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A STUDY OF THE KNOWLEDGE OF PHYSICIANS WORKING IN ANTENATAL CARE REGARDING ORAL HEALTH DURING PREGNANCY IN DIYALA GOVERNORATE

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ABSTRACT

Background: Physicians' knowledge of oral health during pregnancy is a vital aspect of prenatal care. Poor oral health in pregnancy increases the risk of early childhood caries, low birth weight, and premature births. Many expectant mothers remain unaware of these risks and rarely seek dental care during pregnancy. **Methodology:** A cross-sectional study was conducted from May to September 2012 in Diyala governorate to assess the knowledge of physicians working in antenatal care services regarding oral health during pregnancy. Data were collected through a self-reported questionnaire, which included demographic details (age, sex, degree, work location, years since graduation, and number of pregnant women examined weekly) and 20 true/false statements categorized into four areas: oral health problems, disease diagnosis, management, and complications (five questions each). Physicians' knowledge sources were also assessed. **Results:** Of the physicians surveyed, only 36% (52) demonstrated good knowledge about oral health during pregnancy, while 64% (94) had poor knowledge. Age and the number of pregnant women examined weekly were significantly associated with better knowledge, but other factors, such as work location and years since graduation, showed no significant correlation. **Conclusions:** The study revealed a lack of adequate knowledge among physicians about oral health during pregnancy and its implications, such as preterm delivery and low birth weight. Training programs for antenatal care physicians on managing oral health issues during pregnancy are essential to improve outcomes for mothers and infants.

KEYWORDS: Knowledge, physicians, antenatal care, oral health, pregnancy.

INTRODUCTION

Oral health plays a critical role in overall health and well-being, yet many women do not visit a dentist before, during, or after pregnancy, even when oral disease is evident. This neglect can lead to adverse outcomes for both mother and child. Poor oral health during pregnancy is associated with increased risks of early childhood caries, low birth weight, and preterm births. Fortunately, there are opportunities to educate health professionals about the importance of oral health care during the perinatal period and to engage them in promoting women's oral health during this time. It is safe to provide oral health services during pregnancy, as delaying necessary treatment can harm both the mother and fetus. Proper dental care, including brushing, flossing, scaling, root planning, and polishing, can help establish a healthy oral environment during pregnancy.[1,2] Pregnancy is marked by physiological changes, such as fluctuating hormones, that increase susceptibility to oral infections like gingivitis and periodontitis. Pregnancy gingivitis, a reversible inflammation of the gums, affects 30–100% of pregnant women and can lead to periodontitis if untreated. Periodontitis, which affects 5–20% of pregnant women, is a severe condition that destroys periodontal structures, leading to tooth loss and potentially triggering adverse pregnancy outcomes like preterm birth and low birth weight.[3] Emerging evidence highlights the link between periodontal infections and adverse pregnancy outcomes. Studies show that periodontal disease can lead to the release of inflammatory markers like prostaglandins and interleukins, which may contribute to preterm labor and intrauterine growth restriction. Maternal periodontal disease has also been associated with conditions like preeclampsia.[4] While interventions to treat periodontal disease may improve pregnancy outcomes, further clinical trials are needed to confirm these findings. Nevertheless, addressing oral health issues during pregnancy can enhance a woman's quality of life and reduce the transmission of caries-causing bacteria to

children, thus delaying the onset of caries in young children.[5] Tooth decay, another significant issue, often leads to painful and stressful situations for pregnant women. While pregnancy itself is not clearly linked to increased dental caries incidence, factors such as gastric reflux and less effective oral hygiene can worsen pre-existing conditions. Addressing tooth decay during pregnancy is vital to avoid complications and improve the quality of life for expectant mothers. Effective preventive measures include neutralizing acids after vomiting, chewing sugarless gum, and using fluoride toothpaste.[6] Loose teeth are another concern during pregnancy, caused by increased progesterone and estrogen levels. This condition is usually temporary and resolves postpartum.[7] Furthermore, dental radiography and treatment are safe during pregnancy when performed with appropriate precautions. Urgent dental care can be provided at any gestational age, while routine treatments are best scheduled during the second trimester to minimize risks.[7] Despite the importance of oral health, disparities in dental care access persist, particularly in vulnerable populations. Studies in the USA emphasize the need for improved oral health training among healthcare providers. While progress has been made, more efforts are required to integrate oral health into prenatal care practices. Unfortunately, in many countries, including ours, no studies have been conducted to explore the impact of neglecting oral health during pregnancy on pregnancy outcomes, highlighting a significant research gap.[8] The aim of study is to assessed Diyala governorate prenatal care physicians' oral health knowledge. Study physician oral health knowledge during pregnancy and related variables.

METHOD

This study was a cross-sectional survey conducted in Diyala Governorate, Iraq, between May 1 and September 30, 2012. The study was conducted in Diyala Governorate, which lies 50 km northeast of Baghdad. The region includes one teaching hospital, six general hospitals, two pediatric and gynecology hospitals, five primary health care sectors, and 28 major primary health care centers. The researcher collected data approximately two days per week, spending about eight hours per day. The study targeted all physicians working in antenatal care units in major primary health care centers, gynecological hospitals, and two general hospitals in Diyala Governorate. Physicians who met the inclusion criteria (those involved in antenatal care services and junior physicians with more than six months of experience in antenatal care services) were included. One physician was excluded based on the exclusion criteria, and two physicians declined participation.

Exclusion Criteria: Junior physicians with less than six months of experience in antenatal care services. Physicians on extended leave during the study period. The study protocol was reviewed and approved by the Diyala Directorate of Health and the Ministry of Health. Data were collected using a self-reporting questionnaire filled out by physicians after obtaining their consent. The questionnaire included.

1. Demographic data (age, sex, qualification, work location, years since graduation, and the number of pregnant women examined weekly).
2. Knowledge assessment through 20 true/false statements categorized into four areas: problems, diagnosis, management, and complications of oral health during pregnancy.
3. Source of physicians' knowledge.

Scoring System: Correct answers were scored 5, while wrong or "I don't know" answers were scored 0. A total score above 50 indicated good knowledge, while 50 or below indicated poor knowledge.

Pilot Study: A pilot study involving 10 physicians and 10 dentists was conducted to refine the questionnaire and measure completion time.

Statistical Analysis: Data were analyzed using SPSS version 20. Frequencies and percentages were presented, and Chi-square tests were used to assess associations. A p-value ≤ 0.05 was considered statistically significant.

RESULTS

A total of 146 physicians participated in this study composed of 98 (67%) females and 48 (33%) males.120 (82%) of them work in primary health care centers and 26 (18%) work in hospitals. The mean age $\pm$ SD of physicians were 33.15$\pm$ 6.23 with no significant difference between males and females' ages (33.33 $\pm$ 5.23years and 33.07 $\pm$ 6.68 year respectively). The physician's degree who participate in this study was as following general physician (MBChB) 126(86.3%), diploma 15 (10.3%), master 1 (0.7%) and board 4 (2.7%). The mean of years since last degree $\pm$SD of physician were 7.05$\pm$5.09 years. The mean number of pregnant women examined by the physician per week $\pm$SD was 40.57$\pm$33.33 pregnant women. As in table 1.

Table 1: distribution of physicians participated according to study variables.

Category	Subcategory	Percentage
Gender	Female	67.0%
	Male	33.0%
Work Location	Health Center	82.0%
	Hospital	18.0%
Age Group	$\leq$ 30 years	40.4%
	31–35 years	35.6%
	36–40 years	13.0%
	41–45 years	6.2%

	> 45 years	4.8%
Qualification	MBChB	86.3%
	Diploma	10.3%
	Board	2.7%
	Master	0.7%
Years of Experience	≤ 5 years	47.3%
	6–10 years	33.5%
	11–15 years	13.0%
	> 15 years	6.2%
Number of Patients/Week	5–20 patients	28.1%
	21–40 patients	41.8%
	41–60 patients	17.8%
	61–80 patients	4.8%
	81–100 patients	3.4%
	> 100 patients	4.1%

Most of the questions that have been asked to assess the oral health knowledge of physicians were answered by physicians, most question answered correctly by the physicians was question about tooth decay about 126 (86.3%) of physicians, while most one answered wrongly by the physicians was question about the effect of gingivitis on pregnancy and question about tooth brushing and hyperemsis gravidarum both of them answered by about 97 (66.4%) of physicians, and most one not answered by physicians (assigned as I don't know) was question about effect of cariogenic bacteria in mother about 24 (16.4%) of physicians, and a question about effect of antacid on tooth enamel about 22 (15.1%) of physicians as showing in table 2.

Table 2: Number and percentage of physician answered for each question.

Questions asked about		**Answered Correct**	**Answered Wrong**	**Not Answered**
Benefit of routine dental care in pregnancy	Problems knowledge	107(73.3%)	37(25.3%)	2(1.4%)
Common oral disease in pregnancy		58(39.7%)	72(49.3%)	16(11%)
Effect of morning sickness on tooth loose		73(50%)	66(45.2%)	7(4.8%)
Association of periodontitis and preterm birth		47(32.2%)	80(54.8%)	19(13%)
Effect of cariogenic bacteria in mother		62(42.5%)	60(41.1%)	24(16.4%)
Time at which pregnancy gingivitis happens	Diagnosis knowledge	52(35.6%)	80(54.8%)	14(9.6%)
Viral hepatitis in pregnancy		39(26.7%)	93(63.7%)	14(9.6%)
Effect of gingivitis on pregnancy		38(26%)	97(66.4%)	11(7.5%)
Dry mouth in pregnancy		116(79.5%)	25(17.1%)	5(3.4%)
Tooth decay in pregnancy		126(86.3%)	11(7.5%)	9(6.2%)
Reduce transmission of cariogenic bacteria to infant	Treatment knowledge	76(52.1%)	53(36.3%)	17(11.6%)
Effect of antacid on tooth enamel		48(32.9%)	76(52.1%)	22(15.1%)
Safety of local anesthesia during pregnancy		91(62.3%)	44(30.1%)	11(7.5%)
Management of dental pain in pregnancy		71(48.6%)	62(42.5%)	13(8.9%)
Use of supplemental fluoride in pregnancy		48(32.9%)	76(52.1%)	22(15.1%)
Tooth brushing and hyperemsis gravidarum	Complications knowledge	31(21.2%)	97(66.4%)	18(12.3%)
Best time for dental procedures in pregnancy		61(41.8%)	75(51.4%)	10(6.8%)
Hepatitis b vaccine in pregnancy		62(42.5%)	65(44.5%)	19(13%)
Reduction the effect of morning sickness on teeth in pregnancy		82(56.2%)	46(31.5%)	18(12.3%)
Use of x-ray for dental emergency in pregnancy		93(63.7%)	52(35.6%)	1(0.7%)

General knowledge assessment of physicians in this study showed about two third 94(64%) of them had poor knowledge (scoring 50 and below) and only52 (36%) had good knowledge. The result regarding to the source of physician's knowledge showed that most of the physicians trusted with textbook 96 (65.8%) of them as showing in figure 1.

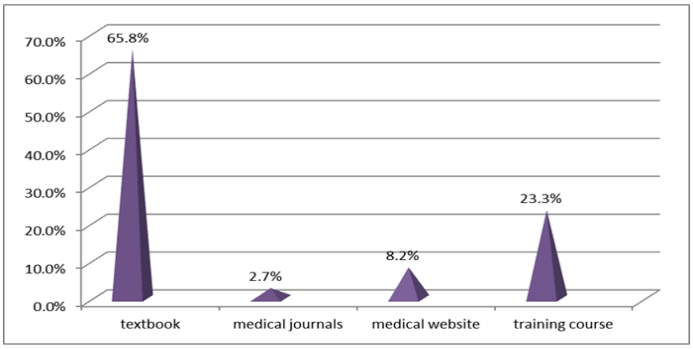

Figure 1: Distribution of sample according to the source of physician's knowledge.

The knowledge of physicians in this study was divided to the major 4 domains of knowledge (problem's knowledge, diagnosis's knowledge, treatment's knowledge, and complication's knowledge) of oral health during pregnancy and estimation to each type of knowledge through 5 questions. From that the result of the physician's knowledge was as following.

a) Problem's knowledge in this type of knowledge about 69(47%) of physicians had a good knowledge while about 77(53%) had poor knowledge.
b) Diagnosis's knowledge for this type of knowledge about half of physicians had a good knowledge 50% and other half had poor knowledge.
c) Treatment's knowledge about 57(39%) of physicians had a good treatment's knowledge and most of them had poor knowledge 89 (61%) of physicians.
d) Complication's knowledge nearly 62(42%) of physicians had a good complication's knowledge and about 84(58%) had poor complication's knowledge as showed in figure 2.

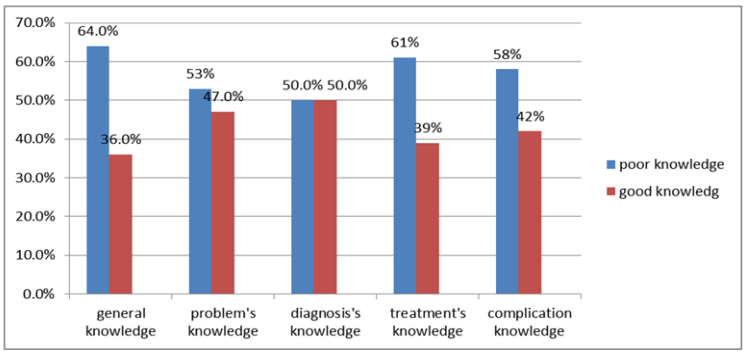

Figure 2: Distribution of physician's knowledge regarding to oral health during pregnancy according to domains asked about.

The general knowledge had no significant association with the following factors (site of work, sex, degree of physicians, years since last degree, and sources of knowledge that physicians trusted) while showed significant association with the age of physicians where younger $\leq$ 35 years were significantly of less knowledge than older one (P=0.025). Also significant association (P=0.03) was found between knowledge and number of pregnant women examined as physicians examine less women $\leq$ 30 per week had more knowledge 63.4% table 3.

Table 3: Distribution of general knowledge of physicians according to some determinant factors.

Variable	General Knowledge				Total		Significance
	Good		Poor				
	No.	%	No.	%	No.	%	
Site of work -health center -hospital	41 11	78.8% 21.2%	79 15	84% 16%	120 26	82% 18%	X^2=0.61 , df=1 and P=0.43
Age $\leq$35 >35	34 18	65.4% 34.6%	77 17	81.9% 17.1%	111 35	76% 24%	X^2=5.01, df=1 and P=0.025

Sex -female -male	32 20	61.5% 38.5%	66 28	70.2% 29.8%	98 48	67% 33%	X^2=1.14, df=1 and P=0.28
Qualification MBChB postgraduate	41 11	78.8% 21.2%	85 9	90.4% 9.6%	126 20	86% 14%	X^2=3.79, df=1 and P=0.051
Years since last degree ≤5 >5	22 30	42.3% 57.7%	47 47	50% 50%	69 77	47.5% 52.5%	X^2=0.79, df=1 and P=0.37
Number of pregnant women examined/week ≤30 >30	33 19	63.4% 36.6%	42 52	44.6% 55.4%	75 71	51% 49%	X^2=4.72, df=1 and P=0.03
Sources of physician's knowledge trusted -textbook -medical journal -medical website -training courses	40 2 2 8	76.9% 3.9% 3.9% 15.3%	56 2 10 26	59.5% 2.1% 10.7% 27.7%	96 4 12 34	65.7% 2.7% 8.2% 23.4%	Non valid test
Total	52	100%	94	100%	146	100%	

DISCUSSION

Integration of oral health promotion into general health care has been emphasized by the WHO, highlighting the role of primary-care physicians in improving oral health care.[9,10] In this study, only 52 (36%) of physicians had good knowledge about oral health during pregnancy, aligning with studies from Tehran and Ohio, where knowledge was similarly limited.[1,11] However, this percentage was lower than a study in Jordan, where 50% of physicians recognized the association between oral health and pregnancy outcomes,[12] and another in Australia, where 54% of general practitioners were aware of the effects of poor oral health on pregnancy outcomes.[13] Most physicians in this study acknowledged the benefits of routine dental care during pregnancy (73.3%), which was comparable to 81% in Australia.[13] However, many physicians referred pregnant women with oral health issues to dentists rather than managing these issues themselves, indicating limited engagement with oral health as part of their practice. About half (49.3%) of physicians could not identify common oral diseases in pregnancy, and many lacked the knowledge to differentiate between gingivitis and periodontitis, considering oral health issues as outside their scope of practice. Morning sickness's impact on teeth was recognized by 50% of physicians, who understood that hormonal changes during pregnancy could loosen teeth.[4] However, 54.8% were unaware of the link between periodontitis and adverse pregnancy outcomes, consistent with findings from Jordan, where only half of physicians recognized this association.[12] Evidence suggests women with periodontitis are two to three times more likely to experience preterm birth or low birth weight.[14,15] Knowledge of cariogenic bacteria was also limited, with only 42.5% of physicians aware of its maternal transmission to infants. This aligns with findings that maternal levels of *Lactobacillus casei* can predict infant birth outcomes.[11,16] Only 35.6% of physicians were aware of pregnancy gingivitis, despite it being the most common oral disease during pregnancy.[17] The limited understanding of its effects on pregnancy outcomes reflects gaps in training and awareness. Regarding viral hepatitis, 26.7% of physicians correctly identified the severe impact of HEV infection in pregnancy.[18,19] Physicians' reliance on simple measures for dry mouth (79.5%) and their recognition of tooth decay as a common issue (86.3%) highlight areas where knowledge was stronger. However, only 32.9% understood the limitations of antacid use during pregnancy due to its effect on iron absorption.[20] In terms of dental pain management, only 48.6% of physicians followed recommended guidelines for analgesics during pregnancy.[4] Similarly, fluoride use was misunderstood, with only 32.9% agreeing that prenatal fluoride supplementation lacks scientific support.[21] Most physicians (63.7%) supported the safe use of dental radiography during pregnancy but cited outdated equipment as a barrier.[21] This study identified significant associations between physicians' knowledge and age (P=0.025) and the number of pregnant women examined weekly (P=0.031), indicating younger physicians and those seeing fewer patients had better knowledge. However, no significant associations were found with work location, degree, gender, or years since graduation, suggesting systemic gaps in oral health education in Iraqi medical curricula. Finally, most physicians (65.7%) relied on textbooks as their primary information source, yet none of the sources showed a significant impact on knowledge. These findings underscore the need for targeted training programs and continuous medical education to address deficiencies in oral health knowledge among physicians.

CONCLUSION

This study demonstrated poor physician knowledge regarding oral health during pregnancy, primarily due to insufficient teaching on this topic. No significant association was found between knowledge and site of

work, sex, degree, years since graduation, or trusted knowledge sources. However, significant associations were observed with physicians' age and the number of pregnant women examined weekly. These findings highlight the need for improved education and training in this area.

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