



Knowledge, Attitude and Practice of Gynecologists and Obstetricians Toward Oral Health Care of Pregnant Women in Sulaymaniyah City, Iraq

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Abstract

Background and objectives: Gynecologists play a vital role in pregnant women's oral health. This study aims to evaluate the knowledge, attitudes, and practices of gynecologists and obstetricians regarding oral health care for pregnant women in Sulaymaniyah, Iraq.

Methods: A cross-sectional study was carried out at the Maternity Teaching Hospital in Sulaymaniyah, Kurdistan Region, Iraq, from October 2022 until February 2023. One hundred and twenty-two female gynecologists and obstetricians were included. The survey covered a range of questions, including demographics and those designed to assess participants' knowledge, attitudes, and practices regarding oral health care for pregnant patients.

Results; Among 122 gynecologists, most board-certified are knowledgeable (60.7%), and most gynecologists with more than 20 years of experience are knowledgeable (100%) , both attitudinally and practically. On the other hand, those with less than 10 years of experience show knowledge (62.1%). Gynecologists aged 30–40 exhibit a higher proportion of high knowledge (71.1%), attitude (67.1%). Local anesthesia is considered safe for dental treatment during pregnancy. Most of the participants (82.0%) said that the safest period to perform dental work is the second trimester of pregnancy. 91.0 percent of gynecologists recognize the importance of dental references for patients. Also, a greater proportion of participants (95.9%) advised pregnant women to abstain from tobacco and alcohol.

Conclusions; In conclusion, the results of this study showed that most gynecologists had good knowledge, attitudes, and practices toward oral health care for pregnant women, but there was still a need for active participation. Gynecologists demonstrated good practice in statics, which is important for pregnant women during pregnancy.

Keywords: Attitude, Gynecologists and obstetricians, Knowledge, Oral care, Practice, Sulaymaniyah, Iraq

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Introduction

Oral health is a vital constituent of overall well-being as it exerts an influence on the entire body. Recognizing its significance, the World Health Organization designated it as one of the ten paramount human health benchmarks in 2010.¹ Among pregnant women's, gingivitis and periodontitis stand out as the most prevalent oral diseases.²⁻⁴ Therefore, oral health deserves significant attention as a crucial element in the holistic wellness of women.⁵ Women are more susceptible to oral diseases during critical life stages such as adolescence, menstruation, pregnancy, menopause, and contraceptive use.⁶ Understanding the dynamics of oral flora changes during pregnancy, their implications for maternal health, and their effects on delivery outcomes is paramount.⁷ Consequently, inadequate oral hygiene can significantly impact one's quality of life.⁸ (WHO)The World Health Organization, which views oral health as a public health issue, advises implementing educational programs to improve oral health, The adoption of public health initiatives that concentrate on the underlying causes of oral disorders is necessary for future advancements in oral health and a decrease in disparities in oral health.⁹ The human oral cavity harbors the second most abundant and diverse microbiota after the gastrointestinal tract. Periodontal diseases, primarily caused by dental plaque, necessitate both pathogenic bacteria and a susceptible host for their development.¹⁰⁻¹² Systemic factors, including hormone levels, influence susceptibility, with increased inflammatory responses during adolescence, pregnancy, oral contraceptive use, and post menopause.¹¹ Mothers play a pivotal role in their children's overall development.¹³ Gynecologists provide a substantial contribution to the dental health of mothers. Initiatives are required to increase the oral health awareness of medical professionals who provide

preventative care.¹⁴ A multidisciplinary approach, with gynecologists actively involved from prenatal to postpartum stages, is crucial.¹⁵ The competence of healthcare practitioners, particularly gynecologists, in overseeing pregnant women's dental health remains uncertain. Hence, gynecologists must recognize dental disorders as a risk factor for infant health and identify oral issues at various life stages, referring patients to dentists when necessary.¹⁶ This study aims to evaluate the oral health knowledge, attitude, and practice of gynecologists in Sulaymaniyah regarding dental care for pregnant women. The specific objectives for the given study aim to find out the association between demographic characteristics and the knowledge, attitude, and practice of gynecologists, to identify the knowledge and attitude of gynecologists, and to identify the impact of practice among gynecologists regarding oral health care of pregnant women.

Martials and methods

In this cross-sectional study, 122 gynecologists aged 25 and above were recruited from the Sulaymaniyah Maternity Teaching Hospital, all of whom were female, between October 2022 and February 2023, Ethical approval was obtained from the Ethics Committee of the Kurdistan higher council of medical specialties (KHCMS) under approval number 1563 issued on 8/9/2022. The survey questionnaire, consisting of 16 questions adapted from the research by Popoli et al., was employed in this study.¹⁷ The questions focused on demographic characteristics, gynecologists' knowledge, attitudes, and practices concerning the oral health care of pregnant patients. For knowledge and attitude, the coding used was 1 for "yes" and 0 for "no," enabling the creation of a scale where a positive response indicated a higher score. Similarly, for practice-related questions, a binary coding of 1 for "yes" and 0 for "no"



was employed to assess adherence to recommended practices. The sum or average of these responses for each participant was then calculated to quantify their knowledge and attitude levels. For knowledge-related questions, scores ranging from 2 to 6 were assigned, with higher values indicating greater knowledge. Attitude responses were coded on a scale from 0 to 4, where higher values reflected more positive attitudes. Practice-related questions were coded from 2 to 6, with elevated scores indicating more frequent and positive practices. Importantly, a uniform coding scheme was applied consistently across all participants to ensure the comparability of responses. For the purpose of categorical comparison of knowledge, attitude, and skills scores with education levels and years of experience of gynecologists, we categorized the scores into low, moderate, and high. The study used a sample size consistent with previous research,^{2,17} and all gynecologists voluntarily participated, with most completing questionnaires within five to ten minutes before submitting them to the researcher. Descriptive statistics were utilized to elucidate the study results, while inferential statistics, including chi-square tests, were employed to assess the relationships between various parameters. Statistical analyses were performed using SPSS V.25 software for Windows (SPSS Inc., Chicago, IL, USA), with a significance level set at 5% for all tests.

Results:

One hundred and twenty-two female gynecologists were included at the Maternity Teaching Hospital in Sulaymaniyah, Kurdistan Region, Iraq. The minimum age of the participant was 28 and maximum age was 74, with mean $\pm$ SD was 38.42 ± 8.53 . The Table (1) provides a snapshot of the

demographic characteristics of the study participants. The majority (62.3%) falls within the 30-40 age group. In terms of educational levels, those Board certified (50.0%), followed by an HDG (36.9%) and MSc (13.1%), pointing towards a highly educated sample. Regarding years of medical practice, more than half (54.1%) have less than 10 years of experience, with the majority falling within the 10-20 years category.

Table (1): Demographic characteristics of participants.

Variables		No.	%
Age group	<30	13	10.7
	30-40	76	62.3
	40-50	18	14.8
	50-60	14	11.5
	>60	1	0.8
Education	Board certified	61	50.0
	MSc	16	13.1
	HDG	45	36.9
Years of Medical Practice	<10	66	54.1
	10-20	41	33.6
	20-30	8	6.6
	30-40	6	4.9
	40-50	1	0.8

Table (2) The study reveals a high awareness of oral health concerns among 122 gynecologists, with 97.5% recognizing drug side effects during pregnancy. However, there is a gap in understanding the safety of diagnostic dental X-rays, with 59.8% expressing uncertainty. Local anesthesia is considered safe for dental treatment, with 97.5% identifying the second trimester as the safest period for dental work.



Table (2): Knowledge of oral health concerns among gynecologists (N=122).

Questions		No.	%
Can certain drugs create oral side effects in fetus when taken during pregnancy?	No	3	2.5
	Yes	119	97.5
Do any changes in dental health occur during pregnancy?	No	5	4.1
	Yes	117	95.9
Can gum disease in the mother affect the birth weight of child?	No	27	22.1
	Yes	95	77.9
Diagnostic dental X-ray can be taken during pregnancy?	No	73	59.8
	Yes	49	40.2
Use of local anesthesia is safe during pregnancy to carry out dental treatment?	No	3	2.5
	Yes	119	97.5
Second trimester is the safest period to take dental treatment?	1 st trimester	0	0.0
	2 nd trimester	100	82.0
	3 rd trimester	22	18.0

Table (3) presents the attitudes of 122 gynecologists toward oral health concerns during pregnancy. The majority of gynecologists (91.0%) recognize the

importance of dental references for patients, 69.7% recognize the benefits of oral health conferences, and 55.7% believe patient attitudes are related to maternal health.

Table (3): Attitude of oral health concerns during pregnancy among gynecologists (N=122).

Questions		No.	%
Do you think dental references are important for your patients during pregnancy?	No	11	9.0
	Yes	111	91.0
Do you feel examination of oral cavity should be an integral part of pregnancy?	No	21	17.2
	Yes	101	82.8
Do you think attending a conference on oral health will be beneficial for you?	No	37	30.3
	Yes	85	69.7
Do you think that patients' attitude toward dental care is related to maternal health?	No	54	44.3
	Yes	68	55.7

Table (4) presents insights into the oral health practices of 122 gynecologists regarding their recommendations for pregnant patients. Notably, 75.4%, advocate for the use of fluoridated toothpaste, emphasizing the importance of dental care. Moreover, 89.3%

of gynecologists actively refer their patients to dentists, highlighting a collaborative approach to maternal oral health, engage in recommending lifestyle changes such as quitting tobacco/alcohol (95.9%).

Table (4): Practice of oral Health concerns during pregnancy among gynecologists (N=122).

Questions		No.	%
Do you advice your patients to use fluoridated tooth paste?	No	30	24.6
	Yes	92	75.4
Do you refer your patients to dentist?	No	13	10.7
	Yes	109	89.3
Do you check the oral cavity of expectant mothers?	No	90	73.8
	Yes	32	26.2
Do you advice major/minor dental surgery during pregnancy?	No	84	68.9
	Yes	38	31.1
Do you advice diet counseling to your patient?	No	35	28.7
	Yes	87	71.3
Do you advice patient to quit tobacco/alcohol?	No	5	4.1
	Yes	117	95.9



Table (5) provides a detailed breakdown of knowledge, attitude, and practice scores among individuals with different education levels (Board certified, MSc, and HDG). For knowledge, the Board-certified holders demonstrate high knowledge (60.7%), while MSc holders are spread across (31.3%) and (62.5%) categories. Similarly, for attitude, (73.8%) of Board-certified holders exhibit high attitudes, while MSc holders show

variability between moderate (24.6%) and high (62.5%) categories. In terms of practice, the distribution is more balanced, with varying proportions in each education group across low, moderate, and high practice categories. The findings suggest potential associations between education levels and KAP scores, with trends observed in Knowledge and Practice, though not statistically significant ($P > 0.05$).

Table (5): Association of Knowledge, Attitude, and Practice (KAP) scores level by Education Level among gynecologists (N=122).

KAP scores levels		Education						p*
		Board certified		MSc		HDG		
		No	%	No	%	No	%	
Knowledge	Low	4	6.6	0	0.0	0	0.0	0.054
	Moderate	20	32.8	1	6.3	13	28.9	
	High	37	60.7	15	93.8	32	71.1	
Attitude	Low	1	1.6	1	6.3	4	8.9	0.315
	Moderate	15	24.6	5	31.3	8	17.8	
	High	45	73.8	10	62.5	33	73.3	
Practice	Low	21	34.4	9	56.3	13	28.9	0.393
	Moderate	22	36.1	3	18.8	17	37.8	
	High	18	29.5	4	25.0	15	33.3	

* By Chi Square test

Table (6) shows that gynecologists with over 20 years of experience have higher Knowledge, Attitude, and Practice scores, while those with less than 10 years have a

more diverse distribution. The findings suggest potential associations between years of medical practice and KAP scores.

Table (6): Association of KAP scores level by years of medical practice among gynecologists

KAP score levels		Years of Medical Practice									
		<10		10-20		20-30		30-40		40-50	
		No.	%	No.	%	No.	%	No.	%	No.	%
Knowledge	Low	2	3.0	2	4.9	0	0.0	0	0.0	0	0.0
	Moderate	23	34.8	9	22.0	0	0.0	1	16.7	1	100
	High	41	62.1	30	73.2	8	100	5	83.3	0	0.0
Attitude	Low	2	3.0	4	9.8	0	0.0	0	0.0	0	0.0
	Moderate	19	28.8	7	17.1	0	0.0	2	33.3	0	0.0
	High	45	68.2	30	73.2	8	100	4	66.7	1	100
Practice	Low	24	36.4	14	34.1	2	25.0	3	50.0	0	0.0
	Moderate	28	42.4	11	26.8	2	25.0	1	16.7	0	0.0
	High	14	21.2	16	39.0	4	50.0	2	33.3	1	100





Table (7) presents the distribution of Knowledge, Attitude, and Practice (KAP) scores among gynecologists across different age groups. Practice scores vary by age group,

with gynecologists aged 30-40 showing higher Knowledge, Attitude, and Practice scores, while those under 30 have lower prevalence.

Table (7): Association of KAP scores level by age group among gynecologists (N=122).

KAP scores level		Age group				
		<30	30-40	40-50	50-60	>60
		No. (%)	%	%	%	%
Knowledge	Low	0 (0.0)	4(5.3)	0(0.0)	0(0.0)	0(0.0)
	Moderate	9 (69.2)	18 (23.7)	5(27)	2(14.3)	0(0.0)
	High	4 (30.8)	54 (71.1)	13(72.2)	12(85.7)	1(100.0)
Attitude	Low	0 (0.0)	6(7.9)	0(0.0)	0(0.0)	0(0.0)
	Moderate	4 (30.8)	19(25)	3(16.7)	1(7.1)	1(100.0)
	High	9(69.2)	51(67.1)	15(83.3)	13(92.9)	0(0.0)
Practice	Low	3(23.1)	29(38.2)	5(27.8)	5(35.7)	1(100.0)
	Moderate	4(30.8)	32(42.1)	3(16.7)	3(21.4)	0(0.0)
	High	6(46.2)	15(19.7)	10(55.6)	6(42.9)	0(0.0)

Discussion

This research is the first of its kind in Sulaymaniyah, revealing that experienced gynecologists with years of medical practice have a higher level of knowledge about dental health, with a majority of Board-certified holders having a (60.7%) of knowledge, and the majority (62.3%) are between 30 and 40 years old. The study showed that 75.4% of gynecologists recommended fluoridated tooth paste for pregnant women, which is significantly higher than the 42.1% of gynecologists who recommended fluoridated toothpaste in the study conducted by Harsh et al.^{18,20} In our study, 89.3% of gynecologists showed positive practice in terms of referring patients to dentists. In previous studies conducted by Harsh et al. and Varun et al., this practice ranged between 24.3% and 40%, respectively.^{18,19} More than two-thirds of gynecologists said examination of the oral cavity should be an integral part of routine checkups during gestation, showing a high level of attitude. The current study found that (89.3%) of gynecologists emphasized the significance of referring pregnant women to dentists; this finding is consistent with

previous research indicating that gynecologists also referred patients to dentists.^{21,22} Over two-thirds of gynecologists advocate for routine oral cavity examinations in antenatal care, but some still need motivation to undergo dental consultations and examinations for oral health.²³ When asked if some medications had oral negative effects on a baby taken during pregnancy, (97.5%) of respondents answered in the affirmative, which is in line with a 2022 study by Popoli et al.¹⁷ Based on the responses to this survey, (69.7) percent of gynecologists showed positive attitude about interested in attending a conference on oral health and are confident in their ability to significantly contribute to the promotion of oral health, which is consistent with Hashim.² where (71.3%) of participants recommend diet counseling during gestation, similar to Subramaniam's study, with gynecologists also advising pregnant women to seek such advice.²³ Tobacco-related oral illnesses are prevalent in high-income countries, with rising risks of periodontal disease, tooth loss, and oral cavity cancer in low- and middle-income nations.¹ The study confirmed that a greater proportion of participants advised





pregnant women to abstain from tobacco and alcohol. A similar pattern of results was reported by Popoli et al.¹⁷ Our study found that nearly one-third of gynecologists considered major and minor dental surgery to be risk-free. Over half, 55.7%, believe that patients' attitudes toward dental care are related to maternal health, which is lower than that found in the study conducted by Popoli et al.¹⁷ Nonetheless, there is knowledge of the safety of local anesthetics during pregnancy—97.5% of respondents believe it to be safe when receiving dental care. Research has consistently emphasized the significance of dental x-rays during pregnancy, with less than 60% of respondents stating that such radiographs are unsafe. On the other hand, 40.2% said they were safe. However, studies have shown that intraoral and extraoral dental radiographs are safe for pregnant women to undergo, and they do not pose any danger to the developing fetus.^{17,18} The results of the study indicated that most of the participants said that the safest period to perform dental work is the second trimester of pregnancy, which is confirmed by the study of Hashim.² Also, less than 20% said the third trimester. The second trimester of pregnancy is the ideal period for delivering efficient dental care.^{2,24} The distribution of knowledge, attitude, and practice ratings among gynecologists of various ages. Notably, there is a statistically significant relationship between practice scores and age groups (p -value < 0.05). The study explores the understanding and practices of gynecologists in Sulaymaniyah City regarding oral hygiene for pregnant women. It highlights the importance of gynecologists as primary healthcare providers for dental health during and after pregnancy.

Conclusion

In conclusion, the results of this study showed that most gynecologists had good knowledge, attitudes, and practices toward oral health care for pregnant women, but

there was still a need for active participation. Gynecologists demonstrated good practice, which is important for pregnant women during pregnancy. It must be remembered that maintaining good oral hygiene can enhance general health and positively affect the course of pregnancy. Gynecologists are mostly responsible for this.

Conflicts of interest

The author reports no conflicts of interest.

References:

1. Petersen PE. World Health Organization global policy for improvement of oral health-World Health Assembly 2007. *Int Dent J*. 2008 Jun;58(3):115–21.
2. Hashim R, Akbar M. Gynecologists' knowledge and attitudes regarding oral health and periodontal disease leading to adverse pregnancy outcomes. *J Int Soc Prev Community Dent*. 2014 Dec;4(Suppl 3):S166–72.
3. Wu M, Chen SW, Jiang SY. Relationship between Gingival Inflammation and Pregnancy. *Mediators Inflamm*. 2015; 2015:623427.
4. Wen X, Fu X, Zhao C, Yang L, Huang R. The bidirectional relationship between periodontal disease and pregnancy via the interaction of oral microorganisms, hormone and immune response. *Front Microbiol*. 2023 Jan 26; 14:1070917.
5. Clemmens DA, Kerr AR. Improving oral health in women: nurses' call to action. *MCN Am J Matern Child Nurs*. 2008;33(1):10–4; quiz 15–6.
6. Patil SN, Kalburgi NB, Koregol AC, Warad SB, Patil S, Ugale MS. Female sex hormones and periodontal health-awareness among gynecologists - A questionnaire survey. *Saudi Dent J*. 2012 Apr;24(2):99–104.
7. Jang H, Patoine A, Wu TT, Castillo DA, Xiao J. Oral microflora and pregnancy: a systematic review and meta-analysis. *Sci Rep*. 2021 Aug 19;11(1):16870.





8. Baiju R, Peter E, Varghese N, Sivaram R. Oral Health and Quality of Life: Current Concepts. *J Clin Diagn Res*. 2017 Jun;11(6):ZE21–6.
9. Watt RG. Strategies and approaches in oral disease prevention and health promotion. *Bull World Health Organ*. 2005 Sep;83(9):711–8.
10. Moye ZD, Zeng L, Burne RA. Fueling the caries process: carbohydrate metabolism and gene regulation by *Streptococcus mutans*. *J Oral Microbiol*. 2014 Sep 5; 6:10.3402/jom.v6.24878.
11. Boyapati R, Cherukuri SA, Bodduru R, Kiranmaye A. Influence of Female Sex Hormones in Different Stages of Women on Periodontium. *J Midlife Health*. 2021;12(4):263–6.
12. Griessl T, Zechel-Gran S, Olejniczak S, Weigel M, Hain T, Domann E. High-resolution taxonomic examination of the oral microbiome after oil pulling with standardized sunflower seed oil and healthy participants: a pilot study. *Clin Oral Investig*. 2021 May;25(5):2689–703.
13. Vásquez-Echeverría A, Alvarez-Nuñez L, Gonzalez M, Loose T, Rudnitzky F. Role of parenting practices, mother's personality and depressive symptoms in early child development. *Infant Behav Dev*. 2022 May; 67:101701.
14. Bottenberg P, Van Melckebeke L, Louckx F, Vandenplas Y. Knowledge of Flemish paediatricians about children's oral health--results of a survey. *Acta Paediatr*. 2008 Jul;97(7):959–63.
15. Hartnett E, Haber J, Krainovich-Miller B, Bella A, Vasilyeva A, Lange Kessler J. Oral Health in Pregnancy. *J Obstet Gynecol Neonatal Nurs*. 2016;45(4):565–73.
16. Ramya S, Ashwini R, Arathi R, Mamata T. Knowledge, attitude and practice amongst gynecologists and pediatricians about oral health in Mangalore City: A questionnaire survey. *J Pierre Fauchard Acad*. (India Section). 2012 Mar 1;26(1):39–40.
17. Popli HP, Kumar VD, Khatib M, Ameer B, Peerzade SM, Reddy SK. Knowledge, Attitude and Practices among Gynecologists Regarding Oral Health of Expectant Mothers of South Bengaluru, Karnataka. *Int J Clin Pediatr Dent*. 2022;15(1):85–9.
18. Shah HG, Ajithkrishnan C, Sodani V, Chaudhary NJ. Knowledge, attitude and practices among Gynecologists regarding Oral Health of expectant mothers of Vadodara City, Gujarat. *Int J Health Sci (Qassim)*. 2013 Jun;7(2):136–40.
19. Suri V, Rao NC, Aggarwal N. A study of obstetricians' knowledge, attitudes and practices in oral health and pregnancy. *Educ Health (Abingdon)*. 2014;27(1):51–4.
20. Reddy SB, Prakash S, Lakshminarayan N. Gynecologists' concerns about oral diseases – A step to interdisciplinary approach. *Int. J. Oral Health Sci*. 2014 Dec;4(2):58.
21. Golkari A, Khosropanah H, Saadati F. Evaluation of knowledge and practice behaviours of a group of Iranian obstetricians, general practitioners, and midwives, regarding periodontal disease and its effect on the pregnancy outcome. *J Public Health Res*. 2013 Sep 2;2(2): e15.
22. Rocha JM da, Chaves VR, Urbanetz AA, Baldissera R, Rösing CK. Obstetricians' knowledge of periodontal disease as a potential risk factor for preterm delivery and low birth weight. *Braz Oral Res*. 2011;25(3):248–54.
23. Subramaniam P, Babu KL, Babu PS, Naidu P. Oral health care of children: gynecologists and pediatricians' perspective. *J Clin Pediatr Dent*. 2008;32(3):253–8.
24. Kurien S, Kattimani VS, Sriram RR, Sriram SK, Rao V, Bhupathi A, et al. Management of Pregnant Patient in Dentistry. *J Int Oral Health*. 2013 Feb;5(1):88–97.

