The Impact of Oral Pain on Quality of Life During Pregnancy in Low-Income Brazilian Women

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Aims: *To assess the effects of oral pain on oral health–related quality of life during pregnancy and document measures taken by pregnant women seeking relief for oral pain. Their experience of other types of pain were also investigated.* ***Methods:*** *A sample of pregnant women who were admitted to a public hospital to give birth were invited to participate in this cross-sectional study. Those who agreed were asked if they had experienced any pain due to problems with their mouth, teeth, or dentures during the 6 months prior to the interviews. Interviewees who answered affirmatively were questioned about the effects of this pain on their normal activities with the Oral Impacts on Daily Performances (OIDP) tool.* ***Results:*** *The study population consisted of 504 subjects (83% of the eligible individuals). A high prevalence of untreated dental caries was found. The prevalences of oral pain, headaches, back pain, and pelvic pain were 39.1%, 61.5%, 59.3%, and 60.9%, respectively. Of those reporting pain, 168 (33.3%) reported having had difficulty doing at least one of the activities included in the OIDP due to oral pain. The most frequently mentioned effects were difficulty in maintaining emotional balance (23.6%), difficulty eating (22.8%), and difficulty cleaning teeth (20%). The mean and median OIDP scores were 13.9% and 8.0%, respectively.* ***Conclusion:*** *Oral pain during pregnancy was an important problem for this group of women and had a negative effect on their quality of life.* J OROFAC PAIN 2006;20:297–305

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Pain is a common symptom of oral and dental diseases that can have social, economic, and psychological consequences for the affected individuals.[1] For example, dental pain can result in absence from work and school, avoidance of certain types of food, sleep disturbances, disruption of social contacts, and concern about oral health.[1–4] Moreover, when dental pain affects a large number of workers, it leads to a significant reduction in productivity and becomes an important burden to society.[5,6]

Since the seminal work of Cohen and Jago[7] was published in 1976, interest in evaluating the functional and social consequences of oral problems has grown considerably and a number of instruments were developed to measure the impact of oral health on quality of life (QoL). The Oral Impacts on Daily Performances (OIDP) is one of such instruments. This questionnaire, which was

designed by Adulyanon and Sheiham,[8] focuses on measuring the main physical, psychological, and social effects of oral conditions on the ability of an individual to perform 9 different daily activities. The OIDP was found to be psychometrically acceptable when used in Great Britain,[9] Greece,[10] and Brazil.[11] An abbreviated version of the questionnaire was tested in Tanzania and proved to be both valid and reliable.[12] More recently, the OIDP was adapted for use with young children.[13] The instrument has shown to be a versatile tool, since it has been applied successfully in cross-sectional studies to estimate the extent to which oral health affects the quality of life. It was used, for example, in studies of young[14] and older adult subjects[9] and in a randomized clinical trial to investigate the effect of reservoir biteguards on the QoL of people with xerostomia.[15] It was also used in a case-control study to assess the socio-dental effects of untreated fractured anterior teeth in Brazilian schoolchildren[16] and in a cohort study to determine the effect on QoL of implant-stabilized overdentures when compared to conventional complete dentures.[17]

Pregnant women may suffer from oral pain due to untreated dental problems.[18,19] The aim of the present research was to assess, through self-evaluation using the OIDP, the effects of pain caused by problems associated with the teeth, gingiva, or dental prostheses on oral health–related quality of life (OHRQoL) during pregnancy. The measures taken by pregnant women seeking relief for oral pain and their experience of other types of pain were also investigated.

Materials and Methods

Ethical approval was granted by the Human Research Ethics Committees of the participating institutions, and written consent was obtained from each subject.

Sampling

For the purpose of calculating sample size, the overall prevalence of impact due to oral pain was estimated to be 0.35 (ie, that 35% of the sample would report that oral pain had affected 1 or more activities of daily living).[14] Thus, it was decided that it would be necessary to recruit at least 350 women to allow for the calculation of a 95% confidence interval (CI) for the expected prevalence in the study population with a margin of error no more than 0.05.[20]

Study Population

All the women who gave birth to children with gestational age of 25 weeks or greater at a public maternity hospital in the city of Rio de Janeiro between January 6 and February 27, 2002, were invited to participate.

Data Collection

The data were obtained through interviews and dental examinations carried out by 2 trained female researchers (an experienced dentist and a senior dental student) in a public ward. The interviews and examinations lasted, on average, 12 minutes (SD 5 minutes) and 1.16 minutes (SD 0.55 minutes), respectively, and took place no later than 10 days after delivery. After data collection, interviewees were given advice on methods of basic oral health care for themselves and for their babies. In addition, they were advised on management of the problems identified during the survey.

The interviews collected a wide range of data, including sociodemographic information, experience with 4 types of pain (mouth, head, pelvic, and back), and attitudes related to obtaining dental treatment. Economic status categorization was derived from economic classification criteria developed by the Brazilian Advertising Association.[21] These criteria allow for the classification of individuals into 5 categories (A to E, where A is the highest) according to the level of education of the head of the household, the possession of consumer goods (eg, television sets, vacuum cleaners), the number of bathrooms, and the number of servants. In the metropolitan Rio de Janeiro area, the population is distributed across these economic categories as follows: class A, 5%; class B, 23%; class C, 39%; class D, 32%; and class E, 4%.[21]

The OIDP[14] questionnaire was included in the interviews. The dental examinations provided data on the number of permanent teeth, the use and type of prosthesis, the presence of untreated dental caries lesions, and supragingival calculus. Visual inspection of the mouth and teeth of the participants was carried out with the help of a flashlight, and the basic methods for oral health surveys recommended by the World Health Organization were applied.[22]

Measures

The questions about the experience of pain and its effects referred to the 6-month period preceding the interview. Thus, the estimates of pain and its

Table 1a Frequency Scale of the OIDP—Response Options

For people affected on a regular or periodic basis	For people affected for a period	Score
Never affected in past 6 months	0 days	0
Less than once a month	Up to 5 days in total	1
Once or twice a month	Up to 15 days in total	2
Once or twice a week	Up to 30 days in total	3
Three or 4 times a week	Up to 3 months in total	4
Every day or nearly every day	Over 3 months in total	5

If the phenomenon occurred on a regular basis, they described the pattern of occurrence. If it occurred for a period, they described the length of the period.

Table 1b Severity Scale of the OIDP—Response Options

Scale	Score
None	0
Very little	1
Little	2
More or less	3
Quite a bit	4
A lot – extreme	5

The subject rated the degree to which each item affected her daily living.

effects include both pain experienced at the time of the interview and reports of episodes of pain in the preceding 6-month interval (period prevalence).

The question used to estimate the prevalence of oral pain was: "At any time during the last 6 months, did you feel pain due to problems with your teeth, gums, or prosthesis?"

The OIDP was applied only to women who responded in the affirmative to the question on oral pain, and they were asked whether, because of this pain, they had felt any of the effects included in the index during the preceding 6 months. The version of the OIDP used was an adaptation of the Brazilian version of the instrument developed by Goes,[11] without the item on "difficulty smiling, laughing, and showing teeth without embarrassment." The OIDP response options are depicted in Tables 1a and 1b. The total OIDP score for each individual was calculated in the following manner: for each item, a score was obtained by multiplying the frequency by the severity score. The points relative to each item were totaled. The sum was then divided by the maximum possible score ($8 \times 5 \times 5 = 200$) and multiplied by 100 to give a percentage score.

The intensity of oral pain was evaluated on a scale ranging from 0 (no pain) to 10 (the worst pain imaginable).

Reliability

An interexaminer reliability study was also carried out with the second investigator being blind to the result of the first interview/examination. The time interval between the 2 administrations of the questionnaire and the 2 clinical examinations ranged from 1 to 3 days (mean, 1 day).

The reinterview of 106 randomly selected women allowed for the estimation of the kappa coefficient relative to the question about the occurrence of oral pain. In order to estimate the reliability of the data obtained from the remaining questions on the questionnaire, including the OIDP and the clinical variables, 65 women were reinterviewed from among those who had said during the first interview that they had experienced oral pain. The OIDP reliability was computed using the intraclass correlation coefficient (ICC) and the Cronbach's alpha coefficient (alpha). The proportion of agreements and the kappa coefficient were calculated for the remaining variables. For the ordinal variables, the quadratic weighted kappa was calculated.

Table 2 Sociodemographic Characteristics of the Study Population

Characteristics	Frequency	
	n	%
Occupational status		
Housewife	322	63.9
Shop worker	60	11.9
Household help	58	11.5
Student	40	7.9
Other	24	4.8
Schooling		
None	7	1.4
1 to 3 years	56	11.1
4 to 7 years	251	49.8
8 to 11 years	182	36.1
12 years or more	8	1.6
Marital status		
Married	378	75.0
Single, living with a relative	89	17.6
Single, living alone	34	6.7
Single, living with friends or employer	3	0.7
Economic status*		
A ($3,500)	0	0
B ($1,600)	29	5.7
C ($422)	204	40.5
D ($193)	232	46.0
E ($94)	27	5.4
No data	12	2.4
Race		
White	259	51.4
Black	139	27.6
Mixed race	102	20.2
Indian	1	0.2
Asian	2	0.4
No data	1	0.2
Total	504	100.0

*Mean monthly income in US dollars is shown in parentheses.

Statistical Analysis

Stata 7.0 software was used for the statistical analyses. They included estimates of medians, means, and proportions, with their corresponding confidence intervals, and hypothesis testing using the Mann-Whitney test, Pearson's chi-square test, the Fisher exact test, and the test for trend across ordered groups. The level of significance was set at 95%.

Results

Description of the Study Population

A total of 504 of the 607 women (83.0%) who were admitted to the hospital during the study period were interviewed and examined. Of the 103 women not interviewed, 1 refused to participate, and the others were discharged from hospital before being contacted by the research team. In order to analyze the chance that selection bias resulted from sample attrition, an attempt was made to compare the data on those not interviewed with that of a simple random sample of the study population, made up of 100 interviewees using information gleaned from the live birth certificates issued by the hospital. It was possible to obtain data relating to 89 postpartum women interviewed and 83 postpartum women not interviewed. The mean age in the 2 groups was the same (24 years), and the number of previous gestations was similar (1.3 among interviewees and 1.5 among noninterviewees). The frequency distributions of marital status, type of birth, number of prenatal consultations, and child's race were similar. However, women not interviewed showed a significantly higher level of schooling and gestation time than did those interviewed (test for trend across ordered groups, $P < .05$).

The mean age of the study population was 24 years (SD 6.2), and 86.5% of the subjects were from economic classes D and C (mean monthly family incomes of US $193 and $422 US, respectively). Additional demographic data about the participants, such as race, educational level, and marital status are reported in Table 2.

The study participants had an average of 26 teeth (SD 5.6), and 62 women (12.3%; 95% CI, 9.6 to 15.5) wore some type of prosthesis. The prevalence of unrestored dental caries lesions was 60.7% (95% CI, 56.3 to 65.0), and the prevalence of supragingival calculus was 22.6% (95% CI, 19.0 to 26.5).

Reliability of the Main Outcome Measures

The kappa coefficient relative to the question about the occurrence of oral pain was 0.92 (95% CI, 0.84 to 0.99). The ICC and alpha values for the OIDP were, respectively, 0.63 and 0.87.

Pain Experience

Four hundred forty-five women (88.3%) said they had experienced at least 1 of the following types of pain in the 6 months preceding the interview: headaches (61.5%; 95% CI, 57.1 to 65.8), back pain (59.3%; 95% CI, 54.9 to 63.6), and pelvic pain (60.9%; 95% CI, 56.5 to 65.2). The prevalence of oral pain, although high (39.1%; 95% CI, 34.8 to 43.5), was lower than the prevalence of other types of pain investigated. On a scale of 0 to 10, the average intensity of pain for problems with the teeth, gingiva, or prostheses experienced by the interviewees was 6.1 (SD 2.9).

One hundred fifty (29.7%) women said they had been prevented from doing some of their normal activities (work, studying, or recreation) because of headaches (n = 43; 8.5%; 95% CI, 6.2 to 8.3), back pain (n = 82; 16.3%; 95% CI, 13.1 to 19.8), or pelvic pain (n = 100; 19.8%; 95% CI, 16.4 to 23.6). Seventy-four women (14.7%; 95% CI, 11.7 to 18.1) had trouble doing work, household, or study tasks or recreational activities because of oral pain.

Of the 197 women who experienced oral pain, 79 (40.1%) sought dental care, with the services offered by the public health sector (dental clinics or emergency rooms) being the most used often (ie, by 59 of the 79 women; 75.6%). Objective and subjective reasons were used as justification by the 118 interviewees who had not sought professional dental help. Some examples are: a belief that treatment might harm their pregnancy and that such pain during pregnancy was normal (30; 25.4%), fear of the dentist (9; 7.6%), lack of time on the part of the patient (12; 10.2%), a health-care professionals' strike (8; 6.8%), and lack of money (5; 4.2%). Of the 79 women who sought dental care, 58 (29.4% of those who felt oral pain) were seen by a dentist, but only 32 of those received some type of professional intervention aimed at relieving the pain. Most of the 26 professionals who did not provide the dental treatment requested (18; 69.2%) alleged that treatment could interfere with the gestation. Among the 58 women who were seen by a dentist, problems with teeth (41; 70.7%) and with gingiva (8; 13.8%) were identified as the main causes of the pain felt.

One hundred twenty-one interviewees (23.8%) adopted some sort of home remedy without any professional guidance, with the aim of alleviating their oral pain. Of these, 63 used analgesics and 2 took antibiotics. The analgesics used were dypirone, acetaminophen, diclofenac potassium, diclofenac sodium, and aspirin (Table 3).

Fifty (41.3%) of the 121 women who had recourse to household solutions for pain relief, with no guidance from a doctor or dentist, remained permanently free from pain. Twenty (62.5%) of the 32 women who received some type of professional intervention for relieving the pain remained completely free of it.

The effect of oral pain on the performance of daily activities was measured using the adapted OIDP. Of the 197 women who reported oral pain, 168 (33.3% of the study population) stated that they had had difficulty in doing at least 1 of the 8 activities included in the OIDP. Difficulty in maintaining emotional balance was reported the most frequently, followed by difficulty in eating, clean-

Table 3 Absolute and Relative Frequency of Measures Taken by Interviewees to Relieve Oral Pain

Measure	Frequency n	%
Household solution*		
None, waited for the pain to pass	76	15.1
Took an analgesic	63	12.5
Took an antibiotic	2	0.4
Applied a substance to the tooth	41	8.1
Gargled or applied a compress	20	4.0
Cleaned the tooth	9	1.8
Rubbed the painful area with finger	1	0.2
Talked to a doctor	90	17.8
Sought out a dentist	79	15.7

*The question related to household solutions for pain relief allowed multiple responses.

Table 4 Prevalence of the Various Items from the OIDP

Item	Prevalence	95% CI
Difficulty eating and enjoying food	22.8	19.2 to 26.7
Difficulty talking and pronouncing clearly	7.14	5.1 to 9.7
Difficulty cleaning teeth	20.0	16.6 to 23.8
Difficulty sleeping and relaxing	19.0	15.7 to 22.7
Difficulty maintaining emotional balance	23.6	19.9 to 27.6
Difficulty carrying out major work or social role	10.7	8.1 to 13.7
Difficulty enjoying contact with people	11.5	8.8 to 14.6
Difficulty doing physical activities	4.6	2.9 to 6.7
Some sort of difficulty	33.3	29.2 to 37.6

Table 5 Mean and Median Scores for Each OIDP Item by Frequency and Severity

	Frequency scale (0 to 5)		Severity scale (0 to 5)	
OIDP item	Mean	Median	Mean	Median
Difficulty eating and enjoying food	1.5	1.0	2.0	2.0
Difficulty talking and pronouncing clearly	0.4	0	0.7	0
Difficulty cleaning teeth	1.4	1.0	1.7	1.0
Difficulty sleeping and relaxing	1.2	0	1.8	0
Difficulty maintaining emotional balance	1.5	1.0	2.1	3.0
Difficulty carrying out major work or social role	0.7	0	0.9	0
Difficulty enjoying contact with people	0.7	0	1.0	0
Difficulty doing physical activities	0.3	0	0.4	0

ing teeth, and sleeping (Table 4). In the population reporting oral pain, OIDP scores ranged from 0% to 77.5% (mean, 13.9%; median, 8.0%), and the mean number of tasks with which the subject experienced difficulty was 3.0 (SD 2.4). The higher mean and median severity scores were related to the difficulty in maintaining emotional balance (Table 5).

Discussion

Pain in the mouth was highly prevalent in the pregnant women who took part in this study. This pain appears to have been caused predominantly by dental problems, as suggested by the high prevalence of open carious lesions. Although dental pain was less prevalent than headaches and backaches, it affected the subjects' normal activities much more than headaches and only a little less than back or pelvic pain. Pelvic pain during pregnancy is considered a common problem and seems to be associated with a loosening of the joints in the pelvic region. It affects 50% to 81% of women, independent of their socioeconomic status, but has a more marked effect on poorer women, who cannot give up activities requiring much exertion during their pregnancies.[23] Back pain occurs in 48% to 56% of pregnant women as a result, mainly, of repeated changes in posture and, in susceptible individuals, of the inability of the trunk musculature to adjust to the rapid weight gain observed between the fifth and seventh months of pregnancy. Back pain interferes with the accomplishment of daily activities in more than a third of the women affected.[24] Based on the fact that similar proportions of women were prevented from doing their daily activities because of oral, back, and pelvic pain, it can be concluded that oral pain had practically as much impact on the lives of the women studied as did back and pelvic pain. Oral pain, however, is not necessarily associated with pregnancy and is avoidable in most cases, while back and pelvic pain are considered typical of gestation, since they result from changes in a woman's body during this period.

Direct comparisons between the results of this study and similar surveys were hampered by their use of diverse methodologies. Two studies[1,3] included facial pain and sensitivity to heat or cold in the estimates of pain prevalence, and 1 included denture soreness.[25] The questions used in these studies to assess the impact of pain varied and included questions regarding whether a dentist or a doctor had been consulted,[1,3] whether pain had caused the subject to stay in bed more than usual,[1,3] and whether pain had resulted in loss of working time.[2] Methods of data collection varied (eg, in-person interviews[3,25] or a postal questionnaire[1]), as did the time periods for which experience of pain was investigated (eg, 4 weeks[1,3]). In addition, these studies focused on diverse populations (eg, industrial workers in Malaysia,[3] voters in Canada,[1] hospital patients in Great Britain,[2] and adults 45 years old or older in the United States[25]). Therefore, no attempts were made to compare the prevalence of the various pain impacts estimated by the present study with those obtained in previously published studies.

The proportion of participants who felt oral pain and spoke with a doctor or sought out a dentist was greater in the present study than in studies conducted by Jaafar et al[3] and by Locker and Grushka.[1] This might be explained by the intensity of the pain experienced. People who experience more intense pain are more likely to suffer from interference with their normal activities than do those who experience less intense pain.[1] In the study conducted by Jaafar et al,[3] for example, 90% of the participants described their pain as light or moderate. In the present study, only 47.2% of the interviewees attributed a value less than or equal to 5 to the intensity of the pain experienced, on a scale of 0 to 10. Furthermore, it is possible that pregnancy facilitated the interview-ees' access to a health-care professional. Most of the study's participants saw an obstetrician regularly and so had a better chance of reporting to a health-care professional that they were experiencing oral pain.

One fourth of the women who did not seek dental treatment to relieve their pain feared that it might in some way compromise their pregnancy or assumed it was normal to feel oral pain during gestation. A noticeable proportion of the women who were unable to see a dentist or who, once examined, were not treated, received the explanation that such treatment should be avoided during pregnancy. Such findings confirm the data obtained from studies carried out in other Brazilian cities,[19,26] as well as in developed countries such as the United Kingdom[27] and the United States[28]; these studies have documented the difficulty pregnant women have in obtaining dental treatment for both subjective and objective reasons. In many cases avoidance of dental treatment is justified by popular beliefs and reinforced by misinformed professionals. Thus, there is a need to educate both the lay population and the dental community on the safety of providing dental treatment for pregnant women.[29] There is also a need to remove objective barriers that hinder people's access to professional care; some women reported that they could not take time off from work to go to the dentist or that no one could do their chores for them so that they could take time to visit a dentist. A strike by health-care professionals was mentioned by a large number of those interviewed who had not received dental treatment.

In the study population, oral pain caused the inappropriate use of analgesic medicines during pregnancy, including dypirone and aspirin, which can put the baby's health at risk.[30] At the same time, professional care seemed to be more effective than self-medication in solving the problem, as 62.5% of the women with guidance from a doctor or dentist remained permanently free from pain, while among those with no such guidance the corresponding percentage was 41.3%. These facts underline the importance of facilitating access to dental care for pregnant women.

The performance of daily activities, evaluated using the OIDP, was clearly affected by oral pain, and the severity of the impacts was more pronounced than the frequency of the pain. Among the difficulties included in the OIDP, the "difficulty in maintaining emotional balance" was the most frequent and severe, showing that the greatest impact oral pain had on the study participants' lives occurred on the psychological level. Although the questionnaire asked specifically about the impact of oral pain, it may have been difficult for the women to sort out the effects of oral pain and the effects of other important life circumstances. Difficulty maintaining emotional balance may be associated both with being pregnant and with oral pain.[31] Interference with eating, cleaning teeth, and sleeping were also frequently reported. The frequency of such interferences in the present study was similar to that obtained by Adulyanon et al,[14] who used the same instrument in Thailand to assess OHRQoL in a predominantly adult female population of low educational level and limited access to dental care. In the present study, oral pain had some effect on one third of the interviewees, but for the most part, OIDP scores were low (eg, 8 women had an OIDP score of 50% or more, while 111 had an OIDP score of 10% or less). Due

to the fact that the total OIDP score is calculated by multiplying the frequency by the severity score, short-lasting or less frequently experienced dental problems tend to result in reduced total scores. This may explain why, in the present study, the impact of oral pain, which is usually a problem of an acute nature, was represented mostly by low OIDP scores. The definition of low, medium, or high OIDP scores needs to be explored and this is the objective of a forthcoming paper.

Despite the small number of losses, the interviewees differed from those not interviewed in length of gestation period, birth weight of the newborn, and level of schooling. The women not interviewed, and their babies, were probably in good health and, consequently, were discharged sooner from the hospital, thus reducing their chance of being interviewed. Considering that these factors are also usually associated with socioeconomic level, one can theorize that those interviewed came from more socioeconomically disadvantaged backgrounds than those who were not. This should be taken into account when making inferences from the present results.

The study sample was not necessarily representative of the general population of women who give birth in the general health-care network of the city of Rio de Janeiro, which limits the generalizability of the current results. Based on data from the National Information System on Live Births (SINASC), less-educated women were overrepresented in the study sample. Given that less educated women tend to have behaviors less favorable to good health, it is possible that the prevalence of oral pain and its effects reported by this sample are higher than would be found for the general population. Nonetheless, since the reliability of the data in this field of the SINASC, as measured by the kappa coefficient, can vary from poor[32] to good,[33] one cannot discard the possibility that the differences found are related to problems with the quality of SINASC's data and not to real differences between populations.

Conclusions

The present study has confirmed that oral pain is among the most frequently occurring types of pain and has also shown that it has a significant impact on the QoL of young pregnant women seen in the public health-care system of the city of Rio de Janeiro. A high frequency of episodes of oral pain is unacceptable given that, in most cases, this type of pain can be easily avoided. Pregnancy may involve a certain amount of pain, but it is regrettable that many suffer more than necessary.

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