

INFLUENCE OF ORAL HEALTH ON QUALITY OF LIFE IN PREGNANT WOMEN

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ABSTRACT

This study evaluated the relationships between oral conditions and oral health-related quality of life (OHRQoL), as well as related factors. A cross-sectional study was performed on 119 postnatal women who had sought pre-natal care during pregnancy in the public health system of São Paulo State, Brazil. The women received oral clinical exams and were interviewed using the questions on the OHIP-14. A second survey with information about their socio-economic status, pregnancy and health habits was administered. The highest OHIP-14 scores were found in the area of physical pain, with an average score of 10.6. Average DMFT rate for the population was 12.2 (±6.1), with the majority having DMFT ≥ 4.5 (89.9%). Most of the women needed some type of dental prosthesis (59.7%), had some type of

periodontal disease (90.8%), tooth decay (73.9%), missing teeth (64.7%) and were in need of oral treatment (68.1%). The OHIP-14 scores were significantly associated with age ($p=0.02$), first pregnancy ($p<0.001$), need for dental prosthesis ($p<0.001$), presence of dental caries ($p<0.001$) and missing teeth ($p=0.01$). In the multivariate analysis, the worst OHRQoL was significantly associated with the presence of caries ($p=0.03$). The results suggest an association between the worst oral condition and poorer quality of life during pregnancy. This risk group should be prioritized in the health services in order to treat and recover the oral health of pregnant women, promoting better oral health conditions and better quality of life for their children.

Key words: Oral health, quality of life, pregnancy.

INFLUÊNCIA DA SAÚDE BUCAL NA QUALIDADE DE VIDA DE GESTANTES

RESUMO

O presente estudo avaliou as relações entre condições bucais e o impacto da saúde bucal na qualidade de vida de gestantes, bem como fatores relacionados. Um estudo transversal foi realizado em 119 mulheres que, durante a gravidez, tinham procurado atendimento pré-natal no sistema público de saúde do Estado de São Paulo, Brasil. Foram realizados exames clínicos bucais e as gestantes foram entrevistadas utilizando o questionário OHIP-14, forma abreviada, e um segundo inquérito, com informações sobre os seus hábitos de status sócio-econômico, gravidez e saúde foi administrado. As maiores pontuações OHIP-14 foram encontrados na área de dor física, com uma pontuação média de 10,6. A taxa média de CPO-D para a população foi de 12,2 (± 6,1), com a maioria tendo um CPOD de ≥ 4,5 (89,9%). A maioria das mulheres precisava de algum tipo de prótese dentária (59,7%), tiveram algum tipo de doença periodontal (90,8%),

apresentaram cárie dentária (73,9%), falta de dentes (64,7%) e estavam na necessidade de tratamento odontológico (68,1%). Os escores do OHIP-14 estiveram significativamente associados com a idade ($p = 0,02$), primeira gravidez ($p < 0,001$), necessidade de prótese dentária ($p < 0,001$), presença de cárie dentária ($p < 0,001$) e falta de dentes ($p = 0,01$). Na análise multivariada, o pior impacto da saúde bucal sobre a qualidade de vida de gestantes esteve significativamente associada com a presença de cárie ($p = 0,03$). Os resultados sugeriram que a pior condição bucal esteve relacionada com pior qualidade de vida durante a gravidez. Este grupo de risco deve ser priorizado nos serviços de saúde, a fim de tratar e recuperar a saúde bucal destas grávidas, promovendo melhores condições de saúde bucal e da qualidade de vida de seus filhos.

Palavras chave: Saúde bucal, qualidade de vida, gravidez.

INTRODUCTION

The classic diagnosis of oral health focuses only on professional clinical evaluation of the patient. It does not assign any importance to other factors that directly affect oral health, such as quality of life, income, schooling level, habits, and an individual's perception of their own health¹. If quality of life

indicators and self-perception of oral health are taken into account in the oral health diagnosis, the estimated need for treatment may be greater and assessment criteria may be more realistic².

To evaluate the impact of oral health on quality of life, many studies have used the OHIP-14 questionnaire (Oral health impact profile questionnaire –

short form), developed by Slade and Spencer²⁻⁹. The 14 questions in the questionnaire were effective in terms of revealing associations between clinical, social and demographic factors¹⁰. The OHIP-14 has already been tested and validated for use in the Portuguese language and Brazilian culture and, in addition, this version of the OHIP-14 had good psychometric properties, similar to those shown by the original version⁶. The OHIP-14 enables evaluation of the unfavorable impacts of the oral condition on a patient's well-being and quality of life. It also reveals subjective experiences associated with oral health. Using an indicator like the OHIP-14 can facilitate dental service planning by enabling prioritization of care for people whose oral health has high impact on their quality of life¹ and thus directly affects the oral health and quality of life of their children^{8,11}. Pregnant women are considered to be a special category of patients because they are at higher risk for oral diseases and are undergoing physical, biological and hormonal changes that may create adverse conditions in the oral environment and their psychosocial state².

The quality of life of pregnant women affects maternal health as well as fetal and infant health^{12,13}. Studies have demonstrated that the absence of teeth can damage both nutrient intake and psychosocial behavior^{3,12}.

Few studies have investigated the impact of oral health on a pregnant woman's quality of life^{3-5,8,12,14}. Oral pain during pregnancy has been found to have a negative effect on Brazilian women's quality of life and causes difficulty in maintaining emotional balance, eating and oral hygiene during pregnancy, and may harm the fetus¹². A study of pregnant Indian women found that increasing age, multiparity, tooth decay and periodontal disease adversely affected OHRQoL³. Another study undertaken on pregnant Indian women showed that they had more periodontal problems than non-pregnant women, and that OHIP-14 scores were significantly higher for pregnant women⁵. A survey conducted on pregnant women in Uganda using the OIDP (Oral Impacts on Daily Performance) to assess OHRQoL showed that there was a strong association between the score and loss of teeth, but no association with periodontal disease⁴. An evaluation of Argentina's low-income pregnant women using the OHIP-49 found that even with high prevalence of caries and gum disease in the study population, oral health

status was not verified to have any impact on quality of life, although it can be an important variable for the demand for services¹⁴. A study conducted in Shanghai, China showed that the negative oral impacts experienced by pregnant women were mainly related to functional limitation and physical pain, and the loss of teeth was associated with OHRQoL⁸. There is no consensus on whether oral health status during pregnancy causes further impact on quality of life, due to the few studies on this topic. The aim of this study was therefore to evaluate the relationships between oral conditions and OHRQoL, as well as related factors.

MATERIAL AND METHODS

Study Design and Ethics

This research formed part of "The Impact of Care in the Practice of Maternal Breastfeeding and Oral Health on the Mother-Child Binomial" conducted by the Graduate Program in Preventive and Social Dentistry of São Paulo State University (UNESP) at all public health units of two medium-sized cities in the State of São Paulo, Brazil. The study conforms to the Strobe guidelines for cross-sectional studies¹⁵. A research project was submitted and approved by the Ethics Committee on Research Involving Humans of the Araçatuba School of Dentistry-UNESP.

Participants

The total calculated sample consisted of 120 pregnant women, a number obtained by calculation through finite populations¹⁶. To calculate sample size, the OHIP-14 score obtained in a similar study conducted on Brazilian pregnant women, according to the literature¹², was considered, with significance level $\alpha = 0.05$, absolute sampling error 6.4% and finite population during the study period (August-October 2007).

Written informed consent was obtained from all participants. Included were women who sought prenatal care at the public health units of the Brazilian Health System (*Sistema Único de Saúde - SUS*) from August to October 2011 and women in the last trimester of pregnancy. Pregnant women who refused to undergo clinical examination were excluded ($n = 1$). The final sample consisted of 119 pregnant women, who represented 95% of the pregnant population of the municipalities in the study period.

Data sources/ measurement

A pilot study was performed on pregnant women to calibrate examiners and check for possible errors in data collection. During the pilot study, the methods of data collection, administration of the clinical exam and statistical data analyses were tested.

Women in the study received clinical oral exams and were interviewed using two forms, one containing the OHIP-14 questions to evaluate the OHRQoL and a second questionnaire, which was pre-tested during the pilot study and contained questions about socioeconomic status, pregnancy and health habits.

Variables

Socio-economic status included household monthly income (0–1 BMW – [Brazilian Minimal Wage]; More than 1 BMW) – one BMW was equivalent to US\$150.05 in 2011 (standard value) and years of schooling (0–8 years; 9 or more years). Demographic data included ethnicity (White; Non-White - Brown; Black); age (up to 21 years; 22 years old or older); employment (yes; no) and marital status (living with partner; no partner). Questions about pregnancy and habits were included: first pregnancy (yes; no); number of pregnancies; presence of systemic diseases (yes; no) and unplanned pregnancy (yes; no).

Clinical oral exams were performed by a previously-calibrated team, according to WHO (World Health Organization)¹⁷ criteria (Kappa test = 0.91), using a flat mouth mirror and a CPI (Community Periodontal Index) probe for the epidemiological survey under natural light, with the examiner and the patient seated. Dental conditions were recorded, such as the WHO standardizations for the crown (codes – 0: sound; 1: decayed; 2: filled, with decay; 3: filled, no decay; 4: missing, as a result of caries; 5: missing, any other reason; 6: fissure sealant; 7: bridge abutment, special crown or veneer/implant; 8: unerupted tooth; T: trauma; 9: not recorded), and for the treatment needed (codes– 0: none; 1: one surface filling; 2: two or more surface fillings; 3: crown for any reason; 4: veneer or laminate; 5: pulp care and restoration; 6: extraction; 7: white spot remineralization; 8: fissure sealant; 9: not recorded)²⁰. The DMFT index (number of teeth that are decayed (D), missing (M), or filled (F) in an individual, applied to permanent dentition) was calculated. Additionally, periodontal

condition was assessed by the CPI score (codes – 0: healthy; 1: bleeding; 2: calculus; 3: shallow pockets 4–5mm; 4: deep pockets > 6mm; X: excluded), and the need for prostheses was recorded (codes – 0: no prosthesis needed; 1: need for one-unit prosthesis; 2: need for multi-unit prosthesis; 3: need for a combination of one- and/or multi-unit prostheses; 4: need for full prosthesis; 9: not recorded)¹⁷.

The OHIP-14 was used to measure the social impact of problems that may compromise oral health. The questions asked whether any of the problems evaluated by the OHIP-14 had occurred during the previous six months and the response choices were: Often, Never, Rarely, Sometimes, Repeatedly or Always. The Portuguese version of the OHIP-14 questionnaire was not changed or altered¹².

To increase the reliability of the results in the pilot study population, the questionnaires were reapplied after an interval of seven days and test-retest reliability was analyzed by calculating the Pearson correlation coefficient (0.87; $p < 0.01$) and Cronbach's alpha test (0.93). The results showed stability and internal consistency, demonstrating that the examiner was capable of applying the instruments successfully.

In the pilot study, we realized that we needed to develop an explanation for the options in the questionnaire. This included adding the following details: Never – never in the past 6 months; Rarely – once or twice in the past 6 months; Sometimes – Every month or every week in the past 6 months; Repeatedly – Nearly every day or twice or more times per week and Always – All the time, daily during the past 6 months.

The OHIP-14 deals with the following domains: functional limitations (questions 1 and 2), physical pain (questions 3 and 4), psychological discomfort (questions 5 and 6), physical disability (questions 7 and 8), psychological disability (questions 9 and 10), social disability (questions 11 and 12), and handicap performing daily activities (questions 13 and 14)¹⁸.

To calculate the impact of oral health on a pregnant women's quality of life, the original OHIP-14 scoring was assigned to each question, according to the response provided: never – 0; rarely – 1; sometimes – 2; frequently – 3; always – 4. Final scores for all questions could thus range from 0 to 56 points. The higher scores indicated a greater perception of OHRQoL¹⁹.

Statistical methods

All the questionnaires were reviewed, entered and analyzed employing the Epi Info 7 program²⁰ and the Bioestat program 5.3, freely available in Brazil²¹. The variables (social and demographic status and the women's clinical oral health condition) were described via frequency distributions for categorical variables and the average for continuous variables. The Chi-square test was used to evaluate the associations between the categorical variables. The adopted statistical significant p-value was equal to or lower than 0.05.

Clinical variables were evaluated according to the method adapted by Cohen-Carneiro et al.¹⁹, which associates OHIP scores with the following clinical parameters: need for prostheses (yes, type of oral prosthesis corresponds to codes 1 to 4; not needed, code 0); need for dental treatment (yes, presence of at least one type of treatment needed, classified as 1 to 8; no, all the teeth with codes 0 or 9); presence of untreated decayed teeth (yes, "D" component of the DMFT index different from zero; no, "D" component equal to zero); missing teeth (yes, "M" component of the DMFT different from zero; no, "M" component equal to zero); periodontal disease (yes, if there was any kind of change - codes 1, 2, 3, 4 according to the CPI score). The non-parametric Mann-Whitney test was used to compare

the OHIP scores with the dichotomous nominal values described above.

Spearman's Rank Correlation Coefficient was used to evaluate the relationship among CPI, DMFT, age, number pregnancies and OHIP scores.

The variables that had a p-value of ≤ 0.20 were included in the analysis of multiple logistical regression. The results were presented using frequencies and an Odds Ratio (OR) with a 95% CI.

RESULTS

The majority of the study population consisted of mothers of average age 24.7 (± 5.9) years, not working, with more than eight years of schooling, living with their partners, with low household income and not in their first pregnancy.

Table 1 shows the numerical and percentage distributions of the scores for the OHIP-14 responses. The higher scores are concentrated around the second area of the questionnaire, which asked about physical pain. The average OHIP-14 score for the population was 10.6(± 14.4).

Most of the women in this study (Table 2) had DMFT (decayed, missing and filled teeth index) ≥ 4.5 (89.9%) and some type of periodontal disease - CPI $\neq 0$ (90.8%). Average DMFT for the population was 12.2(± 6.1). Most women needed some kind of dental prosthesis (59.7%), showed some kind of periodontal

Table 1: Numerical distribution of pregnant women, according to OHIP-14 performance items and total prevalence scores for domains.

Items		0 Never n (%)	1 Rarely n (%)	2 Sometimes n (%)	3 Repeatedly n (%)	4 Always n (%)
Functional limitation	Articulation	105 (88.2)	1(0.8)	2 (1.7)	2 (1.7)	9 (7.6)
	Sense of taste	94 (79.0)	3 (2.5)	7 (5.9)	1 (0.8)	14 (11.8)
Physical pain	Pain	55 (46.2)	5 (4.2)	20 (16.8)	9 (7.6)	30 (25.2)
	Eating	72 (60.5)	1 (0.8)	11 (9.3)	2 (1.7)	33 (27.7)
Psychological discomfort	Self-conscious	95 (79.8)	0 (0.0)	7 (5.9)	2 (1.7)	15 (12.6)
	Felt tense	83 (69.8)	2 (1.7)	8 (6.7)	8 (6.7)	18 (15.1)
Physical disability	Diet unsatisfactory	88 (73.9)	4 (3.4)	5 (4.2)	5 (4.2)	17 (14.3)
	Interrupt meals	89 (74.8)	1 (0.8)	6 (5.0)	4 (3.4)	19 (16.0)
Psychological disability	Relax	85 (71.5)	3 (2.5)	6 (5.0)	2 (1.7)	23 (19.3)
	Embarrassed	95 (79.9)	1 (0.8)	6 (5.0)	1 (0.8)	16 (13.5)
Social disability	Irritable	97 (81.5)	0 (0.0)	3 (2.5)	2 (1.7)	17 (14.3)
	Usual work	107 (89.9)	1 (0.8)	4 (3.4)	2 (1.7)	5 (4.2)
Handicap performing daily activities	Less satisfied	96 (80.7)	3 (2.5)	4 (3.4)	3 (2.5)	13 (10,9)
	Unable to function	114 (95.8)	0 (0.0)	3 (2.5)	0 (0.0)	2 (1.7)

change (90.8%), had tooth decay (73.9%), missing teeth (64.7%) and were in need of treatment (68.1%). Table 2 shows the association between the OHIP-14 scores and variables. There was a statistically significant relationship between the OHIP-14 scores and age, first pregnancy, need for prosthesis, presence of decayed tissue and missing teeth. Spearman's correlation was analyzed to investigate the relationship between the clinical indicators of periodontal condition, the DMFT index, age, the

number of prior pregnancies and the women's OHIP-14 scores (Table 3). There was a statistically significant correlation between the DMFT score and all of the domains of the OHIP-14 and for the total OHIP-14 score ($p < 0.001$). Moreover, age and the number of pregnancies were significantly correlated ($p = 0.05$ and $p < 0.001$, respectively). In the multivariate analysis (table 4), the worst OHRQoL was significantly associated with the presence of caries ($p = 0.03$).

Table 2: The association between mean OHIP-14 scores and variables.

	Variables	n	Mean (\pm SD)	p
Age	Up to 21 years old	39	6.2 (11.1)	0.02
	22 years or older	80	12.7 (15.4)	
Employed	No	65	11.0 (14.6)	0.52
	Yes	54	10.1 (14.3)	
Skin color	White	49	12.1 (13.7)	0.70
	Nonwhite	70	9.6 (15.3)	
Marital status	With a partner	93	11.7 (15.1)	0.12
	No partner	26	6.7 (11.1)	
Years of Schooling	Up to 8 years of schooling	52	12.4 (12.8)	0.19
	More than 8 years of schooling	67	8.3 (15.4)	
Household income	Up to twice the BMW*	77	12.0 (15.4)	0.22
	More than twice the BMW*	42	8.1 (12.2)	
First pregnancy	No	61	15.0 (16.4)	<0.001
	Yes	58	5.9 (10.2)	
Presence of systemic diseases	No	86	8.7 (12.9)	0.08
	Yes	33	15.7 (16.9)	
Unplanned pregnancy	No	44	11.7 (12.0)	0.75
	Yes	75	8.8 (15.6)	
Need of dental prosthesis	No	48	5.0 (9.2)	<0.001
	Yes	71	14.4 (16.1)	
DMFT Value	DMTF \leq 4.4	12	5.0 (10.3)	0.18
	DMTF \geq 4.5	107	11.2 (14.1)	
Periodontal disease	No – CPI = 0	11	5.3 (8.4)	0.27
	Yes - CPI \neq 0	108	11.1 (14.8)	
Presence of tooth decay	"D" component of the DMFT = 0	31	5.2 (10.7)	<0.001
	"D" component of the DMFT \neq 0	88	12.5 (15.1)	
Need of some form of treatment	No	38	11.1 (13.5)	0.87
	Yes	81	10.4 (14.9)	
Missing teeth in the mouth	"M" component of the DMFT = 0	42	5.6 (10.0)	<0.001
	"M" component of the DMFT \neq 0	77	13.3 (15.7)	

SD - Standard deviation
BMW - US\$150.05

Table 3: Correlation* between variables and OHIP-14 performance items and total prevalence scores.

Variables	Age	Number of pregnancy	DMFT	CPI	PIP
Functional limitation	0.1167	0.2066	0.2954 (<0.001)	0.1301	-0.0517 (0.58)
rs (p)	(0.20)	(0.02)	0.1859	(0.15)	-0.0624 (0.50)
Physical pain	0.1317	0.3236 (<0.001)	(0.04)	0.8031	-0.0276
rs (p)	(0.15)	0.3195	0.2340	(0.37)	(0.77)
Psychological discomfort	0.1292	(<0.001)	(0.01)	0.0883	-0.0458 (0.62)
rs (p)	(0.16)	0.2999 (<0.001)	0.2634 (<0.001)	(0.34)	-0.0234
Physical disability	0.1822	0.3232	0.2882 (<0.001)	0.1260	(0.80)
rs (p)	(0.04)	(<0.001)	0.2017	(0.17)	0.0174
Psychological disability	0.1380	0.2179	(0.02)	0.1004	(0.85)
rs (p)	(0.13)	(0.02)	0.1851	(0.28)	-0.0920 (0.32)
Social Disability	0.0319	0.3551 (<0.001)	(0.04)	0.0430	0.0517
rs (p)	(0.73)	0.3952 (<0.001)	0.2954	(0.64)	(0.58)
Handicap in performing daily activities	0.1730		(<0.001)	0.0603	
rs (p)	(0.06)			(0.51)	
Total OHIP	0.1754			0.1105	
rs (p)	(0.05)			(0.23)	

rs -coefficient

p - Value of significance: p < 0.05

Spearman's rho test

*Spearman's correlation analysis

Table 4: Multiple logistical regression analysis between variables and OHRQoL.

Variables	p	Coefficient	SD	OR	CI (95%)
Age	0.75	0.0146	0.05	1.01	0.93 – 1.11
Working	0.92	-0.0432	0.46	0.95	0.39 – 2.88
Marital Status	0.06	1.0175	0.56	2.77	0.92 – 8.29
Years of schooling	0.99	-0.0020	0.99	0.99	0.38 – 2.62
Household income	0.70	0.0082	0.02	1.01	0.97 – 1.05
First pregnancy	0.34	-0.4576	0.48	0.63	0.24 – 1.64
Presence of systemic diseases	0.48	0.3246	0.46	1.38	0.56 – 3.41
Need of dental prosthesis	0.52	0.3574	0.56	1.42	0.48 – 4.30
DMFT Value	0.83	0.0094	0.04	1.01	0.92 – 1.10
Presence of tooth decay	0.03*	1.1229	0.53	3.07	1.08 – 8.73
Missing teeth in the mouth	0.76	0.1894	0.61	1.21	0.37 – 3.9

SD - Standard deviation

OR – Odds ratio

DISCUSSION

This study's main findings were to verify that a pregnant woman's oral health condition interferes with her quality of life and that women with poorer

oral health conditions (presence of caries) had poorer OHIP-14 scores, which was also verified by the clinical oral exams. The average score of the OHIP-14 in this study was 10.6, a value higher than

those found for Chinese women (7.9)⁸, pregnant women in India (7.0)^{3,5} and pregnant women in Brazil (3.8)⁶. A national survey of oral health conducted in 2010 in Brazil showed that average ODP in non-pregnant women aged 15 to 44 years ranges from 1.19 to 1.44²².

One limitation of this study was sample size. Another limitation was related to study design, since it was a cross-sectional study and therefore may have some biases such as memory or social desirability and inability to provide more evidence on the results. Longitudinal studies are needed. Multi-site studies should be performed on a larger sample representative of the population of pregnant Brazilian women with more heterogeneous characteristics.

The most commonly employed method for evaluating oral health condition is professional clinical evaluation. However, this method assigns little or no importance to crucial factors such as how the state of the mouth affects a person's daily life. In order to provide better care for patients, it is necessary to use subjective indicators of oral health to better capture the specific needs of individuals¹.

It is widely accepted that oral problems can cause a significant impact on physical, social and mental wellbeing during pregnancy. The results of our study demonstrate that the impact of oral health on quality of life, as reflected by the OHIP-14 scores, was significantly worse for those patients who also had a clinical issue. This confirmed the work of Acharya et al.³ and Acharya and Bath⁵. It constitutes a matter of concern because pregnant women's quality of life and health condition are known to have a direct effect on their children's quality of life and health condition¹¹.

Increasing age, multiple pregnancies, DMFT index, presence of tooth decay, need for treatment and dental prosthesis, and missing teeth were all associated with a poorer impact on the women's quality of life. These associations are in agreement with the findings of Acharya et al.³.

Women not in their first pregnancy had higher oral health impact scores than women in their first pregnancy, suggesting that the number of pregnancies may be an important predictor for this impact. This finding may explain why, during pregnancy, a woman is at increased risk of mouth disease due to changes in her habits, such as eating more sugary foods, less tooth brushing because of an increase in

nausea and vomiting, and/or hormonal changes caused by pregnancy that increase the inflammatory response²³.

The study shows that factors such as presence of caries were important predictors of the impact of oral health on quality of life in the multivariate analysis. The DMFT index was associated to all the domains of the OHIP. This pattern suggests that the presence of caries and missing teeth can cause dental pain, thereby leading the patient to be constrained by her oral health condition and prompting her to socialize less with relatives, friends, and acquaintances²⁴. The loss of a tooth as a result of caries and periodontal disease also had a negative impact on the OHRQoL in another study⁸.

We found no such correlation between the OHIP-14 score and periodontal disease as pointed out in the literature^{3,5}, perhaps because the present study had high prevalence of the disease (90.8%). It is also important to note that the CPI index was used, which although easy to use and enabling comparison of data with international studies to be indexed and indicated by the WHO on periodontal disease⁴, is partially performed with regard to some teeth indices and not performed on all teeth (full mouth)⁸. These women are an essential part of the family unit regarding oral health, since after childbirth they are also responsible for their children's oral health. Studies have shown that the worse the mother's oral health, the worse is their children's^{24,25}.

The definition of a specific population's need for dental treatment is an important step in planning health policies, using subjective indications, such as applying the OHIP-14 questionnaire, which complements the clinical exam and allows health professionals to better understand a person's perception of his or her oral health and perceived need for treatment. This knowledge also helps healthcare professionals to formulate effective programs and health services.

CONCLUSION

These results suggest that poor oral conditions have a negative influence on quality of life during pregnancy. This risk group should be prioritized in the health services in order to treat and recover the oral health of pregnant women, thereby also promoting better oral health conditions and quality of life of their children.

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REFERENCES

- Miotto MH, Barcellos LA, Velten, DB. Evaluation of the impact on quality of life caused by oral health problems in adults and the elderly in a southeastern Brazilian city. *Cien Saude Colet* 2012; 17: 397-406.
- Sheiham A, Tsakos G. Assessing needs through socio-dental approach. In: Pinto VG editor. *Public Oral Health*. São Paulo, Brazil: Ed. Santos; 2008.
- Acharya S, Bhat P, Acharya S. Factors affecting oral health-related quality of life among pregnant women. *Int J Dent Hyg* 2009; 7: 102-107.
- Wandera MN, Engebretsen IM, Rwenyonyi CM, Tumwine J, Astrom AN. Periodontal status, tooth loss and self-reported periodontal problems effects on oral impacts on daily performances, OIDP, in pregnant women in Uganda: a cross-sectional study. *Health Qual Life Outcomes* 2009; 7: 89.
- Acharya S, Bhat PV. Oral-Health-Related Quality of Life during Pregnancy. *J Public Health Dent* 2009; 69: 74-77.
- 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.
- Slade GD, Spencer AJ. Development and evaluation of the oral health impact profile. *Community Dent Health* 1994; 11: 3-11.
- Lu H, Xu W, Wong MC, Wei TY, Feng XP. Impact of periodontal conditions on the quality of life of pregnant women: a cross-sectional study. *Health Qual Life Outcomes* 2015; 13:67.
- Gonzales-Sullcahuamán JA, Ferreira FM, de Menezes JV, Paiva SM, Fraiz FC. Oral health-related quality of life among Brazilian dental students. *Acta Odontol Latinoam* 2013; 26:76-83.
- Kuo HC, Chen JH, Wu JH, Chou TM, Yang YH. Application of the Oral Health Impact Profile (OHIP) among Taiwanese elderly. *Qual Life Res* 2011; 20:1707-1713.
- Johnson M, George A, Dahlen H, Ajwani S, Bhole S, Blinkhorn A, Ellis S, Yeo A. The midwifery initiated oral health-dental service protocol: an intervention to improve oral health outcomes for pregnant women. *BMC Oral Health* 2015; 15:2.
- Oliveira BH, Nadanovsky P. The impact of oral pain on quality of life during pregnancy in low-income Brazilian women. *J Orofac Pain* 2006; 20: 297-305.
- Volpato FC, Jeremias F, Spolidório DM, Silva SRC, Valsecki Junior A, Rosell FL. Effects of oral environment stabilization procedures on *Streptococcus mutans* counts in pregnant women. *Braz. Dent J* 2011; 22: 280-284.

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- Cornejo C, Rossi G, Rama A, Gomez-Gutierrez N, Alvaredo G, Squassi A, Klemonsks G. Oral health status and oral health-related quality of life in pregnant women from socially deprived populations. *Acta Odontol Latinoam* 2013; 26: 68-74.
- Strobe Statement - Checklist of items that should be included in reports of cross-sectional studies.
URL: http://www.strobe-statement.org/fileadmin/Strobe/uploads/checklists/STROBE_checklist_v4_cross-sectional.pdf.
- Hulley SB. *Outlining the clinical research: an epidemiological approach*. 3th edition Porto Alegre, Brazil: Ed. Artmed; 2008.
- World Health Organization. *Oral health surveys: basic methods*. 4th edition. 2009. 93p.
- Slade GD. Derivation and validation of a short-form oral health impact profile. *Community Dent Oral Epidemiol* 1997; 25: 284-290.
- Cohen-Carneiro F, Rebelo MA, Souza-Santos R, Ambrosano GM, Salino AV, Pontes DG. Psychometric properties of the OHIP-14 and prevalence and severity of oral health impacts in a rural riverine population in Amazonas State, Brazil. *Cad Saude Publica* 2010; 26: 1122-1130.
- Center for Disease Control and Prevention. *Program Epi Info™ Version 7.0*. 2012. URL: <http://www.cdc.gov/epiinfo/>.
- Ayres M, Ayres Júnior M, Ayres DL, Santos AS. *Bioestat 5.0: statistical applications in the biological and medical sciences areas*. Belém: Mamirauá Civil Society; 2007. URL: <http://www.mamiraua.org.br/download/index.php?dirpath=/BioEstat%205%20Portugues&order=0>.
- Brazil. Ministry of Health. Department of Health Care. Secretariat of Health Surveillance. *SB Brazil 2010: National Oral Health Survey: Main results*. Brasilia: Ministry of Health. 2012.
- Moimaz SAS, Rocha NB, Saliba O, Garbin CAS. The access of pregnant to dentistry treatment. *Rev Odontol Univ Cid São Paulo* 2007; 19: 39-45.
https://www.researchgate.net/publication/242164447_Access_of_pregnant_women_to_dentistry_treatment_in_a_low-income_population_in_Sao_Paulo
- Zanata RL, Navarro MF, Pereira JC, Franco EB, Lauris JR, Barbosa SH. Effect of caries preventive measures directed to expectant mothers on caries experience in their children. *Braz. Dent. J.* 2003; 14: 75-81.
- Shearer DM, Thomson WM, Broadbent JM, Poulton R. Does maternal oral health predict child oral health-related quality of life in adulthood? *Health Qual Life Outcomes* 2011; 9: 50. DOI: 10.1186/1477-7525-9-50.