Brazilian Research in Pediatric Dentistry and Integrated Clinic 2016, 16(1):269-278
DOI: http://dx.doi.org/10.4034/PBOCI.2016.161.28
ISSN 1519-0501

Original Article

Impact of Oral Problems on the Quality Of Life of Women Subjected To Chemotherapy for Breast Cancer: A Longitudinal Study

Marcela Vieira Calmon[1], Maria Aparecida Amaral Musso[1], Larissa Rodrigues Dell'Antonio[1], Eliana Zandonade[2], Maria Helena Costa Amorim[2], Maria Helena Monteiro de Barros Miotto[2]

[1]MSc, Health Sciences Center, Federal University of Espírito Santo, Vitória, ES, Brazil
[2]PhD, Health Sciences Center, Federal University of Espírito Santo, Vitória, ES, Brazil

Author to whom correspondence should be addressed: Marcela Vieira Calmon, Av. Marechal Campos 1468, Maruípe, Vitória, ES, Brazil. 29043-900. Phone: +552798122-0302. E-mail: marcelavcalmon@gmail.com.

Academic Editors: Alessandro Leite Cavalcanti and Wilton Wilney Nascimento Padilha

Received: 05 February 2016 / Accepted: 17 August 2016 / Published: 02 September 2016

Abstract

Objective: To evaluate the impact of oral problems on the quality of life of women before and during chemotherapy for breast cancer. **Material and Methods:** A longitudinal study was conducted on women with breast cancer at a Hospital reference, Espírito Santo, Brazil from January 2012 to January 2013. Assessment was performed at three time-points, the first before the onset of therapeutic intervention, the second after the first chemotherapy session, and the third after the second chemotherapy session. The volunteers were assessed using interviews that included the application of the subjective indicator *Oral Health Impact Profile* (OHIP-14). The data were subjected to descriptive analysis based on tables of absolute and percentage frequencies relative to the OHIP-14 dimensions. McNemar's test assessed the direction of discordance, and the *Kappa* test measured the levels of concordance among the three assessments. The significance level was established at 5%. **Results:** The percent frequency of the impact of oral problems on the quality of life increased from the first (27%) to the second (49%) time-point, and functional limitation (p=0.001), physical pain (p=0.039), and physical disability (p=0.039) were statistically significant. **Conclusion:** Oral problems exerted a substantial impact on the volunteers' quality of life before the onset of chemotherapy, and quality of life became poorer after the onset of treatment. Patients with breast cancer require specific oral care and should be monitored before, during, and after anticancer treatment to minimize the deleterious effects of chemotherapy and improve their quality of life.

Keywords: Oral health; Quality of life; Disease impact profile; Breast cancer.

Introduction

Chronic non-communicable diseases (NCDs) represent a global health problem and a threat to health and human development [1]. Changes in the pattern of consumption and lifestyle, accelerated urbanization, and marketing strategies are the main factors that account for the perceived increase of NCDs [2]. Cancer has become a worldwide public health concern in the past decades.

Breast cancer is the most frequent neoplasm among women in developing and developed countries [3]. Data from the National Cancer Institute (INCA) show that the estimated risk of breast cancer is 56,2 cases per 100,000 women in Brazil for 2016. Breast cancer in the country's Southeastern area is the most frequent neoplasm among women with a frequency of 68,08 new cases per 100,000 women, and 1.010 new cases in the state of Espírito Santo (ES) are expected for 2016 [3].

Treatment, including surgery, chemotherapy, radiotherapy, and hormone therapy, aims at the destruction of neoplastic cells and the inhibition of their proliferation. Some studies report that 40% of cancer patients using chemotherapy develop oral complications because those drugs act on all cells undergoing proliferation without discriminating between malignant and normal oral mucosal cells [4]. The oral complications of chemotherapy may lead to severe systemic affection resulting in longer hospital stays, higher treatment costs, and a direct impact on the patients' quality of life [5].

Therefore, a quality of life assessment in cancer patients might contribute to decision-making on the efficacy of treatment, improve patient understanding of the expected treatment side effects, and improve the organization and quality of healthcare [6]. The treatment of breast cancer significantly influences patients' lives. Mastectomy, chemotherapy, and radiotherapy are inversely correlated with the quality of life [7].

Quality of life indicators are designed to measure health from a holistic approach, i.e., including psychological and sociological aspects that are expressed by subjective feelings. Despite the growing number of scientific articles focused on quality of life, how oral conditions affect the well-being of people is still relatively little known [8].

The clinical aspects of oral health have been thoroughly investigated in epidemiological surveys. Although, less is known about the impacts of oral health on quality of life [9]. The assessment of oral health and its impact on the quality of life of individuals is an important step in health care practices, and some measuring instruments have been proposed in the literature to perform this assessment [10]. Among these, Slade and Spencer [11] formulated and tested the subjective indicator, the *Oral Health Impact Profile* (OHIP), to assess the impact of oral health on an individual's quality of life, measured according to the perception of oral health [10].

OHIP was formulated based on the conceptual model of Locker [12], in which assessments of oral health-related quality of life comprise seven dimensions: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap.

OHIP is the most widely used instrument to assess the impact of oral health on wellbeing and quality of life [13], and this instrument detects changes in these states [14].

The present study assessed the impact of oral problems on the quality of life of women before and during chemotherapy for breast cancer.

Material and Methods

The present study was a longitudinal study that included all women diagnosed with breast cancer using histopathological methods at the Santa Rita de Cássia Hospital (HSRC), Vitória, Brazil from January 2012 to January 2013.

HSRC is a general, philanthropic, and private hospital that is recognized as a reference center for cancer and several other medical specialties in the ES. Volunteer follow-up data were collected from the Program of Rehabilitation of Mastectomized Women (Premma), which is conducted at an HSRC outpatient clinic.

The volunteers were assessed at three time-points: before the onset of any therapeutic intervention, between the first and second chemotherapy sessions, and between the second and third chemotherapy sessions.

The sample size was calculated using McNemar's method in Bioestat 5.0. We assumed that oral problems would not alter the quality of life after the onset of chemotherapy in 30% of the volunteers (concordant set), and discordance would occur in 25% of the sample. The minimum sample size was calculated as 41 volunteers, and a 20% addition compensated for eventual losses. Therefore a sample size of 49 volunteers was selected with 5% alpha and 80% power.

All women diagnosed with breast cancer at the HSRC during the study period were screened for compliance with the inclusion and exclusion criteria. The following inclusion criteria relative to the first assessment time-point were used: women with breast cancer at the HSRC with no previous cancer treatment aged 18 years or older. The following exclusion criteria were used for the second and third assessments: use of post-surgery treatment other than chemotherapy, and no definition of treatment within the study period. All patients signed an informed consent form, and the investigator conducted interviews to collect data.

The interviews were comprised of two scripts: one to record socio-demographic data, and the second was the OHIP, which assessed the volunteers' perception of the impact of oral health on their quality of life at the three assessments.

The original version of OHIP includes 49 items, but the short version includes only 14 items. The reduced version of the OHIP is parsimonious, reliable, and valid to capture the construct "impact of oral health on quality of life" [15]. The present study used the OHIP-14.

OHIP was developed in English in different sociocultural contexts, and it was translated into several languages [13], including Portuguese, and cross-culturally adapted and validated for the Brazilian Portuguese language [16].

OHIP items used a five-point Likert scale that corresponded to the frequency of the investigated problems in a given period of time. The answer options included always, often, sometimes, seldom, and never/does not apply. The responses were dichotomized as follows: responses "always" and "often" impacted the quality of life, and responses "sometimes", "seldom", and "never" did not impact the quality of life.

The OHIP dimension data were subjected to descriptive analysis using frequency tables in which the absolute and percent values of the three assessments were entered. McNemar's test investigated the direction (tendency) of discordance (i.e., changes between the three assessments), and the *Kappa* test measured the levels of concordance between pairs of time-point assessments, which were classified as follows: almost perfect (0.80-1.00), substantial (0.60-0.79), moderate (0.41-0.59), reasonable (0.21-0.40), and poor (≤ 0.20) [17].

Another investigatory collected the clinical data, which served as complementary sources in the present study. McNemar's test investigated the discordance of oral problems between pairs of time-point assessments.

The level of significance was established as 5%. The data were organized using Microsoft Office Excel 2007 *for Windows* and analyzed using the Statistical Package for Social Science (SPSS) version 20.0.

The ethics committee of the Federal University of Espírito Santo approved the study, no. 274/11, on December 14 2011.

Results

The initial sample included 89 women, of whom 48 (53.9%) were excluded. Twenty-six (29.2%) women had other treatments performed, such as radiotherapy or hormone therapy, and treatment was not defined within the study period in 22 (24.7%) women. Therefore, the final sample included 41 volunteers.

Table 1 describes the socio-demographic characteristics and oral problems in the sample. Most women were 50 years or older (61%), married in a stable union (68%), attended up to the third grade of elementary school (33%), white (56%), and belonged to social class C (63%). Only 5% of the volunteers resided in Vitória.

The following oral problems were observed at the three assessments: mucositis in 5% of the volunteers only at the third time-point; dry mouth in 15% at the first and third assessments and 20% at the second assessment; and gingivitis in 10% at the first time-point, 22% at the second, and 15% at the third (Table 1). These differences were not statistically significant by McNemar's test ($p > 0.05$).

Table 2 describes the absolute and percent frequency of impact on the seven dimensions and OHIP total score at the three assessment time-points. The percent frequency of impact on the total score was 27% at the first time-point, 49% at the second (after the first chemotherapy session), and 46% at the third (after the second chemotherapy session).

The second assessment was performed an average of 17 days (range 7 to 26 days) after the first chemotherapy session, and the third assessment was performed from 5 to 25 days after the second chemotherapy session.

Table 1. Socio-demographic characteristics and oral manifestations in women with breast cancer. Vitória, Brazil, 2012-2013.

Variables	Category	N	%
Age range	Up to 49 years old	16	39%
	50 – 59 years old	14	34%
	60 years old and older	11	27%
County of residence	Vitória	2	5%
	Other	39	95%
Marital status	Single	3	7%
	Marries/stable union	28	68%
	Separate	3	7%
	Widow	7	17%
Skin color/ethnicity	White	23	56%
	Black	2	5%
	Brown	16	39%
Educational level	Illiterate/up to third grade of elementary school	14	34%
	Complete fourth to incomplete eighth grade of elementary school	8	20%
	Complete elementary school	6	15%
	Complete secondary school	10	24%
	Complete higher education course	3	7%
Socio-economic classification	B	7	17%
	C	26	63%
	D	8	20%
Mucositis	Time-point 1	0	0%
	Time-point 2	0	0%
	Time-point 3	2	5%
Dry mouth	Time-point 1	6	15%
	Time-point 2	8	20%
	Time-point 3	6	15%
Gingivitis	Time-point 1	4	10%
	Time-point 2	9	22%
	Time-point 3	6	15%

Table 2. Frequency of impact per dimension in women with breast cancer at three assessment time-points. Vitória, Brazil, 2012-2013.

Dimensions OHIP	Time-point 1		Time-point 2		Time-point 3	
	n	%	n	%	n	%
Functional limitation	1	2%	15	37%	14	34%
Physical pain	5	12%	13	32%	12	29%
Psychological discomfort	8	20%	5	12%	4	10%
Physical disability	1	2%	8	20%	5	12%
Psychological disability	6	15%	2	5%	3	7%
Social disability	1	2%	2	5%	2	5%
Handicap	3	7%	1	2%	2	5%
Total score	11	27%	20	49%	19	46%

Comparisons of the frequency of impact per dimension between the first and second assessment time-points found statistically significant differences in functional limitation (p=0.001),

physical pain (p=0.039), and physical disability (p=0.039). The final OHIP score was potentially significant (p=0.064) and suggested a poorer quality of life (Table 3).

Table 3. Comparison of the frequency of impact per dimension in women with breast cancer between the first and second assessment time-points. Vitória, Brazil, 2012-2013.

		Time-point 2				McNemar
OHIP	Time-point 1	Yes	No	**Kappa**	**p-value**	**p-value**
Functional limitation	Yes	1	0	0.083	0.183	0.001
	No	14	26			
Physical pain	Yes	3	2	0.191	0.147	0.039
	No	10	26			
Psychological discomfort	Yes	1	7	0.004	0.977	0.549
	No	4	29			
Physical disability	Yes	0	1	-0.045	0.618	0.039
	No	8	32			
Psychological disability	Yes	1	5	0.191	0.147	0.219
	No	1	34			
Social disability	Yes	0	1	-0.034	0.891	1.000
	No	2	38			
Handicap	Yes	0	3	-0.038	0.776	0.625
	No	1	37			
Total score	Yes	6	5	0.063	0.655	0.064
	No	14	16			

Comparisons of the frequency of impact per dimension between the second and third assessment time-points found statistically significant concordance in all the dimensions that varied from reasonable to substantial ($p < 0.05$) and moderate concordance in OHIP total score (p=0.003) (Table 4).

Table 4. Comparison of the frequency of impact per dimension in women with breast cancer between the second and third assessment time-points. Vitória, Brazil, 2012-2013.

		Time-point 3				McNemar
OHIP	Time-point 2	Yes	No	**Kappa**	**p-value**	**p-value**
Functional limitation	Yes	9	6	0.414	0.008	1.000
	No	5	21			
Physical pain	Yes	8	5	0.482	0.002	1.000
	No	4	24			
Psychological discomfort	Yes	2	3	0.377	0.015	1.000
	No	2	34			
Physical disability	Yes	5	3	0.728	0.001	0.250
	No	0	33			
Psychological disability	Yes	1	1	0.363	0.017	1.000
	No	2	37			
Social disability	Yes	1	1	0.474	0.002	1.000
	No	1	38			
Handicap	Yes	1	0	0.655	0.001	1.000
	No	1	39			
Total score	Yes	14	6	0.462	0.003	1.000
	No	5	16			

Comparisons of the frequency of impact per dimension between the first and third assessment time-points found statistically significant difference in functional limitation (p=0.001), which denotes a poorer quality of life, and reasonable concordance in OHIP total score (p=0.040) (Table 5).

Table 5. Comparison of the frequency of impact per dimension in women with breast cancer between the first and third assessment time-points. Vitória, Brazil, 2012-2013.

OHIP	Time-point 1	Time-point 3		Kappa	p-value	McNemar p-value
		Yes	No			
Functional limitation	Yes	1	0	0.092	0.160	0.001
	No	13	27			
Physical pain	Yes	2	3	0.076	0.574	0.092
	No	10	26			
Psychological discomfort	Yes	1	7	0.042	0.771	0.344
	No	3	30			
Physical disability	Yes	0	1	-0.042	0.706	0.219
	No	5	35			
Psychological disability	Yes	0	6	-0.108	0.456	0.508
	No	3	32			
Social disability	Yes	0	1	-0.034	0.819	1.000
	No	2	38			
Handicap	Yes	0	3	-0.062	0.684	1.000
	No	2	36			
Total score	Yes	8	3	0.293	0.040	0.057
	No	11	19			

Discussion

The present study included a sample of women subjected to chemotherapy for breast cancer at HSRC. Most chemotherapy agents affect all body tissues, and several side effects may impact the oral cavity [4,18]. The mitotic index of oral epithelial cells is high, and these cells are particularly susceptible to the toxic effects of chemotherapy agents [19]. The most frequent oral signs and symptoms associated with chemotherapy for cancer include mucositis [4,5,18-20], dry mouth [4-5], periodontal disease [18], and infection [4].

The frequency of oral problems was not significantly increased after the onset of chemotherapy, as measured by McNemar's test, which suggests that oral health status did not deteriorate in the investigated volunteers. These findings disagree with the unanimous assertion of previous authors that the frequency of chemotherapy-related oral problems is high [18]. In addition, patients with breast cancer undergoing chemotherapy show considerable changes in the Global Quality of Life and its various dimensions [7].

However, previous studies assessed the prevalence of oral problems at a single time-point, and further longitudinal studies are needed to assess variations in oral problems during the course of treatment.

One problem with the present study was that the period for data collection between chemotherapy sessions was difficult to standardize. The most fitting period for assessment would have been 5 to 10 days after each session because that is the time when oral problems manifest according to some authors [19]. However, 95% of the volunteers did not reside in the towns where treatment was performed, and therefore, most volunteers could not attend the appointments during the indicated period.

Although the oral problems did not increase significantly after the onset of chemotherapy, the frequency of their impact on the volunteers' quality of life did increase.

The results of the frequency of the impact of oral problems on the volunteers' quality of life before intervention corroborate the previous studies in different populations of adults and older adults in Brazil [21-24]. A higher impact has been found in women, lower family income and low schoolin [9,24]. However, these results differ from studies in Australia and the United States, in which the frequency of impact was lower [13].

Therefore, the results of the present study support the precarious state of oral health in adults and older adults in Brazil, which is primarily the legacy of the curative and mutilating dentistry that was practiced in this country [25].

In addition, previous studies in cancer patients showed that poor oral health status before the onset of anticancer treatment is directly correlated with the appearance of oral complications [19,26,27].

The assessment after the onset of chemotherapy found a substantial increase in the frequency of impact of oral problems on the quality of life. Previous studies reported oral problems in approximately 40% of individuals subjected to chemotherapy [4,19]. The lack of studies comparing the frequency of impact of oral problems at different time-points after the onset of chemotherapy hindered comparisons between the present and previous studies.

Analysis of the frequency of impact of oral problems on the volunteers' quality of life per dimension between the first and second assessment time-points indicated statistically significant differences in functional limitation, physical pain, and physical disability. The final OHIP score exhibited a potentially significant result. These results denote a deterioration in the volunteers' quality of life.

OHIP is a subjective indicator that was formulated to obtain an encompassing self-reported measure of oral health-related dysfunctions, discomfort, and disability [22]. OHIP can detect changes in the impact of oral health state [14].

The OHIP functional limitation dimension includes items related to speech problems and reductions in taste. The physical pain dimension includes items related to pain and discomfort while eating. The physical disability dimension includes items related to dietary dissatisfaction and the need to interrupt meals due to oral problems.

Therefore, these three dimensions assess the impact of oral problems on basic human actions. Some authors showed that the oral side effects of chemotherapy are the most devastating in the short- and long-term precisely because of the effect on the most basic human actions, such as eating and communicating. Speech limitations might lead to social isolation, and nutritional problems might weaken the patients overall. An interruption of treatment might be required to allow the oral mucosa to recover [5].

The comparison of the impact frequencies per dimension between the second and third assessment time-points found statistically significant concordance in all dimensions. *Kappa* analysis showed that the level of concordance varied from reasonable to substantial and that the concordance relative to the OHIP total score was moderate. These findings suggest that no further assessment

would have been needed after the second time-point. Nevertheless, further longitudinal studies with larger samples are needed to further support these results.

The comparison of the impact frequencies between the first and third assessment time-points found a statistically significant difference in functional limitation only and reasonable concordance relative to OHIP total score. These findings indicate that speech difficulties and reductions in taste exert a negative impact on the quality of life during the course of chemotherapy. The concordance levels of the other dimensions were low, which indicates that the results at those time-points were not equivalent.

Importantly, the dichotomization of the OHIP scores, resulting in the percent measures, might have limited the perception of the frequency of oral problems in the volunteers. An analysis of the mean values of the scores (i.e., measures of severity) might provide greater precise.

Indeed, the oral health can interfere with individuals' daily activities and affect the productivity at work [8]. The results of the present study support the inclusion of dentists among the multidisciplinary staff who assist cancer patients. Programs that include dental care concomitant to chemotherapy promote the balance and maintenance of patient oral health [5].

The inclusion of dentists in the oncology staff is of paramount importance for patient care at all stages of disease. Cancer patients require specific oral care and should be monitored before, during, and after anticancer treatment to minimize the deleterious effects of chemotherapy and improve their quality of life.

Conclusion

The impact of oral problems on the volunteers' quality of life increased from the first to the second assessment time-points. Differences in functional limitation, physical pain, and physical disability were statistically significant, and these deteriorations interfered with basic functions, such as speech and nutrition.

The results of the present study indicate that oral problems exerted a substantial impact on the volunteers' quality of life before the onset of anticancer treatment and deteriorated after the onset of chemotherapy.

References

1. Schmidt MI, Duncan BB, Silva GA, Menezes AM, Monteiro CA, Barreto SM, Chor D, Menezes PR. Chronic non-communicable diseases in Brazil: load and current challenges. Lancet 2011; 377(9781):1949-61.
2. Mendes EV. Healthcare networks. Brasília: Organização Pan-Americana da Saúde, 2011.
3. Instituto Nacional de Câncer José Alencar Gomes da Silva. Estimate 2016: cancer incidence in Brazil. Rio de Janeiro: INCA, 2015.
4. Paiva MDEB, Biase RCCG, Moraes JJC, Angelo AR, Honorato MCTM. Oral complications of anticancer treatment. Arq Odonto 2010; 46(1):48-55.
5. Hespanhol FL, Tinoco BEM, Teixeira HGC, Falabella MEV, Assis NMSP. Oral manifestations in patients subjected to chemotherapy. Ciênc Saúde Coletiva 2010; 15(1):1085-94.
6. Araujo SSC, Padilha DMP, Baldisserotto J. Assessment of the oral health state and quality of life of patients with head and neck cancer assisted at a public hospital in Porto Alegre. Rev Bras Cancerol 2009; 55(2):129-38.

7. Lôbo AS, Fernandes AFC, Almeida PC, Carvalho CML, Sawada NO. Quality of life in women with breast cancer undergoing chemotherapy. Acta Paul Enferm 2014; 27(6):554-9.
8. Montero JM, Pérez MB, Martínez AA, Martín LAH, Gallardo EMR. Validation the Oral Health Impact Profile (OHIP-14sp) for adults in Spain. Med Oral Patol Oral Cir Bucal 2012; 17(3):469-76.
9. Batista MJ, Perianes LBR, Hilgert JB, Hugo FN, Sousa MLR. The impacts of oral health on quality of life in working adults. Braz Oral Res 2014; 28(1):1-6.
10. Campos JADB, Carrascosa AC, Zucoloto ML, Maroco J. Validation of a measuring instrument for the perception of oral health in women. Braz Oral Res 2014; 28(1):1-7.
11. Slade GD, Spencer AJ. Development and evaluation of the oral health impact profile. Community Dent Health 1994; 11(1):3-11.
12. Locker D. Measuring oral health: a conceptual framework. Community Dental Health 1988; 5:5-13.
13. Sanders AE, Slade GD, Lim S, Reisine ST. Impact of oral disease on quality of life in the US and Australian populations. Community Dent Health 2009; 37(2):171-81.
14. Slade GD, Hoskin GW, Spencer AJ. Trends and flutuations in the impact of oral conditions among older adults during a one year period. Commun Dent Oral Epidemiol 1996; 24:317-21.
15. Zucoloto ML, Maroco J, Campos JADB. Psychometric properties of the Oral Health Impact Profile and new methodological approach. J Dent Res 2014; 93(7):645-50.
16. Oliveira BH, Nadanovsky P. Psychometric properties of the Brazilian version of the Oral Health Impact Profile-short form. Community Dent Oral Epidemiol 2005; 33(4):307-14.
17. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics 1977; 33:159-74.
18. Chung EM, Sung EC. Dental management of chemoradiation patients. J Calif Dent Assoc 2006; 34(9):735-42.
19. Sanches Junior JA, Brandt HRC, Moure ERD, Pereira GLS, Criado PR. Adverse tegument reactions associated with anticancer agents – Part I. An Bras Dermatol 2010; 85(4):425-37.
20. Volpato LER, Silva TC, Oliveira TM, Sakai VT, Machado MAAM. Radiotherapy - and chemotherapy-induced oral mucositis. Rev Bras Otorrinol 2007; 73(4):562-68.
21. Chapelin CC, Barcellos LA, Miotto MHBM. Effectiveness of dental treatment and reduction of impact on the quality of life. UFES Rev Odontol 2008; 10(2):46-51.
22. Bombarda-Nunes FFB, Miotto MHMB, Barcellos LA. [Self-perception of oral health by community health agents in Vitória, ES, Brazil]. Pesq Bras Odontoped Clin Integr 2008; 8(1):7-14.
23. Miotto MHMB, Barcellos LA, Velten DB. Assessment of the impact of oral problems on the quality of life of the adult and elderly population of a Southern area country. Cien Saude Colet 2012; 17(2):397-406.
24. Rocha EKTG, Vanderlei AD, Ribeiro CMB, Lima ALO, Santos AF, Trindade Filho EM. Impact of tooth loss on quality of life. Pesq Bras Odontoped Clin Integr 2016; 16(1):69-78.
25. Moreira RS, Nico LS, Tomita NE, Ruiz T. Oral health of Brazilian older adults: systematic review relative to the epidemiological situation and access to oral healthcare services. Cad Saúde Pública 2005; 21(6):1665-75.
26. Seroli W, Rapoport A. [Assessment of oral health in the diagnosis of patients with oral cancer]. Rev Bras Cir Cabeça Pescoço 2009; 38(3):157-62.
27. Lopes IA, Nogueira DN, Lopes IA. [Oral manifestations of chemotherapy in children assisted at a cancer treatment center]. Pesq Bras Odontoped Clin Integr 2012; 12(1):113-9.