Research Article

Self-Rated Periodontal Health and Its Association With Pre-Eclampsia Among Pregnant Patients in Lagos State

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Background: Periodontal disease is a risk factor for preterm birth, low birth weight, and other perinatal outcomes, but due to limited access to dental services and a shortage of trained dental professionals, self-reported measures can serve as a valuable adjunct for identifying at-risk populations, facilitating early intervention, and optimizing resource allocation in settings where comprehensive clinical assessments are not readily available. This study aims to determine the association between self-rated maternal periodontal status and preeclampsia among pregnant women in Lagos, Nigeria.

Methods: A descriptive survey was conducted at the Lagos State University Teaching Hospital (LASUTH) Obstetrics and Gynecology department among pregnant women with a diagnosis of Pre-eclampsia. Self-Rated Periodontitis Assessment was measured using the validated periodontal disease self-report surveillance questionnaire, while the participants' demographic and clinical parameters were recorded. A binary logistic regression analysis was used to determine the risk factors for self-rated periodontitis among the pre-eclamptic participants. Statistical analyses provided odds ratios and their respective 95%CI.

Results: The study findings reveal that self-rated periodontitis was not significantly associated with most pregnancy outcomes, though gravidity demonstrated a significant association with self-rated periodontitis (p=0.026), with multigravida women (60.5%) showing a higher prevalence compared to primigravida women (27.9%). In the logistic regression analysis, although not statistically significant, higher odds of self-rated periodontitis were observed among women with increased parity (aOR = 1.610, 95% CI: 0.915-2.834, p=0.099), greater gravidity (aOR = 1.089, 95% CI: 0.787-1.507, p=0.606),

maternal admission (aOR = 1.293, 95% CI: 0.574-2.913, p=0.536), and low birth weight infants (aOR = 1.315, 95% CI: 0.467-3.700, p=0.604). The absence of a significant association with stillbirth (aOR = 0.957, p=0.950) contrasts with the slightly elevated odds in other obstetric parameters.

Conclusion: Higher odds were observed in the logistic regression model for increased parity, gravidity, maternal admission, and low birth weight with self-rated periodontitis. These findings emphasize the need for future research utilizing larger cohorts and a control group to better elucidate the potential interplay between self-rated periodontal disease.

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Introduction

Maternal and child health (MCH) is crucial to the Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being). It aims to reduce maternal and child mortality, improve access to quality healthcare, and promote nutrition, immunization, and reproductive health. Strengthening MCH enhances social and economic development by ensuring healthy generations, reducing poverty, and promoting gender equality (SDG 5).[1][2] Maternal and child health remains a fundamental public health priority, particularly in low- and middle-income countries (LMICs) where maternal and infant mortality rates remain unacceptably high.[3][4] Despite global efforts to reduce maternal mortality, sub-Saharan Africa continues to account for over 66% of maternal deaths worldwide, with Nigeria contributing significantly to these statistics. [4] The high burden of maternal complications is closely linked to inadequate prenatal care, limited access to essential health services, and socio-economic disparities. [5] While significant attention has been given to maternal conditions such as preeclampsia, anemia, and postpartum hemorrhage, a critical but often overlooked determinant of maternal health is periodontal health.[6] Evidence increasingly suggests that poor maternal oral health is associated with adverse pregnancy outcomes, including preterm birth, low birth weight, and preeclampsia, and that periodontal therapy can reduce adverse pregnancy outcomes.[6][7]

Approximately 40% of pregnant women have some form of periodontal disease, and the rate is higher among racial and ethnic minorities and women of low socioeconomic status. [8] Periodontitis is a chronic inflammatory condition triggered by localized bacterial infections, leading to the progressive breakdown of periodontal tissues and potential tooth loss. [9][10] Worldwide, an estimated 616 million individuals are

affected by severe periodontitis [11][12], with central Sub-Saharan Africa reporting a higher prevalence of 13.5%.[13] Periodontal diseases (PD) have demonstrated a biological pathway to produce a systemic inflammatory response through the release of metalloproteinases, prostaglandins (PgE2), and cytokines like IL-1β, IL-6, and TNF-α, leading to bone resorption and systemic spread via the bloodstream. PD may exacerbate immune responses and elevate systemic inflammatory markers, potentially contributing to complications such as gestational diabetes, preeclampsia, intrauterine growth restriction, early abortion, preterm birth, low birth weight, and neonatal infections.[14]

Although oral diseases are highly prevalent during pregnancy and are well-established risk factors for adverse pregnancy outcomes, a significant proportion of pregnant women do not proactively seek dental care during this critical period[15][16][17]. This reluctance is partly driven by the widespread misconception that oral health complications are an inherent aspect of pregnancy and will spontaneously resolve postpartum[15]. Unfortunately, oral health screenings are often overlooked in antenatal care services, including in numerous healthcare facilities across Nigeria. Incorporating dental health services into Nigeria's primary healthcare system can improve access to oral care for pregnant women, as antenatal care is a fundamental component of primary healthcare in the country. However, only a limited number of primary healthcare centers in Nigeria provide oral health services[18], with the majority concentrated in urban centers such as Lagos. Therefore, it is crucial to enhance oral health awareness among pregnant women by integrating oral health education into routine antenatal visits, potentially through a dedicated section in the *Road to Health* chart[19].

The role of periodontal disease as a risk factor for preterm birth, low birth weight, and other perinatal outcomes has been explored in many high-income countries (HIC).[20] However, Nigerian studies remain limited in scope, often focusing on descriptive surveys on oral health knowledge, and often have no representation in studies that assessed the clinical impact of periodontal diseases on pregnancy-related outcomes.[5][6][7] Moreover, limited access to dental services, coupled with a shortage of trained dental professionals in Nigeria,[21][22] poses significant challenges to the utilization of normatively assessed periodontal status in both clinical and epidemiological settings. The reliance on professional periodontal examinations is often constrained by inadequate healthcare infrastructure, particularly in resource-limited regions, where dental workforce shortages further exacerbate disparities in oral healthcare access. Consequently, self-rated periodontal health has emerged as a pragmatic and cost-effective alternative for preliminary periodontal screening. By enabling individuals to assess their periodontal

condition subjectively, self-reported measures can serve as a valuable adjunct for identifying at-risk populations, facilitating early intervention, and optimizing resource allocation in settings where comprehensive clinical assessments are not readily available. Integrating self-rated periodontal health assessments into routine healthcare services could thus serve as a crucial strategy for bridging the gap in periodontal disease surveillance and management.[23][24] This study seeks to bridge the existing research gap by exploring the association between self-rated maternal periodontal status and preeclampsia among pregnant women in Lagos, Nigeria.

Methodology

Study Design

This study adopted a hospital-based cross-sectional design to explore the relationship between self-rated periodontitis and pre-eclampsia among pregnant women in Lagos State. The cross-sectional design aims to identify potential associations between self-rated periodontitis and pre-eclampsia.

Study Setting

The study was conducted in the Lagos State University Teaching Hospital (LASUTH) Obstetrics and Gynecology department, a tertiary referral center providing comprehensive antenatal and maternity services. The LASUTH Obstetrics and Gynecology Department is a consultant-led, 170-bed capacity, state-of-the-art facility, with cutting-edge medical equipment, 30 incubators, five operating theaters, oxygen plants, an intensive care unit, and a high-dependency unit, among other advanced resources. This facility was selected based on its high patient turnout, accessibility, and availability of qualified healthcare professionals to confirm the diagnosis of pre-eclampsia. At the time of the study, the hospital was among the three primary referral centers in Lagos State, which has an estimated population of around 25 million. Lagos State was chosen as the study location due to its ethnically diverse population and significant burden of hypertensive disorders in pregnancy[25]. The study received approval from the Health Research and Ethics Committee of the Lagos State University Teaching Hospital. Written informed consent was obtained from all participants before data collection. Confidentiality was strictly maintained by de-identifying participant data and storing electronic records securely with password protection.

Study Population and Eligibility Criteria

The study population comprised pregnant individuals attending antenatal and maternity clinics in the selected healthcare institutions.

- The study population comprised women diagnosed with pre-eclampsia or eclampsia who gave birth in the maternity unit.
- Pre-eclampsia was defined based on the presence of hypertension and proteinuria.
- Hypertension was identified as a systolic blood pressure of ≥ 140 mmHg or diastolic blood pressure of ≥ 90 mmHg, recorded on two separate occasions at least four hours apart.
- Proteinuria was confirmed by either:
- A urinary protein level of ≥ 300 mg in a 24-hour urine collection, or
- A dipstick reading of ≥ 1+ on at least two occasions, spaced at least four hours apart, without a urinary tract infection.

Inclusion Criteria

- Pregnant individuals aged ≥18 years.
- Gestational age of ≥20 weeks.
- Attending antenatal clinics in the hospital.
- Willingness to provide informed consent.

Exclusion Criteria

- Individuals with a pre-existing diagnosis of chronic hypertension before pregnancy.
- History of renal disease, autoimmune disorders, or cardiovascular diseases before pregnancy.
- Use of immunosuppressive therapy.
- Prior significant periodontal treatment (e.g., periodontal surgery) within the last six months.
- Participants with dentures or orthodontic braces,
- Those with a history of in vitro fertilization.

Sample Size Calculation

The formula, $n= Z^2 p(1-p)/d^2$, was used to calculate the sample size for this study, where n = sample size, Z = Z statistic for a level of confidence, P = expected prevalence or proportion, and d = level of precision. For

this study, prevalence (P) was assumed to be 19.2%, the prevalence of periodontitis from a previous study[26]: Z = 1.96 corresponding to a 95% confidence level; P = 90.4% = 0.142; Q=1-P = 0.09% = 0.855; d = 5% = 0.05;

N=133.35

A total of 150 people were recruited for the study.

Sampling Technique

Participants were selected using a simple random sampling technique. Eligible participants were identified during their antenatal visits, and using the balloting method with the attendance register serving as the sampling frame, those who met the inclusion criteria were enlisted until the required sample size was reached.

Data Collection Methods

Data were collected using a structured questionnaire, which has been adapted from validated instruments assessing self-rated periodontitis and pre-eclampsia risk factors. The questionnaire obtained information on Sociodemographic Characteristics such as Age, parity, marital status, educational level, occupation, and ethnicity; Medical and Obstetric History including history of hypertension, diabetes, renal disease, preterm births, and previous pre-eclampsia episodes; Clinical Parameters including Blood pressure and proteinuria assessment using dipstick tests; and perinatal outcomes including birth weight, Apgar scores, and neonatal admissions.

Self-Rated Periodontitis Assessment was measured using the validated periodontal disease self-report surveillance questionnaire, which has been validated in Nigeria[27] and was designed by the periodontal disease surveillance workgroup, convened by the Division of Oral Health, Center for Disease Control and American Academy of Periodontology[28]. The responses to the CDC-APP self-report questionnaire were grouped into two: positive and negative responses. For the question “Overall, how would you rate the health of your gums?” the responses “Excellent”, “Very good”, and “Good” were regarded as positive, while “Fair”, “Poor”, and “I don’t know” were regarded as negative. The remaining questions and the question “Do your gums bleed when you brush”; “Yes” was regarded as a positive response, while “No” and “I don’t know” were negative. Participants with a positive response to questions 3, 4, 5, and 6 were regarded as having periodontitis, while those with negative responses but positive responses to the

question “Do you bleed when you brush” were grouped as having gingivitis. A negative response to all these was regarded as not having periodontal disease.

Data Analysis

Data were entered into SPSS software (version 26) for analysis. Descriptive analysis was conducted using means, standard deviations, frequencies, and percentages to summarize participant characteristics. For bivariate analysis, the chi-square test was applied to categorical variables, while the independent t-test was used to analyze continuous variables. A multivariate logistic regression model was constructed to account for potential confounders, including maternal age, parity, BMI, smoking, alcohol intake, and other comorbidities. The adjusted odds ratio (AOR) and 95% confidence intervals (CI) were reported to assess the strength of associations.

Results

Table 1 shows that the study population predominantly comprised women aged 26-35 years (54.7%), followed by those aged 36-45 years (26.0%). Women younger than 25 years (15.3%) and those older than 45 years (4.0%) were in the minority. Yoruba participants constituted the largest ethnic group (64.7%), followed by Igbo (30.0%) and Hausa (3.3%), with a small proportion identifying as “Other” (2.0%). The majority had tertiary education (67.3%), while 28.0% attained secondary education, and a smaller proportion had primary (2.7%) or no formal education (2.0%). Most participants were married (96.0%), with a few single (3.3%) or cohabiting (0.7%). Christianity was the predominant religion (78.0%), followed by Islam (21.3%) and traditional faith (0.7%). None of the participants reported smoking, but 11.3% consumed alcohol.

	Frequency (n=150)	Percentages (%)
Age Groups		
19-25	23	15.3
26-35	82	54.7
36-45	39	26.0
46-55	5	3.3
56-65	1	0.7
Ethnicity		
Yoruba	97	64.7
Igbo	45	30.0
Hausa	5	3.3
Others	3	2.0
Educational Level		
None	3	2.0
Primary	4	2.7
Secondary	42	28.0
Tertiary	101	67.3
Marital Status		
Single	5	3.3
Married	144	96.0
Cohabiting	1	0.7
Religion		
Christian	117	78.0
Muslim	32	21.3
Traditional	1	0.7
Smoking		

	Frequency (n=150)	Percentages (%)
Yes	0	0.0
No	150	100.0
Alcohol		
Yes	17	11.3
No	133	88.7

Table 1. Sociodemographic characteristics of the study participants

Table 2 illustrates the relationship between self-rated periodontal health and the self-rated indicators used to assess it among preeclamptic patients. Among those with no family history of gum disease, 76.3% reported no periodontitis, whereas 73.3% of those with a positive family history reported that they had periodontitis ($p < 0.001$). Increased root exposure was significantly associated with self-rated periodontitis, with 100% of those reporting root exposure classified as having periodontitis ($p < 0.001$). Self-assessed tooth mobility was a strong indicator, as all individuals who reported tooth loss due to mobility (100%) or having loose teeth (100%) had periodontitis, compared to 17.1% of those who had never noticed tooth mobility ($p < 0.001$). The prevalence of self-reported periodontitis was 28.7%, while 71.3% reported no periodontitis.

Question	Self-rated Periodontitis			
	No periodontitis (%)	Periodontitis (%)	X^2	P value
Does anyone in your family (parents /sibling) suffer from gum diseases?				
No	103 (76.3)	32 (23.7)	14.482[b]	<0.001
Yes	4 (26.7)	11 (73.3)		
How often do you visit a dentist?				
Annually	3 (12.5)	21 (87.5)	47.285[b]	<0.001
I avoid visits to the dentist	104 (83.2)	21 (16.8)		
Regular visits + S&P	0 (0.0)	1 (100.0)		
Have your gums already been treated?				
Yes + no follow-up	0 (0.0)	6 (100.0)	108.120[b]	<0.001
Yes + regular follow-up	0 (0.0)	5 (100.0)		
Yes + last was 10 years ago	0 (0.0)	23 (100.0)		
No	107 (92.2)	9 (7.8)		
Have you observed an increase in the incidence of bleeding gums?				
No	105 (71.9)	41 (28.1)		0.324
Yes	2 (50.0)	2 (50.0)		
Have you noticed any increase in exposed root surfaces?				
No	107 (75.9)	34 (24.1)	23.970[b]	<0.001
Yes	0 (0.0)	9 (100.0)		
Please provide assessment on the movability of your teeth.				
Tooth lost due to mobility	0 (0.0)	7 (100.0)	56.450[b]	<0.001
Some teeth are loose	0 (0.0)	14 (100.0)		
Never noticed such	107 (82.9)	22 (17.1)		
	Frequency (n=150)	**Percentages (%)**		

doi.org/10.32388/MFPK60

Question	Self-rated Periodontitis			
	No periodontitis (%)	Periodontitis (%)	X^2	P value
Periodontitis				
No periodontitis	107	71.3		
Periodontitis	43	28.7		

Table 2. Association Between Self-Rated Periodontal Health and self-rated periodontal Health Indicators Among Patients with Preeclampsia

Table 3 shows that the mean systolic blood pressure (SBP) of participants was 167.70±21.99 mmHg, while the mean diastolic blood pressure (DBP) was 104.67±17.13 mmHg. Comorbidities were rare, with only 4.0% reporting diabetes and 0.7% having heart disease, while 95.3% had no comorbid conditions. The majority of babies were born alive (92.0%), whereas 8.0% were stillbirths. Among live births, 69.3% required special unit admission, while 30.7% did not. Preterm deliveries were most common (74.7%), whereas full-term births accounted for 24.7% and post-term births for 0.7%. Primiparous women made up 82.0% of the study population, while multiparous and nulliparous women accounted for 16.0% and 2.0%, respectively. Regarding gravidity, most were multigravida (67.3%), while primigravida and grand multigravida accounted for 28.0% and 4.0%, respectively. Birth weight distribution showed that 46.0% of neonates had low birth weight, 27.3% had normal birth weight, 19.3% had very low birth weight, and 7.3% had extremely low birth weight.

	Frequency (n=150)	Percentages (%)
Mean BP		
Systolic 167.70±21.993		
Diastolic 104.67±17.129		
Comorbidities		
Diabetes	6	4.0
Heart disease	1	0.7
none	143	95.3
Fate of Baby		
Alive	138	92.0
Still birth	12	8.0
Special unit admission (If alive, n=137)		
No	42	30.7
Yes	95	69.3
Gestational Classification		
Preterm	112	74.7
Full term	37	24.7
Post term	1	0.7
Parity		
Nulliparous	3	2.0
Primiparous	123	82.0
Multiparous	24	16.0
Gravidity		
Nulligravida	1	0.7
Primigravida	42	28.0
Multigravida	101	67.3

	Frequency (n=150)	Percentages (%)
Grandmultigravida	6	4.0
Birth weight		
Extremely low	11	7.3
Very low	29	19.3
Low	69	46.0
Normal	41	27.3

Table 3. Maternal Health and Pregnancy Outcomes among study participants

In **Table 4**, women with periodontitis had a higher mean age (33.72±7.22 years) compared to those without (31.59±6.75 years), though this difference was not statistically significant (p=0.089). Regarding religion, Muslims exhibited a higher prevalence of periodontitis (43.8%) compared to Christians (24.8%), though this difference was not statistically significant (p=0.068). Marital status did not show a significant association with periodontitis, as married women (29.2%) and unmarried women (16.7%) had relatively comparable proportions (p=0.507). Educational level similarly showed no significant variation, with tertiary-educated participants having a slightly lower prevalence (30.7%) than those with no formal education (33.3%) (p=0.868). Ethnic distribution did not significantly affect periodontitis prevalence, though Hausa participants had a slightly higher proportion (40.0%) than Yoruba (29.9%) and Igbo (26.7%) (p=0.717).

	Self-rated Periodontitis			
	No periodontitis (%)	**Periodontitis (%)**	X^2	**P value**
Mean Age ± SD	31.59±6.750	33.72±7.223	t=-1.714	0.089
Religion				
Christian	88 (75.2)	29 (24.8)	4.708[b]	0.068
Muslim	18 (56.3)	14 (43.8)		
Traditional	1 (100.0)	0 (0.0)		
Marital status				
Unmarried	5 (83.3)	1 (16.7)	0.440[a]	0.507
Married	102 (70.8)	42 (29.2)		
Education				
No formal education	2(66.7)	1 (33.3)	1.062[b]	0.868
Primary	3 (75.0)	1 (25.0)		
Secondary	32 (76.2)	10 (23.8)		
Tertiary	70 (69.3)	31 (30.7)		
Ethnicity				
Yoruba	68 (70.1)	29 (29.9)	1.395[b]	0.717
Igbo	33 (73.3)	12 (26.7)		
Hausa	3 (60.0)	2 (40.0)		
Others	3 (100.0)	0 (0.0)		

Table 4. Association between Self-Rated Periodontitis and Sociodemographic Characteristics

Table 5 shows that the fate of the baby (alive vs. stillborn) was not significantly associated with periodontitis, though the prevalence among women with stillborn infants (9.3%) was lower than in those

with live births (90.7%) (p=0.743). Maternal hospitalization was slightly more common among those with self-rated periodontitis (62.8%) than those without it (37.2%), though this difference was not statistically significant (p=0.678). Gestational classification did not differ significantly, though those with preterm births had a higher proportion (79.1%) of those with self-rated periodontitis compared with those without (72.9%) (p=0.669). Birth weight distribution was also not significantly different, though a higher proportion of women with periodontitis had infants with low birth weight (51.1%) compared to those with normal birth weight (23.3%) (p=0.379). Gravidity showed a significant association with self-rated periodontitis (p=0.026), with those who were multigravida (60.5%) having a higher prevalence than primigravida (27.9%). Parity did not show a significant association (p=0.306), though nulliparous women had a higher prevalence (74.4%) than multiparous women (23.3%). Women with no prior contraceptive use had a significantly higher prevalence of self-reported periodontitis (88.4) (p=0.021).

	Self-rated Periodontitis			
	No periodontitis (%)	**Periodontitis (%)**	X^2	**P value**
Mean Age ± SD	31.59±6.750	33.72±7.223	t=-1.714	0.089
Fate of baby				
Alive	99 (92.5)	39 (90.7)	0.135[b]	0.743
Still born	8 (7.5)	4 (9.3)		
Mother admitted				
Yes	71 (66.4)	27 (62.8)	0.172[a]	0.678
No	36 (33.6)	16 (37.2)		
Gestational age			0.882[b]	0.669
Preterm		78(72.9)	34 (79.1)	
Full term	28 (26.2)	9 (20.9)		
Post term	1 (0.9)	0 (0.0)		
Birthweight				
Normal	31 (29.0)	10 (23.3)	3.093[b]	0.379
Low		47 (43.9)	22 (51.1)	
Very low	19 (17.8)	10 (23.3)		
Extremely low	10 (9.3)	1 (2.3)		
Gravidity				
Nulligravida	2 (1.9)	0 (0.0)	8.353[b]	0.026*
Primigravida	29 (27.1)	12 (27.9)		
Multigravida	75 (70.1)	26 (60.5)		
Grandmultigravida	1 (0.9)	5 (11.6)		
Parity				
Nulliparous	6 (5.6)	1 (2.3)	2.653[b]	0.306

	Self-rated Periodontitis			
	No periodontitis (%)	**Periodontitis (%)**	X^2	**P value**
Primiparous	87 (81.3)	32 (74.4)		
Multiparous	14 (13.1)	10 (23.3)		
Co-morbidities				
Diabetes	3 (2.8)	3 (7.0)	3.845[b]	0.142
Heart disease	0 (0.0)	1 (2.3)		
None	104 (97.2)	39 (90.7)		
Prior contraceptive use				
Yes	2 (1.9)	5 (11.6)	6.566[a]	0.021*
No	105 (98.1)	38 (88.4)		

Table 5. Association between Self-rated periodontitis and Maternal and child characteristics

Table 6 shows that the mean systolic blood pressure (SBP) was slightly lower in women with periodontitis (165.11±17.97 mmHg) compared to those without (168.74±23.41 mmHg), though this was not statistically significant (p=0.362). However, the mean diastolic blood pressure (DBP) was significantly lower among women with periodontitis (99.94±13.98 mmHg) compared to those without (106.57±17.95 mmHg) (p=0.032). The mean gravidity was higher among women with periodontitis (2.93±1.81) than those without (2.48±1.35), though this difference was not statistically significant (p=0.098). Similarly, the mean parity was higher in women with periodontitis (1.50±1.05) than in those without (1.16±0.55), though this difference was borderline significant (p=0.051).

	Self-rated Periodontitis			
	No periodontitis (%)	**Periodontitis (%)**	X^2	**P value**
Mean SBP ± SD	168.74±23.412	165.11±17.969	t=0.915	0.362
Mean DBP ± SD	106.57±17.952	99.94±13.982	t=2.169	0.032*
Mean Gravidity ± SD	2.48±1.345	2.93±1.805	t= -1.663	0.098
Mean Parity± SD	1.16±0.546	1.50±1.053	t= -2.002	0.051

Table 6. Association Between Self-Rated Periodontitis and Physiological Parameters

Table 7 presents the results of a binary logistic regression analysis assessing the association between self-rated periodontal health and clinical variables in preeclamptic patients. Diastolic blood pressure (DBP) was the only significant predictor of self-rated periodontal status, with an aOR of 0.967 (95% CI: 0.936–0.999, p = 0.042). Parity (aOR: 1.610, 95% CI: 0.915–2.834, p = 0.099); maternal age (aOR: 1.038, 95% CI: 0.973–1.108, p = 0.258); gravidity (aOR: 1.089, 95% CI: 0.787–1.507, p = 0.606); admission status (aOR: 1.293, 95% CI: 0.574–2.913, p = 0.536), and low birth weight (<2.5kg) (aOR: 1.315, 95% CI: 0.467–3.700, p = 0.604) were not significantly associated with self-rated periodontitis, though they were associated with a higher odds of self-rated periodontitis. Other clinical parameters, including systolic blood pressure (aOR: 1.002, 95% CI: 0.976–1.029, p = 0.871), and obstetric outcomes such as stillbirth (aOR: 0.957, 95% CI: 0.246–3.731, p = 0.950) did not show statistically significant associations and were not associated with increased odds of self-rated periodontitis.

Variables	S.E	Wald	p-value	aOR	Confidence interval	
					Lower	Upper
Parity	0.288	2.730	0.099	1.610	0.915	2.834
Gravidity	0.166	0.266	0.606	1.089	0.787	1.507
Age	0.033	1.281	0.258	1.038	0.973	1.108
SBP	0.013	0.026	0.871	1.002	0.976	1.029
DBP	0.017	4.155	0.042	0.967	0.936	0.999
Fate of baby (stillbirth)	0.694	0.004	0.950	0.957	0.246	3.731
Mother admitted (Yes)	0.415	0.383	0.536	1.293	0.574	2.913
Gestational class (Premature)	0.533	0.270	0.603	0.758	0.267	2.156
Birthweight class (<2.5kg)	0.528	0.269	0.604	1.315	0.467	3.700
Constant	1.856	0.000	0.985	0.967		

Table 7. Binary Logistic Regression Analysis of Self-Rated Periodontal Status Among Patients with Preeclampsia (Excluding Comorbidities)

Discussion

The preponderance of women aged 26-35 years in this study aligns with prior research conducted in Nigeria, indicating that women in this age group is typically in their prime reproductive years[29]. The ethnic distribution, dominated by Yoruba participants, also reflects the geographical location of the study, while the high proportion of participants with tertiary education suggests that higher educational attainment may be associated with better healthcare access and awareness, a trend that has been documented in other Nigerian maternal health studies[30]. Maternal health parameters revealed worrying trends, particularly about hypertensive disorders in pregnancy. The mean systolic and diastolic blood pressures observed in this study were significantly higher than the national averages reported for pregnant women[31]. This finding underscores the burden of hypertensive disorders among Nigerian pregnant women, with potential implications for adverse pregnancy outcomes[32]. The observed

prevalence of diabetes and heart disease was relatively low; however, these comorbidities, albeit rare, can significantly contribute to maternal and perinatal morbidity[33][34]. Moreover, the high rate of adverse pregnancy outcomes, including the 8.0% stillbirth rate and 74.7% preterm delivery rate, necessitates urgent attention. These figures exceed regional and national estimates in Nigeria[35]. suggesting a complex interplay of hypertension in pregnant women and healthcare system inadequacies. The substantial proportion of infants requiring special unit admission further highlights neonatal vulnerabilities that this condition produces[36].

Studies have demonstrated a biological pathway linking periodontal infections to increased inflammatory markers such as prostaglandins and cytokines, which can trigger premature labor and contribute to low birth weight[14]. Furthermore, hypertensive disorders of pregnancy (HDP), including preeclampsia, have been linked to poor maternal oral health, yet this association remains underexplored in LMIC settings, particularly in Nigeria. The prevalence of self-reported periodontitis in this study was 28.7%. This is far lower than the prevalence of normatively assessed periodontitis in a recent meta-analysis[37], possibly suggesting an underestimation of the condition by the pregnant women using the self-assessed tool. Women with periodontitis had a higher mean age compared to those without (31.59±6.75 years), while those with tertiary education had a slightly lower prevalence than those with no formal education, as supported by literature. The significant association between periodontitis and gravidity in this study suggests that increasing parity may contribute to periodontal disease, possibly due to hormonal fluctuations and physiological stress during repeated pregnancies, as previously shown in the literature[38]. No prior contraceptive use was, however, surprisingly significantly associated with self-rated periodontitis, which was contrary to reports demonstrating an association between hormonal influences and periodontal health as shown in previous studies[39][40]. This association was, however, refuted by other researchers, who observed that the adverse events profile of oral contraceptives on the periodontium was dose-dependent and that the development of the modern low-dose formulations that are in use today shows that oral contraceptives no longer place users at any increased risk for gingivitis or periodontitis[41]. This, however, requires further research exploration.

In this study, most of the variables associated with poor neonatal and maternal outcomes were associated with self-rated periodontitis. A higher proportion of women with self-rated periodontitis had infants with very low birth weight, maternal hospitalization, preterm births, and neonates with low birth weight. Similarly, gravidity showed a significant association with self-rated periodontitis, with those who were multigravida having a higher prevalence than those who were primigravida. These findings from the

bivariate analysis align with previous research, which shows an association between periodontitis and an elevation of cardiovascular risk factors among pregnant women. Epidemiological studies consistently demonstrate an increased risk of preeclampsia among pregnant individuals with periodontal disease, independent of traditional risk factors. Proposed mechanisms linking periodontal disease to PE include genetic factors, systemic inflammation, endothelial dysfunction, and immune dysregulation[41][42][43][44][45][46]. This observation is confirmed in the internal validity from the regression analysis, which showed increased odds of self-rated periodontal disease among those with increased parity (1.61); gravidity (1.09), maternal admission (1.29), and low birth weight (1.31). However, there are other potential confounders, such as nutritional status, stress levels, and genetic predispositions, which may influence this observation.

Limitations

This study has some limitations. First, its cross-sectional design does not allow for causal inferences between self-rated periodontal health and preeclampsia-related outcomes. While associations were identified, further longitudinal studies with clinical periodontal assessments are necessary to clarify the direction and strength of these relationships. Second, self-reported periodontal health assessments introduce the potential for recall bias and misclassification, as participants may overestimate or underestimate their periodontal condition compared to professional clinical evaluations. Third, the study was conducted in a single tertiary hospital in Lagos, Nigeria, which may limit the generalizability of findings to other populations, particularly rural or underserved communities with different healthcare access. Lastly, the lack of a comparison control group and unmeasured confounders—such as dietary habits, systemic inflammatory conditions, and stress levels—may also influence the observed associations. Despite these limitations, the study has an important strength—it is the first of its kind in Nigeria, providing a foundation for future research. Moreover, the use of a self-rated screening tool, while imperfect, holds significant potential as a non-invasive, early identification method for periodontal disease among pregnant women, particularly in indigent populations with limited access to professional dental care. Future research should consider these variables to provide a more comprehensive understanding of the relationship between periodontal health and pregnancy outcomes.

Conclusion

This study examined the relationship between self-rated periodontitis and maternal and neonatal outcomes in preeclamptic patients. The findings indicate that periodontitis was not significantly associated with most adverse outcomes, though higher odds were observed in the logistic regression model for increased parity, gravidity, maternal admission, and low birth weight. These findings emphasize the need for future research utilizing larger cohorts and a control group to better elucidate the potential interplay between self-rated periodontal disease.

Statements and Declarations

Contributions

The authors declare that they have participated sufficiently in contributing to the intellectual content, concept, and design of this work, or the analysis and interpretation of the data (when applicable), as well as the writing of the manuscript, to take public responsibility for it, and have agreed to have their names listed as contributors.

Data Availability

All the data collected during the study is presented in this manuscript and no data from the study has been or will be published separately.

Funding

None.

Conflicts of Interest

There are no conflicts of interest.

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Declarations

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.