



Periodontal Health Status and Pregnancy Outcomes: A Survey in Medical Doctors

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ABSTRACT

Introduction: Periodontal disease and caries are the most common causes of tooth loss worldwide. Studies have demonstrated strong association between periodontitis and adverse pregnancy outcomes. Medical doctors, who are the primary healthcare providers, seldom advise women to seek dental care during pregnancy. This study was undertaken to explore the knowledge, attitudes and behaviours of medical doctors towards oral health and to identify the barriers of prenatal periodontal healthcare in their practices and its possible implications on pregnancy outcomes.

Methods: Total 377 doctors filled the questionnaire. The data collected through personal contacts, social networking, emails, online forms and networking at conferences were analysed using Statistical Package for the Social Sciences 20 software program and presented in tables, charts and diagrams.

Results: Out of 263 (69.8%) male and 114 (30.2%) female doctors enrolled in the study, only 52 (13.8%) had received education or training on oral care during pregnancy. Among them 299 (79.3%) agreed that there is possible link between health of teeth-gums and pregnancy. Approximately 105 (27.9%) encountered patients with oral/periodontal problem every week but only 108 (28.6%) "always" advised their patient for regular dental check-ups. Similarly, 358 (95%) agreed that there is need for universal guidelines. However, 133 (35.3%) thought there was insufficient time to advise patients on oral health during check-ups.

Conclusions: There is need for training on 'oral healthcare during pregnancy' for medical doctors. Developing universal guidelines for oral healthcare in pregnant women for all health professionals would be another important step. An adequate referral system to oral healthcare providers and biannual check-ups is recommended for both general patient as well as pregnant women for preventing adverse situations related to oral and specifically periodontal diseases.

Keywords: *low birth weight; Nepal; oral health; periodontal medicine; pregnancy outcomes.*

INTRODUCTION

Periodontitis is an infection with multi-factorial characteristics.¹ Low birth weight (LBW) and preterm delivery (PTD) are major health problems associated with high morbidity and mortality.² Studies in various populations have demonstrated strong association

between periodontal diseases and adverse pregnancy outcomes such as preterm low birth weight (PTLBW).³⁻⁵

Potential mechanism of periodontal disease in mother

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to be associated with the occurrence of PTD, LBW and PTLBW^{1,3,4} suggested is that periodontal infections serve as chronic reservoir of microorganisms that cause production of interleukins and prostaglandins which in turn induce preterm parturition.² Medical doctors are the ones who often deal with antenatal care (ANC). However, very few studies exist regarding their oral health awareness⁶⁻⁹ and none could be found in context to Nepal.

This study was conducted to assess the knowledge and practices of medical doctors towards oral health care during pregnancy, thereby increasing their awareness of possible systemic implications of periodontal diseases. Consequently, helping decrease chances of PTLBW due to oral and periodontal conditions.

METHODS

This is a cross-sectional survey that was carried out for five months duration from August to December 2017. among medical doctors (medical officers, residents and specialists) registered at Nepal Medical Council (NMC) and practicing in various parts of Nepal.

Before embarking upon the study, ethical approval was taken. The privacy of the volunteers were fully maintained and informed consent was taken after explaining all the relevant details, its importance and implications. Those who did not give consent for any reason were excluded from the study. Confidentiality was maintained to the utmost. No names, documents or results are disclosed or circulated anywhere other than among the researchers. The names of the participants do not appear in the final report.

The inclusion criteria included all the male and female doctors holding an MBBS (Bachelor of Medicine and Bachelor of Surgery) degree, registered with NMC and willing to sign an informed consent whereas the exclusion criteria were MBBS degree holders not registered at NMC or unwilling to sign an informed consent.

Convenience (non-probability) sampling technique was utilised and the sample size of 376 was calculated by utilizing following formula on the total database of medical doctors provided by NMC as of 2016 December:

$$\text{Sample Size} = \frac{\frac{Z^2 \times p(1-p)}{e^2}}{1 + \frac{Z^2 \times p(1-p)}{e^2 N}} = 375.88$$

Where Population size (N) = 17449; Confidence level (%) = 95; P=0.5 with Margin of error (e) = 0.05.

The questionnaire survey addressed the domains of knowledge, attitude, barriers and practices of oral healthcare, periodontal impact on pregnancy outcomes along with the demographics. Both open and close-ended questions were asked. Most survey items were derived and modified from existing studies exploring the knowledge of medical doctors regarding oral health and awareness about possible implications during pregnancy.^{7, 9-11} The proforma was reviewed by experts to establish content validity and then tested twice in a group of medical doctors practicing in the Kathmandu city (initially in 25 doctors, then 34). Survey content, clarity and length were modified and improved in response to the reviews. Participants were recruited through personal contacts, social networkings, via emails, online forms and networking at conferences. The findings were filled in the proforma developed for this study and data were entered in Microsoft Excel. The statistical analyses were performed using Statistical Package for Social Sciences (SPSS) software program for Windows version 20.0. Armonk, NY: IBM Corp. SPSS Statistics. Qualitative data are presented as frequencies and percentages and quantitative data as means and standard deviations. The level of significance was set at 0.05.

RESULTS

The total number of doctors who participated in the study was 377 out of which 263 (69.8%) were males and 114 (30.2%) females.

Table 1. Responses of the medical doctors.

Questions	Responses		
	Yes	No	-
Have you received any education/ training on "Oral Health Care"?	167 (44.3)	210 (55.7)	-

Have you received any education/training on "Oral Care during Pregnancy"?	52 (13.8)	325 (86.2)	-
	Yes	No	Don't Know
There is possible connection between health of teeth and gums and pregnancy?	299 (79.3)	4 (1.1)	74 (19.6)
Pregnancy increases the tendency for the gums to bleed, swell or be red	288 (76.4)	14 (3.7)	75 (19.9)
Gingivitis is more serious than periodontitis	77 (20.4)	156 (41.4)	144 (38.2)
Tooth and gum problems can affect the outcomes of pregnancy	224 (59.4)	55 (14.6)	98 (26)
Calcium is drawn out of teeth for the developing baby	62 (16.4)	159 (42.2)	156 (41.4)
Periodontal disease can be treated safely during pregnancy with a procedure called scaling and root planing	193 (51.2)	26 (6.9)	158 (41.9)
Pregnancy exacerbates existing oral/dental problems	219 (58.1)	37 (9.8)	121 (32.1)
Periodontal disease has been associated with:			
• Stillbirth	63 (16.7)	92 (24.4)	222 (58.9)
• Preterm delivery	142 (37.7)	61 (16.2)	174 (46.2)
• Preeclampsia	44 (11.7)	118 (31.3)	215 (57.0)
• Low-birth weight	157 (41.6)	48 (12.7)	172 (45.6)
Basic dental treatment is safe during pregnancy	331 (87.8)	16 (4.2)	30 (8.0)
It is unsafe to obtain dental radiographs in pregnant women	183 (48.5)	132 (35.0)	62 (16.4)
Pyogenic granuloma and pregnancy tumour are same	63 (16.7)	130 (34.5)	184 (48.8)

Elective dental treatment should be delayed until after pregnancy	135 (35.8)	140 (37.1)	102 (27.1)
	Agree	Disagree	-
There is insufficient time to advise patients/ pregnant women on oral health during check-ups	133 (35.3)	244 (64.7)	-
Asking patient/ pregnant women about oral healthcare is outside routine medical check-up/ ANC practice	165 (43.8)	212 (56.2)	-
Cost of dental treatment is barrier to advising patients/ pregnant women for dental check-ups	199 (52.8)	178 (47.2)	-
There is need for universal guidelines for oral healthcare during pregnancy for all health professionals	358 (95.0)	19 (5.0)	-

The participants are presented according to their ages (Table 2), working sectors (Figure 1), specialties (Figure 2) and highest academic qualifications (Table 3). The faculties from Basic Sciences and Community Medicine were grouped together as "Non-clinical" Specialty.

The total work experience after internship completion varied from a minimum of zero years to a maximum of 32 years (Mean \pm S.D. = 5.96 \pm 5.516 years). Similarly when asked for work experience in antenatal care, it ranged from zero to 31 years (Mean \pm S.D. = 1.70 \pm 3.531).

Table 2. Age categories of medical doctors.

Age Category (years)	Male n (%)	Female n (%)	n (%)	Mean \pm S.D. (years)
24-30	121 (32.1)	65 (17.2)	186 (49.3)	31.94 \pm 5.76
31-35	75 (19.9)	33 (8.8)	108 (28.6)	
36-45	63 (16.7)	10 (2.7)	73 (19.4)	
46-60	4 (1.1)	6 (1.6)	10 (2.7)	
Total	263 (69.8)	114 (30.2)	377	

Minimum: 24 years; Maximum: 60 years.

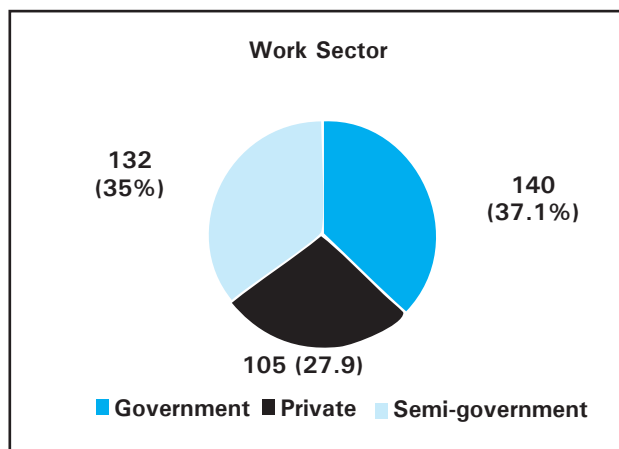


Figure 1. Work sector of the participant doctors.

The number of pregnant women encountered per week varied a lot depending upon specialties and experience level. In an average it was found to be 22 pregnant women per week (mean = 22.43).

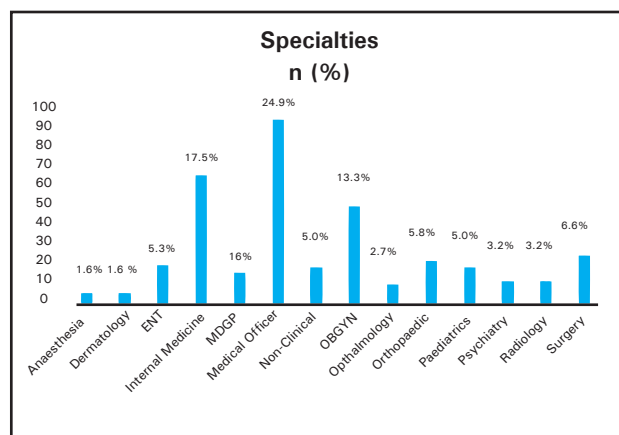


Figure 2. Distribution of specialties of medical doctors (n = 377).

Table 3. Highest academic qualification.

Academic Qualification	n (%)
Bachelors	102 (27.1)
Postgraduate Diploma	30 (8.0)
Masters/ Pursuing Masters	187 (49.6)
Fellowship	26 (6.9)
DM/ MCh	19 (5.0)
Doctorate (Phd.)	4 (1.1)
Postdoctorate (Post-Phd.)	9 (2.4)
Total	377

When asked, "How often do you encounter patients with oral/periodontal problem?" about 105 (27.9%) confirmed as every week, 99 (26.3%) on monthly basis, 75 (19.9%) quarterly basis, 38 (10.1%) yearly and 60 (15.9%) answered as "never."

Only 108 (28.6%) of the participating doctors "always" advised their patient for regular dental check-ups, while 244 (64.7%) did "sometimes" and 25 (6.6%) answered as "never."

DISCUSSION

Oral health, though an integral component of general health, is often overlooked by medical doctors.¹²⁻¹⁵ Periodontitis is frequent oral health problem globally. Periodontal health maintenance during pregnancy is an important aspect of ANC. Approximately 70% perinatal deaths occur due to PTD (<37 weeks) or LBW (<2500 g).¹ PTLBW affects the growth and overall health of the individuals throughout their lifetime. Hormonal variations during pregnancy put women at risk of suffering from various dental problems¹⁶ and poor maternal periodontal status has often been associated with adverse pregnancy outcomes.^{4,17} LBW and PTD are associated with increased local and systemic inflammatory mediators and intra-uterine infections. Evidence suggests that maternal periodontitis may represent potential source of microorganisms that routinely enter the circulation, and affect the health of foeto-maternal unit.¹⁸ The periodontal pathogens and by-products that reach placenta and spread to foetal circulation and amniotic fluid can elicit foetal immune/inflammatory response characterized by the production of antibodies and elevated inflammatory mediators levels that can induce miscarriage or PTD and LBW.¹⁹ Misconceptions surrounding oral healthcare during pregnancy by both healthcare providers and pregnant women may be contributing to the problem.¹¹ Unfortunately, pregnant women and their ANC providers are unaware of the implications of poor oral health and seldom seek dental care during pregnancy.^{9, 10,20} There is increasing evidence to support this lack of awareness among medical doctors about periodontal health consequences and long-term risk associated with poor oral hygiene especially during pregnancy.^{7,9,21,22} Similarly, there is limited evidence about the perceptions of such ANC providers in Nepal towards provision of prenatal oral health care.

In the current study, medical doctors did not have adequate information on the impact of poor maternal oral health and rarely initiated this topic during prenatal care. Only 16.7% doctors knew that pyogenic granuloma and pregnancy tumour were same. Of them, 58.62% doctors did not know that periodontitis was more serious than gingivitis. Among the doctors, 79.3% were aware of the possible connection between health of teeth and gums and pregnancy, 76.4% also agreed on pregnancy increasing gingival inflammation but only 59.4% agreed that tooth-gum problems could affect the pregnancy outcomes. This is in agreement with Al-Habashneh et al

(2008),⁹ George et al (2012)¹¹ and in contrast to Bhavya et al (2015).⁸ Despite acknowledging the importance of maternal oral health, very few medical doctors are well-informed about prenatal oral health and supportive of dental treatments. Many doctors are uncertain about the safety of such procedures and are hesitant in referring pregnant women to dental specialists.¹¹ This can be attributed to lack of education or training in oral care during pregnancy (only 13.8% had). Because of competing general health, ANC providers seldom focus on oral health care during antenatal care.^{11,23}

Though 87.8% of doctors agreed that basic dental treatment is safe during pregnancy, only 28.6% of the doctors “always” advised their patient for regular dental checkups, while 64.7% did “sometimes” and 6.6% answered as “never.” This was similar to previous studies.^{7-9,11} One of the reasons for non-referral to dentist could be the misconception that, no dental treatment should be performed during pregnancy. Although it is well-documented that dental treatments during pregnancy are safe,^{24,25} many doctors still believe that dental procedures could be risky and unsafe and often advise delaying dental treatment until after birth.

Dental radiography is another unclear area in ANC. About half, that is, 48.5% of the participants thought it was unsafe. Although it is universally acknowledged to be true for general radiography, the teratogenic risk of radiation exposure by dental radiography is 1,000 times less than the natural risk of spontaneous abortion or malformation.²⁶ Yes, whenever possible, oral radiographs should be delayed until after first-trimester and screening radiography until after delivery, but it can be safely performed in pregnancy for acute diagnostic purposes¹⁶ with the help of lead aprons, thyroid shields, modern fast-films and avoiding retakes.

Many doctors (43.8%) believed that asking patient or pregnant women about oral healthcare is outside routine medical checkup or ANC practice. Other studies have also reported similar findings.^{9,11} Few doctors (35.3%) responded to lack of time to advise patients on oral health check-ups. Consequently, there is delay in dental care to pregnant women, resulting in postponing treatment beyond the safest period for treatment, the second trimester.²⁴ About 58.1% doctors agreed that pregnancy exacerbated existing oral problems but half the doctors (52.8%) thought cost to be barrier in advising patients for dental check-ups. Regular dental check-ups, preferably biannual visits can reduce cost of oral care to a negligent amount. Only when the treatment is delayed, dental treatments cost lot and number of visits to dentists increase.

Other important obstacles for dental care during pregnancy could be lack of adequate training on “oral

healthcare during pregnancy” and fear of medicolegal consequences. Total of 95% doctors agreed that there is need for universal guidelines for oral healthcare during pregnancy. The American Academy of Periodontology recommends all women who are pregnant or planning to become pregnant, undergo periodontal examinations and necessary treatment. Internationally (UK, USA, Canada and Australia) have certain guidelines, though developing countries like Nepal lack such evidence-based guidelines for oral care of pregnant women.

The limitation is that the study was conducted among general doctors. Research among pure ANC providers like gynaecologists/obstetricians²⁷ or general practitioners, internists²⁸ and medical officers would have provided more accurate representation of actual scenario among Nepalese doctors. Similarly, the mechanism by which periodontitis has been associated with several poor pregnancy outcomes remains unclear and controversy exists.^{19,29} The benefits of periodontal treatment on pregnancy outcomes is not consistent.^{2,16,30} However, studies have reported no harm to mother or foetus from maternal periodontal treatment.¹⁸ In addition, a longer study period would have included larger population.

CONCLUSIONS

Medical doctors are in excellent position to promote maternal periodontal health and prevent associated adverse pregnancy outcomes. In context to Nepal, medical doctors are the ones who often deal with ANC. Their awareness can help decrease the chances of PTLBW due to oral and periodontal disease conditions. The findings of this study highlights the lack of knowledge and inadequate practices of doctors towards oral healthcare. It is recommended that all women should receive a comprehensive oral health evaluation during pregnancy and referred for appropriate dental treatment.

Another important issue is that treating periodontitis during pregnancy might be too late to achieve a positive result. Therefore, focus should be on improving the condition before pregnancy. In developed countries, it is strongly advised and promoted to visit their dentist by antenatal care providers. However, Nepal lacks such guidelines for the maintenance of oral health during pregnancy. Thus, there is need for training and reinforcement among doctors to take more active role in advising all patients for oral health maintenance, especially the women in fertile age groups. Lastly biannual dental check-ups to reduce cost and severity of oral conditions can go long way.

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