

## ORIGINAL ARTICLE

# MEDICAL NURSES KNOWLEDGE AND ATTITUDE TOWARD ORAL HEALTH OF PREGNANT WOMEN IN ERBIL CITY/ IRAQ

Vian Mohammed Hussein<sup>1\*</sup>, Ruheyza Shwan Shahswar<sup>2</sup>

Kurdistan Higher Council of Medical Specialties, Iraq

**ABSTRACT**

**Background:** Nurses are responsible to help provide key Oral Health (OH) tips to antenatal mothers. This study aims to investigate the knowledge and attitude of nurses in concerning OH in antenatal mothers.

**Materials & Methods:** This was a cross-sectional study on 495 nurses in antenatal health care at Maternity hospital of Erbil city/ Iraq from June to December 2023 used self-administered questionnaires. Sampling was done by purposive sampling method. Data were collected using an adapted questionnaire assessing nurses' knowledge through 23 items and attitudes through 6 items on a Likert scale. Also, there was a question about the source of information of the nurses related to pregnant women OH care.

**Results:** The mean knowledge score was  $34.836 \pm 3.632$ , and the mean attitude score was  $15.036 \pm 2.551$ . Nurses under 35 years old had significantly higher knowledge ( $35.761 \pm 4.370$ ) and attitude scores ( $15.619 \pm 2.505$ ) compared to those over 35 years old ( $34.414 \pm 3.159$  and  $14.770 \pm 2.531$ , respectively,  $P \leq 0.001$ ). Most nurses were aware of the causes and symptoms of gum disease, but there were gaps in knowledge regarding the effects of pregnancy on gum health. Most nurses 477 (96.4%) expressed a need for training in OH screening.

**Conclusion:** The study revealed inadequate knowledge among nurses regarding the OH of pregnant women, despite their positive attitude towards providing OH care. The knowledge and attitude of nurses was positive and significantly correlated with age, education, work experience and ward.

**KEY WORDS:** Knowledge; Attitude; Pregnancy; Oral health; Nurses; Periodontal disease.

**Cite as:** Hussein VM, Shahswar RS. Medical nurses knowledge and attitude toward oral health of pregnant women in Erbil City/ Iraq. *Gomal J Med Sci* 2024 Jul-Sep;22(3):232-9. <https://doi.org/10.46903/gjms/22.03.1667>

**INTRODUCTION**

Oral health (OH) is a critical aspect of overall health, particularly for pregnant women.<sup>1</sup> During pregnancy, hormonal changes can increase the risk of developing oral health problems such as gingivitis, periodontitis, and dental caries, which can lead to adverse pregnancy outcomes like preterm birth, low birth weight (LBW), and even maternal and fetal mortality.<sup>2,3</sup> Studies showed that the prevalence of oral disease in pregnancy is about 44.2%.<sup>4</sup>

Despite the significance of oral health during pregnancy, studies have shown that many pregnant

women lack knowledge about the importance of oral health and the need for regular dental visits.<sup>5,6</sup> This lack of knowledge can be attributed to various factors, including limited access to oral health education, socioeconomic status, and cultural beliefs.<sup>1,7,8</sup> Research has shown that access to dental health-care differs between low-income nations (35%) and upper-middle-income countries (75%).<sup>1</sup>

Nurses play a crucial role in promoting oral health among pregnant women, as they are often the first point of contact for these women in antenatal care settings.<sup>9</sup> Nurses can provide oral health education, conduct oral health assessments, and refer pregnant women to dental professionals when necessary.<sup>9,10</sup> However, studies have shown that health professionals often lack knowledge about oral health during pregnancy and may have misconceptions about the relationship between oral health and pregnancy outcomes.<sup>11</sup>

Given the importance of early detection and management of oral health problems, nurses' knowledge and attitudes toward oral health care for pregnant

**Corresponding Author:**

Dr. Vian Mohammed Hussein  
Assistant Professor, Dental Health  
Kurdistan Higher Council of Medical Specialties  
Kurdistan, Iraq

E-mail: [vian\\_jaf@yahoo.com](mailto:vian_jaf@yahoo.com)

**Date Submitted:** 18-01-2024

**Date Revised:** 03-08-2024

**Date Accepted:** 12-08-2024

women are crucial. The gaps in the current literature underscore the necessity of conducting the present study. While previous research has acknowledged the importance of oral health during pregnancy, there has been insufficient focus on the specific knowledge and attitudes of nurses who are integral to maternal healthcare. Therefore, the current study aimed to investigate the nurse's knowledge and attitude concerning OH of antenatal mothers.

## MATERIALS AND METHODS

**Study Design and Setting:** This was an analytical cross-sectional study with the aim of investigating the nurse's knowledge and attitude in antenatal health care at Maternity hospital of Erbil city/ Iraq from June to December 2023.

**Participants:** Sampling was done using hospital data and purposive sampling method and all nurses working in prenatal care were able to enter the study. The sample size was 495 nurses. The inclusion criteria for the study were nurses with at least 1-year job experience in antenatal care. The exclusion criteria encompassed any nurses who did not were unwilling to participate in the study.

**Data collection:** The data collection instruments employed in this study comprised three main components. Firstly, a demographic checklist was utilized to gather essential information about the participants including age, sex, educational, work experience, and ward of the participants. Secondly, the knowledge of nurses regarding OH during pregnancy was assessed using a questionnaire adapted from the study by Sharif et al. This questionnaire comprised 23 items evaluating the understanding of periodontal disease causes, symptoms, and the impact on pregnant women. Responses were collected using a format of 'Yes', 'No', and 'I don't know'. Thirdly, the attitudes of nurses towards OH care were evaluated using a 6-item Likert scale ranging from 'strongly agree' to 'strongly disagree'. The knowledge score varied from 0 to 46, with a higher number indicating superior knowledge. The scores for the two negative attitude statements were inverted. The overall attitude score varied between 0 and 30, with a higher score indicating a more positive attitude.<sup>9</sup>

Validity and reliability of the questionnaire was done using a pilot study by 10 nurses. Validity of the questionnaire was checked by nursing and dental hygiene experts. The reliability of the questionnaires was confirmed through a Cronbach's alpha coefficient of 0.82, indicating good internal consistency.

**Ethical Approval:** The ethics committee of Kurdistan higher council of medical specialties number 2021 at 6/ 11/ 2022 approved the protocol of this study. Written informed consent was obtained from all participants, ensuring anonymity and confidentiality of the findings.

**Statistical analysis:** The data analysis was performed using IBM SPSS statics v.22. Descriptive statistics for categorical data were expressed as percentages and frequencies, and for continuous data as means and standard deviations. An independent sample t-test was used to assess the knowledge and attitude of the nurses based on their demographic data. Significance was attributed to P values less than 0.05 for statistical analysis.

## RESULTS

**Demographic characteristics:** The results of demographic variables in 495 nurses under study are shown in Table (1). The Mean  $\pm$  (SD) age of the study participants was  $8.654 \pm 28.95$  years. The age characteristics showed that the 201 (40.6%) nurses were within the 35-44 age group. With regard to sex distribution, females comprised a larger portion of the participants, with 321 female nurses (65%). The educational background was predominantly Bachelor's degree holders, who accounted for 400 of the participants (80.9%). When considering work experience in years, the largest segment was those with more than 16 years of experience, with 164 nurses (33.1%) falling into this category. Most of the participants, 120 (24%) nurses worked in the Maternity ward. Furthermore, the length of service specifically in antenatal care showed that 183 nurses (36.9%) had  $\geq 16$  years of experience.

**Descriptive data regarding nurses' knowledge of periodontal diseases and OH care of pregnant women:** The findings of the current study on the nurses' understanding of periodontal diseases and dental hygiene treatment for pregnant women are shown in Table (2). In assessing the knowledge of nurses regarding the causes and associations of gum diseases among pregnant women, 469 (94.7%) nurses identified excess sugar consumption as a cause of gum diseases. Similarly, genetic factors were recognized by 467 nurses (94.3%) as contributing to gum diseases, and dental plaque was identified by 456 nurses (92.1%) as a cause. Regarding the symptoms of gum disease, the responses also showed a high level of knowledge among the nurses. Pain from the gums was the most recognized symptom, noted by 476 participants (96.2%). Additionally, swollen gums were acknowledged by 465 nurses (93.9%), and changes in gum color were identified by 456 participants (92.1%). When it came to understanding the potential adverse outcomes of gum problems during pregnancy, the majority of nurses recognized the link between gum diseases and LBW newborns, with 477 participants (96.4%). However, knowledge regarding other complications such as preterm birth and cleft lip and palate was notably lower, with only 28 nurses (5.7%) and 35 nurses (7.1%) respectively aware of these associations.

**Table 1: Demographic characteristics of the participation in study**

Characteristics		Frequency (%)
Age (year)		28.95±8.654
Age group (years)		
≤ 34		155 (31.3%)
35-44		201 (40.6%)
45-54		102 (20.6%)
≥ 55		37 (7.5%)
Sex	Female	321 (65%)
	Male	174 (35%)
Education level		
Diploma		70 (14.1%)
Bachelor		400 (80.9%)
Master's degree		25 (5%)
Work experience (years)		
≤ 5		109 (22%)
6-10		70 (14.1%)
11-15		152 (30.7%)
≥ 16		164 (33.1%)
Ward		
Maternity		120 (24%)
Emergency		90 (18%)
Dispensary		70 (14%)
Operating room		50 (10%)
ICU		40 (8%)
CCU		35 (7%)
Internal		35 (7%)
Surgery		30 (6%)
Radiography		25 (5%)
Length of service in antenatal care (years)		
≤ 5		147 (29.6%)
11-15		165 (33.3%)
≥ 16		183 (36.9%)

**Description data of the nurses' toward oral health care of antenatal mothers:** The findings of the study on the nurses' perspective on OD hygiene for expect-

ant women are shown in Table (3); where 477 (96.4%) nurses believed that they should receive training to perform OH screening, 393 (79.4%) nurses neither agreed nor disagreed with the statement "I am responsible for diagnosing common oral diseases".

229 (46.3%) nurses disagreed with the statement "I am not obligated to look into my patients' mouths to diagnose OH problems".

207 (41.8%) nurses neither agreed nor disagreed with the statement "I need to update my knowledge about oral hygiene for pregnant women", 430 (86.9%) nurses believed that they should assist in educating pregnant women, and 249 (50.3%) nurses agreed with the statement "There is no need to refer to a dental clinic if pregnant mothers have no problems with their OH".

#### **Source of data regarding the relationship between pregnancy and OH**

The results of the investigation of information sources variable related to the relationship between OH and pregnancy showed that 265 (53.5%) nurses read books, journals, or pamphlets as their information sources. 165 (33.3%) nurses had consulted medical journals as their information sources. 265 (51.7%) nurses had consulted the medical curriculum as their information source. Clinical experience was the information source for 292 (59%) nurses. Television watching and internet browsing were the information sources for 433 (87.5%) and 387 (78.2%) nurses respectively, and 136 (27.5%) nurses had consulted other sources. (Table 4)

Comparison of mean knowledge and attitude scores  
The mean knowledge score was  $34.836 \pm 3.632$  (95% CI: 34.515 – 35.157) and the mean attitude score was  $15.036 \pm 2.551$  (95% CI: 14.811 – 15.261). Table (5) compares the mean scores of nurses' attitudes and knowledge across age groups, work experience, and years of prenatal care. The knowledge and attitude related to nursing experience and prenatal care did not significantly correlate with each other. But the nurses' knowledge and attitude were significantly different according to age groups ( $P \leq 0.001$ ), so that the mean score of knowledge in the age group less than 35 years  $35.761 \pm 4.370$  was higher than the age group more than 35 years  $34.414 \pm 3.159$ . Also, the mean attitude score in the age group of less than 35 years  $15.619 \pm 2.505$  was higher than the age group of more than 35 years  $14.770 \pm 2.531$  (Table 5).

Correlation of nurses' knowledge and attitude with demographic variables show in Table 6. Based on the results of the correlation between the knowledge of nurses and the age of nurses, education, work experience and ward there was a positive and significant correlation ( $P \leq 0.05$ ). Correlation between the Attitude of nurses and the age of nurses, sex, education, work experience and ward there was a positive and significant correlation ( $P \leq 0.05$ ).

**Table 2: Knowledge of nurses about periodontal diseases and OH care of antenatal mothers**

Knowledge item Yes		Frequency (%)		
		No	Do not know	
Gum diseases is caused by / associated with	Dental plaque	456 (92.1%)	29 (5.9%)	10 (2%)
	Smoking	306 (61.8%)	165 (33.3%)	24 (4.8%)
	Tooth Decay	449 (90.7%)	38 (7.7%)	8 (1.6%)
	Excess sugar consumption	469 (94.7%)	13 (2.6%)	13 (2.6%)
	Genetics	467 (94.3%)	19 (3.8%)	9 (1.8%)
	Pregnancy	313 (63.2%)	83 (16.8%)	99 (20%)
Symptoms of gum disease include	Bleeding gums	361 (72.9%)	52 (10.5%)	82 (16.6%)
	Swollen gums	465 (93.9%)	24 (4.8%)	6 (1.2%)
	Pain from the gums	476 (96.2%)	8 (1.6%)	11 (2.2%)
	Changes in gum color	456 (92.1%)	24 (4.8%)	15 (3%)
	Loose tooth	199 (40.2%)	91 (18.4%)	205 (41.4%)
	Bad breath (halitosis)	82 (16.6%)	372 (75.2%)	41 (8.3%)
	Gum abscess	439 (88.7%)	35 (7.1%)	21 (4.2%)
	Pregnancy-induced hormonal changes heighten the susceptibility to gum disease.	279 (56.4%)	90 (18.2%)	126 (25.5%)
	Pregnant mothers should be advised to discontinue brushing if they have bleeding in their gums.	206 (41.6%)	259 (52.3%)	30 (6.1%)
Gum problems in pregnant mothers may result in adverse outcomes such as:	LBW babies	477 (96.4%)	7 (1.4%)	11 (2.2%)
	Preterm birth	28 (5.7%)	455 (91.9%)	12 (2.4%)
	Cleft lip and palate	35 (7.1%)	395 (79.8%)	65 (13.1%)
	The acid responsible for tooth decay is generated by the reaction between bacteria and sugars found in carbohydrates.	45 (9.15)	385 (77.8%)	65 (13.1%)
	Vomiting may lead to the erosion of tooth surfaces due to the discharge of stomach acids.	59 (11.9%)	410 (82.8%)	26 (5.3%)
	Administering dental treatments when pregnant may have adverse effects on the developing baby.	120 (24.2%)	108 (21.8%)	267 (53.9%)
	Using toothpaste that contains fluoride may effectively prevent tooth decay while brushing teeth.	158 (31.9%)	291 (58.8%)	46 (9.3%)
	The fetus will extract calcium from the mother's teeth.	405 (81.8%)	58 (11.7%)	32 (6.5%)

**Table 3: Attitude of nurses toward oral health care of antenatal mothers**

Attitude item	Frequency (%)				
	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
I need training to do oral health screenings.	48 (9.7%)	429 (86.7%)	18 (3.6%)	0 (0%)	0 (0%)
I am responsible for diagnosing common oral diseases	42 (8.5%)	41 (8.3%)	393 (79.4%)	19 (3.8%)	0 (0%)
I am not obligated to look into my patients' mouths to diagnose oral health problems	7 (1.4%)	175 (35.4%)	79 (16%)	229 (46.3%)	5 (1%)
I need to update my knowledge about oral hygiene for pregnant women	50 (10.1%)	181 (36.6%)	207 (41.8%)	57 (11.5%)	0 (0%)
I should assist in educating expectant mothers about OH.	45 (9.1%)	385 (77.8%)	55 (11.1%)	10 (2%)	0 (0%)
There is no need to refer to a dental clinic if pregnant mothers have no problems with their oral health	31 (6.3%)	249 (50.3%)	112 (22.6%)	92 (18.6%)	11 (2.2%)

**Table 4: Descriptive data of the source of learning information among the participants**

Source of learning	Frequency (%)	
	Yes	No
I read it in a book, magazine or pamphlet	265 (53.5%)	230 (46.5%)
It was mention in the medical journal	165 (33.3%)	330 (66.7%)
It was mention in the medical curriculum	265 (51.7%)	239 (48.3%)
Clinical experience	292 (59%)	203 (41%)
I saw it on TV	433 (87.5%)	62 (12.5%)
I saw it on the internet	387 (78.2%)	108 (21.8%)
Others	136 (27.5%)	359 (72.5%)

**Table 5: Comparison of mean knowledge and attitude scores**

Characteristics	Mean (SD)	Mean difference	t statistic	P-value*
Knowledge				
34.836±3.632 95 % CI (34.515 – 35.157)				
Age group (years)				
< 35	35.761±4.370	1.346	3.447	0.001
≥ 35	34.414±3.159			
Work experience				
≤ 10	35.353±4.357	0.808	2.132	0.034
> 10	34.545±2.977			
Length of service in antenatal care (years)				
≤ 10	35.076±4.554	0.396	1.084	0.279
> 10	34.680±2.878			
Attitude				
15.036±2.551 95 % CI (14.811 – 15.261)				
Age group (years)				
< 35	15.619±2.505	0.848	3.484	0.001
≥ 35	14.770±2.531			
Work experience				
≤ 10	15.179±2.604	0.223	0.929	0.354
> 10	14.955±2.521			
Length of service in antenatal care (years)				
≤ 10	14.974±2.613	-0.102	-0.432	0.666
> 10	15.076±2.513			

\* P-value independent t-test

**Table 6: Correlation of nurses' knowledge and attitude with demographic variables**

Characteristics	Age		Sex		Education		Work experience		ward	
	r	P-value	r	P-value	r	P-value	r	P-value	r	P-value
Knowledge	0.3	0.02	0.2	0.78	0.5	0.01	0.3	0.03	0.2	0.01
Attitude	0.4	0.01	0.1	0.04	0.4	0.02	0.3	0.01	0.4	0.02

## DISCUSSION

In the present study, the nurses' knowledge and attitude about OD health care of antenatal mothers was investigated. Nurses' knowledge about the causes of gum disease and the symptoms of gum disease during pregnancy was adequate, but the nurses' knowledge about the consequences of gum disease during pregnancy was low. Examining the attitudes of nurses also showed that the nurses had a good attitude about education and referral about OD health care of antenatal mothers, but there was no proper attitude among nurses about diagnosing diseases. Given the significance of OH for expectant mothers, programs for providing OD hygiene should take this into account. This is because an unhygienic mouth

or dental environment may harm both the mother's and the unborn child's health.<sup>12</sup> Accordingly, paying attention to the state of knowledge and attitude of nurses who are in direct contact with pregnant women and are in charge of caring for pregnant women is essential and vital, because the lack of sufficient knowledge and inappropriate attitude among nurses regarding OD health care of antenatal mothers can endanger the OD health of pregnant women.<sup>13</sup>

The results of this study on the factors that cause gum diseases during pregnancy showed that more than 90% of nurses were aware of effect of dental plaque, tooth decay, excess sugar consumption and genetics. Although their knowledge of the effects of smoking and pregnancy in causing gum disease

was less than other factors. In a study conducted in Turkey by Şahin and Kaya (2022) with the aim of investigating the knowledge, attitude and practice of nurses and midwives regarding OD health during pregnancy, the knowledge of nurses and midwives about the factors causing gum diseases and OH were similar to the results of the current study and in a good condition. Although the information of the participants about some factors such as gingival infection, periodontal diseases and patient visits and referrals was not adequate.<sup>13</sup>

The nurses demonstrated adequate knowledge regarding the symptoms of gum disease in antenatal mothers, specifically in relation to bleeding gums, swollen gums, gingival pain, alterations in gum coloration, and the presence of gum abscesses. However, their understanding of symptoms such as loose teeth, halitosis, hormonal changes, and the recommendation to stop brushing if bleeding occurs was found to be insufficient. In the study conducted by Sharif et al. (2016) that the knowledge and attitude of 133 nurses about OD hygiene during pregnancy were investigated, although the knowledge status of nurses about OD hygiene in pregnant women was not appropriate, but the knowledge of nurses regarding the symptoms of gum disease and the consequences of gum disease was higher than the results of the present study, and the reason for this difference can be in the methodology and small sample size of this study.<sup>9</sup> In another study conducted in Iran, which was conducted with the aim of investigating the knowledge, attitude and practice of gynecologists and obstetricians towards the OD hygiene of antenatal mothers. The results showed that the knowledge of doctors about OD hygiene was at an optimal level, so that most of the doctors (85%) had good knowledge about the cause, symptoms and consequences of OD disease. Also, the attitude and performance of the doctors was at a good level, and the referral of patients to the dentist and the training of health measures were also at a good level.<sup>14</sup>

Examining the status of nurses' attitudes showed that most nurses agreed to receive training on OD health care in antenatal mothers and transfer this training to pregnant mothers, and they also had appropriate attitudes about referring mothers to clinics, but their attitudes for the diagnosis of OD diseases and problems was not suitable. In general, nurses had a good attitude about OD care in antenatal mothers, which was also found in the studies of Australia<sup>15</sup>, Malaysia<sup>9</sup>, and Rwanda.<sup>1</sup>

Based on the results of the current study, nurses' sources of information about OD health care in antenatal mothers were watching TV, the Internet, and nurses' clinical experience, while in the study of Daneshvar et al. (2023) the sources of information were TV, medical science journals and work in dental centers and offices.<sup>8</sup> In the study Gaffar et al.

(2023) the most important sources of information for the participants in the study were university education, social media, and publications and scientific journals.<sup>16</sup>

In the current study, there was a notable difference in the knowledge status of nurses based on age and work experience, while the attitude status of nurses had a significant difference only based on age, and these results were different from other studies, which shows that age and experience can be involved in the knowledge and attitude of nurses.<sup>1,9</sup>

**Limitations:** This study had several limitations. The cross-sectional nature of the study prevents the determination of causality between nurses' knowledge and attitudes and their actual practices. Additionally, the study is confined to a single geographic location and hospital, which may not reflect the situation in other regions or healthcare settings. Finally, self-reported data might introduce response bias, affecting the accuracy of the findings.

## CONCLUSION

The results of the current study revealed that the nurses had inadequate knowledge about OD hygiene in antenatal mothers, while the nurses had a good and appropriate attitude in this matter. Increasing the awareness level of nurses can be effective in improving their attitude and performance. The knowledge of nurses was positively and significantly correlated with age, education, work experience and ward, and the attitude of nurses was also positively and significantly correlated with age, gender, education, work experience and ward. Since pregnant women have a higher risk of contracting OD diseases due to the special conditions of pregnancy, and on the other hand, these diseases have ill-known effects on perinatal outcomes, researchers based on the findings of this study suggest that OH education programs during pregnancy should be given more attention and emphasis.

**Acknowledgment:** We would like to show our gratitude to the esteemed participants who has helped us during this research study. Furthermore, we express our deep gratitude to the nurses, whose willingness to share their experiences and insights has enriched our understanding of the subject matter.

## REFERENCES

1. Jahan SS, Hoque Apu E, Sultana ZZ, Islam MI, Siddika N. Oral Healthcare during Pregnancy: Its Importance and Challenges in Lower-Middle-Income Countries (LMICs). *Int J Environ Res Public Health*. 2022;19(17):10681. <https://doi.org/10.3390%2Fijerph191710681>
2. Nannan M, Xiaoping L, Ying J. Periodontal disease in pregnancy and adverse pregnancy outcomes: Progress in related mechanisms and management strategies. *Front Med*. 2022;9:963956. <https://doi.org/10.3389%2Ffmed.2022.963956>

3. Adebayo ET, Abodunrin OR, Adewole IE, Salako AO, Lusher J, Akinsolu FT, et al. Oral Diseases and Adverse Pregnancy Outcomes in Sub-Saharan Africa: A Scoping Review. *BioMed*. 2024;4(1):1-18. <https://doi.org/10.3390/biomed4010001>
4. Lasisi TJ, Abdus-Salam RA. Pattern of Oral Health Among a Population of Pregnant Women in Southwestern Nigeria. *Arch Basic Appl Med*. 2018;6:99-103.
5. Uwambaye P, Munyanshongore C, Kerr M, Shiau H, Nyiringango G, Rulisa S. Assessment of the knowledge, attitude and practices of nurses and midwives working at antenatal clinics in the Southern Province of Rwanda on periodontal diseases: a cross-sectional survey. *Adv Med Educ Pract*. 2020;11:517-23.
6. Radwan-Oczko M, Hirnle L, Szczepaniak M, Duś-Ilnicka I. How much do pregnant women know about the importance of oral health in pregnancy? Questionnaire-based survey. *BMC pregnancy and childbirth*. 2023;23(1):348. <https://doi.org/10.1186/s12884-023-05677-4>
7. Tenenbaum A, Azogui-Levy S. Oral Health Knowledge, Attitudes, Practices, and Literacy of Pregnant Women: A Scoping Review. *Oral Health Prev Dent*. 2023;21:185-98. <https://doi.org/10.3290/j.ohpd.b4100965>
8. Daneshvar S, Ghazanfari Z, Hoseiny-Rad M, Aivazi N, Aivazi AA. Oral Health Among Pregnant Women at Ilam, Iran: A KAP Study. *J Health Rep Technol*. 2023;9(2):e130772. <https://doi.org/10.5812/jhrt-130772>
9. Sharif S, Saddki N, Yusoff A. Knowledge and Attitude of Medical Nurses toward Oral Health and Oral Health Care of Pregnant Women. *Malays J Med Sci*. 2016;23(1):63-71.
10. Muhammad-Safwan N-AS, Abdul-Mumin KH, Abdul Rahman H, Gharif R, Haji-Momin H-M, Kisut R, et al. Knowledge, attitudes, and practices of healthcare professionals on oral care of pregnant women in Brunei Darussalam. *BDJ Open*. 2023;9(1):35. <https://doi.org/10.1038/s41405-023-00162-8>
11. Cagetti MG, Salerno C, Ionescu AC, La Rocca S, Camoni N, Cirio S, et al. Knowledge and attitudes on oral health of women during pregnancy and their children: an online survey. *BMC Oral Health*. 2024;24(1):85. <https://doi.org/10.1186/s12903-023-03732-2>
12. Abdollahi M, Tehrani H, Mahdizadeh M, Nemat-Karimooy A, Gholian-Aval M. Perceptions and determinants of oral health care among Iranian pregnant women: a qualitative study. *BMJ open*. 2024;14(1):e080033. <https://doi.org/10.1136/bmjopen-2023-080033>
13. Şahin NH, Dinç H. Knowledge, Attitude and Practices of Nurses and Midwives towards Oral and Dental Health Care during Pregnancy: A Cross Sectional Study. *J Basic Clin Health Sci*. 2022;6(1):66-72. <https://doi.org/10.30621/jbachs.977546>
14. Alizadeh L, Allahyari E, F. K. An Evaluation of Knowledge, Attitude, and Practices of Obstetricians and Midwives Concerning Oral Health of Pregnant Women in Birjand in 2019. *Avicenna J Dent Res*. 2019;11(4):125-30. <https://doi.org/10.34172/ajdr.2020.25>
15. George A, Ajwani S, Bhole S, Dahlen HG, Reath J, Korda A, et al. Knowledge, attitude and practices of dentists towards oral health care during pregnancy: A cross sectional survey in New South Wales, Australia. *Aust Dent J*. 2017;62(3):301-10. <https://doi.org/10.1111/adj.12505>
16. Gaffar B, Bakhurji E, AlKhateeb R, AlHashim H, AlGaoud H, AlDaamah Z, et al. Exploring factors influencing nurses' attitudes towards their role in dental care. *PloS one*. 2023;18(7):e0288927. <https://doi.org/10.1371/journal.pone.0288927>

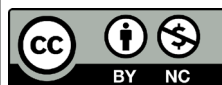
**CONFLICT OF INTEREST**  
 Authors declare no conflict of interest.  
**GRANT SUPPORT AND FINANCIAL DISCLOSURE**  
 None declared.

#### AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	VMH, RSS
Acquisition, Analysis or Interpretation of Data:	VMH, RSS
Manuscript Writing & Approval:	VMH, RSS

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



Copyright © 2024. Vian Mohammed Hussein, et al. This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License, which permits unrestricted use, distribution & reproduction in any medium provided that original work is cited properly.