Article

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

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Significance for public health

Preterm labour and low birth weight are considered to be one of the greatest problems in obstetrical medicine and are one of the most prevalent risk factors for death during the neonatal period. On the other hand, periodontal diseases are considered as important factors affecting pregnant women and their new-born children. Therefore it seems quite important to find out whether the healthcare providers who are most visited by pregnant women are aware of the periodontal disease and its relationship with poor pregnancy outcomes. The present study aimed to assess and compare the knowledge and beliefs of a group of Iranian obstetricians, general practitioners, and midwives regarding periodontal disease, and to assess whether their practice behaviours reflected their beliefs. The authors hope that publication of this paper would provide an evidence to plan for these health professionals' education on the importance of pregnant women's oral health promotion.

Abstract

Background. Periodontal disease is considered as a risk factor for poor pregnancy outcomes, including preterm birth and low birth weight. Only few studies have assessed the knowledge and practice behaviours of healthcare providers, concerning oral health during pregnancy, periodontal diseases and their role in adverse pregnancy outcomes. The present study aimed to compare the knowledge and practice behaviours of a group of Iranian obstetricians, general practitioners, and midwives about periodontal disease.

Design and methods. A cross-sectional study was conducted using a self-administered, structured questionnaire that was previously used in North Carolina. The questionnaire was translated into Persian language and was randomly distributed among 200 obstetricians, general practitioners, and midwives participating in an international congress. Data were analysed by Chi-square and spearman correlation tests using SPSS statistical software (version PASW 18).

Results. A total of 150 completed the questionnaires, achieving a response rate of 75%. Totally, the knowledge of the obstetricians was more accurate compared to the two other groups and the midwives were the worst. More experienced general practitioners (P=0.002) and obstetricians (P=0.049) did less dental examinations for their patients during their first visit or periodically. More experienced obstetricians also referred their patients for dental examinations during pregnancy less than their less experienced colleagues (P<0.001).

Conclusions. Although the participants had some knowledge about periodontal disease and its association with adverse pregnancy outcomes, there is much space for improvements. The participants' attitude and knowledge were consistent.

Introduction

Preterm labour (delivery before 37 weeks of gestation) and low birth weight (a birth weight lower than 2500 gr) are still considered to be the greatest problems in obstetrical medicine and are one of the most prevalent risk factors for death during the neonatal period.[1-4] In comparison to the full-term infants, preterm infants who survive the neonatal period, face a higher risk for several disabilities, such as neuro developmental problems, congenital anomalies, and neuromotor dysfunction, and even show a higher prevalence of behavioural problems such as attention deficit hyperactivity disorder and formal conduct disorder.[5] The potential risk factors regarding preterm birth (PTB) and low birth weight (LBW) have been the centre of many studies for several years. Recently, researchers suggest periodontal disease as an important risk factor in determining poor pregnancy outcomes, including PTB and LBW due to translocation of bacterial products (specially LPS) or inflammatory mediators (specially IL-1, IL-6,TNF-α and PGE2).[6-9] On the other hand, during pregnancy, oestrogen and progesterone level increase which lead to hyper vascularization of the periodontium and changes in collagen production, increasing the vascular permeability and making the gingival tissue more susceptible to local irritants such as bacterial biofilm. So, exacerbation of inflammatory alterations such as gingivitis, gingival hyperplasia, granuloma and worsening of pre-existing periodontitis may happen.[10,11] Therefore it seems quite important to find out whether the healthcare providers who are most visited by pregnant women are aware of the periodontal disease and its relationship with poor pregnancy outcomes.

Up to now, few studies have assessed the knowledge and practice behaviours of healthcare providers, such as obstetricians, general practitioners, nurses, and midwives, concerning oral health during pregnancy, periodontal diseases and their role in adverse pregnancy outcomes.[12-15]

The present study aimed to assess and compare the knowledge and beliefs of a group of Iranian obstetricians, general practitioners, and midwives regarding periodontal disease, and to assess whether their practice behaviours reflected their beliefs. To the best of our knowledge, no similar study had been conducted before, comparing the knowledge and practice behaviours of different groups of healthcare providers towards the periodontal disease during pregnancy in Iran.

Design and Methods

In the present cross-sectional study, a self-administered, structured questionnaire which was validated and used in a study conducted in North Carolina was used.[12] This questionnaire contained 19 questions

in four sections: i) personal data, ii) being concerned with the periodontal disease, iii) knowledge of possible changes during pregnancy and possible risk factors of PTB and LBW, and iv) their ability to examine their patients regarding the periodontal disease.

The original questionnaire was translated into Persian by a dentist with acceptable proficiency in English. The resulting questionnaire was translated back into English by a native English lay person fluent in Persian. The re-translated questionnaire was compared with the original one by authors to assure the proper translation. The final modifications were applied wherever necessary.

A pilot study was carried out to assess the face and content validity of the Persian questionnaire. Twenty midwives, twenty general practitioners, and twenty obstetricians were conveniently selected and asked to read the questionnaires, complete them, and discuss their impression of the questionnaires. At first the results were analysed separately for each study group, and then the three groups combined. When testing the internal reliability of questions that assessed the participants' knowledge and practice, Cronbach's alphas of 0.684, 0.651, and 0.650 were obtained for general practitioners, midwives, and obstetricians respectively. A Cronbach's alpha of 0.665 was observed when all three groups were added up. This value was increased to a maximum of 0.680 when items were deleted one by one. No significant difference was found in alpha coefficients between groups. The majority (90%) of the participants reported that the questions were easily understood. No modification was found necessary in this stage.

The questionnaire was randomly distributed between 200 participants of the international congress of women's health which was held in Shiraz (Iran, 2012), in which obstetricians, general practitioners, and midwives from all over Iran were participating. The randomization was conducted based on their congress registration ID. The data from the questionnaires were analysed by the SPSS statistical software (version PASW 18), using frequency descriptive measurements along with Chi-square and spearman correlation tests.

Results

One hundred and fifty out of 200 distributed questionnaires were returned, yielding a response rate of 75%. Forty eight participants were obstetricians, 52 were general practitioners, and 50 were mid-

wives. The mean age of the participants were 33.83±9.26 years and ranged from 21 to 66 years. Female participants comprised 100% of the midwives, 87.5% of the obstetricians, and 57.7% of the general practitioners. Midwives were less experienced than the other two groups. Most of the midwives (82%) had less than 5 years of experience, while participants of the other two groups were almost normally distributed regarding their experience. The median experience of midwifes, general practitioners, and obstetricians were 8, 16, and 23 years respectively (with interquartile ranges of 5, 11.75, and 17 respectively).

Just over one third of the participants (39.3%, N=59) reported that they had at least one dental visit and 24.7% (N=37) had undergone periodontal examinations in the past 6 months. Overall, 19.3% (N=29) of the participants had never been told of having gingival disease. The participants were asked about the causes and risk factors of periodontal disease. Bacteria, and tooth decay were the two most commonly chosen factors (Figure 1).

When asked about the description of gingivitis, the majority of the participants answered that it was a reversible redness and/or swelling of the gums (51.3%, N=77) and a potentially reversible infection of the gums (32.7%, N=49) (Table 1). Table 2 demonstrates what partici-
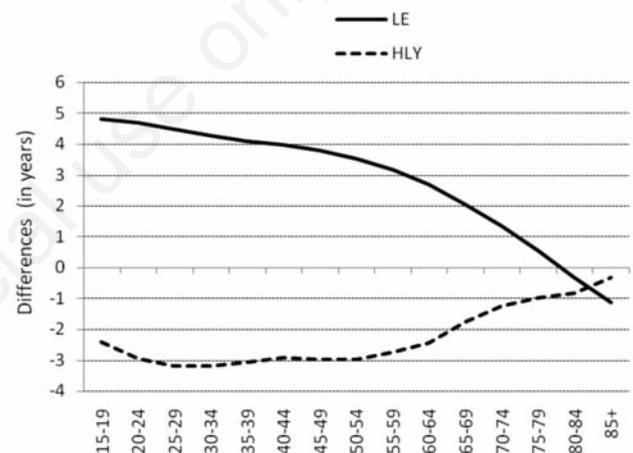

Figure 1. The participants' reply to: *which of the followings can cause periodontal disease?* **(N=150).**

Table 1. The participants' response to: what is the definition of gingivitis? (N=150).

Group	Tooth decay, N (%)	Reversible infection of the gums, N (%)	Reversible redness and/or swelling of the gums, N (%)	Lesions on the tongue, N (%)
Obstetricians	4 (8.3)	10 (20.8)	34 (70.8)	0 (0)
General practitioners	6 (11.5)	18 (34.6)	28 (53.8)	0 (0)
Midwives	14 (28)	21 (42)	15 (30)	0 (0)
Total	24 (16)	49 (32.7)	77 (51.3)	-

Table 2. The participants' response to: what is the definition of periodontitis? (N=150).

Group	Tooth decay, N (%)	Potentially reversible infection of the gums, N (%)	Lesions on the tongue, N (%)
Obstetricians	8 (16.7)	38 (79.2)	2 (4.2)
General practitioners	13 (25)	38 (73.1)	1 (1.9)
Midwives	28 (56)	20 (40)	2 (4)
Total	49 (39)	96 (64)	5 (3.3)

pants think periodontitis is. Less than half of the participants (44%, N=66) knew that periodontitis is a condition more serious than gingivitis. The percentage of the obstetricians' correct answer was more than that of the other 2 groups (58.3%, N=28) and this percentage was the least for the midwives (36%, N=18). A high percentage of the participants knew that gingival swelling (82%, N=123) and bleeding (74.5%, N=112) may occur during pregnancy. Regarding tooth loss, 65.4% (N=99) thought it probably or definitely occurs during pregnancy. In addition, 87.4% (N=131) of the participants believed that pregnancy can probably or definitely be associated with increased tooth decay. Overall, the obstetricians had more correct answers than the other two groups (Figure 2). Figure 3 represents the knowledge of the participants regarding the risk factors for preterm birth and/or low birth weight (PLBW). The majority of the participants knew that periodontal disease is a risk factor for PLBW just the same as maternal smoking, preeclampsia, and bacterial vaginosis. The minimum and maximum correct answers regarding identifying periodontal disease as a risk factor for PLBW were provided by the general practitioners (73%, N=38) and the obstetricians (91.7%, N=44), respectively.

Figure 4 describes the frequency of the participants recommending educational classes on child birth classes, breastfeeding consultations, genetic screening, and dental examination to their patients during the prenatal care. As the Figures illustrates, recommendation for dental examination was almost the same as the other recommendations (more than 80% for all, N=123).

When asked about when they looked into their patients' mouth, 40% of the participants (N=60) answered that they did so at the initial prenatal examination, 22% (N=33) did so periodically, and 10.7% (N=16) did this examination if the patient mentioned a problem. Besides, 3.3% (N=5) of the participants rarely or never did this examination and 24% of all participants (N=36) and 34% of midwives (N=17) though it was the dentist's duty, not theirs (Table 3).

The study results revealed a significant negative correlation between general practitioners' experience and doing dental examinations at the initial visit or periodically (r=0.56 , P=0.002); less experienced ones did more dental examinations at the initial visit or periodically than the more experienced ones (r=0.44, P=0.042). Almost the same result was found for obstetricians: The probability of doing dental examination decreased as experience increased (P=0.049). However, this relationship was not significant regarding midwives (P=0.729). Moreover, working experience was negatively correlated with the frequency of recommendation for dental examination during pregnancy for obstetricians (P<0.001). This relationship was not significant for the midwives (P=0.387) or general practitioners (P=0.051). On the other hand, no significant relationship was found between having regular dentacheck-upsps for the participants themselves and referring their patients for dental (P>0.500 in all 3 groups).

Discussion and Conclusions

The present study aimed to assess the knowledge and attitudes of three different groups of healthcare providers (obstetricians, general practitioners, and midwives) about the relationship between periodontal disease and PLBW.

In general, the knowledge of the obstetricians participating in our study was more accurate compared to the other two groups, which may show that the obstetricians' medical education emphasizes the importance of oral health more than the other two groups. The results of this study showed that recommendation for dental examination during pregnancy was almost the same as the other recommendations, such as genetic consultation or breast feeding. Sixty two percent of the partic-
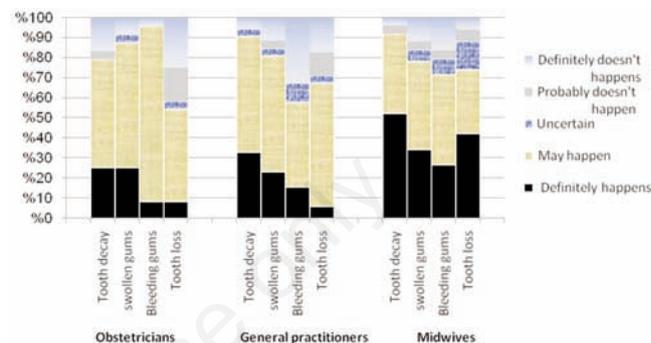

Figure 2. The participants' response to: *what is the probability of each the followings to occur or worsen during pregnancy?* (N=150).
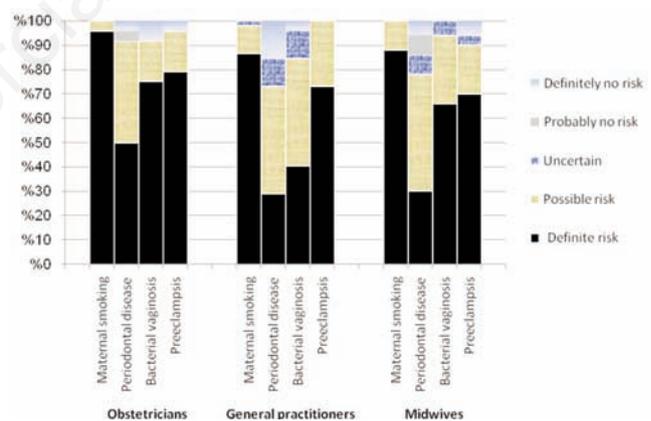

Figure 3. The participants' response to: *which ones of the followings are related or can be risk factors for PLBW?* (N=150).

Table 3. The participants' response to: when do you examine your pregnant patients' mouth? (N=150).

Group	Initial exam, N (%)	Periodically, N (%)	If the patient mentions a problem, N (%)	Rarely or never, N (%)	It is dentist's duty, N (%)
Obstetricians	20 (41.7)	8 (16.7)	10 (20.8)	0 (0)	10 (20.8)
General practitioners	22 (42.3)	17 (32.7)	4 (7.7)	0 (0)	9 (17.3)
Midwives	18 (36)	8 (16)	2 (4)	5 (10)	17 (34)
Total	60 (40)	33 (22)	16 (10.7)	5 (3.3)	36 (24)

ipants conduct oral and dental examinations for their patients in the initial visit or periodically.

Based on the findings of the present study, the knowledge of the midwives about oral health and its influence on systemic health was not sufficient; while, they can have an important role in improving the community's health by detecting oral diseases and referring the patients for appropriate treatment. Therefore, their medical education should emphasize on oral health and its impact on systemic health.

Previously, two studies evaluated the knowledge of obstetricians and one study focused on Nurse Practitioners' (NPs) and Certified Nurse Midwives' (CNMs) knowledge regarding periodontal disease as a possible risk factor for PLBW.[12-14] According to their results, both NPs and CNMs had limited knowledge of oral health.[14] For example, only 67% of them knew the description of periodontitis and when they were asked about the causes of periodontal disease, 73% answered tooth decay, 69% mentioned aging, and 51% answered excessive dietary sugar. In our study, the results were almost the same and the midwives' knowledge was less than the obstetricians' and general practitioners' knowledge. Nonetheless, both studies evaluating the obstetricians demonstrated that although there was some knowledge about the periodontal disease and its association with adverse obstetric outcomes, the attitudes of the obstetricians was not completely consistent with their apparent knowledge.[12,13] In the study conducted in North Carolina,[12] although a high percentage of the obstetricians believed that periodontal disease could be a possible risk factor for adverse pregnancy outcomes, recommendations for dental examinations as a part of prenatal care and also visual dental exams during the initial visit or periodically were not routine. However, in a Brazilian study,[13] more than 90% of the obstetricians recommended dental examinations during pregnancy, which is consistent with the findings of the present study. Our study showed a negative relationship between general practitioners' and obstetricians' experience and doing dental examinations during the initial visit or periodically, while this relationship was positive in the study conducted in North Carolina.[12] Our study also showed a negative relationship between the working experience and the frequency of the recommendations for dental examination during pregnancy in obstetricians groups. On the other hand, the Brazilian study showed that more experienced participants more frequently recommended dental examinations to their patients.[13] The results of our study might indicate the need for proper training regarding oral health during continuing professional development of those health care providers that deal with pregnant women.
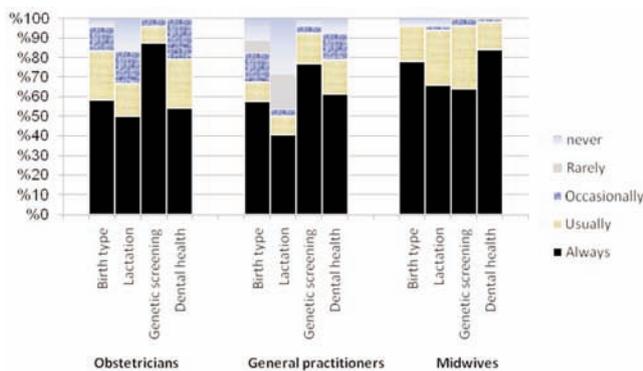
The Brazilian study showed that the obstetricians who underwent a dental visit in the last year referred their patients to dentists more than others.[13] However, this relationship was not significant for the participants of this study. Although the low number of participants can be regarded as a limitation for the present study; the high response rate (75%) compared to other similar studies (40% in North Carolina's study and 55% in Brazilian one) is of its important strengths. The difference of the response rate between the present study and the other two is very important as those who did not respond might be those who had less knowledge or less interest in oral health. Although the study participants had some knowledge about periodontal disease and its association with adverse pregnancy outcomes, there is much space for improvements. More dental information and association between oral health and systemic health should be incorporated into the medical *curricula* to change the physicians' attitude towards periodontal disease, especially in pregnant women.

Figure 4. The participants' response to: *how often do you consult your pregnant patients or refer them for consultation for each of the followings?* **(N=150).**

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