

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

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Introduction: Oral health is considered an important component of general health; the mouth cannot be considered in isolation from the rest of the body. Studies indicate an association between periodontitis and preterm and lowbirth weight outcomes. One of the opportunities to improve the oral health care of pregnant women during antenatal care consultations is through collaboration with nurses and midwives. It can be of importance if nurses/midwives are equipped with the right knowledge, attitude and practices regarding oral health. Therefore, this study assessed the existing knowledge, attitude and practices of nurse/midwives working in antenatal clinics in 12 selected health facilities in the Southern Province of Rwanda on periodontal diseases.

Patients and Methods: A descriptive cross-sectional study was done on 79 nurses and midwives working at antenatal care clinics and maternity wards. An ANOVA test was used to compare knowledge, attitude and practices mean scores of nurses/midwives about periodontal diseases and their management. A correlation test was also used to ascertain the relationship among knowledge, attitude, practices and other continuous variables.

Results: The average age of nurses/midwives was $M=33.57$, $SD=6.1$. Nurses had limited knowledge about oral health of pregnant women and had some misunderstandings about oral health, although they had good attitudes. Age, length of service as a nurse or midwife and length of service in antenatal care had no effect on the knowledge, practice and attitude scores of the nurses/midwives. The ANOVA test did not find any significant difference in means for knowledge, attitude, practice and education level ($p=0.69, 0.93, 0.27$), respectively.

Conclusion: Although nurses/midwives have good attitude regarding the management of periodontal diseases of pregnant women, their knowledge is insufficient and it is highly recommended that oral diseases can be included in their curriculum so that they can be in the best position to advise/screen for periodontal diseases during pregnancy.

Keywords: knowledge, attitude, practice, oral health, pregnancy

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Introduction

Oral health is considered an important component of general health; the mouth cannot be considered in isolation from the rest of the body. Specifically, the literature supports an association between periodontal diseases with other general systemic conditions such as diabetes, cardiovascular diseases and adverse pregnancy outcomes.¹ Therefore, poor oral hygiene can have a negative effect on quality of life.

Due to the fact that oral health problems are considered as public health concerns, especially in developing countries, the World Health Organization (WHO) recommends the inclusion of educational programs to promote oral health.^{2,3} For women during pregnancy, with an increased level of estrogen and progesterone, there is an increased susceptibility to certain variants of periodontal disease.⁴ Pregnancy may be regarded as a risk indicator for periodontal diseases, as it leads to a robust gingival tissue response to dental plaque, thereby contributing to the development of clinical gingivitis.⁵ Pregnancy-associated gingivitis is very common and affects about 30% to 86% of all pregnant women.⁴

A Brazilian study of pregnant women revealed a 47% prevalence of periodontal disease, suggesting a need for attention toward oral health care during early pregnancy.⁶ Furthermore, with studies indicating maternal periodontitis associated with preterm low birth weight outcomes, there is a need to involve nurses/midwives to screen for periodontal diseases during pregnancy.⁷ In Rwanda, nurses and midwives are in charge of ANC at health centers and health posts. In Rwanda's referral system, all ANC and deliveries are conducted at health centers or health posts unless the pregnancy has complications.⁸ Thus, nurses and midwives working in antenatal clinics, are in a position to help deliver key oral health messages to pregnant women. In particular, nurses can provide advice on preventive oral health care, including regular dental visits, and can refer pregnant women for comprehensive dental examination.¹

Both nurses and midwives already provide instruction on practical life-skills related to care of a newborn; they would be similarly positioned to offer education in aspects of oral health.⁹ All antenatal care providers (eg, midwives and nurses) are advised to provide oral and dental care training before and in the early stages of pregnancy.⁵ The American Academy of Pediatric Dentistry (AAPD) advises that oral and dental care for newborns should start by focusing on maternal oral health care in check-ups during the prenatal period.² Unfortunately, the traditional training of nurses and midwives often overlooks topics of oral disease.

In most nursing and midwife curricula, the topic of oral disease is given low priority, with most content focused on referral to a dental specialist. In Rwanda, the education includes dental nursing units which cover the essentials of oral diseases, but eschew clinical skills necessary for performing oral screening.⁹⁻¹¹ The overall literature reveals a lack of knowledge by practicing nurses

and midwives on oral health and, therefore, prohibits the possibility of periodontal screening during antenatal care consultations. However, most of these studies were conducted in developed countries where the health system is different in that nurses/midwives may not have the same responsibilities of conducting ANC like in developing countries, eg, Rwanda. Moreover, little is known about the knowledge, attitude and practices of nurses/midwives in developing countries including Rwanda. Thus, the purpose of this study is to ascertain the knowledge, attitude and practices of nurses/midwives about periodontal diseases which may contribute to improving the measure of handling periodontal disease in terms of early prevention, detection and treatment.

Patients and Methods

A descriptive cross-sectional study was done on the nurses and midwives working at antenatal care clinics and maternity wards in the Southern Province of Rwanda in 12 selected health facilities of Southern Province. In the Demographic Health Survey (DHS) (2015), the Southern Province was reported to have a high maternal and neonatal mortality rate. Thus, the study selected all district hospitals of Southern Provincial and six nearby health centers. Conveniently, all nurses/midwives working in ANC in all these health facilities were requested to participate.

All 79 nurses and midwives working in antenatal care clinics and maternity wards in these health facilities agreed to participate in this study. In Rwanda, nurses/midwives are categorized into mainly three education levels: secondary certificate (A2), 3 years at college (A1) and 4 years at college (bachelor's degree). However, in this study, 88.6% of participants have 3 years of college (A1).

During the period of data collection, a structured and standardized questionnaire was used to collect information regarding the knowledge, attitude and practices of nurses and midwives working at ANC clinics in maternity wards of the Southern Province of Rwanda on periodontal diseases during pregnancy. The questionnaires used by Sharif et al and Aikins and Eigbobo were requested and adapted for use in the current study.^{9,12} The questionnaire was sent to experts for content validation and it was piloted to ensure that it captures all variables and to ensure that the questions are clear to the respondents.

The questionnaire was piloted in Nyamata district hospital in the Eastern Province to ensure cross-culture validation and also to ensure that it captures all the information required and clarity of questions. After the

pilot study, all the inputs from the participants were considered and questions that were not clear were corrected accordingly. The questionnaire was translated into Kinyarwanda using forward and backward translation whereby this questionnaire was translated into Kinyarwanda from English and it was again translated back to English by another translator to see if the meaning remains the same and the corrections were harmonized.

The questionnaire had 10 knowledge questions, thus the total score was out of 10, and later converted to 100%. Attitude was assessed by 6 attitude questions using a Likert scale. The attitude scale was created by summing the 6 questions, thus the score ranges from 0 to 24 marks, which was later calculated out of 100%. Practices were assessed using 6 practice questions, with each question scored as correct (1) or wrong (0) and also converted to 100%. Moreover, the questionnaire revealed the following variables: age of the respondent, education level, length of practice as a nurse/midwife, length of practice in the maternity ward/antenatal, the average number of pregnancies each attend per day, the average number of deliveries each attend per day as well as knowledge, attitude and practices toward oral health. A correlation test was used to determine if there is a relationship between the three dependent variables, namely knowledge, attitude and practice, and some continuous variables like age, length of practice, length of working in the unit, number of pregnancies received per day and average number of deliveries attended per day. In addition, an ANOVA test was used to compare the knowledge, attitude and practices means about periodontal disease and its management among nurses and midwives in relation to different variables. The level of significance was set at 0.05 for two-tailed analysis.

Results

A total of 79 nurses and midwives who work in antenatal care consultations and maternity wards from 12 health facilities of the Southern Province participated in the study. They filled questionnaires regarding their oral health knowledge, attitude and practices on periodontal diseases. The participants were distributed with respect to age, length of practice, years of working in maternity wards and antenatal and number of women and deliveries attended per day. Their average age was $M=33.57$, $SD=6.1$, the minimum age was 23 years old and the maximum was 55 years old. The average length of practice was $M=7.35$, $SD=5.6$, the average knowledge score was $M=53.29$, $SD=17.4$, the average attitude score

was $M=74.31$, $SD=8.9$ and the average practice score was $M=50.84$, $SD=13.0$ (Table 1).

Among 79 participants, 34.2% ($n=27$) were nurses and 65.8% ($n=52$) were midwives, and most of the participants (88.6%, $n=70$) had advanced diploma A1 (Figure 1).

The researchers analyzed how nurses and midwives answered different questions regarding knowledge, attitude and practice of oral health on pregnant women. For knowledge, questions were based on how they know about periodontal diseases and how they take care of their patients using their knowledge on oral health, and for attitude, the questions were about their attitude on oral health. For practice, questions were about how they themselves practice oral health and how they can advise their client to practice oral health. The results showed that 54.4% of participants had never heard of periodontal diseases, 83.5% never check for oral diseases during ANC, 84.8% do not give any basic oral care during ANC and 73.4% do not know if periodontal diseases affect the baby before delivery. Attitude questions were also analyzed, and the results revealed that 97.5% of participants would wish to be trained on basic oral care during ANC and 98.7% need to be updated on knowledge regarding oral care for pregnant women. On the other hand, some participants (50.7%) think that they do not need to refer pregnant women to dental services if not in dental pain, and many respondents (75.9%) think that it is not their responsibility to look into their patients' mouth. Finally, on the practice questions, the participants responded as follows; most of the participants (93.7%) reported that they clean their teeth at least two or three times a day, 100% of participants use a toothbrush and toothpaste for brushing and 56% had ever visited a dentist. On the other hand, 94.9% do not know

Table 1 Description of Study Participants

N=79	Mean (SD)	Min	Max
Age (years)	33.57 (6.1)	23	55
Length of practice (years)	7.35 (5.6)	1	31
Length of working in maternity wards (years)	6.06 (4.5)	1	23
No. of pregnancies per day	11.01 (5.1)	2	23
No. of deliveries per day	5.03 (2.3)	1	13
	Percentage	Low Score	High Score
Knowledge	53.29 (17.4)	20%	90%
Attitude	74.31 (8.9)	50%	92%
Practice	50.84 (13.0)	17%	83%

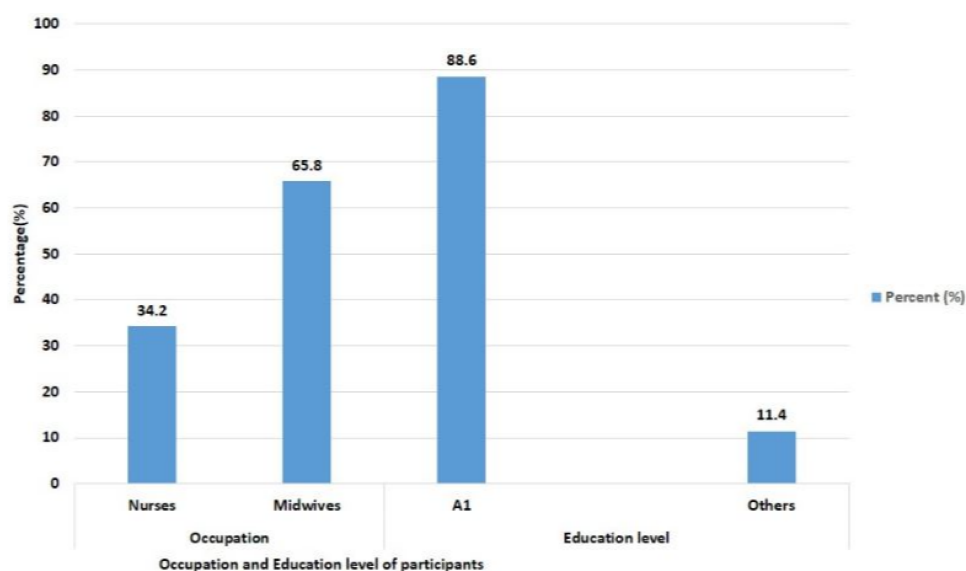


Figure 1 Occupation and education level of participants.

the time of brushing and 75.9% do not know when to change their toothbrush (Figure 2).

The ANOVA test was used to compare the means in terms of knowledge, attitude and practices among nurses and midwives in relation to different variables. However,

the results showed no significant difference in knowledge of periodontal diseases between nurses and midwives ($p=0.881$). Similarly, the results did not show any significant difference in score means for attitude and practice between the two groups ($p=0.08, 0.24$) respectively. The

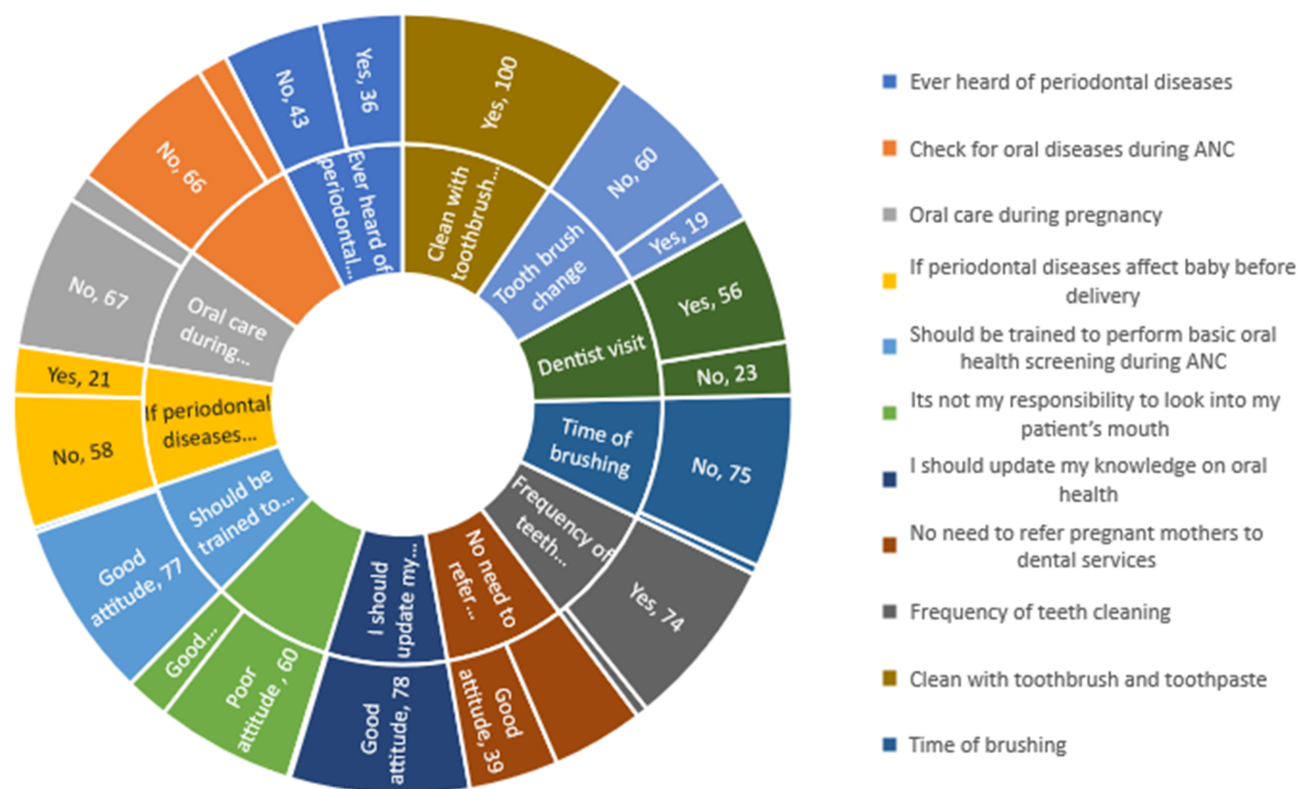


Figure 2 How different questions were answered.

Table 2 Knowledge, Attitude and Practices of Nurses and Midwives on Periodontal Diseases

		Periodontal Knowledge, Mean (SD)	Periodontal Attitude, Mean (SD)	Periodontal Practice, Mean (SD)
Occupation	Nurses	53.7 (18.0)	72.9 (9.4)	51.85 (9.6)
	Midwives	53.08 (17.3)	75.0 (8.7)	50.32 (14.6)
	(p-value)	0.881	0.35	0.624
Education level	Advanced diploma (AI)	53.57 (16.9)	74.29 (9.0)	51.43 (12.6)
	Others	51.1 (22.0)	74.54 (9.4)	46.3 (16.1)
	(p-value)	0.69	0.93	0.27

ANOVA also revealed no significant difference in score means for knowledge, attitude and practice in education level ($p=0.69, 0.93, 0.27$) respectively (Table 2).

The correlation test was used to determine if there is any relationship among the three dependent variables, namely knowledge, attitude and practice, and some demographic variables like age, length of practice, length of working in the unit, number of pregnancies received per day and average number of deliveries attended per day. The results showed positive correlations between age and length of practice as well as length of working in maternity wards ($r=0.824, p<0.001$; $r=0.674, p<0.001$) respectively. Similarly, there was a positive correlation between number of pregnant women received per day and number of deliveries attended per day ($r=0.390, p<0.001$). However, the results did not find any correlation between knowledge and age ($r=-0.098$), or knowledge and length of practice ($r=-0.088$). Moreover, attitude and practice did not correlate with either age, length of practice or length of working in maternity wards as shown in Table 3.

Discussion

Pregnant women are affected by oral disease and problems, which may contribute to adverse pregnancy

outcomes. Some studies revealed the association between periodontitis and preterm birth and low birth weight.⁷ One of the opportunities to improve the oral health care of pregnant women during antenatal care consultations is through collaboration with nurses and midwives. As these groups of health care providers are routinely visited, during and after the pregnancy, there is a promising opportunity to promote oral health of pregnant women if they are equipped with the right knowledge, attitude and practice regarding oral health. Unfortunately, our findings revealed that nurses/midwives have insufficient knowledge ($M=53.29, SD=17.4$) about oral health of pregnant women. One positive finding of this investigation was that nurses and midwives, who work in both antenatal care and delivery wards, have a good attitude ($M=74.31$) regarding oral health of pregnant women.

The finding of insufficient knowledge of oral health among gynecologists–obstetricians, nurses and midwives was similar to many other studies.^{3,5,9} A cross-sectional study done in Malaysia on 133 nurses' knowledge and attitude on oral health also showed that nurses had low knowledge on oral health, although they showed good attitude.⁹ Similarly, another study was done in Turkey on 281 nursing and midwifery students on oral health knowledge. This study concluded that those students had

Table 3 Correlation Between Knowledge, Attitude and Practice and Other Continuous Variables

		1	2	3	4	5	6	7	8
Age (1)	Pearson correlation	1							
Length of practice (2)		0.824**	1						
Length of working in maternity (3)		0.674**	0.784**	1					
No. of pregnancies (4)		0.037	-0.088	-0.028	1				
No. of deliveries per day (5)		0.014	0.094	0.105	0.390**	1			
Knowledge score(6)		-0.098	-0.088	-0.108	-0.232*	-0.021	1		
Attitude score (7)		0.115	0.125	0.115	0.102	-0.02	-0.101	1	
Practice score (8)		0.023	0.009	-0.075	-0.07	-0.164	-0.041	-0.033	1

Notes: ** Correlation is significant at 0.01. * Correlation is significant at 0.05.

insufficient knowledge regarding oral health.¹ Moreover, Aikins and Eigbobo in their study on assessment of maternal oral health knowledge of nurses and midwives revealed that only 3.8% of Ghanaian nurses and 33.8% of Nigerian nurses were cognizant of associations between periodontal diseases and delivery status; the researchers concluded that those nurses and midwives had insufficient knowledge on maternal and child oral health.¹² Another cross-sectional study on oral and dental knowledge and attitude by Jordan University nursing students revealed a generally poor knowledge score (46%) on oral and dental health, but a positive attitude toward oral health (85%).¹³

The majority of nurses/midwives in our study were unfamiliar with periodontal diseases (54.4%); neglected to check for oral diseases during antenatal consultations (84.4%); never provided oral health advice to the pregnant women (84.8%); and had no knowledge of associations between periodontitis and adverse pregnancy outcome (73.4%). A similar finding was reported by Sharif et al from Malaysia, that less than half of nurses did not know about the link between maternal periodontal disease and adverse pregnancy outcomes.⁹ Al-Habashneh et al in Jordan reported that some physicians did not routinely advise their patients on oral care during pregnancy because they are less informed about oral care during pregnancy but, on the other hand, found that few physicians who knew about the association between oral health problems and pregnancy outcomes were likely to advise their patients.¹⁴ Also according to Sharif et al in Malaysia, pregnant women who knew about the relationship between oral diseases and adverse pregnancy outcomes were more likely to visit dentists during pregnancy.⁹ It is in this regard that efforts should be made to increase awareness of nurses/midwives on this association between periodontal diseases and pregnancy outcomes. In contrast to the above findings, Wagner and Heinrich-Weltzien reported a high prevalence of German midwives (78.6%) providing advice to pregnant women on periodontitis.⁵

Although studies repeatedly highlight the importance of oral health in pregnant women,^{5,9,15} this current study found no association between, knowledge, attitude and practices with age of practitioners, length of practice as nurses or length of practice in the maternity unit. One possible explanation is that oral health is not included in nursing or midwifery curriculum, nor is a priority of continuous professional development (CPD). As a consequence, there is no practical application of oral health-related activities in

the routine care of pregnant women. Other studies concur, highlighting the lack of knowledge of nurses and midwives in oral health, and also recommending the inclusion of oral diseases in the curriculum.^{9,10} Our investigation underscores this crucial need for nurses and midwives in Rwanda to obtain appropriate training in oral health sciences.

Conclusion

The nurses/midwives in the current study had limited knowledge about oral health and oral health care for pregnant women, but showed good attitude on the importance of oral health during pregnancy. Age, experience as a nurse/midwife and length of practice in maternity wards/antenatal care unit were not associated with knowledge, attitude and practice. Thus, inclusion of appropriate oral health education in the curriculum of nurses and midwives is highly recommended so that they can be in the best position to advise/screen for periodontal diseases during pregnancy. Moreover, the screening tool should be developed to be used by nurses and midwives to screen for periodontal diseases and be incorporated into the antenatal care package.

Ethics Approval and Consent to Participate

Permission to conduct the study was sought from the ethics committee of the University of Rwanda, College Medicine and Health Sciences and approval from study sites. Also, permission from the Ministry of Health to conduct the study in the selected health facilities was sought and granted. Informed consent forms were given to the participants. Participants were informed about their right to withdraw at any time and that their participation was entirely voluntary. The participants were given the information sheet containing all the information about the study and for those who did not know how to read, we read for them. After understanding the study benefits and risks and everything that was involved in the study, those who agreed were given the consent form to sign that they have voluntarily agreed to participate in the study. Information from the participants was kept confidential and used for study purposes.

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Author Contributions

All authors made a significant contribution to the work reported, that is, conception, study design, execution, acquisition of data, analysis and interpretation, have critically reviewed the article, have agreed on the journal to which the article will be submitted, gave approval of the final version to be submitted and agree to be accountable for all the contents of the article.

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Disclosure

All authors declared no competing interests.

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