ACTA SCIENTIFIC DENTAL SCIENCES

Volume 9 Issue 2 February 2025

Research Article

Evaluation of the Dental Health Care in the Iraqi Community for Pregnant and Non – Pregnant Women by Dental Caries, Periodontal Conditions, and Treatment Through the Filling, and Tooth Extraction

Sana'a Abdulrazzaq Ibrahim[1]* and Mufeed Jalil Ewadh[2]

[1]*Department of Basic Science, Faculty of Dentistry, University of Kufa, Iraq*

[2]*Professor, Biochemistry Department, College of Medicine, University of Babylon, Iraq*

***Corresponding Author:** Sana'a Abdulrazzaq Ibrahim, Department of Basic Science, Faculty of Dentistry, University of Kufa, Iraq.

DOI: 10.31080/ASDS.2025.09.1973

Received: January 02, 2025

Published: January 22, 2025

Abstract

Background: The mouth is the mirror of the body, so any defect in the oral health was important to keeping overall body health. Dental caries have been linked with lower socio-economic status and can be considered a disease of poor people. Women are more liable to be influenced to dental caries during pregnancy because the pregnant women faced many physiological changes. These changes may be local and systemic, like those occur in the oral cavity. Oral health is a necessary part of general health, so the problems in the oral cavity in pregnant women must be come across immediately.

Material and Method: During 4 months (May, June, July and, August), 311 samples, all of them females were collected from healthy volunteers. There are 2 groups one of them as controls, whom they are non – pregnant group, the number of this group were 157 women, and 154 blood samples were collected from pregnant women. A questionnaire contains name, sex, past medical history, psychological history, their status, dietary habits, oral hygiene habits, brushing teeth as time, and frequency of dental appointments, ethnicity, and socio-economic status, educational level, and clinical diagnosis as decayed teeth, gingivitis, plaque will be complicates for all individuals. The study subjects will be matched for age.

Results: Our study results explained the differences were very clear between the pregnant and non- pregnant women groups, which mean the dental caries in pregnant women was (P = 0.05), more than the non – pregnant women was (P = 0.08), especially in non – pregnant with the age (15 -25) yrs the (P value = 0.001), and age (26 – 35) yrs, the (p value = 0.07) and age (36 – 45) yrs, the (P value = 0.02), and the total (P value = 0.005).

Discussion: According to our investigation by used WHO, Oral Health Survey Basic Methods [27], 87.7% of our pregnant sample was having dental caries. About 57% of DMFT score in our pregnant sample untreated dental caries, with about 21% of the same score with dental filling, and 22% of DMFT score was extracted teeth in this sample. These results explained the high needed of treatment for this group.

Conclusion: There are many factor effected the oral health and caused dental caries for pregnant women, including the socio – economic and demographic characterizes, which caused a big problem in our society because the low of monthly income for the family, the low education, the use of unhealthy food, the increased eating of sweets and soft drinks, and the failure to use the brush and toothpaste properly, which causes a lot of tooth decay in pregnant women.

Keywords: Oral Health; Dental Caries; Pregnant Women; Socio – Economic; Soft Drink; Filling; Tooth Extraction; DMFT Score

Introduction

Dental health or oral health was defined as a healthy mouth, free of infections, injuries and other problems with teeth and gums. The mouth is the mirror of the body, so any defect in the oral health was important to keeping overall body health. Also the age, lifestyle choices were made in the past played an important role in overall health and quality of life.

Disease and other conditions can affect dental health and dental problems can affect other parts of body. Failing to properly care for oral health may lead to other health problems. The goal is to prevent complications such as tooth decay (cavities) and gum disease and to maintain the overall health of the mouth.

In simplified terms was the effect of oral complications on daily functioning. But it was a simple explaining. These definitions suggest that oral health related quality of life equaled the health but at the same time it includes dimensions were broader range than health [1].

Dental diseases caused discomfort, pain, and affect important oral functions like chewing, smiling and talking and can influence the social roles for every person. As a result from deferent nested researches and clinical attempt explained that dental treatments and general public health can be improve the oral health related quality of life. Gift HC and Atchison KA have specified three areas of dental health in which significance oral health related quality of life will be important, namely clinical practice of dentistry, dental education and dental research [2].

Multiple item questionnaires are the more quite used measure, and should be fixed on:

- It should be patient or person concentrated
- It should take aspects of daily life that are significant to them which may be influenced by the upset or the status in question.

Oral health related quality of life tools may be:

- Socio dental indicators;
- Global self-ratings of oral health;
- Multiple item questionnaires [3].

Dental caries

Dental caries or cavities, also known as tooth decay, is the breakdown of teeth due to acids made by bacteria, primarily Streptococcus mutans that metabolize sugars to produce acid, which over time, demineralized tooth structure. The cavities may be a number of different colors from yellow to black. The cause of cavities is acid from bacteria dissolving the hard tissues of the teeth [4]. Teeth mineralized organs, surrounded by alveolar bone, and formed by three distinctive hard tissues (enamel, dentin and cementum. The tooth mineralization process occurs parallel to the skeletal mineralization, yet if mineral metabolism is disturbed then the failures will occur similarly to those that occur in bone tissue. Enamel is a highly mineralized substance covering the tooth crown, hard, and protects the tooth as a barrier. If mineral breakdown is greater than build up, as in the enamel gets demineralized, the enamel becomes thin and translucent [5], from sources such as saliva, caries results, so is a prevalent chronic infectious, leading to the spread of the effect of bacteria till dentin, hence causing demineralization of it which eventually leads to deep cavity formation resulting from tooth-adherent specific bacteria [4].

The etiology of dental caries can be explained by a simple which consists of recently, a time, which describes the duration of the interaction of the depict diet, dental plaque, or microbial load, and the host. Plaque and dietary factors are interdependent upon each other in the causation of dental caries, as in [6].

These factors are:

- Micro-organisms in dental plaque as Streptococcus mutans [7].
- A suitable carbohydrate substrate, fermentable carbohydrates as cariogenic diet must be present for dental caries to occur [8].
- A susceptible tooth surface, enamel or dentin [9].
- Time needed for changed the food to acid created by bacteria [7].
- Saliva as buffering capacity [9].
- Fluoride as protecting factors, but if there is no fluoride supplement leads to dental caries [10].
- Modifying factors as different individuals will be susceptible to different degrees depending on the oral hygiene habits, the shape of their teeth, socioeconomic, and general body health.

Dental caries occurs usually in exposed surfaces of tooth in oral cavity, the incidence of cementum caries increases in older adults as gingival recession occurs from either trauma or periodontal disease. While the structure of tooth embedded in the bone not affected [11].

Streptococcus mutans (*S. mutans*) primarily has links with dental caries initiation [7], and Lactobacilli have links with the progression of dental caries. The substrates for these bacteria were fermentable carbohydrates and the bacterial generated carbohydrate reserve in the biofilm. As the bacteria metabolize these substrates, they form

lactic and other acids. The formation of lactic acid, along with host factors, lowers down the oxygen coefficient locally, which fosters the rate and progression of dental caries [12]. Repeated cycles of acid generation result in the microscopic dissolution of calcified tissue in the tooth and eventually into cavitation. Studies shown that enamel demineralization occurs at sudden decrease in plaque pH following glucose as pH of 5.5 and below [4]. The process is dynamic, however, as remineralization can also occur if the acid is neutralized by saliva or mouthwash. Fluoride toothpaste or dental varnish may aid remineralization [13].

Poverty line is also a significant social determinant for oral health. Dental caries have been linked with lower socio-economic status and can be considered a disease of poor people [14].

Worldwide, approximately 3.9 billion people had dental caries in their permanent teeth [15]. In baby teeth it affects about 620 million people or 9% of the population [16]. Between 29% and 59% of adults over the age of 50 yrs, had experience caries [17]. The classic DMF (decay/missing/filled) index is one of the most common methods for assessing caries prevalence as well as dental treatment needs among populations.

Women were more liable to be influenced to dental caries during pregnancy because the pregnant women faced many physiological changes. These changes could be local and systemic, like those occur in the oral cavity. Oral health is a necessary part of general health, so the problems in the oral cavity in pregnant women came across immediately. The dentist should be care about the physiological changes that occur throughout pregnancy and be apprehensive about his interference by dental treatments, which had effects on the lives of the mother and the baby in some time. Therefore, the dentist should be taking on all measures requisite to minimize the risk of reverse events [18].

Pregnancy is not a disease condition; rather it is a sign of being healthy. Any person who is healthy not expected to lose their teeth without any causes. Pregnant women had the same roles. If these women take a precautions they would not have any defect or loss of teeth or had any dental problems, but if there is a bad oral health in pregnancy and failure to take care would lead to dental problems [19].

The hormone levels changing in pregnancy, directly affected gum, and indirectly tooth decay. In general we knew that tooth decay increases during pregnancy. The teeth decay causes severe pain; also tooth losses could be visible [19].

The deterioration of oral and dental health during pregnancy depends on the following factors.

- Some pregnant women during the first months of pregnancy may had extreme interest in such type of foods, especially carbohydrates, and neglected of tooth brushing after they eat these kinds of food.
- Due to the effect of pregnancy hormones (estrogen, progesterone), Pregnant women gum tissue would be bleeding more every time and this lead to avoid brushing their teeth. A result, bacterial plaque accumulated, so, the mouth needs more care.
- In the first few months, vomiting, during the pregnancy increases the acidic environment in the mouth. So after vomiting, the pregnant women must be give attention to oral care. An acidic environment will form in the mouth, if the teeth are not brushed sufficiently.
- Because of saliva flow decreases during pregnancy, the formation of dental caries increases during this period.

Various studies have found evidence linking together poor maternal oral health, pregnancy outcomes and dental health of the offspring. These may range from preterm delivery and low birth weight to higher risk of early caries among infants. Oral health promotion, disease prevention, early detection and timely intervention are crucial aspects for maternal and child oral health.

Pregnant women can neglected their oral and dental health care, which in turn causes a decline of oral health. The main advantage of finding primary decalcified lesions chalky spots is that these can be treated by remineralization. Untreated carious lesions increase the incidence of abscess and cellulites [20]. Also some psychosocial factors were suggested, such as stress levels, and social support of pregnant women which usually may be get from their families and friends, and also factors were identified to be associated with oral health was social context and environment as health care system, other factors, including demographic and personal characteristics, all of these affected the pregnant women oral health and teeth, Another barriers to seeking dental services include lack of knowledge and value, negative oral health experiences, negative attitudes toward oral health professionals and negative attitudes of dental staff toward pregnant women [21].

Material and Method

Subjects and study design

During 4 months (May, June, July and, August), 311 samples, all of them females were collected from healthy volunteers. There are 2 groups one of them as controls, whom they are non – pregnant group, the number of this group were 157 women, and 154 were

collected from pregnant women attending to AL- Zahra Hospital, and some other private dental clinic and some primary health centers in AL- Najaf city and Babylon city. All of them Iraqi people, they lived in this society with poor to middle and some of them with good life style and the income of these families approximately at the same.

A questionnaire contains name, sex, past medical history, psychological history, their status, dietary habits, oral hygiene habits, brushing teeth as time, and frequency of dental appointments, ethnicity, and socio-economic status, educational level, and clinical diagnosis as decayed teeth, gingivitis, plaque will be complicates for all individuals. The study subjects will be matched for age.

The study would be described in details for all participants and their consent will be obtained. The study will be approved by Babylon Medical College Ethical Committee.

The chart of the questionnaire included questions about independent variables of non – pregnant and pregnant women's socio – demographic data, employment status (Age, Number of children, Family monthly income (Student, Housewife, Part – time Job, Full – time Job), Health status, Psychological status, Level of education as (Master, Four Year college, Two year College, High School, Less than high school, Secondary or middle or primary School, None), Type of nutrition, Use of soft drinks, Use brush and toothpaste and the oral hygiene status (Never brush, Sometimes, Once a day or more), Periodically review the dentist (Private, Public, None), Last dental visits within the past (6 Months, 1 Year, 2 Years, 3Years, 5 Years, Never been to dental clinic, Number of dental caries, Number of filling, Number of extraction teeth, and gingival condition).

For pregnancy women chart in addition to the questions above also there are another questions as, (Number of Previous Pregnancies, Stage of pregnancy).

Mothers were invited to examine at dental room in public clinics and seated on dental chair and used a special dental instruments as, probe and mirror to check the oral cavity. Dental caries prevalence was assessed by the DMFT index and their dental caries experience severity by the DMFS index [22,23].

All participants were voluntary; they signed paper consent collected from pregnant and non – pregnant women who agreed to share in this study. The consents for the two groups started from age 15 – 45 years. All aspects of this study, even the consent form were approved by the Scientific Research Ethics Committee of College of Medicine/University of Babylon.

Statistical analysis

The socio-economic and demographic characteristics and the laboratory statistics of 311 of pregnant and non-pregnant women are shown as means and standard deviations or as percentages.

Data were analyzed using SPSS software version 26. Categorical variables were presented as frequencies and percentages while continuous variables were presented as mean and SD. Chi square test was used to assess the relationships between categorical variables. Clustered bar charts were used as needed.

Risk indicators associated with tooth decay were identified using the 95% confidence intervals (95% CI) were calculated. The p value < 0.05 will be selected to define statistical significance.

Results

General Characteristics, Socio- economic and Demographic tests of the Studied Population.

Dental health and management of pregnant women considered to be a very principle part. It is suitable to appreciate patient's present dental health status, and then to educate these women about the expectant changes during pregnancy, and then can be helpful to prevent the pain and stress. A total of (311) Iraqi woman was included in the study, of which 154 were pregnant women. There are socio – demographic and behavioral characteristics, which obtained from interview of the women for two groups. Health status, psychological status, and medical history were including dental history and dental examination for dental caries, filling and teeth extraction. Age was one of the socio – demographic characteristic which considered the dependent variable and divided to the three groups as (15-25), (26-35), (36-45) years, in pregnant and non – pregnant women. Lifestyle factors, as educational levels, appointment of dental clinic visit, brushing the teeth, type of the diet, soft drink, all these were summarized in (table 1, and 3).

In contrast there are 157 non – pregnant women with the same characteristics and lifestyle factors summarized in (table 2, and 4).

The number of each group was showing in (figure 1), and how distributed.

In this study the socio- economic status was using scale for two groups as good, median, and poor as in (table 1, and 2).

The pregnant women should understand the important relation between the oral health and dental caries experience DMFT.

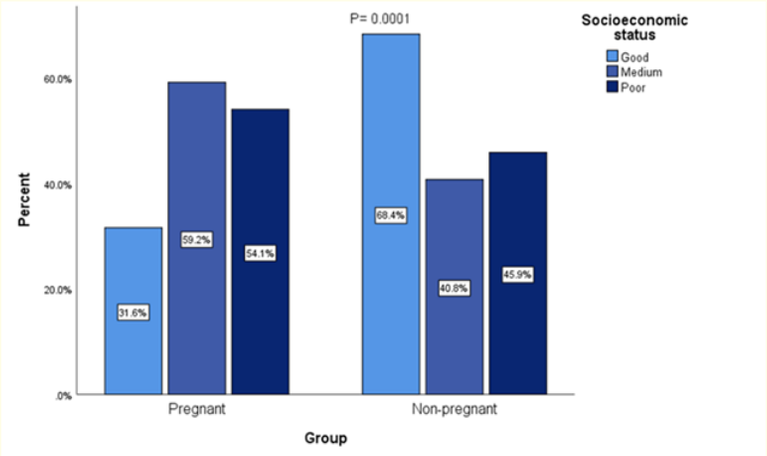

Figure 1: Distribution of 2 samples according to the age and number of each group.

Table 1: Distribution of pregnant women samples according to age, gravida, socioeconomic status, health status, psychological status, educational status, nutrition, soft drink.

		Age group			Total	P
		15-25 (n = 72)	26-35 (n = 69)	36-45 (n = 13)		
Gravida	1.00	36(50%)	11(15.9%)	0(0%)	47(30.5%)	0.0001
	2.00	22(30.6%)	9(13%)	1(3.1%)	32(28.8%)	
	3.00	14(19.4%)	45(65.2%)	5(38.5%)	64(41.6%)	
	4.00	0(0%)	4(5.8%)	7(53.8%)	11(7.1%)	
Socioeconomic status	Good	12(16.7%)	19(27.5%)	0(0.0%)	31(20.1%)	0.08
	Medium	47(65.3%	33(47.8%	10(76.9%)	90(58.4%)	
	Poor	13(18.1%)	17(24.6%)	3(23.1%)	33(21.4%)	
Health status	Good	67(93.1%)	60(87%)	10(76.9%)	137(89%)	0.6
	Not	5(6.9%)	9(13%)	3(23.1%)	17(11%)	
Psychological status	Good	67(93.1%)	62(89.9%	11(84.6%)	140(90.9%	0.6
	Depressed	5(6.9%)	7(10.1%)	2(15.4%)	14(9.1%	
Education	Higher education	14(19.4%)	19(27.5%)	6(46.2%)	39(25.3%)	0.2
	Secondary	6(8.3%)	9(13%)	3(23.1%)	18(11.7%)	
	Intermediate	8(11.1%)	6(8.7%)	0(0%)	14(9.1%)	
	Primary	35(48.6%)	24(34.8%)	3(23.1%)	62(40.3%)	
	Not educated	9(12.5%)	11(15.9%)	1(7.7%)	21(13.6%)	
Nutrition	Good	45(62.5%	46(66.7%)	7(53.8%	98(63.6%	0.3
	Poor	25(34.7%	20(29%)	4(30.8%	49(31.8%	
	Mostly sweets	2(2.8%)	3(4.3%	2(15.4%)	7(4.5%)	
Soft drink	Yes	44(61.1%)	27(39.1%)	8(61.5%)	79(51.3%)	0.03
	No	28(38.9%)	42(60.9%)	5(38.5%)	75(48.7%)	

Table 2: Distribution of non- pregnant women sample according to age, number of children, socioeconomic status, health status, psychological status, educational status, nutrition, soft drink.

		Age group			Total	P
		15-25 (n = 66)	26-35 (n = 45)	36-45 (n = 46)		
Parity	Nulliparous	50(75.8%)	8(17.8%)	7(15.2%)	65(41.4%)	0.0001
	1-3	15(22.7%)	26(57.8%)	24(52.2%)	65(41.4%)	
	4+	1(1.5%)	11(24.4%)	15(32.6%)	27(17.2%)	
Socioeconomic status	Good	31(47%)	15(33.3%)	21(45.7%)	67(42.7%)	0.3
	Medium	25(37.9%)	21(46.7%	16(34.8%)	62(39.5%)	
	Poor	10(15.2%)	9(20%)	9(19.6%)	28(17.8%)	
Health status	Good	62(93.9%)	39(86.7%)	39(84.8%)	140(89.2%)	0.6
	Not	4(6.1%)	6(13.3%)	7(15.2%)	17(10.8%)	
Psychological status	Good	66(100%)	38(84.4%)	41(89.1%)	145(92.4%)	0.006
	Depressed	0(0.0%)	7(15.6%)	5(10.9%)	12(7.6%)	
Education	Higher education	37(56.1%)	22(48.9%)	19(41.3%)	78(49.7%)	0.1
	Secondary	7(10.6%)	0(0.0%	4(8.7%)	11(7%)	
	Intermediate	6(9.1%)	5(11.1%)	6(13%)	17(10.8%)	
	Primary	7(10.6%)	9(20%)	13(28.3%)	29(18.5%)	
	Not educated	9(13.6%)	9(20%)	4(8.7%)	22(14%)	
Nutrition	Good and diverse	44(66.7%)	33(73.3%)	36(78.3%	113(72%)	0.7
	Poor	18(27.3%)	10(22.2%)	9(19.6%)	37(23.6%)	
	Mostly sweets	4(6.1%)	2(4.4%)	1(2.2%)	7(4.5%	
Soft drink	Yes	33(50%)	19(42.2%)	12(26.1%)	64(40.8%)	0.04
	No	33(50%)	26(57.8%)	34(73.9%)	93(59.2%)	

Index for pregnant and non - pregnant was carried, statistically significant differences was observed in the total percent of pregnant women for medium and poor 123(79.9%), while the good 31(20.1%), when compared with the non – pregnant women as medium and poor 90(57.3%), while the good 67(42.7%), this explained in (figure 2) with P = 0.0001.

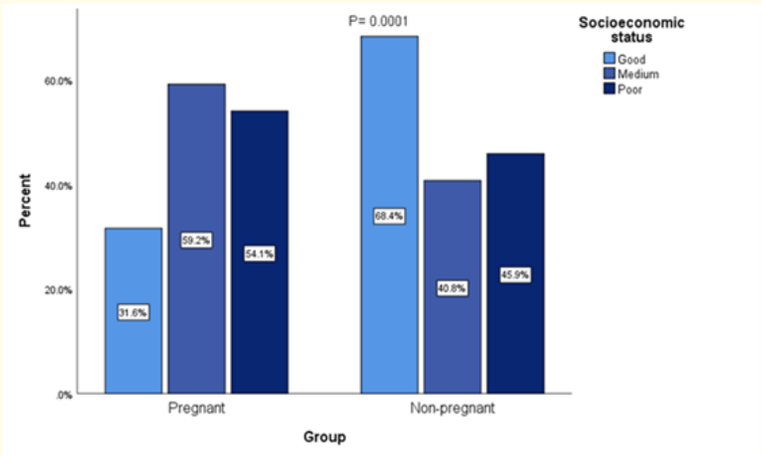

Figure 2: Distribution of 2 samples according to the socioeconomic status.

Psychological status significant in the non-pregnant women (p = 0.006) when compared with the pregnant women (p = 0.6), as in (figure 3).

Another demographic characteristics and life style factors were the same as health status, soft drink which more in pregnant women, gingivitis, and using of teeth brush was better in the non – pregnant women, this explained for two groups, as in (figures 4, 5, 6, and 7).

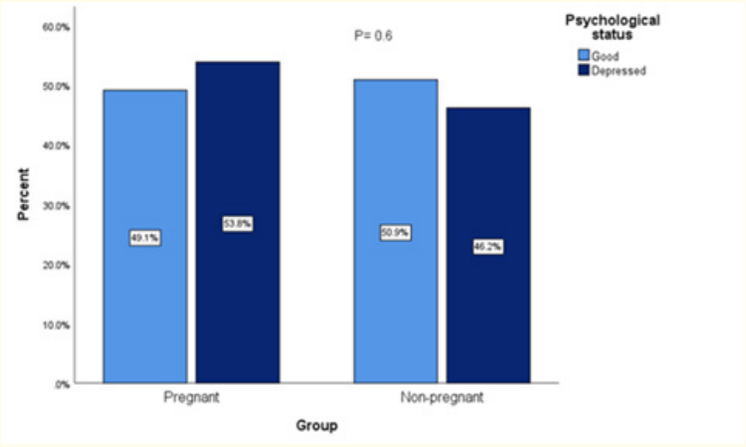

Figure 3: Distribution of 2 samples according to the psychological status.

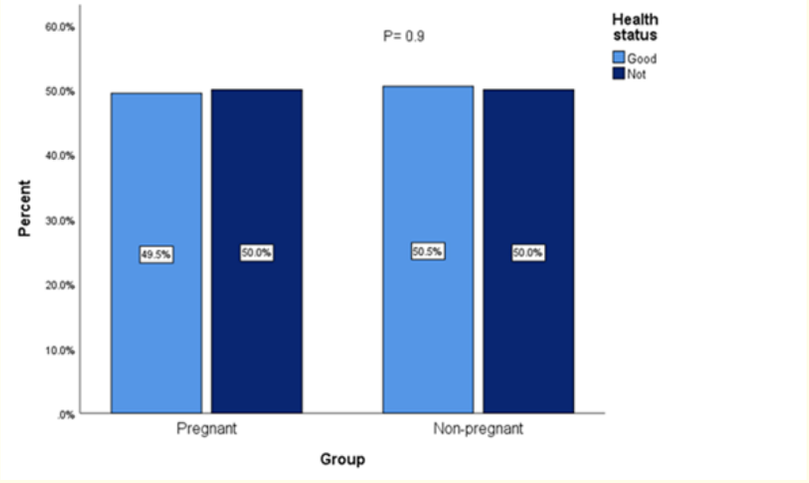

Figure 4: Distribution of 2 samples according to the health status.

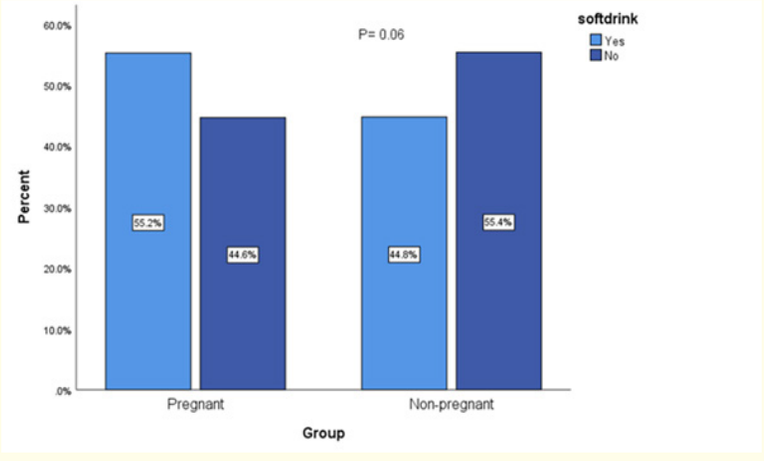

Figure 5: Prevalence of 2 samples with diet and cola drink.

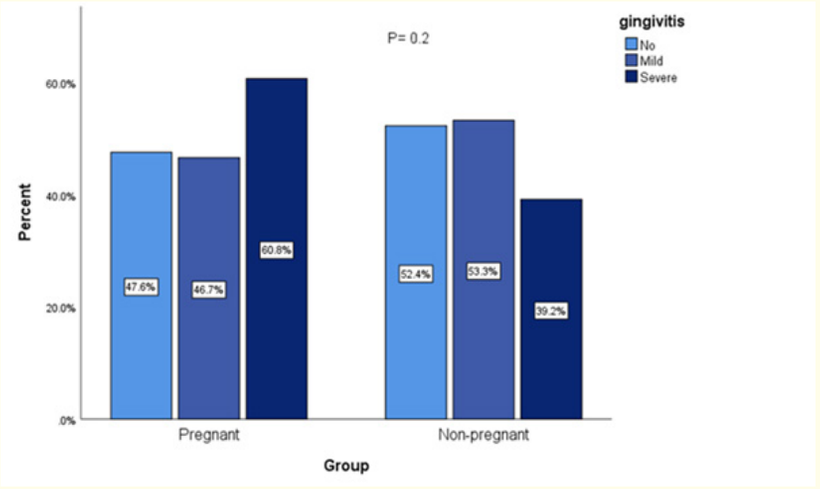

Figure 6: Prevalence of 2 samples with gingivitis.

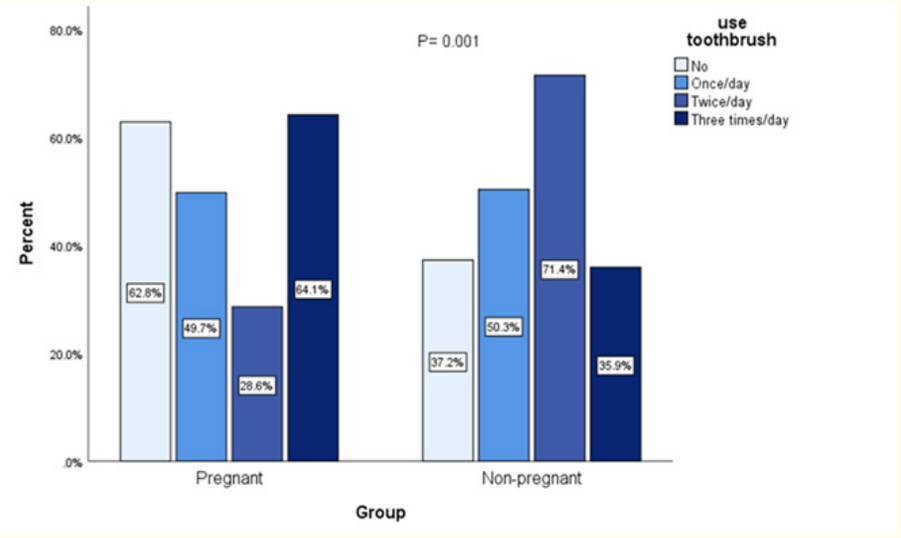

Figure 7: Prevalence of 2 samples with teeth brushing.

Dental examination and behavioral

After splitting the socio – demographic and behavioral characteristics, variances were found in the dental caries experience in our study.

Dental history and dental examination for dental caries were including filling and teeth extraction. Appointment of dental clinic visit, brushing the teeth was examined.

Most of pregnant women 154(97.4%) (p = 0.4), they thought it was unsafe for them to get dental treatment during pregnancy, so they did not visit the dental clinic for checkup or cleaning or any dental work, and they believed to lose a tooth because the pregnancy. If compared with non – pregnant women 127(81.4%) (p = 0.002), they not visited the dental clinic as in (table 3, and 4).

Level of education was important factor to demonstrate correct way to using teeth brush and this explained in (figure 7), that the group of pregnant women (62.8%) with high level of them no brushing them teeth, if compared with non – pregnant women with (37.2%) no brushing them teeth.

In our study the younger pregnant women was the more number who not used teeth brush, at the same more number of low education, and more number of dental caries.

Type		Age Groups			Total	P
		(15 – 25) yrs (n = 72)	(26 – 35) yrs (n = 69)	(36 – 45) yrs (n = 13)		
Caries	Free	7(7.9%)	11(15.9%)	1(7.7%)	19(12.3%)	0.05
	With	65(90.3%)	58(84.1%)	12(92.3%)	135(87.7%)	
Filling	Free	55(76.4%)	34(49.3%)	3(23.1%)	92(59.7%)	0.0001
	With	17(23.6%)	35(50.7%)	10(76.9%)	62(40.3%)	
Extraction	Yes	18(25%)	40(58%)	9(69.2%)	67(43.5%)	0.0001
	No	54(75%	29(42%	4(30.8%)	87(56.5%)	
Gingivitis	No	34(47.2%)	37(53.6%)	10(76.9%)	81(52.6%)	0.2
	Mild	23(31.9%)	19(27.5%)	0(0%)	42(27.3%)	
	Severe	15(20.8%)	13(18.8%)	3(23.1%)	31(20.1%)	
Dental visit	Yes	1(1.4%)	2(2.9%)	1(7.7%)	4(25.3%)	0.4
	No	71(98.6%)	67(97.1%)	12(92.3%)	150(97.4%)	
Use teeth brush	No	14(19.4%)	9(13%)	4(30.8%)	27(17.5%)	0.3
	Once/day	40(55.6%)	40(5%)	6(46.2%)	86(55.8%)	
	Twice/day	4(5.6%)	11(15.9%)	1(7.7%)	16(10.4%)	
	Once every 2 days	14(19.4%)	9(13%)	2(15.4%)	25(16.2%)	

Table 3: Distribution of dental caries, filling, and teeth extraction in pregnant women group.

Type		Age Group			Total	P
		(15 – 25) yrs (n = 66)	(26 – 35) yrs (n = 45)	(36 – 45) yrs (n = 46)		
Caries	Free	21(31.8%)	6(13.3%)	12(26.1%)	39(24.8%)	0.08
	With	45(68.2%)	39(86.7%)	34(73.9%)	118(75.2%)	
Filling	Free	34(51.5%)	18(40.0%)	10(21.7%)	62(39.5%)	0.007
	With	32(48.5%)	27(60.0%)	36(78.3%)	95(60.5%)	
Extraction	Yes	20(30.3%)	21(46.7%)	38(82.6%)	79(50.3%)	0.0001
	No	46(69.7%)	24(53.3%)	8(17.4%)	78(49.7%)	
Gingivitis	No	38(57.6%)	22(48.9%)	29(63%)	89(56.7%)	0.4
	Mild	22(33.3%)	14(31.1%)	12(26.1%)	48(30.6%)	
	Severe	6(9.1%)	9(20%)	5(10.9%)	20(12.7%)	
Dental visit	Yes	14(21.2%)	1(2.2%)	14(31.1%)	29(18.6%)	0.002
	No	52(78.8%)	44(97.8%)	31(68.9%)	127(81.4%)	
Use teeth brush	No	6(9.1%)	4(8.9%)	6(13%)	16(10.2%)	0.4
	Once/day	35(53.0%)	23(51.1%)	29(63.1%)	87(55.4%)	
	Twice/day	21(31.8%)	12(26.7%)	7(15.2%)	40(25.5%)	
	Once every 2 days	4(6.1%)	6(13.3%)	4(8.7%)	14(8.9%)	

Table 4: Distribution for dental caries, filling, and teeth extraction in the non - pregnant women group.

Also the two groups were the same in the filling, and teeth extraction (FT) component, which reflect dental treatments for the pregnant women 62 (40.3%), (p = 0.0001) compared with non – pregnant the filling 95 (60.5%) p = 0.007), as in (figures 8), and (tables 3, and 4).

The teeth extraction for pregnant 67 (43.5%), (p = 0.0001), versus the non- pregnant group 79 (50.3%) (p = 0.0001) as in (figure 9), and (table 3, and 4).

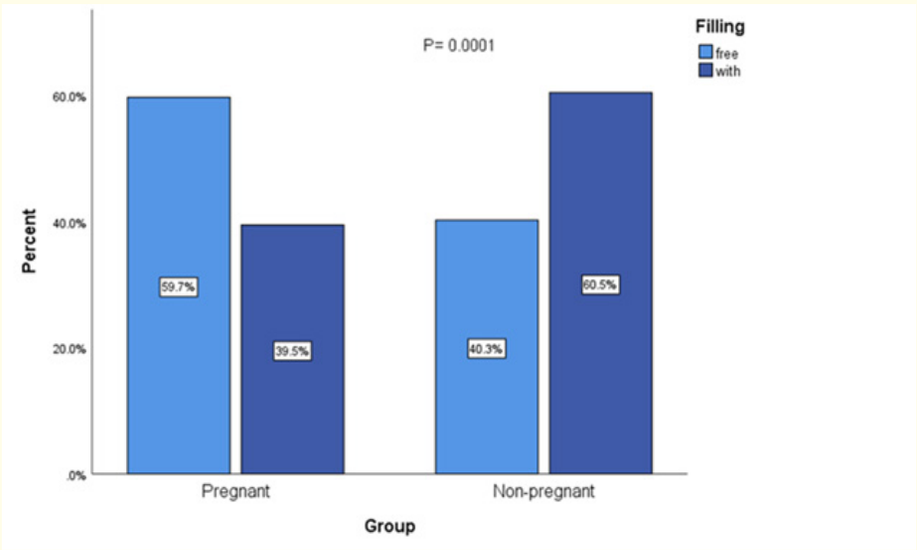

Figure 8: Prevalence of 2 samples with filling.

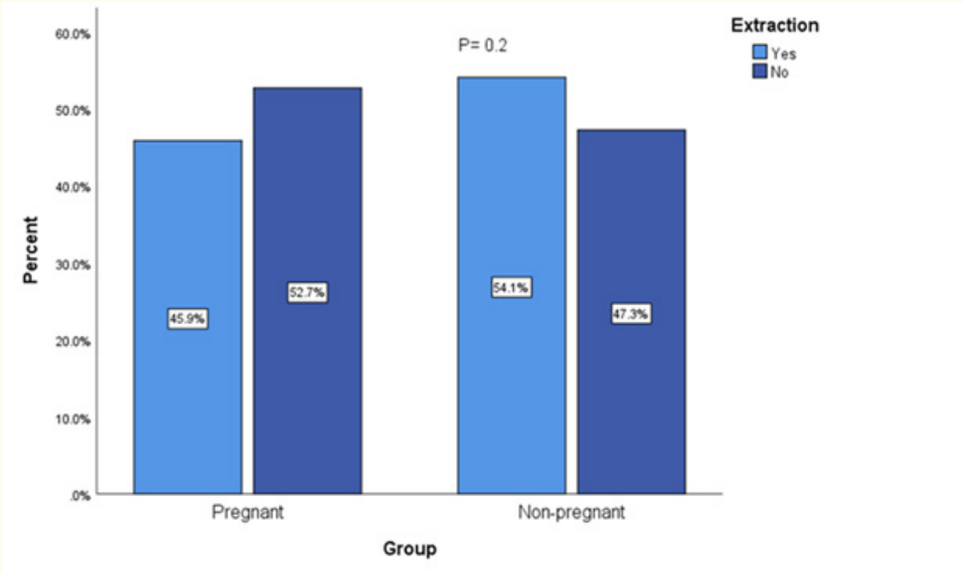

Figure 9: Prevalence of 2 samples with extraction.

For dental caries as explained in (table 3), we showed that 135 (87.7%) of pregnant women had dental caries. In contrast with non – pregnant women were 118 (75.2%) in (table 4).

Tooth decay was more in lower age group and lower educational group. Education was an important factor in dental caries experiment, so there was statistically a difference between groups. Most of pregnant women at age (15-25) yrs, 35 (48.6%) with primary school education and 9(12.5%) no educated, so that mean 44(61.1%) with low education for this age only. while if compared with non – pregnant women we had 37(56.1%) high educated at this age (15 – 25) yrs, who was high education level had low DMFT scores.

In this table 5, the differences were very clear, which mean the dental caries in pregnant women was (P = 0.05), more than the non – pregnant women was (P = 0.08), especially in non – pregnant with the age (15 -25) yrs the (P value = 0.001), and age (26 – 35) yrs, the (p value = 0.07) and age (36 – 45) yrs, the (P value = 0.02), and the total (P value = 0.005).

The frequency of dental caries was higher among lower age group of pregnant women [24], so 7.9% free from tooth decay, while 90.3% with tooth decay as in (table 5).

Age group	Pregnant Dental caries		Non – pregnant Dental caries		Total	P
	Free	With	Free	With		
(15 – 25)	7(7.9%)	65(90.3%)	21(31.8%)	45(68.2%)	138(44.3%)	0.001
(26 – 35)	11(15.9%)	58(84.1%)	6(13.3%)	39(86.7%)	114(36.7%)	0.07
(36 – 45)	1(7.7%)	12(92.3%)	12(26.1%)	34(73.9%)	59(19%)	0.02
Total	19(6.1%)	135(43.4%)	39(12.5%)	118(37.9%)	311(100%)	0.005
P	0.05		0.08			

Table 5: Distribution for dental caries for the pregnant and non – pregnant women.

Figure 10, represented the prevalence of dental caries in both groups, and showed the inclined toward caries – free in non – pregnant women.

The aim of this work was to study the risk index related to dental caries during pregnancy. A risk index may be supposed a risk factor [25]. We did in this study some variables considered as important risk indexes for tooth decay such as dental hygiene habits, and dietary habits.

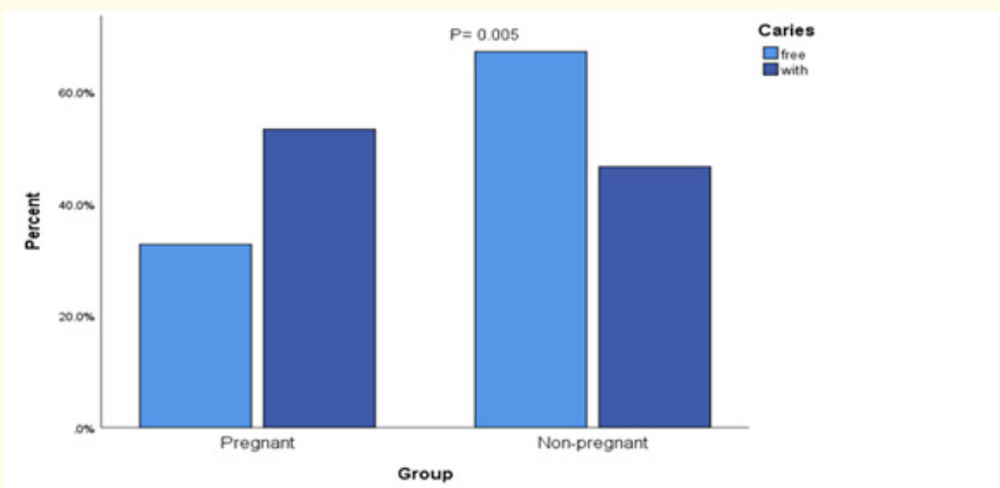

Figure 10: Prevalence of 2 samples with dental caries.

Discussion

In this data, we answered approximately all questions, which we were put it previously. There are many studies based on that a good oral health during pregnancy not only make better to the life quality of pregnant women, but also reduced the complications during pregnancy and reduced the risk for her child development, as Early Childhood Caries (ECC) in future.

Most pregnant women have a fault idea about the oral cavity health during pregnancy, which lead to neglected them to take care of the oral cavity during this period [26].

In this study, I investigated pregnant and non- pregnant Iraqi women, from many centers and hospitals, and even from private dental clinic. The investigation included the oral cavity health confidences and behaviors and estimated their dental caries experiments.

The samples for two groups randomly selected, and approximately shared the same socio – demographic characteristic.

Our results for pregnant group with low educational level, low monthly incomes, and irregular dental visits, and used soft drink, all the pregnant women suffered from dental caries.

These pregnant women also had other oral treatments as fillings, and extraction teeth, and these treatments also related to dental caries in past

.

According to our investigation by used WHO, Oral Health Survey Basic Methods [27], 87.7% of our pregnant sample was having dental caries. About 57% of DMFT score in our pregnant sample untreated dental caries, with about 21% of the same score with dental filling, and 22% of DMFT score was extracted teeth in this sample. These results explained the high needed of treatment for this group.

We take some data published in different areas of the world about pregnant women included dental caries experience, which showed significant differences in these areas.

In Finland, DMFT score of pregnant women (DMFT = 18), in Brazil (DMFT = 14), and in Hungary (DMFT = 12.57), while in Iran (DMFT = 5.4), in India (DMFT = 3.6 and 4.8), which indicated the lower loaded of the disease in the developing countries of Africa and Asia [28-33]. Our result in pregnant group (DMFT = 6.2).

These great differences in dental caries experience which happened in different areas in the world explained by the distinction of the culture structures, and socio – economic status, and other characteristics, as changing living conditions, and health their life style, of the samples in each study.

In other hand, the socio –economic status of pregnant group play a role in presented of dental caries, about 79.9% of our sample with low middle and poor socio – economic status, while 20.1% belonged good socio – economic status. There is a verse relationship between the socio – economic status and dental caries, and this increased in adults [34], and especially in pregnant women [35].

Pregnant woman at first time of pregnancy considered a sensible group of peril women; she may be affected by low health education, so she has poor health knowledgement [36]. Socio – economic status is related with oral health in general because people with low socio – economic status had a bad oral and general health if compared to people with the high socio – economic status group, and this due to neglect with poor oral practice, lack of knowledge, improper food intake [37], for pregnant women were founded she needed many important pregnancy requirement and treatment, therefore neglected dental care and leave the dentist's visiting except when feeling pain due to the high cost [38,39].

Level of education was important factor for dental caries experience, because these women were able to use a correct way of brushing teeth, so reducing the plaque accumulation on their teeth, in addition showed that level of education considered a factor that affected the personal dental care access, community and organization level [40].

There is a wrong belief about oral health during pregnancy played an important role in defect the teeth, especially dental caries experience, and this belief was strongest foreteller of high level of disease. The belief said that pregnant women must be losing a tooth or teeth in pregnancy, and they also thought that visiting dentists during pregnancy for dental care was unsafe.

Conclusion

There are many factor effected the oral health and caused dental caries for pregnant women, including the socio – economic and demographic characterizes, which caused a big problem in our society because the low of monthly income for the family, the low education, the use of unhealthy food, the increased eating of sweets and soft drinks, and the failure to use the brush and toothpaste properly, which causes a lot of tooth decay in pregnant women,

there is irregular time in visiting the dentist periodically, lack of the presence of adequate health care for pregnant women in government health centers, the lack of interaction and cooperation between the gynecologist and the dentist for pregnant women, the lack of professionalism among dentists to treat pregnant women in government health centers, the fear of treatment for them, and the lack of spreading health awareness in Iraqi society on this topic. Therefore, all these reasons lead to an exacerbation of the problem in the oral and dental health of pregnant women, in addition to the causes of the general health condition of pregnant women.

I hope that there will be more studies in the future to confirm this matter and take the necessary measures to reduce tooth decay in pregnant women and reduce their tooth loss, as well as ensuring the health of teeth in newborns and controlling oral health.

Bibliography

1. Rmbaiju., *et al*. "Oral Health and Quality of Life: Current Concepts". *Journal of Clinical and Diagnostic Research* 11.6 (2017): ZE21-ZE26.

2. Gift HC., *et al*. "Conceptualizing oral health and oral health related quality of health". *Social Science and Medicine* 44.5 (1997): 601-608.

3. Jansson H., *et al*. "Impact of periodontal disease experience on oral health related quality of life". *Journal of Periodontology* 85 (2014): 438-445.

4. Stsepetova J., *et al*. "Impact of polyolson oral microbiome of Estonian schoolchildren". *BMC Oral Health* 19 (2019): 10.

5. Preetha Parthasarathy., *et al*. "Relationship Between Vitamin D And Dental Caries- Review". *Journal of Pharmaceutical Sciences and Research* 8.6 (2016): 459-460.

6. Frencken JE., *et al*. "Global epidemiology of dental caries and severe periodontitis - a comprehensive review". *Journal of Clinical Periodontology* 44.18 (2018): S94-S105.

7. M Gabor., *et al*. "Characteristics, diagnosis and treatment of the most common bacterial diseases of the oral cavity". *Orvosi Hetilap* 160 (2019): 739-746.

8. Southam JC and Soames JV. "2. Dental Caries". Oral pathology (2nd ed.). Oxford: Oxford Univ. Press (1993).

9. Smith B., *et al*. "1. Why restore teeth?". Pickard's manual of operative dentistry (6th ed.). Oxford University Press. (1990).

10. Zadik Yehuda and Bechor Ron. "Hidden Occlusal Caries - Challenge for the Dentist". *The New York State Dental Journal* 74.4 (2008): 46-50.

11. Summit James B., *et al*. "Fundamentals of Operative Dentistry: A Contemporary Approach". 2nd edition. Carol Stream, Illinois, Quintessence Publishing Co, Inc, (2001): 14.

12. Marsh Philip D., *et al*. "Dental plaque as a biofilm and a microbial community—Implications for treatment". *Journal of Oral Biosciences* 57.4 (2015): 185-191.

13. Silverstone LM. "Remineralization and enamel caries: new concepts". *Dental Update* 10.4 (1983): 261-273.

14. Watt RG., *et al*. "Social inequalities in oral health: from evidence to action Archived (2015-06-19) at the Wayback Machine". London: International Centre for Oral Health Inequalities Research and Policy; www.icohirp.com

15. Oral health". www.who.int". Retrieved (2019-09-14).

16. Vos T. "Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010". *The Lancet* 380.9859 (2012): 2163-2196.

17. Healthy People: 2010 Archived 2006-08-13 at the Wayback Machine. Html version hosted on Healthy People.gov Archived 2017-03-10 at the Wayback Machine website (2006).

18. Vittorio Favero., *et al*. "Pregnancy and Dentistry: A Literature Review on Risk Management during Dental Surgical Procedures". *Dental Journal* 9 (2021): 46.

19. Pinto GDS., *et al*. "Early-life events and developmental defects of enamel in the primary dentition". *Community Dentistry and Oral Epidemiology* 46 (2018): 511-517.

20. Jafri Z., *et al*. "Influence of female sex hormones on periodontium: A case series". *Journal of Natural Science, Biology and Medicine* 6.1 (2015): 146-149.

21. Giglio JA., *et al*. "Oral health care for the pregnant patient". *Journal of the Canadian Dental Association* 75 (2009): 43-48.

22. Elham Kateeb and Elizabeth Momany. "Dental caries experience and associated risk indicators among Palestinian pregnant women in the Jerusalem area: a cross-sectional study". *BMC Oral Health* 18 (2018): 170 Page 2 of 8.

23. Petersen Paul Erik and Baez Ramon J. "Oral health surveys: basic methods - 5th ed". World Health Organization I. ISBN 978 92 4 154864 9 (NLM classification: WU 30) © World Health Organization (2013).

24. Jean-Noel Vergnes., *et al*. "For the EPIPAP group: Frequency and Risk Indicators of Tooth Decay among Pregnant Women in France: A Cross-Sectional Analysis". *PLoS One* 7.5 (2012): e33296, p1-7.

25. Burt BA. "Definitions of risk". *Journal of Dental Education* 65 (2001): 1007-1008.

26. Elham Kateeb and Elizabeth Momany. "Dental caries experience and associated risk indicators among Palestinian pregnant women in the Jerusalem area: a cross-sectional study". *BMC Oral Health* 18 (2018): 170.

27. Petersen Paul Erik and Baez Ramon J. "Oral health surveys: basic methods - 5th ed". World Health Organization I. ISBN 978 92 4 154864 9 (NLM classification: WU 30) © World Health Organization (2013).

28. Soderling E., *et al*. "Influence of maternal xylitol consumption on acquisition of Mutans streptococci by infants". *Journal of Dental Research* 79 (2000): 882.

29. Zanata RL., *et al*. "Effect of caries preventive measures directed to expectant mothers on caries experience in their children". *Brazilian Dental Journal* 14 (2003): 75-81.

30. Radnai M., *et al*. "The oral health status of postpartum mothers in south-East Hungary". *Community Dental Health* 24 (2007): 111-116.

31. Shamsi M., *et al*. "The status of dental caries and some acting factors in a sample of Iranian women with pregnancy". *World Journal of Medical Sciences* 9.4 (2013): 190-197.

32. Acharya S and Bhat PV. "Oral-health-related quality of life during pregnancy". *Journal of Public Health Dentistry* 7 (2009): 69-74.

33. Santhosh Kumar S., *et al*. "Factors influencing caries status and treatment needs among pregnant women attending a maternity hospital in Udaipur city". *Indian Journal of Clinical and Experimental Dermatology* 5.2 (2013): e72-76.

34. Rehman MM., *et al*. "The relationship of caries with oral hygiene status and extra oral risk factors". *Journal of Ayub Medical College Abbottabad* 20 (2008): 103-107.

35. Hirimuthugoda L., *et al*. "Determinants on dental caries among pregnant mothers in medical officer of health area, Ambalantota, Sri Lanka". *International Journal of Dental Medicine* 4 (2018): 5-8.

36. Jacqueline M., *et al*. "Oral health literacy and knowledge among patients who are pregnant for first time". *Journal of the American Dental Association* 143 (2012): 972-980.

37. Oberoi SS., *et al*. "A cross-sectional survey to assess the effect of socioeconomic status on the oral hygiene habits". *Journal of Indian Society of Periodontology* 20 (2016): 531-542.

38. Kloetzel MK., *et al*. "Oral health in pregnancy: educational needs of dental professionals and office staff". *Journal of Public Health Dentistry* 72 (2012): 279-286.

39. Chung LH., *et al*. "Sociodemographic disparities and behavioral factors in clinical oral health status during pregnancy". *Community Dentistry and Oral Epidemiology* 42 (2014): 151-159.

40. Kateeb ET., *et al*. "Predicting dentists' decisions: a choice-based conjoint analysis of Medicaid participation". *Journal of Public Health Dentistry* 76.3 (2016): 171-178.