AVALIAÇÃO DOS CONHECIMENTOS, ATITUDES E PRÁTICAS DE GESTANTES EM SAÚDE PERIODONTAL E SAÚDE BUCAL E SEUS EFEITOS NO FETO DURANTE A GRAVIDEZ

INVESTIGATING THE KNOWLEDGE, ATTITUDE, AND PRACTICE OF PREGNANT WOMEN ABOUT PERIODONTAL HEALTH AND ORAL HEALTH, AND THEIR EFFECT ON THE FETUS DURING PREGNANCY

بررسی آگاهی، نگرش و عملکرد خانم‌های باردار در مورد سلامت پریودنتال و بهداشت دهان و دندان و تاثیر آن‌ها بر روی جنین در دوران بارداری

MOHAMADIMOGHADAM, Marzieh¹; SHAKIB Seyed Hojat^{2*}; SALMANI Fatemeh³

¹ Birjand university of medical sciences, School of Dentistry, Department of Periodontics, Iran

² Birjand university of medical sciences, Faculty of Dentistry, Department of Orthodontics, Iran

³ Birjand University of Medical Sciences, Faculty of Health, Department of Epidemiology and Biostatistics, Iran

* Corresponding author

e-mail: drmohamadi@gmail.com

Received 09 February 2021; received in revised form 24 June 2021; accepted 20 July 2021

RESUMO

Introdução: A periodontite ou piorrêia leva a resultados adversos da gravidez, como parto pré-termo, baixo peso ao nascer, pré-eclâmpsia, aborto espontâneo ou perda precoce da gravidez. **Objetivo:** O objetivo deste estudo foi avaliar o conhecimento, atitude e prática de gestantes no campo da saúde periodontal e saúde bucal e seu impacto no feto. **Métodos:** O presente estudo é um estudo descritivo-analítico com 210 gestantes no primeiro e segundo trimestre de encaminhamento para os centros de saúde Birjand em 2019. O instrumento utilizado neste estudo foi um questionário de pesquisa composto por quatro seções: informações demográficas das mulheres, consciência das mulheres, atitude e prática, sua validade e confiabilidade foram confirmadas. Após a coleta de dados, os dados foram digitados no software SPSS versão 22 e, em seguida, analisados por meio de estatística descritiva, teste t de student independente e análise de variância unilateral. O Significância estatística foi considerado 0.05 em todos os testes. **Resultados e Discussão:** Neste estudo, os escores médios de conhecimento, atitude e prática das gestantes foram $5,6 \pm 1,92$, $55,9 \pm 5,1$ e $25,9 \pm 3,7$, respectivamente. Houve uma diferença significativa entre o escore médio de atitude e a idade das mães. Também houve diferença significativa entre os escores médios de conhecimento, atitude e prática das mulheres e conhecimento, atitude e prática de gestantes empregadas e donas de casa; Em termos de prática, houve uma diferença significativa entre donas de casa grávidas e mulheres trabalhadoras. Houve uma relação significativa entre a média desses escores e o emprego das mães, de modo que os escores médios foram maiores nas mulheres ocupadas do que nas demais. **Conclusões:** Os resultados do nosso estudo mostraram que o escore médio de conhecimento, atitude e prática das gestantes em Birjand na área de saúde bucal durante a gravidez não é desejável e adequado.

Palavras-chave: Conhecimento; Atitude; Prática; Mulheres grávidas

ABSTRACT

Background: Periodontal infection leads to adverse pregnancy outcomes such as preterm delivery, low birth weight, preeclampsia, miscarriage, or early pregnancy loss. **Aim:** The aim of this study was to investigate the knowledge, attitude, and practice of pregnant women about periodontal health and oral health and their effect on the fetus. **Methods:** The present study is a descriptive-analytical study on 210 pregnant women in the first and second trimesters referring to health centers in Birjand in 2019. The tool used in this study was a researcher-made questionnaire with four parts: women's demographic information, and women's knowledge, attitude, and practice, the validity, and reliability of which were confirmed. After data collection, it was entered into SPSS software version 22 and then analyzed using descriptive statistics, independent t-test, and one-way analysis of

variance. The significance level was considered 0.05 in all tests. **Results and Discussion:** In this study, the mean scores of knowledge, attitude, and practice of pregnant women were 5.6 ± 1.92 , 55.9 ± 5.1 , and 25.9 ± 3.7 , respectively. There was a significant difference between the mean attitude score and mothers' age. There was also a significant difference between the mean scores of knowledge, attitude, and practice of women and significant difference in knowledge, attitude, and practice of employee and housewife pregnant women; In terms practice, there were significant differences between pregnant housewives and self-employed women. There was a significant relationship between the mean of these scores and mothers' jobs so that the mean scores were higher in employed women than others. **Conclusions:** The results of our study showed that the average score of knowledge, attitude, and practice of pregnant women in Birjand regarding oral hygiene during pregnancy is not satisfactory and appropriate.

Keywords: Knowledge; Attitude; Practice, Pregnant Women

چکیده

مقدمه: عفونت پریودنتال منجر به پیامدهای نامطلوب بارداری مانند زایمان زودرس، نوزادان کم وزن، پره اکلامپسی، سقط جنین و یا ازدست دادن بارداری در اوایل بارداری می شود. **هدف:** هدف از این بررسی آگاهی، نگرش و عملکرد خانم‌های باردار در مورد سلامت پریودنتال و بهداشت دهان و دندان و تاثیر آن‌ها بر روی جنین می باشد. **روش کار:** در یک مطالعه توصیفی تحلیلی 210 زن باردار مراجعه کننده به مراکز بهداشت در سه ماهه اول و دوم در شهرستان بیرجند در سال 1398 مورد بررسی قرار گرفتند. ابزار جمع آوری داده پرسشنامه محقق ساخته بود که دارای چهار قسمت: اطلاعات دموگرافیک زنان، آگاهی، نگرش و عملکرد مادران بود. داده‌ها پس از جمع‌آوری وارد نرم‌افزار SPSS نسخه 22 گردید و سپس داده‌های توصیفی بوسیله آمارهای توصیفی، و داده‌های تحلیلی با آزمون آنالیز واریانس و تی مستقل تجزیه و تحلیل شد. **نتایج و بحث:** در این مطالعه میانگین نمره آگاهی، نگرش و عملکرد زنان باردار به ترتیب 5.6 ± 1.92 ، 55.9 ± 5.1 و 25.9 ± 3.7 بود. بین میانگین نمره نگرش با سن مادران اختلاف معناداری مشاهده شد ($P < 0.05$). همچنین بین میانگین نمره آگاهی، نگرش، عملکرد زنان اختلاف معناداری وجود داشت ($P < 0.05$). همچنین تفاوت معنی داری در آگاهی ($p = 0.05$) و نگرش ($p < 0.001$) و عملکرد ($p = 0.04$) خانم‌های باردار کارمند و خانه دار وجود داشت؛ از نظر عملکرد نیز خانم‌های باردار خانه دار و خانم‌های دارای کار آزاد تفاوت معنی داری با هم داشتند ($p < 0.001$). بین میانگین این نمرات و شغل مادران ارتباط معناداری مشاهده شد بطوریکه میانگین نمرات در زنان شاغل بیشتر از سایر زنان بود ($p < 0.05$). **نتیجه گیری:** نتایج مطالعه ما نشان داد که میانگین نمره آگاهی، نگرش و عملکرد زنان باردار شهرستان بیرجند در خصوص رعایت بهداشت دهان و دندان در دوران بارداری رضایت بخش و مناسب نیست.

واژه های کلیدی: آگاهی؛ نگرش؛ عملکرد، زنان باردار

1. INTRODUCTION:

Pregnancy is an important period in the life of women with various physiological changes that may occur in the body, and these changes may have a negative impact on oral health (Ambereen, Babu, Vivekananda, and Shivaprasad). Emphasis on oral health care during pregnancy has been used as an important public health issue worldwide (Gambhir, Nirola, Gupta, Sekhon, and Anand, 2015).

During pregnancy, changes in hormone levels, such as increased levels of progesterone in the bloodstream, along with poor oral hygiene, increase the incidence of oral diseases such as periodontitis, which is accompanied by redness, inflammation, and a tendency to bleed (Haririan, Mohammadpour, and Aghajanloo, 2010). Approximately 30% of women develop periodontitis during pregnancy (Lee, McWilliams, and Janchar, 1999).

Periodontal disease is an inflammatory reaction in periodontal tissues, which leads to tissue destruction, bone loss, and eventual tooth loss (Atarbashi Moghadam, Haerian Ardakani, Rashidi Meybodi, and Khabazian, 2014). Many studies have reported that the oral health needs of pregnant women are quite different from the general population (Giglio, Lanni, Laskin, and

Giglio, 2009; Lee *et al.*, 1999; Mills and Moses, 2002). Pregnant women pay less attention to their health due to certain conditions, strong appetite, mood swings, and mental health conditions (Mehdipoor *et al.*, 2019). The American Academy of Periodontology recommends that periodontal examinations and appropriate treatment be performed for pregnant women and women planning to become pregnant (Tarannum, Prasad, Vivekananda, Jayanthi, and Faizuddin, 2013). The periodontal infection leads to adverse pregnancy outcomes such as preterm delivery, low birth weight infants, preeclampsia, miscarriage, or early pregnancy loss (Govindasamy *et al.*, 2018).

Some researchers have suggested that the cause of this problem is a severe generalized inflammatory condition inside the arteries. Likewise, during childbirth, women with severe periodontal disease were at higher risk for developing preeclampsia (Brockington, 2003; Haririan *et al.*, 2010). General nonspecific inflammatory mediators of periodontal disease are those that play an important role in initiating labor. In a normal delivery, labor occurs when the levels of inflammatory cytokines such as IL-1, TNF- α , and PGE2 in the placenta increase.

In the case of periodontitis, due to increased bacteremia, the level of premature inflammatory mediators that are involved in normal

delivery increases and leads to premature rupture of the placental membrane, which causes preterm delivery (Contreras *et al.*, 2006; Mokeem, Molla, and Al-Jewair, 2004; Scannapieco, Bush, and Paju, 2003).

Prevention of oral diseases and its complications during pregnancy is possible with the knowledge of health issues and the attitude and proper practice of pregnant women in this case (Bamanikar and Kee, 2013). Controlling and reducing dental plaque by adopting related behaviors including brushing, flossing, and using mouthwash, as well as increasing oral care by health care providers during pregnancy, can make a significant contribution to reducing oral problems and their consequences in pregnant women (Behdani, Mosavifar, Hebrani, Soltanifar, and Mohamadnejad, 2008).

Due to hormonal changes that cause sensitivities and gingivitis, pregnant women use less toothbrush or floss, which eventually leads to the formation of microbial plaque on the teeth. Morning sickness also causes the teeth to be exposed to stomach acid, and the risk of caries increases (Christensen, Jeppe-Jensen, and Petersen, 2003). Therefore, paying attention to oral health in pregnant women is extremely important to maintain the health of themselves and the fetus (Martins, Barreto, and Pordeus, 2008). Despite the known evidence and complications of periodontal infections for mothers and their infants, this important issue has received less attention (Khalaf, Osman, Abbas, and Ismail, 2018).

This study aimed to evaluate the knowledge, attitude, and practice of pregnant women about periodontal health and oral health and their effect on the fetus during pregnancy.

2. MATERIALS AND METHODS:

In this descriptive-analytical study, 210 pregnant women in the first and second trimesters participated. Samples of pregnant women referring to health centers in Birjand were selected using the clustering method from 5 urban clusters. Health centers were selected from 5 urban clusters randomly, and pregnant women were selected through available sampling. Women were in less than 24 weeks of pregnancy, had at least basic education, and had no mental or physical illness.

2.1. Data Collection Tools

The instruments used were a researcher-made questionnaire that had four parts: women's demographic information, mothers' knowledge, attitude, and practice. The validity and reliability of this questionnaire were confirmed. The validity of the questionnaire was initially confirmed using face validity. Then, in order to check the validity of the content, the questionnaire was given to 10 professors (dental specialists, 2 health educators, 1 biostatistician) and content validity ratio (CVR) indices, the average score of the questions, and content validity index (CVI) were calculated.

The questions that were able to receive the acceptable limit remained in the questionnaire. The reliability of the questionnaire was assessed using a test and retest to assess the reliability over time, and Cronbach's alpha coefficient was used for the reliability of the questions. Reliability values for each subsector were (knowledge = 0.60 and attitude = 0.60, and practice= 0.67). After obtaining informed consent from the participants, the questions were answered by the participants. After collecting the data, they were entered into SPSS software version 22, and then the descriptive data were reported by descriptive statistics, dispersion index, frequency, and agreement tables. Kolmogorov-Smirnov test was used for normal data distribution.

The relationship between quantitative variables was analyzed by analysis of variance and independent t-test, and the relationship between qualitative variables was examined using the chi-square test. As well, in case of abnormality, Kruskal-Wallis and Mann-Whitney tests were used. The significance level was considered 0.05 in all tests.

3. RESULTS AND DISCUSSION:

3.1. Results

The results show that the mean age of women participating in the study was 27.60 ± 6.15 years. Most of them were under 25 years old (41.9%). 35.6% (72 people) had been married for less than 2 years. 85.7% were in the second trimester of pregnancy, and 45.7% were pregnant with their first child. 81% were housewives, and the spouses of 6 of them were unemployed. 41% of women had a university education, and 48.6% of their husbands had a high school degree. 84.5%

had health insurance services, and the majority of the population (36.7%) had incomes of less than one million. Most of them had a moderate evaluation of their income (46.2%), and none of them rated their income as excellent (Table 1).

The mean scores of the participants in answering the questions in the section of knowledge, attitude, and practice were 5.60, 55.92, and 25.96, respectively, and their standard deviations were 1.92, 5.16, and 3.79, respectively. There was a significant difference in attitude level between people who were less than 25 years old and participants who were 25-30 years old and 30-35 years old. There was also a significant difference in knowledge ($p = 0.05$) and attitude ($p < 0.001$), and practice ($p = 0.04$) of pregnant employee women and housewives. There were also significant differences in practice between pregnant housewives and self-employed women. There were also significant differences in performance between pregnant housewives and self-employed women ($p < 0.001$).

Regarding the monthly income of the family, the results in the level of knowledge, attitude, and practice showed that people who had less than 40 USD incomes were significantly different from participants who had an income of 40-80 USD, 80-120 USD and more than 120 USD. Regarding the place of residence of pregnant women living in the north, south, west, east and center of Birjand, there was a significant difference in the level of knowledge ($P = 0.037$), attitude ($P = 0.002$), and practice ($P = 0.001$) (Table 2).

Table 3 shows the frequency distribution and response rate of participants in the field of knowledge. For example, 81.4% of pregnant women did not know what dental plaque was; 91.0% did not know the cause of gingival hyperemia. 93.3% knew that sweet and sticky substances increase the risk of tooth decay, and 91.1% knew that toothbrush is the best tool for hygiene and 80.5% knew that dental floss is the best tool for cleaning between teeth. 50% of the participants knew that the best time for dental treatment was the second trimester, and 50% did not know.

Table 4 shows the frequency distribution and percentage of participants' responses in the attitude area. According to it, 50% of the participants agreed and completely agreed with the fact that the calcium required by the fetus is taken from the mother's teeth, and 87.6% agreed and completely agreed that hygiene during pregnancy is more important than before

pregnancy.

Table 5 shows the distribution of frequency and percentage of participants' responses in terms of practice, according to which it is found that 46.7% of women brushed their teeth every night before bed and 51.9% only occasionally used floss. 52.4% did not see a dentist before becoming pregnant, 89.5% rinsed their mouths after morning sickness and vomiting, and most participants did not use chlorhexidine and fluoride mouthwash.

3.2. Discussion

Pregnancy is a physiological process in a woman's life that causes various changes in the oral cavity. Even among healthy women, physiological changes associated with pregnancy can lead to gingivitis, periodontitis, and benign lesions (pregnancy tumors). Hormonal changes and changes in diet and frequency of eating can increase the risk of tooth decay (Patil, Thakur, Madhu, Paul, and Gadicherla, 2013). In the present, most pregnant mothers were under 25 years old. In Nogueira *et al.* (2016), mothers were between 12 and 22 years of age (Nogueira *et al.*, 2016) and were in the second trimester of pregnancy. To Bedre *et al.*, most pregnant mothers were referred in the second trimester (Bedre and Sharma, 2020).

In the current study, most mothers had an income of less than 40 USD and were housewives, and their assessment of income was average. However, studies have shown that income is a risk factor for the high severity of tooth decay (Campos, Botton, Birolo, da Silveira, and Schmitt, 2010; Eigbobo and Onyeaso, 2013). In addition, the type of household occupation, income, and education are related to the severity of tooth decay (de Oliveira and Nadanovsky, 2006; Eigbobo and Onyeaso, 2013).

In the present study, most people had a university degree. Therefore, the mean score of knowledge, attitude, and practice of pregnant women about oral health in women with university education was higher than women with primary education. The study conducted by Haji Kazemi *et al.* (2005), it was stated that there is a significant relationship between the average score of knowledge and different levels of education; while in another study, it was stated that the frequency of high school education and diploma among mothers was higher than other levels of education, which did not agree with the results from the present study (Ebrahimipour, Mohamadzadeh, Niknami, Ismaili, and Vafaii Najjar, 2015). In the current study, 4.8% of pregnant women had a good level of knowledge, and 70.5% of women

had a moderate level of knowledge about oral hygiene.

According to Haji Kazemi *et al.* (2005), 5.6% of women had a good level of knowledge, and 65.9% of women had a moderate level of knowledge about oral health, which is consistent with the present study.

The present study showed that 46.7% of women brushed their teeth every night before going to bed, and 51.9% occasionally used floss. Bayat *et al.* (2016) showed that 95% of participants cited excessive tiredness and boredom as barriers to brushing. In the study by Avula *et al.* (2013), none of the women had ever flossed. In a study, Shamsi *et al.* (2013), stated that the majority of mothers knew that increasing the consumption of sweets in the diet increases the risk of tooth decay, and also 95% of mothers knew that if oral hygiene is not observed, it will lead to tooth decay. In the study of Gupta *et al.* (2013), 33.5% of non-pregnant women and 19% of pregnant women did not know which foods cause tooth decay. In the present study, most pregnant women did not know what dental plaque was and did not know the cause of gingival hyperemia. Christensen *et al.* (2003), they found that pregnant women considered symptoms such as bleeding gums while brushing to be normal and did not change the situation of their. 50% of participants knew that the best time for dental treatment was the second trimester, and 50% did not know.

Tantradi and Madanshetty (2013) believed that seeing a dentist during pregnancy was not safe. The second trimester is the safest period for dental care services due to the formation of embryonic organs (Tantradi and Madanshetty, 2013). However, more than half of the mothers in this study did not see a dentist before becoming pregnant. The study by Saddki *et al.* Showed that mothers' lack of awareness about the relationship between oral health and pregnancy outcomes was reported as the most important barrier to seeing a dentist (Saddki, Yusoff, and Hwang, 2010). In the present study, 89.5% rinsed their mouths after morning sickness and vomiting, and most participants did not use chlorhexidine and fluoride mouthwashes. Christensen *et al.* (2003) showed that nausea and vomiting expose teeth to stomach acid, which leads to tooth decay.

4. CONCLUSIONS:

The results showed that the average score of knowledge, attitude, and practice of pregnant

women in Birjand regarding oral hygiene during pregnancy is unsatisfactory and inappropriate. Considering that oral care is very important during pregnancy, and pregnancy should not be considered a reason for delaying the required dental care; therefore, pregnant mothers should be educated about maintaining good oral hygiene and the expected changes in the oral cavity during regular dental visits. Moreover, women of childbearing age or expecting pregnancy should be screened for caries and oral diseases for timely control.

5. REFERENCES:

1. Ambereen, S., Babu, H. M., Vivekananda, M., and Shivaprasad, D. Practice and knowledge of periodontal health among pregnant women in Hassan, Karnataka: a cross-sectional survey. *Age*, 21(25), 74.
2. Atarbashi Moghadam, F., Haerian Ardakani, A., Rashidi Meybodi, F., and Khabazian, A. (2014). Evaluation of periodontal health knowledge, attitude and oral hygiene practice of pregnant women in Yazd in 2011. *J Adv Periodontol Implant Dent*, 5(2), 71-74.
3. Avula, H., Mishra, A., Arora, N., and Avula, J. (2013). KAP assessment of oral health and adverse pregnancy outcomes among pregnant women in Hyderabad, India. *Oral Health Prev Dent*, 11(3), 261-270.
4. Bamanikar, S., and Kee, L. K. (2013). Knowledge, attitude, and practice of oral and dental healthcare in pregnant women. *Oman Medical Journal*, 28(4), 288.
5. Bayat, F., Karimi-Shahanjarini, A., Bashirian, S., and Faradmal, J. (2016). Assessment of dental care and its related barriers in pregnant women of Hamadan city. *J Educ Community Health*, 3(1), 20-27.
6. Bedre, A. S., and Sharma, S. (2020). Knowledge, Attitude and Practice of Dentists Towards Provision of Dental Care to Pregnant Women. *Indian J Public Health Res Dev*, 11(6).
7. Behdani, F., Mosavifar, N., Hebrani, P., Soltanifar, A., and Mohamadnejad, M. (2008). Anxiety and mood disorders in infertile women referred to Montaserie infertility clinic in Mashhad, North-East Iran. *Iran J Obstet Gynecol Infertil*, 11(3), 15-23.
8. Brockington, I. (2003). Obstetric and gynecological conditions associated with psychiatric disorder. *New Oxford textbook*

- of psychiatry, 1195-1217.
9. Campos, L., Bottan, E. R., Birolo, J. B., da Silveira, E. G., and Schmitt, B. H. E. (2010). Conhecimento de mães de diferentes classes sociais sobre saúde bucal no município de Cocal do Sul (SC). *RSBO Revista Sul-Brasileira de Odontologia*, 7(3), 287-295.
 10. Christensen, L. B., Jeppe-Jensen, D., and Petersen, P. E. (2003). Self-reported gingival conditions and self-care in the oral health of Danish women during pregnancy. *Journal of Clinical Periodontology*, 30(11), 949-953.
 11. Contreras, A., Herrera, J., Soto, J., Arce, R., Jaramillo, A., and Botero, J. (2006). Periodontitis is associated with preeclampsia in pregnant women. *Journal of Periodontology*, 77(2), 182-188.
 12. de Oliveira, B. H., and Nadanovsky, P. (2006). The impact of oral pain on quality of life during pregnancy in low-income Brazilian women. *Journal of Orofacial Pain*, 20(4).
 13. Ebrahimipour, H., Mohamadzadeh, M., Niknami, S., Ismaili, H., and Vafaii Najjar, A. (2015). Predictors of oral health care in pregnant women based on theory of planned behavior. *J Health Syst Res*, 11(3), 496-504.
 14. Eigbobo, J., and Onyeaso, C. (2013). Maternal knowledge and awareness of factors affecting oral health in the pediatric population. *Odonto-Stomatologie Tropicale*, 36(142), 15-24.
 15. Gambhir, R. S., Nirola, A., Gupta, T., Sekhon, T. S., and Anand, S. (2015). Oral health knowledge and awareness among pregnant women in India: A systematic review. *Journal of Indian Society of Periodontology*, 19(6), 612.
 16. Giglio, J. A., Lanni, S. M., Laskin, D. M., and Giglio, N. W. (2009). Oral health care for the pregnant patient. *Journal of the Canadian Dental Association. Journal de L'Association Dentaire Canadienne*, 75(1).
 17. Govindasamy, R., Narayanan, M., Balaji, V. R., Dhanasekaran, M., Balakrishnan, K., and Christopher, A. (2018). Knowledge, awareness, and practice among gynecologists, medical practitioners and dentists in Madurai regarding association between periodontitis and pregnancy outcomes. *Journal of Indian Society of Periodontology*, 22(5), 447.
 18. Gupta, S., Jain, A., Mohan, S., Bhaskar, N., and Walia, P. K. (2015). Comparative evaluation of oral health knowledge, practices, and attitude of pregnant and non-pregnant women, and their awareness regarding adverse pregnancy outcomes. *J Clin Diagn Res*, 9(11), ZC26.
 19. Haji Kazemi, E., Mohseni, S. H., Oskouie, F., and Haghani, H. (2005). The association between knowledge, attitude, and performance in pregnant women toward dental hygiene during pregnancy. *Iran J Nurs*, 18(43), 31-38.
 20. Haririan, H. R., Mohammadpour, Y., and Aghajanloo, A. (2010). Prevalence of depression and contributing factors of depression in the infertile women referred to Kosar infertility center, 2009. *Iran J Obstet Gynecol Infertil*, 13(2), 45-49.
 21. Khalaf, S. A., Osman, S. R., Abbas, A. M., and Ismail, A. (2018). Knowledge, attitude, and practice of oral healthcare among pregnant women in Assiut, Egypt. *Int J Community Med Public Health*, 5, 890-900.
 22. Lee, A., McWilliams, M., and Janchar, T. (1999). Care of the pregnant patient in the dental office. *Dental Clinics of North America*, 43(3), 485-494.
 23. Martins, A. M. E. d. B. L., Barreto, S. M., and Pordeus, I. A. (2008). Factors associated to self-perceived need of dental care among Brazilian elderly. *Revista de Saúde Publica*, 42, 487-496.
 24. Mehdipoor, A., Danesh, M., Pouretemadi, A., Jafary Nodoushan, Z., Shabani Ghazikelayeh, M., and Saleh, A. (2019). Evaluation of Dentists' and Gynecologists' Knowledge, Attitude, and Practice Regarding Oral and Dental Care during Pregnancy in Qom, Iran, in 2017. *Arch Hyg Sci*, 8(3), 163-171.
 25. Mills, L. W., and Moses, D. T. (2002). Oral health during pregnancy. *MCN: American Journal of Maternal Child Nursing*, 27(5), 275-280.
 26. Mokeem, S. A., Molla, G. N., and Al-Jewair, T. S. (2004). The prevalence and relationship between periodontal disease and preterm low birth weight infants at King Khalid University Hospital in Riyadh, Saudi Arabia. *Journal of Contemporary Dental Practice*, 5(2), 40-56.
 27. Nogueira, B. M. L., Nogueira, B. C. L., Fonseca, R. R. d. S., Brandão, G. A. M., Menezes, T. O. d. A., and Tembra, D. P. d. S. (2016). Knowledge and attitudes of pregnant women about oral health. *Int J Odontostomat*, 10(2), 297-302.
 28. Patil, S., Thakur, R., Madhu, K., Paul, S.

- T., and Gadicherla, P. (2013). Oral health coalition: knowledge, attitude, practice behaviours among gynecologists and dental practitioners. *J Int Oral Health*, 5(1), 8.
29. Saddki, N., Yusoff, A., and Hwang, Y. L. (2010). Factors associated with dental visit and barriers to utilisation of oral health care services in a sample of antenatal mothers in Hospital Universiti Sains Malaysia. *BMC Public Health*, 10(1), 1-11.
 30. Scannapieco, F. A., Bush, R. B., and Paju, S. (2003). Periodontal disease as a risk factor for adverse pregnancy outcomes. A systematic review. *Annals of Periodontology*, 8(1), 70-78.
 31. Shamsi, M., Hidarnia, A., Niknami, S., Atarha, M., and Jadidi, R. (2013). Oral health of pregnant women in Arak, Iran. *Payesh Health Monit*, 12(4), 355-365.
 32. Tantradi, P., and Madanshetty, P. (2013). Knowledge of dental interns about management of dental needs of pregnant patients. *Journal of Education and Ethics in Dentistry*, 3(2), 76.
 33. Tarannum, F., Prasad, S., Vivekananda, L., Jayanthi, D., and Faizuddin, M. (2013). Awareness of the association between

periodontal disease and preterm births among general dentists, general medical practitioners, and gynecologists. *Indian Journal of Public Health*, 57(2), 92.

7. OPEN ACCESS

This article is licensed under a Creative Commons Attribution 4.0 (CC BY 4.0) International License, which permits use, sharing, adaptation, distribution, and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third-party material in this article are included in the article's Creative Commons license unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

Figure 1: Distribution of frequency and percentage of correct and incorrect answers of the participants in the field of knowledge

Table 1: Frequency distribution of demographic characteristics of studied pregnant women

Variable	Specifications	Frequency (Person)	Percent
Age (Year)	<25	88	41.9
	30-25	55	26.2
	35-30	38	18.1
	40-35	26	12.4
	>40	3	1.4
Spouse Age	<25	33	15.7
	30-25	76	36.2
	35-30	59	28.1
	40-35	27	12.9
	>40	15	7.1
Duration Of Marriage (Year)	<2	72	35.6
	5-2	44	21.8
	10-5	51	25.2
	15-10	29	14.4
	>15	6	3.0
Pregnancy Weeks	<=12	27	13.0
	>12	180	87.0
Number of Children	0	96	45.7
	1	62	29.5
	2	36	17.1
	3	16	7.6
Previous Pregnancy History	Yes	91	43.3
	No	119	56.7
Job	Housewife	170	81.0
	Employee	26	12.4
	Free	10	4.7
	Manual Worker	4	1.9
Spouse Job	Unemployed	6	2.9
	Employee	69	32.9
	Free	95	45.2
	Manual Worker	40	19.0
Mother's Education	Primary	47	22.4
	High School	77	36.6
	University	86	41.0
Father's Education	Primary	21	10.0
	High School	102	48.6
	University	87	41.4
Insurance Services	Yes	177	84.7
	No	32	15.3
Monthly Income (USD)	<40	77	36.7
	40-80	73	34.8
	80-120	42	20.0
	>120	18	8.5
Income Evaluation	Low	56	26.7
	Medium	97	46.2
	Good	57	27.1

Table 2: Comparison of knowledge, attitude and practice scores by age, occupation, income, place of residence in pregnant women participating in the study

Variable (Age) Score	Mean And Standard Deviation				Test Statistics	P- Value	
	<25	30-25	35-30	>35			
Knowledge	1.69±5.31	2.18±5.67	.2.01±6.00	1.90±5.86	F=1.38	0.24	
Attitude	5.22±54.78	4.46±56.60	5.21±57.34	5.70±56.27	F=2.80	0.04	
Practice	3.41±25.64	4.25±26.58	3.36±26.05	4.50±25.62	F=0.77	0.51	
Variable (Job) Score	Mean And Standard Deviation				Test Statistics	P- Value	
	Housewife	Employee	Free	Manual Worker			
Knowledge	1.95±5.42	1.58±6.76	1.15±6.00	1.82±5.00	F=4.12	0.007	
Attitude	5.00±55.18	5.34±59.80	2.27±58.50	3.74±56.00	F=7.53	<0.001	
Practice	3.73±25.54	3.76±27.61	2.54±29.40	2.08±24.50	F=5.61	0.001	
Variable (Income) Score	Mean And Standard Deviation				Test Statistics	P- Value	
	<40	40-80	80-120	>120			
Knowledge	1.83±4.96	1.94±5.80	1.68±6.11	2.03±6.38	F=5.46	0.003	
Attitude	4.52±54.46	5.15±97	5.78±57.57	4.65±58.16	F=4.84	0.001	
Practice	3.54±25.16	3.90±25.79	3.77±26.57	3.44±28.61	F=4.68	0.003	
Variable (Place Of Residence) Score	Mean And Standard Deviation					Test Statistics	P- Value
	North	South	East	West	Center		
Knowledge	1.83±5.23	1.84±6.35	2.01±5.82	2.05±5.82	1.88±5.73	F=2.60	0.037
Attitude	4.32±54.87	6.86±58.74	4.70±56.86	4.91±55.40	4.17±55.31	F=4.53	0.002
Practice	3.50±24.89	3.33±27.89	3.23±26.69	4.71±26.36	3.63±26.00	F=5.15	0.001

Table 3: Distribution of frequency and percentage of correct and incorrect answers of the participants in the field of knowledge

Question	Incorrect answers		correct answers	
	Frequency (person)	percentage	Frequency (person)	percentage
What is a dental plaque?	171	81.4	36	18.6
What causes dental plaque to accumulate?	144	68.6	66	31.4
In which part of the tooth do plaque accumulate the most?	182	86.7	28	13.3
What causes bleeding gums?	86	91.0	124	59.0
What causes gingivitis in pregnant women?	169	80.5	41	19.5
What are the symptoms of gum disease?	83	39.5	127	60.5
Which of the following substances increases the risk of tooth decay?	14	6.7	196	93.3
What is the best way to maintain good oral hygiene?	18	8.6	191	91.0
What is the best tool for cleaning between teeth?	41	19.5	169	80.5
How many times a day should teeth be cleaned?	174	82.9	36	17.1
What is the minimum time required to brush?	154	73.3	56	26.7
When is the best time to get dental treatment if needed during pregnancy?	105	50.0	105	50.0

Table 4: Distribution of frequency and percentage of correct and incorrect answers of participants in the field of attitude

Question	Score 1		Score 2		Score 3		Score 4		Score 5	
	Frequency (person)	percentage	Frequency (person)	percentage	Frequency (person)	percentage	Frequency (person)	percentage	Frequency (person)	percentage
I love sweets, chocolates and snacks.	16	7.6	71	33.8	42	20.0	65	31.0	15	7.1
I believe that if we do not brush our teeth, tooth decay will happen sooner.	3	1.4	7	3.3	11	5.2	93	44.3	96	45.7
Bad breath can be due to not brushing and flossing regularly.	1	0.5	15	7.1	20	9.5	97	46.2	77	36.7
Brushing should be avoided with nausea and vomiting due to brushing.	6	2.9	36	17.1	73	34.8	79	37.6	16	7.6
I believe that I should floss at least once a day.	0	0	15	7.1	29	13.8	123	58.6	43	20.5
Tooth decay is more likely during pregnancy.	0	0	5	2.4	33	15.7	93	44.3	79	37.6
I believe that we should only go to the dentist when our teeth hurt.	6	2.9	31	14.8	26	12.4	107	51.0	40	19.0
I believe that bleeding gums and gum disease are related.	0	0	10	4.8	75	35.7	91	43.3	34	16.2
I believe gum disease can be one of the causes of bad breath.	0	0	4	1.9	45	21.4	120	57.1	41	19.5
I believe dental services can harm my fetus.	14	6.7	61	29.0	77	36.7	50	23.8	80	3.8
I believe that scaling teeth during pregnancy is harmful to the fetus.	10	4.8	44	21.0	114	54.3	33	15.7	9	4.3
I believe that pregnancy can worsen the condition and disease of the gums and increase bleeding, swelling and redness.	2	1.0	29	13.8	97	46.2	64	30.5	18	8.6
I believe that oral diseases during pregnancy can cause premature birth.	13	6.2	37	17.6	111	52.9	37	17.6	12	5.7
I believe that the calcium needed by the fetus is taken from the mother's teeth.	30	14.3	75	35.7	77	36.7	26	12.4	2	1.0
I believe that oral diseases do not affect the birth weight of my child.	14	6.7	39	18.6	110	52.4	42	20.0	5	2.4
I believe that maintaining good oral hygiene during pregnancy is more important than before pregnancy.	1	0.5	2	1.5	23	11.0	97	46.2	87	41.4

Table 5: Frequency distribution and response percentage of participants in the field of practice

Question	Score 1		Score 2		Score 3	
	Frequency (person)	percentage	Frequency (person)	percentage	Frequency (person)	percentage
Do you brush every night before bed?	13	6.2	99	47.1	98	46.7
Do you brush your teeth after every meal?	55	26.2	129	61.4	26	12.4
Do you brush all surfaces of your teeth carefully?	8	3.8	49	23.3	153	72.9
How often do you change your toothbrush?	39	15.6	110	52.4	61	29.0
Do you floss or toothpick your teeth regularly?	63	30.0	109	51.9	38	18.1
Do you use fluoride toothpaste?	25	11.9	73	34.8	112	53.3
Did you see a dentist before you got pregnant?	110	52.4	13	6.2	87	41.4
Did you have an oral examination by a dentist during pregnancy?	134	63.8	12	5.7	64	30.5
Do you rinse your mouth immediately after eating sweet and sticky foods?	22	10.5	81	38.6	107	51.0
Do you rinse your mouth after morning sickness and vomiting?	7	3.3	15	7.1	188	89.5
Do you use chlorhexidine mouthwash?	183	87.1	19	9.0	8	3.8
Do you use fluoride mouthwash?	170	81.0	28	13.3	12	5.7
How often do you see a dentist?	143	68.1	57	27.1	10	4.8