. Prosthetic status and needs of HIV positive subjects. Adv Med Sci 2006; 51:106-109.
6. Choromańska M, Waszkiel D. Periodontal status and treatment needs in HIV-infected patients. Adv Med Sci 2006; 51:110-113.
7. Kenagy GP, Linsk NL, Bruce D, Warnecke R, Gordon A, Wagaw F, Densham A. Service utilization, service barriers, and gender among HIV-positive consumers in primary care. AIDS Patient Care STDS 2003; 17:235-244.
8. Arora DR, Gautam V, Gill PS, Mishra N. Recent advances in antiretroviral therapy in HIV infection. J Indian Med Assoc 2010; 108:29-34.
9. Gulick RM. Antiretroviral treatment 2010: progress and controversies. J Acquir Immune Defic Syndr 2010; 55:43-48.
10. Schackman BR. Implementation science for the prevention and treatment of HIV/AIDS. J Acquir Immune Defic Syndr 2010; 55: 27-31.
11. Pavi E, Karampli E, Zavras D, Dardavesis T, Kyriopoulos J. Social determinants of dental health services utilisation of Greek adults. Community Dent Health 2010; 27:145-150.
12. Dye BA, Thornton-Evans G. Trends in oral health by poverty status as measured by Healthy People 2010 objectives. Public Health Rep 2010; 125:817-830.
13. Sánchez GA, D'Eramo LR, Cabrini MA, Lecumberri R, Squassi AF. Dental beliefs in HIV+ patients with different oral health care needs. Acta Odontol Latinoam 2009; 22: 81-86.
14. Slade GD, Spencer AJ. Development and evaluation of the Oral Health Impact Profile. Community Dent Health 1994; 11:3-11.
15. Wong MC, Lo EC, McMillan AS. Validation of a Chinese version of the Oral Health Impact Profile (OHIP). Community Dent Oral Epidemiol 2002;30:423-430.
16. Kushnir D, Zusman SP, Robinson PG. Validation of a Hebrew version of the Oral Health Impact Profile. J Public Health Dent 2004;64:71-75.
17. Al-Jundi MA, Szentpétery A, John MT. An Arabic version of the Oral Health Impact Profile: translation and psychometric properties. Int Dent J 2007;57:84-92.
18. Lopez R, Baelum V. Spanish version of the Oral Health Impact Profile (OHIP-Sp). BMC Oral Health 2006; 6:11-18.
19. Piovano S, Squassi AF, Bordoni N. Estado del arte de indicadores para la medición de caries dental. Rev Fac Odont UBA 2010;25:29-43.
20. Ainamo J, Barmes D, Beagrie G, Cutress T, Martin J, Sardo-Infirri J. Development of the World Health Organization (WHO) community periodontal index of treatment needs (CPITN). Int Dent J 1982;32:281-291.
21. Reznik DA. Oral manifestations of HIV disease. Top HIV Med 2005;13:143-148.
22. Coates E, Slade GD, Goss AN, Gorkic E. Oral conditions and their social impact among HIV dental patients. Aust Dent J 1996;41:33-36.
23. Mulligan R, Seirawan H, Alves ME, Navasesh M, Phelan JA, Greenspan D, Greenspan JS, Mack WJ. Oral health-related quality of life among HIV-infected and at-risk women. Community Dent Oral Epidemiol 2008;36: 549-557.
24. Yengopal V, Naidoo S. Do oral lesions associated with HIV affect quality of life? Oral Surg Oral Med Ora Pathol Oral Radiol Oral Endod 2008;106:66-73.
25. Martin J, Bravo-Perez M, Albaladejo-Martinez A, Hernandez-Martin LA, Rosel-Gallardo EM. Validation of the oral helath impact profile (OHIP-14sp) for adults in Spain. Med Oral Patol Oral Cir Bucal 2009;14:E44-50.
26. Locker D. Measuring oral health: a conceptual framework. Community Dent Health 1988;5:3-18.
27. McGrath C, Bedi R. Gender variations in the social impact of oral health. J Ir Dent Assoc 2000;46:87-91.
28. Sampogna F, Johansson V, Axtelius B, Abeni D, Söderfelt B. A multilevel analysis of factors affecting the difference in dental patients and care givers evaluation of oral quality of life. Eur J Oral Sci 2008;116:531-537.
29. Santo AE, Tagliaferro EPS, Ambrosano GMB, Meneghim MC, Pereira AC. Dental status of Portuguese HIV+ patients and related variables: multivariate analysis. Oral Dis 2010; 16:176-184.