



Factors Associated With Self-Perception in Oral Health of Pregnant Women

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Abstract

Background. Health perception is a subjective predictor of long-term morbidity and mortality. Few studies address the perception that pregnant women have of their oral health. **Objective.** The objective of this study was to explore the relationship between socioeconomic factors and self-assessment of oral health in pregnant women from Cali, Colombia. **Method.** A cross-sectional study was carried out with a sample of 998 pregnant women, calculated using the formula to estimate a proportion in finite populations, with a confidence level of 95%. A questionnaire was applied for sociodemographic characterization, as well as to enquire about oral health perception, knowledge, and practices of oral health. **Results.** The mean age of the surveyed mothers was 24.7, with a standard deviation of 6.1, of which 23.6% were adolescents. The perception they had about their oral health status was considered good by 60.8%. Of the 82.9% who reported having attended dentistry, more than half perceived good oral health. Pregnant women with no history of oral problems, with a perception of medium or high income, and with good oral hygiene practices tend to have a good perception of their oral health. **Conclusion.** Pregnant women with no history of oral problems, with a perception of medium or high income, and with good oral hygiene practices tend to have a good perception of their oral health.

Keywords

biological factor, community dentistry, oral health, pregnant women, self-concept, socioeconomic factors

The gestation period presents physiological and psychological changes that expose the oral cavity to pathologies that can affect the general health of the mother (Boggess et al., 2011) such as the oral health of the child. Hormonal changes interfere in the oral cavity, aggravating pathologies such as periodontal disease (Bressane et al., 2011), gingivitis, and dental caries (Committee on Health Care for Underserved Women, 2013). Timely detection of oral pathologies associated with systemic compromises in pregnant women can help reduce complications related to childbirth and the consequences derived from low birth weight (R. Lopez, 2004; Schwendicke et al., 2015). A good control of dental plaque through correct oral hygiene such as tooth brushing, at least twice a day (Dye et al., 2011; Ministerio de Salud y Protección, 2017) can reduce both the appearance of diseases associated with dental plaque in the mother and decreasing the transmission of potentially cariogenic bacteria to infants and reducing the future risk of tooth decay in children. Therefore, governments such as Colombia have followed the international recommendation of the need for dental care during pregnancy (Ministerio de Salud y Protección, 2017). Hence,

the importance of knowing what factors may be influencing the decision to attend dentistry and among these possible factors the perception of your general or oral health needs to be explored. Oral health actions should be directed not only to behavioral factors in the construction of healthy habits but also to the social environments in which healthy behaviors are developed (Sanders, Spencer, and Slade, 2006). Women's perceptions of their oral health are important when planning interventions to address maternal and child health (Keirse & Plutzer, 2010; Plutzer & Spencer, 2008).

Health perception has been considered a good predictor of mortality; it has been extensively studied in Western countries, and it is generally correlated with other assessments of patients' health (Burström & Fredlund, 2001; Idler &

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Benyamini, 1997; N. J. López et al., 2002). Health perception incorporates individual assessment of the history of their health status and the effect of environmental factors on health (Idler & Benyamini, 1997). Self-assessment or self-perception of health has been used as a subjective predictive indicator of long-term morbidity and mortality, with the ability to identify risk groups with health needs (DeSalvo et al., 2006; Fayers & Sprangers, 2002; Ross et al., 2019). Self-rated health has been recorded using a standard question, “How do you rate your health in the last 12 months?” With answers ordinal as very good, good, average, poor, and very poor (Bobak et al., 2000; Mansyur et al., 2008). The practical use and importance given by the respondents to the question has allowed its application in primary care services at the urban level (Bellón et al., 2000); its stability in adulthood has been studied (Vie et al., 2014) and has been applied to the analysis of health equity (Cislaghi & Cislaghi, 2019); some studies have found that income distribution is associated with health outcomes, including self-rated health (Kennedy et al., 1998). People with poorer health are more likely to have multiple conditions, and when evaluating their health, they can consider these existing medical problems (DeSalvo et al., 2006) so they can self-evaluate or self-perceive their health as not good. In a study carried out in the U.S. population, it was found that for each point on the GINI index (on a scale of 100), the risk of having a poor self-perception of health increased by 4%. The GINI index was strongly and negatively related to the self-assessed health status. No smoking, higher educational level, younger age, male sex, being White, and higher income were associated with a better perception of health status. In a multivariate analysis, they found that those who rated their health as excellent or very good were those who had never smoked, who had more education, and who had higher incomes (N. J. López et al., 2002).

The perception of health in pregnant women is a significant morbidity predictor of how poor health self-assessment is associated with increased use of the emergency medical service (Rodríguez et al., 1999). Several authors have found different variables that influence health self-perception, including mental health, psychosocial stress (Ala-Mursula et al., 2002; Dunn, 2002), depression, support of the husband, coping skills, and inequality in income (Weich, Lewis, and Jenkins, 2002).

Some studies show how education and material deprivation are strongly related to self-rated health (Bobak et al., 2000).

Few studies have evaluated the relationship of self-assessment of oral health with the perception of dental and gum problems during pregnancy, as well as the relationship with access to dentistry for pregnant women (Keirse & Plutzer, 2010; Saliba Rovida et al., 2014). The social and economic factors related to the oral health perception of pregnant women have not been explored, but these factors have been studied in relation to the access of pregnant women to dentistry (Deghatipour et al., 2019; Rocha et al., 2018; Silva et al., 2020).

In Colombia, even though their last national study on oral health (Ministerio de Salud y Protección, 2014) included a chapter to assess pregnant women, it did not explore their perception of their oral health.

There are no studies in Colombia about the influence that social determinants may have on the self-assessment that pregnant women have in oral health and its relationship with oral care.

The objective of the study was to explore the relationship that socioeconomic factors have on the self-assessment of oral health of mothers who attended prenatal care in public and private institutions in Cali, Colombia.

Method

A cross-sectional study was carried out to estimate the prevalence of attendance at oral consultation and the perception of oral health of women in the immediate puerperium, in several public and private institutions that attended deliveries in the city of Cali in 2012. Between 2013 and 2014, the fourth national oral health study was carried out in the country that included a sample for pregnant women and that served as a national reference in the 2012–2021 ten-year plan in the oral health component, so the results are valid by serving as a territorial reference at the time of publication in 2021.

The sample size calculation was made using the formula to estimate a proportion in finite populations, with a confidence level of 95%; it was assumed as population the number of births reported in the 2010 management report of the Cali Secretariat of Health, which was 30,420 (Secretaría de Salud de Cali, n.d.). The prevalence (73.6%) was taken from previous studies of gingivitis in pregnant women, which were carried out for the oral health baseline survey in Valle del Cauca (Ojeda et al., 2017). The sample was increased at the request of some ethics committees of the participating institutions that, in addition to participating for the city sample, needed to have a representative institutional sample to know the situation of their users, reaching a definitive sample of 998 participants. A representative sample of the entire city of Cali (third most populated city in the country) was obtained, which, according to records from the Municipal Health Secretariat in 2010, the population of postpartum mothers were affiliated to the contributory regime 55.6% (population with ability to pay), to the subsidized regime 28.8% (population without ability to pay with subsidy benefits), and uninsured 15.7% (population without ability to pay without subsidy). In the final sample, 52.6% were affiliated to the contributory regime. Eight clinics (four private and four public) were selected for the study, which attended 73% of the deliveries that took place in the city in 2012. From considering the average number of daily deliveries per clinic, the days for the interviews were randomly chosen, with each clinic having the same probability of being selected daily, until completing the sample. On each selected day, all postpartum mothers were interviewed. The study was approved by the institutional ethics committee of each

of the institutions participating in the research (Certificate of approval 56-62/2012 Clínica Farrallones; 43FA1-CL5105/2012 Clínica Comfenalco Valle; DCSP/2012/018 Universidad de Guadalajara; presentation letter 4145.122/2012 SSPM). The study included women who approved their participation with prior informed consent, as well as minors with the approval of their legal guardians. The inclusion criteria were being in an immediate puerperium and being a user of one of the participating institutions; the exclusion criteria were the following: not completely answering the questionnaire and presenting a condition that made it difficult for them to carry out the survey. The participants signed the informed consent as established by the ethics committees of each institution; only five mothers refused to participate in the study. Two professionals were standardized in the application of the questionnaire to mothers; they previously reported the general purpose of the study, the motivations, the approximate time of the interview, and the authorization of the ethics committee of the clinic or institution where the survey was conducted.

The survey contained questions conducive to characterizing the population through sociodemographic factors, such as age, ethnic group, level of education, and marital status, among others; in addition, it contained questions that evaluated oral health perception, oral health knowledge, and the eating and oral hygiene habits that the participants had, such as the recommended brushing frequency of at least twice a day (Rethman et al., 2011) or more than recommended, use of dental floss, and use of toothpaste.

The dependent variables were the perceptions of pregnant women about their oral health during pregnancy and the use of the oral care service during pregnancy, which were transformed dichotomously. The answer to the question “How do you consider the state of your oral health since you started the pregnancy?” was rated as good, moderate, or bad. The self-assessment question is adapted from the standard question—“How do you rate your health in the last 12 months?”—proposed in several studies (Carlson, 1998; DeSalvo et al., 2006; Idler & Benyamini, 1997; Mansyur et al., 2008). The independent variables corresponded to social, economic, health services, and lifestyle-related variables in oral health. Variables such as oral health history corresponded to dental and gum problems that, according to the respondent, had occurred during pregnancy.

Statistical Analysis

Data entry and analysis of results were performed using the Statistical Package for Social Sciences (SPSS) for Windows, 2016. The database was refined by subtracting seven surveys for duplication and missing data. Descriptive statistics such as mean and standard deviation values (*SD*) for continuous variables and frequency and percentage for categorical variables were used. The chi-square test was used to compare the profiles of mothers who visited the dentist during their current pregnancy, with those who did not, in addition to comparing

these profiles with oral health perception. The level of significance was set at .05. Once the information collected in the database was available, we proceeded to generate scales to interpret the variables related to lifestyle, grouped into the dimensions of oral health knowledge, risk of consumption of extrinsic nondairy sugars, beliefs about oral health, and oral health practices. Those variables that in the bivariate analysis were related to attendance at the dental consultation with a *p* value <.05 were included in each dimension. Subsequently, these dimensions were transformed on a scale of 1 to 5 to assess the weight of the responses in a quantitative way; non-responses were excluded from the analysis. Scores greater than or equal to 3.8 were assigned to good knowledge of oral health, acceptable practices in oral hygiene, and favorable beliefs in oral health and higher risk in the case of consumption of nondairy extrinsic sugars. The percentages of those who correctly answered each question on knowledge, practices, and risk behaviors were calculated.

The factors associated with the mothers' perception of their oral health status were determined, both at bivariate and multivariate levels using logistic regression analysis.

It was assumed that those variables whose association with attendance at dental consultation at a bivariate level were statistically significant were incorporated into the multivariate analysis.

Results

The mean age of the surveyed mothers was 24.7, with a *SD* of 6.1, of which 23.6% were adolescents. The perception they had about their oral health status was considered good by 60.8%. Of the 82.9% who reported having attended dentistry, more than half perceived good oral health (Table 1). Regarding health insurance, 52.6% were affiliated to the contributory regime, 35.9% were poor and vulnerable population affiliated to the subsidized regime, and the rest were uninsured.

Delivery care was performed in private clinics (57.4%) and in public hospitals (42.6%). A third of the interviewees considered themselves to be Mestizo, 26.6% Afro-Colombian, 2.2 Indigenous people, and the rest did not declare an ethnic identity. Regarding educational level, 57.3% had finished high school and about 7% had university studies. Seventy percent had good oral health knowledge. Income was perceived as very low or low by 29.3%, middle income by 62.3%, and the rest rated their income as medium-high or relatively high. A quarter of them stated that their resources were insufficient to live. During pregnancy, 29.7% had had problems with their teeth and gums, 79.9% brushed three or more times a day, 98.6% brushed with toothpaste, and a third had never used dental floss; 52.3% were first-time pregnant women.

Pregnant women's perception of their oral health was associated with variables in the economic, social, biological, and lifestyle dimensions; the economic variables related to the perception were the type of insurance, perception of

Table 1. Perception of Oral Health During Pregnancy According to Socioeconomic, Biological, and Lifestyle Variables in Cali in 2012.

Variable measured	N	Perception good oral health (%)	Perception moderate or bad (%)	p value	Odds ratio	95% CI
Use of dental services						
Yes	822	63.1	36.9	<.01	1.7	[1.2, 2.4]
No	169	49.7	50.3			
Health insurance						
Contributory regime	521	65.7	34.3	<.01	1.5	[1.2, 2.0]
Subsidized regime and uninsured	470	55.4	44.6			
Delivery attendance network						
Private	600	64	36	<.01	1.4	[1.1, 1.8]
Public	391	56	44			
Ethnic status						
Afro-Colombian	264	50.9	49.1			
Other	727	64.4	35.6	<.01	1.7	[1.3, 2.3]
School level						
High school or higher	634	65.6	34.4	<.01	1.7	[1.3, 2.2]
Incomplete high school	357	52.5	47.5			
Level of knowledge						
Good	694	63.0	37.0	<.05	1.3	[1.0, 1.7]
Moderate or bad	297	55.9	44.1			
Income perception						
High or medium	701	65.6	34.4	<.01	1.9	[1.5, 2.6]
Low	290	49.3	50.7			
Sufficiency of resources						
Sufficient or just to make a living	734	57.5	42.5	<.01	1.7	[1.3, 2.3]
Insufficient	257	70.4	29.6			
Oral and dental history						
Yes	294	44.9	55.1			
No	697	67.6	32.4	<.01	2.6	[1.9, 3.5]
Practices in oral hygiene						
Acceptable	826	63.4	36.6	<.01	1.9	[1.3, 2.6]
Unacceptable	165	47.9	52.1			
Pregnancies						
First-time pregnant women	518	64.1	35.9	<.05	1.3	[1.0, 1.7]
Multiparous woman	473	57.3	42.7			

Source: prepared by the authors.

sufficiency of resources, and perception of income; the social variables related to perception were educational level and ethnicity; the biological variables related to perception were parity and history of oral problems during pregnancy; and the lifestyle variables related to perception were knowledge of oral health and oral hygiene practices (Table 1). When comparing mothers with a history of oral problems during pregnancy with other mothers, it was observed that for each mother with such history there was 2.5 times perceived poor oral health; each mother in the contributory regime was 1.5 times more likely to have a good perception of their oral health compared with mothers in the subsidized and uninsured regime (Tables 1 and 2).

When analyzing the data through logistic regression in the search for variables related to the perception of oral health in pregnant women, three variables were found with a significant odds ratio: history of dental and gingival problems

during pregnancy, oral hygiene practices, and the perception of income in the home (Table 2).

Despite the relationship found between access to dentistry and a good perception of pregnant women's oral health, this relationship was not available on multivariate examination. However, other social, economic, health services, biological, and lifestyle variables were related in the multivariate analysis with pregnant women's access to dentistry, such as marital status (living with a partner 85.8%, adjusted odds ratio [OR] = 2.8; 95% confidence interval [CI]; [1.7, 4.6]), educational level (complete secondary education or higher 88%, adjusted OR = 1.8; 95% CI [1.2, 2.9]), perception of sufficient resources to make a living (86.6%; OR = 1.9; 95% CI [1.2, 2.9]), remission from antenatal care (95.8%; adjusted OR = 8.0; 95% CI [4.5, 14.3]), and primigravida (87.9%; OR = 2.5; 95% CI [1.5, 3.8]).

Table 2. Multivariate Logistic Regression of the Relationship of Socioeconomic, Biological, and Lifestyle Variables With the Perception of Oral Health During Pregnancy in Cali in 2012.

Variable measured	N	Perception good oral health (%)	Perception moderate or bad (%)	p value	Odds ratio adjusted	95% CI
History of dental and gingival problems						
Yes	294	44.9	55.1			
No	697	67.6	32.4	<.01	2.5	[1.8, 3.6]
Practices in oral hygiene						
Acceptable	826	63.4	36.6	<.01	1.6	[1.1, 2.3]
Unacceptable	165	47.9	52.1			
Income						
Medium or high income	701	65.5	34.5	<.01	1.9	[1.3, 2.6]
Low income	290	49.3	50.7			

Note. Variables: Childbirth care network (public/private), Ethnic status, Level of knowledge, Sufficiency of resources, Oral and dental history, Practices in oral hygiene, First Trimester Control (attended), Marital status, Health insurance, Dental floss (use), Belief for each pregnancy is lost one tooth, Age (minors vs. others), Education level, Income.

Variables such as marital status and medical history during pregnancy were not related to oral health perception during pregnancy.

Discussion

This is the first study in a Spanish-speaking population carried out in pregnant women that shows how social, economic, health service, biological, and lifestyle factors in oral health are related to the self-assessment of oral health status perceived during pregnancy in a representative sample in the largest city in southwestern Colombia. Pregnant women with no history of oral problems, with a perception of medium or high income, and with good oral hygiene practices tend to have a good perception of their oral health. Identifying in prenatal control how pregnant women self-evaluate their oral health can guide health services to explore the natural history of common oral diseases, considering the context where pregnant women live and which determine their state of health, in order to improve the planning processes of interventions in oral health of the mother-child binomial. The three variables resulting from the multivariate exploration contribute elements to the hypothesis that the self-assessment of health integrates biological, psychosocial, and social dimensions (Saliba Rovida et al., 2014).

Studies like this one make visible unjust, avoidable, and preventable situations, which will facilitate the application of the social determinants approach in maternal and childcare.

The perception of their oral health was related to using dental services (Table 1), but it was not decisive for the decision of pregnant women for doing that since it behaved as a confounding variable when performing the multivariate analysis, where it is observed that it did not have predictive effect. Other variables, such as income perception, had a greater influence, which is in agreement with those who state that the socioeconomic level influences a series of factors in people's lives that can be reflected in habits and behaviors (Ramos et al., 2000). One of the political implications of this

study is the evidence of how social and economic determinants affect oral health perception, which in turn is associated with attendance at the dental consultation, corroborating findings regarding health perception found by previous studies (George et al., 2013).

This study did not find a relationship between the oral health perceptions of pregnant women and risky behaviors, such as frequent consumption of extrinsic nondairy sugars, contrary to what was found in other health perception studies regarding health risk behaviors (Haddock et al., 2006).

The perception of oral health status in this study was 60.8% in all pregnant women, and 86.1% in mothers who attended dentistry during pregnancy. Other studies found that perception at 62.6% to 82%, between good and excellent (Dunn, 2002; Keirse & Plutzer, 2010), and 41% and 45.7%, good (Saliba Rovida et al., 2014). Knowing how pregnant women perceive oral health (subjective assessment) is a good starting point to carry out motivational actions intended to improve behaviors and practices that help prevent frequent problems, such as caries and periodontium problems (objective assessment), so more than using the dental service, this self-perception can contribute to improving self-care in oral health.

The knowledge in oral health valued from the identification of problems such as caries, inflammation, and bleeding of the gums, as well as the knowledge of the bacterial plaque and means for its control were related to the perception in oral health. But this relationship is affected when comparing the perception between pregnant women who attended and did not attend the dental consultation, where the perception of their oral health loses significance. Contrary situation occurs with oral health practices measured through brushing frequency, the use of dental floss and the frequency of brush change in the year, which in addition to being associated with oral health perception, when compared with accessibility to the dental service, continued to maintain their significance (OR = 1.32; 95% CI [1.12, 1.56] without the interaction of access to dentistry vs. OR = 1.22; 95% CI [1.02, 1.46] with access to dentistry).

When performing a multivariate correspondence analysis between the economic variables registered through the perception of household income and the perception of sufficient resources to live with an objective variable such as affiliation to social security, which is mediated with the ability to pay, a correspondence was found between those with very low incomes and insufficient resources to live with being affiliated to the subsidized regime and a correspondence was found between those who had high and medium incomes and had sufficient or fair resources to live insured in the contributory regime. The self-perception in health and other variables, such as oral care, knowledge achieved in oral health, and hygiene practices, was better in those with better socioeconomic status, confirming that there is an unequal relationship between individual poverty and self-perception of health that occurs in inequitable communities (Deghatipour et al., 2019; Silva et al., 2020).

The effect of oral health perception in relation to the visit to dentistry during pregnancy was attenuated when there were controlled variables such as the orientation given in prenatal control on the importance of attending dentistry. This result suggests not only the importance of the role of the services in the orientation toward dental consultation but also the importance of self-assessment of pregnant women about their oral health status to attend dentistry in those places that did not receive oral health information. Other studies have found how self-perception in health can reflect the availability of resources and the quality of environmental factors that affect health (Idler & Benyamini, 1997).

Income inequality can affect people's perception of health by reducing access to the best care, quality of housing, or health, or it can be part of a chain of causality that ultimately affects the environment of all people (N. J. López et al., 2002).

These findings show that the poor and vulnerable population, despite having subsidized health insurance, do not have other social determinants such as better educational levels and better income opportunities, which affect their perception of health (Deghatipour et al., 2019; Keirse & Plutzer, 2010; Plutzer & Spencer, 2008).

In this study, 52.3% of those interviewed were first-time pregnant women and attended dentistry in a greater proportion than multiparous mothers, in addition to having a better perception of oral health than multiparous mothers. Other studies only reported parity but did not relate it to oral health perception or access to dentistry (Sánchez, 2011).

Oral health perception was associated with a history of dental and gum problems in bivariate and multivariate relational analyses, so it is very important to address treatments once they enter prenatal control, not only because of the improvement they will have in their perception of oral health but also in improving the ability to relate to others, express emotions, and enable the most fundamental functions of smell, taste, touch, chewing, and swallowing (Healthy People 2020, n.d.).

Health education and health are closely linked to the extent that the combination of information and education activities leads to a situation where people want to be healthy, know

how to achieve health, do what they can individually and collectively to maintain it, and seek help when they need it (Fernández y Fernández-Arroyo, 2017a). This study finds opportunities to improve self-perception in oral health of pregnant women through both technical personnel (such as health promoters) and health professionals who care for pregnant women, providing timely guidance on oral hygiene habits and referral to the service of odontology. The burden of dental disease must be addressed at the same time that different health professionals empower pregnant women and communities to gain control over their lives (Asoh & Rivers, 2010; Fernández y Fernández-Arroyo et al., 2014). The differences in perception of health by ethnicity should guide health educators to consider the worldview of health that different ethnic groups have. Health education during pregnancy is a powerful tool in moments of maximum vulnerability such as "pregnancy, childbirth, and the puerperium" (Fernández y Fernández-Arroyo, 2017b).

This study shows how there are social determinants related not only to the perception of oral health but also to access to dental services; therefore, an approach aimed at closing structural gaps such as manifest poverty with low income, low educational level, an ethnic group such as the most vulnerable Afro-Colombians, should be held by the people and entities in charge of promoting healthy communities and this exceeds the recommendation of informative communication and support proposed at the community level. People who promote health education, in addition to inquiring about health perceptions, must scrutinize current realities and policies, foster a positive, activist attitude, refuse to blame the victim, and work for equality, peace, and democracy (Greene & Simons-Morton, 1998).

Pregnant women with poor oral hygiene, who perceive a burden of oral disease either because their gums bleed and because they have dental discomfort or pain, as well as low-income pregnant women should be prioritized in the oral health literacy program, although all pregnant women should be cared for both in prenatal control and in the dental service.

Among the limitations of this study is the type of analytical cross-sectional study, whose scope allows only the generation of hypotheses from statistical explorations at the time of the study. Neither were considered other variables that may influence the decision to attend the health service or the implementation of preventive health practices, such as social capital.

Another of the limitations of the study was the non-inclusion of cultural aspects related to health beliefs that did not obtain acceptable fidelity tests according to Cronbach's alpha values, while other variables related to lifestyles such as health knowledge, oral hygiene, and risk behavior in the intake of extrinsic nondairy sugars, resulted in Cronbach's alpha values qualified as acceptable, so that future studies should include tests that improve reliability tests for beliefs in oral health such as factor to take into account in oral health lifestyles.

This study did not include the clinical evaluation of the interviewees but found risky behaviors such as eating between main meals, the consumption of carbohydrate-rich foods, and poor control of bacterial plaque all increases the chances of dental caries and problems of gums, causing discomfort and a poor or regular perception of your oral health.

Conclusions

Pregnant women with no history of oral problems, with a perception of medium or high income, and with good oral hygiene practices tend to have a good perception of their oral health.

These findings should be taken into account in the development of clinical practice guidelines (Amin & ElSalhy, 2017) as a strategy to approach the social determinants of health from the health services. The findings of the study suggest the hypothesis that the perception of oral health of the pregnant women evaluated is affected by individual and social factors. Health authorities can guide their public policies on oral health of pregnant women considering social conditions, ethnicity, income, and behavioral factors related to oral hygiene and the burden of oral disease present, to be treated intersectoral and interdisciplinary.

Acknowledgments

The authors thank the logistical support given by the Health Secretariat of Cali to carry out the study in hospital institutions of the health network.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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