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Original Article

Pregnancy-Related Oral Health Beliefs in Southwestern Ontario: Prevalence and Implications for Maternal and Fetal Health

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ABSTRACT

Misunderstandings about dental care and oral health during pregnancy can cause expectant mothers to skip dental visits and make limited use of available services. This avoidance may reduce adherence to oral hygiene routines and may have downstream effects on fetal health. The present study examined prevalent oral-health-related beliefs held by pregnant women in Southwestern Ontario, Canada. Participants were recruited through the Family Medicine Obstetrics Clinic in London, Ontario, Canada. Eligible individuals were pregnant women aged 18 years or older, excluding only those who declined involvement. Each participant filled out a 33-item questionnaire that included three open-ended prompts on oral health beliefs and how these might influence pregnancy. These qualitative responses were analyzed for this project. NVivo software was used for thematic coding to identify repeated ideas. Sub-themes were created to organize the content, and the proportion and frequency of each category were calculated. A total of 130 pregnant women qualified for inclusion. Of these, 40.7% (n = 46) believed their oral condition could affect their child's health, 48.2% (n = 53) thought dental procedures could influence fetal health, and 64.4% (n = 76) stated that pregnancy itself changes oral health. Many participants associated oral health issues in pregnancy with infection-related risks. Concerns were commonly expressed about the use of antibiotics, pain-relief medications, and dental x-rays during pregnancy. Frequently mentioned ideas about the effects of pregnancy on the mouth included increased sensitivity, tooth decay, inflammation of the gums, and the perceived loss of minerals from the mother to the fetus. The study identified several significant misconceptions about dental treatment and oral health among pregnant women in Southwestern Ontario. These findings demonstrate the need for stronger oral health education during pregnancy to correct inaccuracies and encourage appropriate dental care. Health professionals are advised to prioritize addressing misinformation, reassure patients about the safety of essential dental procedures, and reinforce the importance of maintaining oral health for both mother and fetus.

Keywords: Pregnancy, Oral health, Ontario, Fetal health

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Introduction

Pregnancy-related hormonal shifts and changes in oral pH increase the likelihood of gingivitis and periodontal problems in expectant mothers [1]. These oral diseases can intensify systemic inflammation and interfere with nutrition and overall health, both of which are critical to maternal and fetal outcomes [2]. Such conditions also negatively influence various dimensions of quality of life, including functional, emotional, and physical aspects [3]. Promoting oral health supports both the well-being of the mother and the growth and development of the fetus [4].

Even though research consistently highlights the importance of oral care during pregnancy, global rates of dental service use during this period remain low [5]. Financial limitations, logistical issues, and limited awareness regarding the relevance of dental care contribute to this reduced access. However, the most influential barrier appears to be negative beliefs about

oral health and fears surrounding the safety of dental treatment while pregnant [6, 7]. A recent systematic review documented frequent misconceptions involving the safety of procedures such as local anesthesia, prescriptions, and restorative work; worries about dental radiographs were the most commonly reported [8]. Another repeated misunderstanding was the belief that routine dental examinations might endanger the fetus, prompting many women to avoid preventive appointments altogether [8]. The review also reported that some women consider gingivitis and dental caries to be an inevitable part of pregnancy [8].

These persistent negative perceptions often arise from cultural norms, family viewpoints, educational limitations, and, in some cases, recommendations from health providers that contradict professional guidelines from the American and Canadian Dental Associations, both of which strongly endorse preventive dental care during pregnancy [9–12]. Social networks, elder family members, and lower socioeconomic or educational backgrounds are among the leading influences shaping such beliefs [13].

Unfavorable oral-health beliefs during pregnancy have been directly linked to avoiding dental treatment and reduced dental service utilization [8, 14]. These perceptions can weaken motivation to maintain proper oral hygiene, which may have consequences for fetal health [13]. Understanding these beliefs is essential for designing effective preventive strategies and improving oral health awareness during pregnancy. Research focused specifically on this topic in Southwestern Ontario is scarce, and Canada's wide cultural diversity further emphasizes the need for localized investigation. Prior studies [15, 16] have noted this gap. This descriptive study aims to contribute to filling that need by examining oral health beliefs among pregnant women in Southwestern Ontario.

Materials and Methods

This project represents one component of a broader cross-sectional investigation examining gaps in oral health care and patterns of dental service use among pregnant individuals in Southwestern Ontario. Ethical clearance was granted by the Western University Health Science Research Ethics Board (Review Reference: 2022-121440-70801) and by the Lawson Health Research Institute (R-22-505).

Participant recruitment and data collection

Recruitment took place at the Family Medicine Obstetrics Clinic within the London Health Sciences Centre in London, Ontario, Canada. The clinic mainly serves pregnant patients who do not have their own primary care provider or an established antenatal care arrangement. To participate, individuals needed to be 18 years or older; declining participation was the sole exclusion criterion. Prior to data collection, clinic staff—including nurses and administrative personnel—attended a 30-minute briefing to familiarize themselves with the study aims, consent process, questionnaire layout, and recruitment steps.

Due to the exploratory nature of the work, data were gathered in two separate time frames—November 8 to December 6, 2022, and May 1 to May 30, 2023—achieving an 86.7% response rate. The two-phase design accommodated clinic workflow and patient volume, as recruitment slowed once the majority of patients at subsequent visits were already enrolled and returning for follow-up. A pause was therefore required until new patients became available.

The clinic assistant approached eligible women to complete a 33-item self-administered questionnaire. Survey versions were available in English, Arabic, and Spanish. When a participant could not communicate in any of these languages, interpretation services routinely provided by the London Health Sciences Centre assisted with survey completion. Development of the instrument and previously reported quantitative findings from 30 of the 33 items have been described in detail elsewhere [17]. For the current illustrative analysis [18], only the three open-ended items (Q31–Q33) were examined. These items were designed to capture the full range of pregnancy-related oral health beliefs identified in an earlier literature scan, which later contributed to a systematic review on unfavorable beliefs [8].

Data analysis

Descriptive statistics were first applied by a single researcher (YMK) to demographic information and to the categorical responses ("Yes," "No," "Not Sure") associated with the three belief-related questions. This initial review was completed before the qualitative work to avoid contaminating the interpretation of the open-ended material.

Qualitative analysis proceeded independently by two researchers (MH and YMK) using a thematic approach. Both reviewers repeatedly read the full set of responses to develop familiarity with the content. Preliminary coding was then applied to specific statements capturing notable ideas linked to the three overarching themes. Codes were subsequently consolidated into broader sub-themes reflecting the main views expressed by participants. To validate these sub-themes, a third reviewer (AJ) conducted member

checking. A content analysis followed, aimed at identifying the most frequently expressed beliefs and assessing variation across responses. Each statement was placed into one of the established sub-themes, and the proportion and frequency of each category were calculated.

Results and Discussion

Out of 150 individuals invited to take part, 130 (86.7%) completed the survey and the belief-related questions concerning oral health access.

Table 1 summarizes participant demographics from the Family Medicine Obstetrics Clinic in Southwestern Ontario. The majority were 22–34 years old (n = 96; 73.6%) and married (n = 86; 66.2%). Nearly half were in their third trimester (n = 60; 46.2%). Higher education was common, with n = 84 (64.6%) reporting completion of college or university programs. Income over $80,000 was reported by n = 28 (22.1%). A large proportion were born outside Canada (n = 88; 67.7%), had lived in Canada for under five years (n = 58; 70.3%), and did not identify as refugees (n = 73; 83.0%).

Table 1. General characteristics of a sample of pregnant women recruited from the Family Medicine Obstetrics Clinic, Southwestern Ontario [17].

Characteristic	n (%)
Age (n = 130)	
18–21 years	7 (5.4%)
22–34 years	96 (73.6%)
35–43 years	27 (20.8%)
Pregnancy trimester (n = 130)	
First trimester	20 (15.4%)
Second trimester	50 (38.5%)
Third trimester	60 (46.2%)
Marital status (n = 130)	
Married	86 (66.2%)
Common-law / living with partner	31 (23.9%)
Other (single, divorced, separated, widowed)	13 (10.0%)
Highest level of education (n = 130)	
Did not complete high school	8 (6.2%)
High school diploma or equivalency	22 (16.9%)
Some college/university or trade/vocational	16 (12.3%)
Completed college or university degree	84 (64.6%)
Country of birth (n = 130)	
Canada	42 (32.3%)
Outside Canada	88 (67.7%)
Years living in Canada (n = 82)*	
≤5 years	58 (70.3%)
>5 years	24 (29.3%)
Refugee status (n = 88)*	
No	73 (83.0%)
Yes	15 (17.1%)
Annual household income (n = 127)	
<$20,000	23 (18.1%)
$20,000–$40,000	27 (21.3%)
$40,000–$60,000	20 (15.8%)
$60,000–$80,000	12 (9.5%)
>$80,000	28 (22.1%)
Prefer not to answer	17 (13.4%)

Table 2 summarizes how participants responded to items related to oral health in pregnancy. Fewer than half indicated that oral health influences fetal well-being (n = 46; 40.7%). Slightly over half believed that dental care can affect the fetus (n = 53; 48.2%), and nearly two-thirds stated that pregnancy itself alters their own oral health (n = 76; 64.4%).

Table 2. Distribution of oral health belief responses among pregnant women attending a family medicine obstetrics clinic in Southwestern Ontario.

Belief / Concept	n (%)
Does oral health affect the health of the baby/fetus? (n = 113)	
Yes	46 (40.7%)
No	54 (47.8%)
Not sure	13 (11.5%)
Does dental treatment affect the health of the baby/fetus? (n = 110)	
Yes	53 (48.2%)
No	45 (40.9%)
Not sure	12 (10.9%)
Does pregnancy affect a woman's oral health? (n = 118)	
Yes	76 (64.4%)
No	27 (22.9%)
Not sure	15 (12.7%)

Table 3 outlines the key themes and corresponding sub-themes associated with oral health beliefs, accompanied by participant examples. Four sub-themes emerged regarding how oral health may influence pregnancy:
(1) infection-related concerns,
(2) fears of negative pregnancy outcomes,
(3) effects on maternal systemic health, and
(4) miscellaneous beliefs.

Participants frequently mentioned possible infections and complications—such as preterm delivery—as consequences linked to oral health during pregnancy.

Table 3. Primary themes and sub-themes describing beliefs about oral health in pregnancy among women recruited at the Family Medicine Obstetrics Clinic, Southwestern Ontario.

Concept	Sub-themes	n	Illustrative excerpts
Beliefs about how oral health influences pregnancy (n = 46)	Risk of infection	16	"Bacterial problems might reach the fetus.""Possibility of a serious infection.""If untreated, it might worsen oral issues and lead to additional complications."
	Adverse pregnancy outcomes	5	"Gingivitis or tartar buildup could trigger an early delivery."
	Maternal overall health	5	"Keeping good oral hygiene may lower disease risk and support mental wellness.""Poor dental hygiene can create infections that circulate in the bloodstream."
	Other	9	"The baby's oral health is linked to the mother's.""Unhealthy teeth can interfere with eating and many daily functions.""If I'm in pain, my baby will sense it too.""Saliva could transfer bacteria to the baby."
Beliefs about how dental treatment affects pregnancy (n = 53)	Negative effects of medications	12	"Using antibiotics might pose danger to my baby.""Chemical components could be harmful to the fetus."
	Negative effects of dental X-rays	11	"Radiographs could be unsafe."
	Negative effects of anesthetics	10	"I'm concerned anesthetics may not be safe.""I assume freezing or anesthesia shouldn't be used during pregnancy.""Anesthetic drugs might impact the baby.""X-rays or anesthetic agents aren't ideal during pregnancy."
	Positive aspects of dental treatment	7	"Clearing an infection would likely be helpful.""If oral care isn't done, problems could become harder to manage.""…it could enhance quality of life.""Catching an issue early is beneficial.""Treatments help fix problems or prevent worsening."

	Risks tied to specific procedures	5	"Certain procedures aren't advisable when pregnant.""Only problematic if surgery or anesthesia is required."
	Other	5	"If a clinic has poor hygiene, treatment could influence pregnancy.""Dental work might increase complications, for example, tooth extraction may raise bleeding risk, which could affect the fetus.""Pain-related irritability.""Higher likelihood of bleeding.""Possibly temporary bacteremia after cleaning."
Beliefs about how pregnancy affects oral and dental health (n = 76)	Gingivitis and gum bleeding	27	"I'm aware that gingivitis is an issue.""Pregnancy can cause swollen gums."It might lead to gum bleeding."
	Dental caries, tooth sensitivity, and pain	19	"Pregnancy raises the chance of cavities.""It can weaken enamel and influence gum health.""I might get more cavities or lose teeth because of insufficient calcium."
	Loss of minerals to the fetus	16	"Loss of calcium and potassium.""I feel more sensitivity, and the baby takes calcium from me."Decalcification or nutrient depletion.""The baby draws everything it needs from the mother.""Calcium levels drop.""Lower calcium might harm teeth.""I might be more cavity-prone or lose teeth due to inadequate calcium."Teeth or bone may weaken because of calcium deficiency."
	Morning sickness and reflux	9	"Acid from vomiting can damage teeth."
	Hormonal changes	7	"Hormonal shifts influence oral tissues.""…and hormones can impact dental health too.""Cavities and gum swelling occur due to hormonal changes."
	Diet	4	"Eating patterns differ during pregnancy."
	Delaying dental care	2	"Pregnancy may postpone dental work, letting problems worsen before treatment is possible.""Immune changes mean dental health also declines during pregnancy."

Beliefs about how dental care might impact pregnancy were organized into six sub-themes:
(1) medication use,
(2) dental radiographs,
(3) anesthetics,
(4) perceived benefits of dental treatment,
(5) risks tied to specific procedures, and
(6) other views.

The most frequent concerns centered on antibiotics, pain medications, and x-ray exposure. Some respondents attributed potential harm to certain interventions, such as surgical procedures carried out during pregnancy. In contrast, others emphasized positive aspects of dental care, noting that eliminating infections, identifying dental issues early, preventing worsening conditions, and resolving oral problems could improve their comfort and overall quality of life.
Beliefs about how pregnancy might influence oral and dental health generated seven sub-themes:
(1) gingival bleeding and inflammation,
(2) dental caries, hypersensitivity, and pain,
(3) mineral depletion by the fetus,
(4) vomiting and acid reflux,
(5) hormonal shifts,
(6) dietary habits, and
(7) postponing dental care while pregnant.

Many participants reported experiencing—or expecting to experience—oral issues such as sensitivity, cavities, gum bleeding, and gingivitis during pregnancy. A prominent sub-theme involved fetal calcium demands, with some believing they were more at risk for tooth decay or tooth loss due to inadequate calcium, calcium "taken" by the baby, or general mineral reduction. Others associated morning sickness and stomach acid with dental problems, and many linked oral changes to hormonal or dietary shifts. Several participants also indicated they might delay dental visits during pregnancy.
This investigation identified the dominant oral health beliefs among pregnant women receiving care at the Family Medicine Obstetrics Clinic in Southwestern Ontario. Most participants rated their oral health as good to excellent and considered oral health to be highly important.

Evaluation of beliefs about oral health during pregnancy revealed several major themes. Four sub-themes emerged regarding the perceived influence of oral health on pregnancy, with infection risk and adverse outcomes being the most often mentioned. Comparable findings were reported by Liu *et al*. [19] and Murphey [9], whose participants expressed anxiety about dental offices and procedures because they feared that microorganisms or treatment environments could endanger the fetus. Such concerns may stem from the ways in which oral conditions influence overall health and daily functioning during the prenatal period [8].

Periodontal inflammation and untreated dental caries can develop into localized oral infections. Although the evidence is not definitive, certain studies have proposed a connection between these oral diseases and outcomes such as preterm delivery or low birth weight [20]. Oral health issues may also heighten stress or discomfort during pregnancy, which can in turn affect both the mother and the developing fetus [21]. Many of these problems, however, are preventable through attention to oral hygiene, regular dental assessment, dietary moderation—including limiting sugar—and timely treatment of active dental disease [8, 22].

Guidance from both the American and Canadian Dental Associations states that dental care during pregnancy is safe and important for maintaining oral health [11]. Deferring essential procedures—such as periodontal therapy, extractions, restorations, or root canal treatment—may escalate into more serious complications [11, 12]. Routine preventive care, including semi-annual examinations and cleanings along with daily brushing and flossing, is recommended throughout pregnancy to reduce the risk of decay, infection, and tooth loss [11, 12].

Beliefs concerning how dental care may influence pregnancy produced six sub-themes, encompassing unfavorable views about medications, dental radiographs, and anesthetics; positive perspectives on dental procedures; and concerns linked to procedure-specific risks, with negative medication-related beliefs being the most frequently noted. These observations align with the systematic review by Kamalabadi *et al*. [8], which reported that many individuals believed dental medications should be avoided to prevent potential harm to the mother or fetus. When antibiotics are required, options such as penicillin, erythromycin, and cephalosporins are considered safe during pregnancy, whereas tetracycline, vancomycin, and streptomycin remain contraindicated [23]. Tetracycline can permanently stain developing teeth and interfere with bone and tooth calcification, and both tetracycline and vancomycin are linked to nephrotoxicity and ototoxicity, respectively [23, 24]. For this reason, any medication use during pregnancy should occur only after consultation with qualified healthcare providers to reduce possible risks to both maternal and fetal health.

The second most frequent sub-theme involved negative impressions of dental x-rays during pregnancy. Kamalabadi and colleagues documented in their review that the proportion of participants holding unfavorable beliefs about radiographic exposure and its supposed association with poor pregnancy outcomes ranged from 31% to 93%, with some suggesting that x-rays might result in miscarriage [8]. Although the safety of dental radiographs in pregnancy has long been debated, more recent research indicates that, when proper protocols are followed, radiation levels remain far below teratogenic thresholds and are unlikely to induce congenital abnormalities [25]. Even with these low exposure levels, some risk persists because the effect of radiation depends on fetal developmental stage—fetuses in the second and third trimesters are more resistant, while the first trimester is more vulnerable [26]. While some scholars emphasize that early diagnosis outweighs potential risks [25], others suggest delaying non-urgent imaging or adopting additional precautions [27]. Participants in this study also highlighted the role of dental care in preventing future oral complications as a rationale for treatment during pregnancy.

Beliefs regarding the influence of pregnancy on oral and dental conditions produced seven sub-themes, the most frequent being gingivitis and gum bleeding, dental caries and tooth sensitivity, and loss of minerals to the fetus. Based on quantitative results, many respondents reported experiencing oral diseases such as periodontal problems and cavities during pregnancy [17]. Comparable findings were noted by Islam & Haque [28], who identified gingivitis, periodontitis, erosion, xerostomia, caries, and pregnancy-associated tumors as common oral concerns in pregnant women. Consequently, these issues are sometimes accepted as a "normal" part of pregnancy, with women expected to manage them independently [29]. Another widely cited belief was that the fetus "draws" minerals—particularly calcium—from the mother, leaving teeth more susceptible to decay. Current evidence, however, does not support this notion [30]. Nawabi *et al*. [31] reported that pregnant women's oral health knowledge varies according to education level, cultural context, socioeconomic factors, and other psychosocial determinants. As our clinic population encompassed diverse social backgrounds, it is plausible that these factors contributed to misconceptions about mineral

loss; nevertheless, larger studies are needed to verify this possibility.

Our findings revealed a mixture of misconceptions and accurate perceptions relating to dental health during pregnancy. Although a portion of beliefs—especially those concerning calcium depletion or the normalization of oral diseases—lack scientific support, participants also reported constructive attitudes, such as timely care-seeking and an understanding of hormonal influences on oral tissues. These outcomes emphasize the value of embedding oral healthcare within routine prenatal services. Israel (32) noted that integrating midwives and community health personnel into clinical practice can enhance prenatal outcomes, reduce complications, and promote successful births and breastfeeding. Such coordinated care should be reinforced through interdisciplinary education involving trainees from dentistry and other health professions to promote sustained collaborative practice.

Limitations

Several limitations should be considered. There is a potential source of bias, as one investigator (YMK) contributed to the quantitative analysis and assisted with coding qualitative responses, which may have shaped interpretation. To minimize this, a second reviewer (MH) and a team member (AJ) participated in verification to strengthen accuracy and consistency. Collecting data concurrently while analyzing each component independently can be challenging, particularly when findings differ, and may also reduce subtlety when categorizing open-ended responses. A small subset of participants were not native English speakers. Although translations into Spanish and Arabic were supplied, some interpretative bias remains possible. Another limitation involves restricted generalizability, as the sample size was modest and drawn from one urban clinic. Future work should incorporate larger, more heterogeneous populations and examine determinants of oral health beliefs—such as culture, economic status, and access to dental care—to broaden applicability. Even with these constraints, the study offers insight into prevalent beliefs among pregnant women within North American and Canadian settings.

Conclusion

This study illustrates the frequent misunderstandings and concerns pregnant women in Southwestern Ontario hold regarding oral health and dental treatment. Although participants generally acknowledged the importance of oral care, several beliefs could discourage them from accessing needed services, potentially affecting maternal and fetal outcomes. The results highlight the importance of focused oral health education and the integration of dental services within prenatal care. Providing clear, evidence-based information may help reduce misconceptions and encourage timely dental treatment throughout pregnancy.

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