



Oral Health Among Pregnant Women at Ilam, Iran: A KAP Study

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Abstract

Background: Pregnancy is a unique period during a woman's life and is characterized by complex physiological changes, which may adversely affect oral health.

Objectives: The current study aimed at determining pregnant women's knowledge, attitude and practice on oral health in 2018 to improve their knowledge, attitude and practice and subsequently decreasing oral diseases.

Methods: In a cross-sectional study, 320 pregnant women referring to Ilam city health centers were selected through simple random sampling method. Data collection was done employing a questionnaire containing four main parts viz demographic, knowledge, attitude, and practice questions on oral health.

Results: The mean age of pregnant women was 27.74 years. Their knowledge, attitude, and practice on oral health during pregnancy were moderate. Further, 16.2%, 12.5%, and 18.1% of them were having good knowledge, attitude and practice on oral health, respectively. The statistically significant relationship was seen between mothers' knowledge and occupation, education, insurance coverage, and training provided in health centers on oral health ($P < 0.05$). The practice of pregnant mothers on oral health showed a significant relationship with their education at 0.05 level.

Conclusions: Based on the finding obtained, the knowledge, attitude, and practice of pregnant women on oral health during pregnancy were almost good. Paying much more attention through proper educational interventions on oral health during pregnancy is highly recommended.

Keywords: Knowledge, Attitude, Practice, Oral Health, Pregnancy

1. Background

Pregnancy is a normal phenomenon marked by changes in metabolism, such as hormone variations (1). As an important public health indicator, oral health becomes even more important during pregnancy (2). These changes affect both oral health status and oral health-related quality of life (3). Gingival changes during pregnancy have been well documented. Increased levels of estrogen in the gums and, prostaglandin synthesis leads to gingival changes seen during pregnancy with reports of gingivitis affecting 25% to 100% pregnant women and pyogenic granuloma developing in 10% (4). The increased susceptibility to oral infections including gingivitis during pregnancy, periodontitis and oral granuloma pyogenic are due to such changes (5). Pregnancy gingivitis usually starts at the second month of gestation and

reaches the highest level at the eighth month, and heals spontaneously after birth (6). It has been stated that periodontal disorders are associated with other health problems such as diabetes, cardiovascular disease, premature birth, and low birth weight (1, 7, 8); some studies have suggested that pregnancy also increases the risk of dental caries (9-11). Also, A recent systematic review reported that oral health-related quality of life during pregnancy in the general population were different from that in pregnant women (12).

Poor maternal oral health is associated with increased risk of adverse birth outcomes (10). Furthermore, it has been revealed that poor oral health mothers may have greater risk of infecting their children by transmitting cariogenic bacteria through unhealthy feeding practices (13). Some cultural beliefs can hinder proper nutrition, and

pregnant women's ability to achieve proper oral health (14).

Some pregnant mothers believe that dental treatment should not be used during pregnancy, while studies have confirmed the effectiveness of these measures during this period (15). Unfortunately, it is commonly known that many women with strong symptoms of oral disease do not go dental clinic before, during or after pregnancy (16). Some people, who believe that they or their fetus might be harmed by dental care, consider poor oral health during pregnancy to be natural (17). However, the time period between the 14th and 20th week is considered ideal (15).

The importance of oral health in pregnant women is of paramount significance, since it not only has a direct effect on the expecting mother but also on the future of the child (18). The awareness and behavior of a woman regarding her own oral health is critical for her children's oral health (19). Children with bad oral health mothers are 5 times more likely than others to have oral health issues (17). Mums are their children's key source of transmissible cariogenic bacteria; it has been shown that *Streptococcus mutans* of mum and infant are phenotypically related and genotypically distinct (19).

Preventive periodontal care could begin early in pregnancy with complete plaque and calculus removal and with instructions on patient oral hygiene. To eliminate the sub-gingival plaque, women should be taught tooth brushing and flossing, and skilled scaling and prophylaxis could be carried out whenever necessary (20). It is also possible to avoid oral and dental disorders and their complications during pregnancy by promoting women's awareness, attitudes and behaviors through oral health education (21).

Pregnant women are easily obtainable as most have daily antenatal check-ups. In addition, their core position in the family allows them to have a significant impact on family members' behavior, and they serve a very crucial role in the young generation's education (22). The proper education about oral healthcare is one of the essential aspects of maintaining oral hygiene (23). So, engaging expectant mothers on oral hygiene can be a successful way of providing dental health education to the wider population, aiming at the individual level, so at the family level, and ultimately at the community level (17, 24).

2. Objectives

In general, pregnant women have limited access to oral health education and no previous research measured their knowledge, attitude and dental practices based on our best knowledge. Consequently, the purpose of the present study was to ascertain knowledge, attitude and practices

among Ilam city pregnant ladies in order to extract the core-line data necessary to construct a preventive oral health program during pregnancy.

3. Methods

3.1. Study Population and Design

By a cross-sectional and observational study, the population of pregnant women in Ilam city selected through cluster sampling from different comprehensive health centers (CHCs), were investigated. Inclusion criterion was pregnancy, while a lack of willingness to participate in the research was exclusion one.

Considering the variability of the population studied, individuals were selected in a month of the spring season, representing one-twelfth of all pregnant women over a year. Out of 50,409 women referring to governmental health centers of Ilam city in 2018, 5,271 ones were pregnant. In order to calculate the sample size, according to the study by Hajikazemi et al. (21), P value as 43.5% was considered. Also, considering the population size, accuracy of sample size, and 95% confidence interval, a sample of 320 individuals, was calculated. Based on pregnant women population of each health center, samples from any center were selected through cluster random sampling.

The sample size was calculated through the following formula and method:

$$n = \frac{Nt2p(1-p)}{Nd2 + t2p(1-p)} \quad (1)$$

$$= \frac{5271 \times 1.96^2 \times 0.245}{5271 \times 0.053^2 + 1.96^2 \times 0.245}$$

$$\cong 320$$

3.2. Data Collection

The data collection was performed using a researcher-made questionnaire. The questionnaire consisted of four parts. The first part included 6 demographic questions related to the pregnant mother, such as age, literacy, job, insurance coverage, and trimester of pregnancy. The second part contained 10 questions on knowledge, with 3 spectra (correct, I do not know, incorrect) with maximum score of 3 and minimum of 1, while "I do not know" was scored as 2. In interpreting the knowledge of pregnant mothers, individuals who were scored less than 12, labeled weak, 12 - 15, average, and above 15, good. The third part contained 7 questions on attitude with 5 spectra (strongly agree, agree, no idea, disagree, strongly disagree) with maximum score of 5 and minimum score of 1 and "no idea" with score

of 3 in the middle of spectrum. In interpreting the attitudes of pregnant mothers, those who were scored less than 12, labeled weak, 12 - 19, average, and above 19 labeled good. The fourth part contained 12 questions on practice with 3 spectra (always, sometimes, never) with maximum and minimum score of 3, 2, and 1, respectively. Totally, in interpreting the status of pregnant mothers' knowledge, those with scores less than 27 were labelled as weak, 27 - 35 as average, and above 35, as good. Validity of the questionnaire was approved through face and content validity methods. For face validity, 20 pregnant women were provided with the questionnaire to assess ambiguity, relativity, proper terms and grammar of items. Content validity of the questionnaire tested by the expert's panel. For content validity the questions were given to 10 specialists in the field of dentistry and public health and their points were integrated. In addition, the methods of internal consistency have been used for determination of reliability of the questionnaire. Internal consistency reliability is measured using the Cronbach Alpha coefficient, considered to indirectly indicate the degree to which a set of items measures a single unidimensional latent construct. The Cronbach's values of 0.86, 0.72 and 0.80 resulted for knowledge, attitude and practice questions, respectively.

3.3. Data Analysis

To describe the data, absolute and relative frequency and for analyzing, chi-square test was used. Statistical level of significance was set at $P < 0.05$.

4. Results

4.1. Demographic Characteristics

The demographic characteristics of the research participants showed that, from literacy point of view, 42% of pregnant mothers were university graduates, 37% K-12 (high school diploma), and 21% high-school and lower. Also, 81% of participants were housekeepers.

In case of insurance coverage, 90% of participants were covered by different agencies such as social security, health insurance, and rural insurance. Besides, 55% of mothers experienced their first pregnancy, of them 21%, 31%, and 48% were in the first, second, and third trimester of pregnancy, respectively.

4.2. Oral Health Knowledge

With respect to oral health level of knowledge among expectant mothers, 64.7% had average median knowledge scores, 16.2% were good scores, and 19.1% were poor (Table 1).

Table 1. Knowledge, Attitude and Practice Among a Sample of Ilam Pregnant Mothers on Oral and Dental Health

Variables	No. (%)
Knowledge	
Weak	61 (19.1)
Average	207 (64.7)
Good	52 (16.2)
Total	320 (100)
Attitude	
Weak	65 (20.3)
Average	215 (67.2)
Good	40 (12.5)
Total	320 (100)
Practice	
Weak	46 (14.4)
Average	216 (67.5)
Good	58 (18.1)
Total	320 (100)

Tables 2 and 3 demonstrate the participants' oral health Knowledge. Most women (84.4%) felt that the main cause of tooth decay was sugar, 45.6% thought that the cause was hormonal changes and 38.7% thought it was due to nausea, vomiting, and acidification during pregnancy. Most people (92.2%) felt that tooth decay could be avoided by tooth washing and brushing. 40.9% believed that it could be prevented by gargling the mouthwash.

Television (quoted at 87.8% of women) was the primary source of oral health information, followed by magazine (80.9%), staff of health centers (69.1%), oral health problems experienced in their previous pregnancy (28.1%), and finally the dentist (20.6%).

4.3. Oral Health Attitude

With respect to oral health scores among pregnant women, 67.2 per cent had average median attitude ratings, 12.5 per cent were strong ratings and 20.3 per cent were poor (Table 1).

Table 4 demonstrates the participants' attitude on oral health. 33.1% of pregnant women agreed that they were at risk for oral disease, 35.9% agreed that oral health behavior during pregnancy had an impact on fetal health, and 50% strongly agreed that oral health had an impact on mental health.

4.4. Oral Health Practice

With respect to oral health scores among pregnant women, 67.5% had an average score suggesting a medium

Table 2. Oral Health Knowledge Among a Sample of Ilam Pregnant Women ^a

Questions	Correct	Incorrect	I Don't Know
Cause of tooth decay during pregnancy is nausea, vomiting and acidification of the mouth.	124 (38.7)	141 (44.1)	55 (17.2)
Tooth decay during pregnancy is due to hormonal changes during this period.	146 (45.6)	133 (41.6)	41 (12.8)
The reason for tooth decay during pregnancy is the use of sugar.	270 (84.4)	36 (11.2)	14 (4.4)
Brushing can prevent tooth decay.	295 (92.2)	18 (5.6)	7 (2.2)
Oral disease affects fetal health.	195 (61.0)	98 (30.6)	27 (8.4)
Referring to a dentist during pregnancy is not prohibited.	102 (31.9)	79 (24.7)	139 (43.4)
Gargling on mouthwash can prevent tooth decay during pregnancy.	131 (40.9)	168 (52.5)	21 (6.6)
Use of dairy products during pregnancy has an impact on mother's oral health.	293 (91.6)	20 (6.2)	7 (2.2)
The use of fluoride supplements under the supervision of a physician during pregnancy will strengthen the enamel.	155 (48.4)	154 (48.2)	11 (3.4)

^a Values are expressed as No. (%).

Table 3. Sources of Oral Health Knowledge Among a Sample of Ilam Pregnant Women

Sources of Oral Health Knowledge	No. (%)
Television	281 (87.8)
Magazine	259 (80.9)
Staff of health centres other than dentist	221 (69.1)
Oral health problems experienced in previous pregnancy	90 (28.1)
Dentist	66 (20.6)

level of results, 18.1% strong scores and 14.4% poor scores (Table 1). The participants' oral health practice is shown in Table 5. Most women (62.5%) reported getting their teeth brushed every night before bedtime, while 17.5% brushed after each meal. Fifteen point three per cent used other oral hygiene methods, including oral wash and dental floss. Only 15.9% of the women reported that they have visited a dentist every 6 months. Also, 62.2% used fluoride toothpaste.

4.5. Relationships of Demographics, Knowledge, Attitude and Practice

The chi-square test showed an important relationship between the job and oral health knowledge ($P = 0.000$), oral health knowledge and education ($P = 0.000$), and there was significant relationship between practice status and education ($P = 0.037$), while no significant relationship between attitude and educational status was observed ($P = 0.75$).

Also, there was significant relationship between the level of knowledge of pregnant women and the insurance coverage ($P = 0.018$). There was an essential relationship between attitude and coverage of the insurance ($P = 0.039$).

No significant relationship between practice status and insurance coverage was seen ($P = 0.41$).

5. Discussion

The study found an important association between education and mothers' oral health awareness ($P < 0.05$). Thomas et al. (25) and Llena et al. (7) reported that the dental awareness was strongly correlated with education. Women with less qualifications were more likely to be at greater risk of impaired periodontal health compared to women with higher educational levels.

However, no significant relationship between knowledge and age groups was seen. In a cross-sectional study by Moawed et al., there was a significant relationship between knowledge and age groups (15), indicating the health belief in oral health changes at different ages.

The results showed that no significant relationship between practice and educational level of women was seen, based on of chi-square test, which is consistent with Hajikazemi et al. findings (21). However, a significant relationship between knowledge of pregnant women and their education was observed, which is in consistence with the results of Thomas et al. (25), indicating that educated people were having much more information regarding oral health.

The findings of our study showed that most of the pregnant mothers were housekeepers that is similar to results of Hajikazemi et al. (21).

In terms of knowledge on oral health, 19.1%, 64.7%, and 16.2% had poor, moderate, and good knowledge, respectively (Table 1), which shows low knowledge of the participants regarding oral health during pregnancy. Therefore, continuous education of pregnant mothers can improve their knowledge on oral health. The study of

Table 4. Oral Health Attitude Among a Sample of Ilam Pregnant Women ^a

Attitude Question	Strongly Agree	Agree	No Idea	Disagree	Strongly Disagree
If I don't comply oral health, my baby may be born sooner.	48 (15)	46 (14.4)	161 (50.3)	45 (14.1)	20 (6.2)
I think one of the reasons for neglecting oral health during pregnancy is impatience.	81 (25.3)	138 (43.1)	40 (12.5)	50 (15.6)	11 (3.5)
Brushing can prevent my teeth decay.	159 (49.7)	143 (44.7)	9 (2.8)	8 (2.5)	1 (0.3)
Good oral health affects my mental health.	158 (49.4)	141 (44.1)	17 (5.3)	3 (0.9)	1 (0.3)
I think I'm more at risk for oral disease than others.	75 (23.4)	106 (33.1)	63 (19.7)	65 (20.3)	11 (3.5)
Oral health affects the quality of my life.	115 (35.9)	140 (43.8)	55 (17.2)	7 (2.2)	3 (0.9)
Failure to comply with oral and dental health can affect fetal health.	65 (20.3)	115 (35.9)	107 (33.4)	22 (6.9)	11 (3.5)

^a Values are expressed as No. (%).

Table 5. Oral Health Practice Among a Sample of Ilam Pregnant Women ^a

Practice Question	Always	Sometimes	Never
Do you brush every night?	200 (62.5)	116 (36.3)	4 (1.2)
Do you brush after each meal?	56 (17.5)	231 (72.2)	33 (10.3)
Do you brush after eating sweets?	83 (25.9)	191 (59.7)	46 (14.4)
Do you use fluoride-containing toothpaste?	212 (66.2)	94 (29.4)	14 (4.4)
Do you brush all the surfaces of your teeth carefully?	243 (76)	71 (22.1)	6 (1.9)
Do you change your toothbrush every three months?	157 (49)	124 (38.8)	39 (12.2)
Do you break hard foods like pistachios and almonds?	16 (5)	101 (31.6)	203 (63.4)
Do you drink cold water immediately after eating hot food?	27 (8.4)	153 (47.8)	140 (43.8)
Do you consume milk and dairy every day?	145 (45.3)	171 (53.5)	4 (1.2)
Do you use dental floss?	84 (26.3)	180 (56.2)	56 (17.5)
Do you use an anti-caries mouthwash?	14 (4.4)	115 (35.9)	191 (59.7)
Do you refer dentist every six months?	51 (16)	120 (37.5)	149 (46.5)

^a Values are expressed as No. (%).

Asgharnia et al. regarding knowledge of postpartum women also indicated low knowledge of pregnant mothers on oral health (26). Also, the finding of studies by Lakshmi et al. (1) and Mousa et al. (5) reported inadequate knowledge regards to oral health.

Based on the results of this study, television was the main source of mothers' knowledge on oral health (87.8%). Similarly, in study of Ibrahim et al. (17), 59% of pregnant women reported that they received information about oral health from television.

According to data presented in Table 1, only 12.5% of the mothers had a good attitude on oral health, while in case of Tang et al. (27), most women presented positive attitudes, which can be justified because of incorrect information and/or misconceptions about oral health and dental procedures during pregnancy. In the study of Bamanikar and Kee (28) no significant relationship between knowledge, attitude and practice of pregnant

women has been reported that is in consistence with the results of present study. It can be said that change in knowledge and attitude did not show any effect on the individuals' behavior; so, the pregnant mothers knew the bad effects of sweet substances on the teeth, but still consumed much more sweets, inattentively.

The findings suggest that 35.9% agreed that oral health behavior during pregnancy had an impact on fetal health. This result has been in line with the findings of Ibrahim et al. (17). In a study of Ferguson et al. (29) in US, 34.3% of pregnant women used mouth wash, while in our study 15.3%. Other oral hygiene approaches such as dental floss and mouth wash were used by pregnant women. Dentist's function during dental prenatal care is important to develop proper healthy habits and prevent oral disease, most of them (84.1%) did not visit the dentist during this pregnancy, among the people assessed. This result has been in line with the findings of Sousa et al. (30). In our

study, 66.2% of mothers used fluoride toothpaste, which was similar to finding of the study Kobylinska et al. (31).

Source of knowledge of mothers who have been conscious of dental health was television, while Al-Habashneh et al. sources of information about the pregnancy and oral health were reported books, magazines and pamphlets (32).

5.1. Limitations

The present study design, using questionnaire showed the limitations such as assessing oral health status neither clinically nor in their (health/dental) records. In addition, in this study data were self-reported. Besides, the cross-sectional nature of the study restricted follow-up of these participants on any adverse dental pregnancy outcomes.

5.2. Conclusions

Based on the results, the level of knowledge, attitude and practice of Ilam pregnant mothers about oral health was not satisfactory. Mothers' education through mass media especially television programs can affect the level of knowledge, attitude, and hopefully practice of Ilam pregnant mothers. Also, owning an appropriate insurance coverage, could increase the number of mothers visiting of health centers, and would change the level of knowledge, attitude, and even practice of mothers due to much more cares in health centers. Considering that in the current study, majority of pregnant mothers were housekeepers, and such occupation affected their level of knowledge, attitude, and practice; it can be concluded that housekeeper mothers due to their lower educational level and less use of books and educational resources, and also lack of proper insurance coverage, have shown less information about oral health.

Therefore, continuing education with the goal of improving knowledge, creating a positive attitude, and bettering the practice is necessary. To achieve such goal, it is suggested that members of the health team, especially midwives, pay more attention to oral health during pregnancy and increase the link between midwife and dentist.

Regarding the sensitizing the oral and dental health in pregnant mothers, providing in-service educational programs for midwives, physicians, and other health team members seems necessary.

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Footnotes

Authors' Contribution: S. D., A. A. A.: Study conception and design; S. D., N. A.: Data collection; S. D., Z. Gh., M. H. R.: Data analysis and interpretation; all authors: Drafting of the article: Provided comments and approved the final manuscript.

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Ethical Approval: Permission letter issued by the Research Ethics Committee of Ilam University of Medical Science to conduct the research. Permission was in advance obtained from respective health centers to conduct the study. Anonymity and confidentiality of participants were ensured via code numbers instead of names. Ethical approval number is EC/92/H/177.

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