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Food Intake, Oral Hygiene Practices, Self-reported Oral Problems, and Knowledge of Oral Diseases among Pregnant and Non-pregnant Women Attending Community Health Center, Child Care Center, and Tertiary Care Hospital in Urban Ajmer

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Abstract

Aim: The aim of this study was to determine food intake, the level of knowledge of oral diseases, practices regarding oral hygiene, and self-reported oral problems among pregnant and non-pregnant women attending community health center, child care center, and tertiary care hospital in urban Ajmer. **Materials and Methods:** This was a quantitative, questionnaire-based, and cross-sectional study, in which 300 respondents of 20–35 years of age. Data were analyzed using the Statistical Package for the Social Sciences. **Results:** Participants in the knowledge of oral diseases were 26% gingivitis signs including gum swelling (5.7%) and bleeding (9.7%). Of all the participants, 21.3% practiced tooth brushing twice/day, 65.7% used toothpowder, and dental floss (17.7). Self-reported oral problems included reddish gums (8%), painful gums (10.7%), burning mouth (15.7%), dry mouth (28%), and bad breath (7%). **Conclusion:** Majority of women studied no basic knowledge of oral diseases and only few knew the causes. All respondents performed tooth cleaning however, majority did not know the appropriate practices, and only few had oral problems. Integration of oral health care to general health promotion and oral therapy given to pregnant women at high risk is recommended to prevent adverse pregnancy outcomes.

Keywords: Food, Knowledge, Oral hygiene, Oral problems, Pregnancy

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Introduction

Pregnancy is a unique time period in a woman's life with many hormonal changes and these changes during pregnancy may negatively affect their oral health.[1] Hormonal changes in pregnancy such as the increased levels of circulating progesterone combined with neglected oral hygiene practices tend to enhance the incidence of oral health diseases such as dental caries, gingivitis, and periodontitis.[2] Oral health is an important part during pregnancy. It is affected by nutritional status and overall health status. Moreover, it has an impact on the quality of life and health outcomes of the patient.[3] During pregnancy, a balanced and healthy diet is necessary to support proper development of the fetus and the complex physiological changes that occur in the mother.[4] Pregnant women (PW) must eat foods that contain optimal amounts of energy as well as macro and micronutrients, which help in achieving appropriate weight gain during pregnancy.[5] These are fundamental aspects of healthy dietary behavior; besides, this ingestion of harmful substances must be avoided that increase the risk of periodontal problems.[6] Periodontal problems enhance adverse pregnancy outcomes including low birth weight, preeclampsia, and preterm birth. Studies shows that good nutrition enhances healthy teeth and gum development and reduces the risk of some oral diseases.[7] Few women are aware that healthy eating is important during pregnancy, women lack knowledge, and understanding of specific dietary recommendations. PW face problems such as food aversions, cravings, nausea, vomiting, constipation, hemorrhoids, heartburn, tiredness, dizziness, dry mouth, and morning sickness.[8] The previous studies show that food cravings, nausea, and vomiting cause some oral diseases such as dental caries and tooth erosion during pregnancy. Due to nausea and vomiting, PW avoid routine oral health practice such as tooth brushing and mouth rinsing after eating and flossing.[9] This could lead to periodontitis, a bacterial infection during pregnancy which has been linked with adverse pregnancy outcomes.[10] Maintenance of oral hygiene prevents dental caries and other oral diseases during pregnancy.[11] Oral hygiene of a PW is an essential part in the oral health status. Good oral hygiene during pregnancy can help on preventing or reducing the severity of the hormone mediated inflammatory oral changes.[12] Pregnancy does not cause periodontal disease, but it does worsen an existing condition.[13] The previous findings have highlighted that during pregnancy the preference should be consume fresh fruits rather than to fruits juices, because chewing stimulates more saliva production

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in mouth and promotes washing effect, and fruit juices may have extrinsic sugars and lower pH that contributes to erosive tooth wear.[14] In PW concerning the meal patterns, it was reported that less frequent meals are recommended over more frequent meals due to their effect on dental caries.[15,16] In pregnant women the oral and dental problems and complications associated with them can be prevented by having appropriate knowledge and practice of right diet and also by seeking dental treatment at the right time.[17,18] PW need to be educated regarding the possible impact of periodontal diseases on pregnancy outcomes, dental disease prevention, and treatment options.[19] Higher nutritional knowledge is associated with better eating behaviors and with better nutritional status.[20] In the developing countries like India, there is a need to investigate the association between PWs lifestyle and their own oral health in view of the changes in habits. In Ajmer, information on balanced diet, oral hygiene practices, and oral problems among PW is lacking. The aim of this study is to assess food intake, knowledge on oral diseases, practices regarding oral hygiene, and self-reported oral problems among PW and NPW attending community health center, child care center (aganbadi), and tertiary care hospital in urban Ajmer.

Materials and Methods

Study Design, Place of Study, and Participants

This was a quantitative, descriptive, cross-sectional exploratory health facility-based study. It was conducted in urban area of Ajmer district located in Rajasthan state. Different health facilities were included such as community health center, child care center, and tertiary care hospital. The study involved 150 PW who agreed to be respondents and who were routinely attending antenatal clinic and 150 non-pregnant women (NPW) who also gave their consent. The selection of the respondents was done by convenient sampling. A convenience sample included PW visiting the hospital during the period January to March 2020. Only healthy PW and NPW (based on medical history questions) were included to avoid confounding by diseases. Written consent was obtained from each respondents before joining the study. The PW were divided in groups of three according to the stage of pregnancy. Each group had 50 PW. Ethical clearance was obtained from the Institutional Ethical Committee. The self-administered and structured questionnaire was developed in English collected data about sociodemographic factors of respondents (age, education, parity, and the trimester of pregnancy), knowledge of oral diseases (five items), and self-reported oral problems (five items).

Data Analysis

Data were entered into a computer and analyzed using the Statistical Package for the Social Sciences version 21.0. Frequency tables were generated and data transformation was undertaken of some variables that had more than two options. Furthermore, the type of occupation of the respondents was also recorded. The responses to specific oral hygiene practices and self-reported oral problems were recorded. In all the analyses, the statistical significance level was set at "<0.05."

The independent variables were consumption of food, healthy eating (servings ranging from 0 to 3), brushing twice or more daily (yes/no), and visiting the dentist (not visiting at all before or after pregnancy and visiting).

Results

Distribution of Study Participants

A total of 300 respondents comprising 150 PW and 150 NPW were studied [Table 1] with age ranging from 18 to 50 years (mean age + standard deviation: 28.34 + 5.61 years). The median age was 28 years. Majority of the respondents were at 25–30 years of age (28.9%). Most of the respondents had primary education or less, and generally, the unemployed group was 56%. Hospital had higher number of respondents (75%) as compared to the commuwnity health center and child care center.

Table 1: Distribution of the respondents by demographic characteristics

Sociodemographic characteristics	*Pregnant women n %*		*Non-pregnant n %*		*All (n=300) n %*		*χ2 value*	*P value*
Age group								
<20	16	10.7	0	0	16	5.33	0.371	0.009
20–25	58	38.7	19	12.7	77	25.7		
25–30	50	33.3	51	34	101	33.7		
>30	26	17.3	80	53.3	106	35.3		
Education level								
Illiterate	7	4.7	13	8.7	20	6.7		
Primary	61	40.7	48	32	109	36.3		
Secondary	68	45.3	50	33.3	118	39.3	0.933	0.368
College	13	8.7	28	18.7	41	27.3		
Higher	8	5.3	5	3.3	13	4.3		
Employment								
Unemployed	126	84	119	79.3	245	81.7	0.501	0.105
Government employed	10	6.7	14	9.3	24	8		
Self-employed	14	9.3	17	11.3	31	10.3		
Health facility								
Hospital	109	90.8	78	52	187	62.3	0.494	0.014
CHC	20	13.3	42	28	62	20.7		
CCC	21	14	30	20	51	17		
Parity								
Primigravida	56	37.3	20	13.3	76	25.3	0.482	0
Multigravida	94	62.7	130	86.7	224	74.7		

Oral Hygiene Practices

The prevalence of oral hygiene practices and self-reported oral problems among PW and NPW is shown in Table 2. Frequency of tooth brushing once per day was 29.3% in PW and 13.3% in NPW. Those who brushed 3 times in a day were 13%. Duration of tooth brushing was estimated to take about 3–5 min (51.3% in PW and 74% in NPW). The use of toothpowder to clean teeth was significantly higher among NPW (69.3%) than in PW (39.3%, $P = 0.001$, $\chi^2 = 0.501$). Frequency of changing tooth brushes once/month was done by 14.7%, while 56% replaced their toothbrushes after every 3 months. Few respondents had the habit of cleaning the tongue regularly.

Self-Reported Oral Problems

The prevalence of self-reported oral problems included bleeding gums (9.7%), painful gums (10.7%), swollen gums (5.7%), reddish gums (8.0%), burning mouth (15.7%), dry mouth (28%), bad breath (7%), excessive saliva (5.3%), enamel erosion (14%), and tooth mobility (7.7%), and there was statistically significant difference between PW and NPW [Table 2]. The level of knowledge of oral diseases among women attending the hospital in urban Ajmer is shown in Graph 1. The level of knowledge of gum and oral diseases is categorized as "yes" or "no" in various PW and NPW, in that the difference was statistically significant which is shown in Table 3.

Intake of Food

Graph 2 shows the levels of intake of the various food groups. The greatest percentage had intake less than the recommended amount in all food groups with percentages ranging from 64.9% to 79.4% in the proteins and grains group. On the other hand, 68.4% of women reported that they sometimes had sugary snacks and 29% reported they regularly consumed them compared to 2.6% who indicated they never used sugary snacks which are shown in Table 4.

Discussion

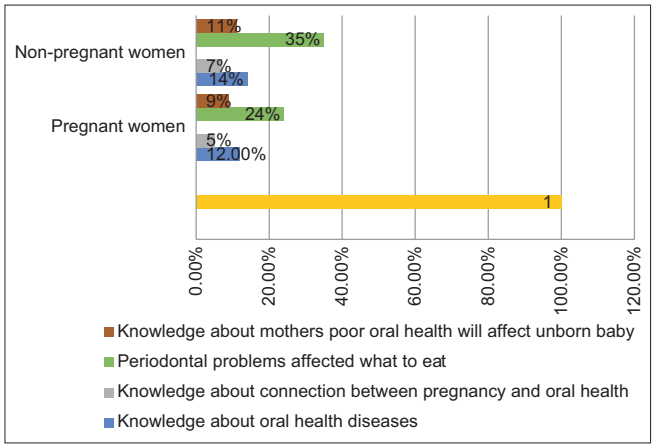
This study was a quantitative and cross-sectional investigation that took place among PW and NPW in Ajmer, urban districts in Rajasthan. In the present study, it was found that almost all the respondents were brushing their teeth at least once a day and the finding is similar to the study of Chaitra *et al*. 2018. In the present study, a minority of the respondents used dental floss, unlike the study done by Africa and Turton 2019, where the majority were using dental floss. This study shows that the majority of the participants used tooth brush and toothpaste to clean their teeth which was similar to the study of Gambhir *et al*. and Venugopal and Gheena. The present study has a low proportion of PW reporting painful gums, swollen gums, and bleeding gums as compared to Satijia *et al*. and Abbas *et al*.[15,21] Lack of knowledge on the importance of food intake was higher in our study done by Nagi *et al*. and Al-Ansari *et al*.[20,22] The study by Patil and Gupta *et al*. indicated that oral healthcare should be an integral part of the routine check-up of PW. Visit a dentist by a PW in every 3 months should be encouraged.

The proportion of knowledge of oral diseases displayed by PW was moderately higher compared to those of NPW. The study

Table 2: Oral hygiene practices and self-reported periodontal problems among pregnant and non-pregnant women in urban Ajmer

Oral hygiene practices	*Distribution in percentages (%)*				
	All (n=300)	*Pregnant women (n=150)*	*Non-pregnant women (n=150)*	*χ2value*	*P value*
Frequency of cleaning					
Brushing once a day	21.3	29.3	13.3	0.495	0*
Brushing twice a day	65.7	59.3	72		
Brushing thrice a day	13	11.3	14.7		
Frequency of changing toothbrush					
1 month	14.7	18.7	10.7	0.495	0.012
3 month	56	48.7	63.3		
6 month	15.3	17.3	13.3		
Once a year	14	15.3	12.7		
Material used for cleaning teeth					
Toothpaste	23	32.7	13.3	0.501	0*
Toothpowder	54.3	39.3	69.3		
Manjun	22	28	17.3		
Brushing timing					
Less than 3 min	16	24	8	0.5	0*
3–5 min	62.7	51.3	74		
10 min	21.3	24.7	18		
Use of mouth freshener	7.7	14	1.3	0.487	0*
Use of mouthwash	25.3	37.3	13.3	0.482	0*
Mouth rinsing	85.7	91.3	80	0.495	0*
Flossing	17.7	22	13.3	0.498	0*
Bleeding gums	9.7	12.7	6.7	0.499	0*
Swollen gums	5.7	8	3.3	0.499	0*
Painful gums	10.7	16.7	4.7	0.492	0*
Reddish gums	8	12	4	0.496	0*
Burning mouth	15.7	24.7	6.7	0.486	0*
Dry mouth	28	36.7	19.3	0.492	0*
Bad breath	7	10.7	3.3	0.496	0*
Excessive saliva	5.3	8	2.7	0.498	0*
Alter tooth mobility	7.7	4	11.3	0.497	0*
Enamel erosion	14	7.3	4.6	0.492	0*

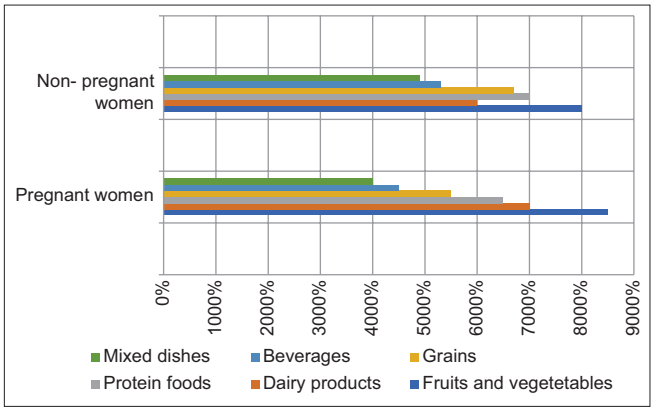
*Significant $P<0.05$



Graph 1: Knowledge of oral diseases among pregnant and non-pregnant women in urban Ajmer

Table 3: Knowledge of oral diseases among pregnant and non-pregnant women

Knowledge	*Pregnant women*	*Non-pregnant women*
Knowledge about oral health diseases	12.00%	14%
Knowledge about connection between pregnancy and oral health	5%	7%
Periodontal problems affected what to eat	24%	35%
Knowledge about mothers poor oral health will affect unborn baby	9%	11%



Graph 2: Intake of various food groups among a pregnant and non-pregnant women in urban Ajmer

Table 4: Food intake among pregnant and non-pregnant women

S. No.	*Food intake*	*Pregnant women*	*Non-pregnant women*
1.	Fruits and vegetables	8500%	8000%
2.	Dairy products	7000%	6000%
3.	Protein foods	6500%	7000%
4.	Grains	5500%	6700%
5.	Beverages	4500%	5300%
6.	Mixed dishes	4000%	4900%

of participants who had attained college education were more knowledgeable than the ones who had primary school education. The most common oral disease during pregnancy is preventable by the simple measures such as regular tooth brushing and flossing. Adequate awareness in NPW disclosed in the present study could probably be the result of higher educational status in them, in which majority of them were found to be graduates. In our study, we found that percentage of PW visited the dentist during their pregnancy than the NPW. Most of the respondents showed positive response toward receiving and gathering information regarding oral health care and to know about the relationship between mothers oral health and well-being of their babies. Hence, it is also the responsibility of the dentist and the gynecologist to inform the PW about the biological plausibility that negligence about the oral health increases not only the risk of unfavorable pregnancy outcomes but also affects the well-being of the new-born.

Conclusion

In this study, most of the PW and NPW had no basic knowledge of oral diseases and only few knew the cause and their prevention. All participants were engaged in tooth brushing procedures; however, the majority did not know the appropriate practices. This study revealed that the level of education and socioeconomic status was significantly associated with oral health and practice. In the context of oral health during pregnancy, awareness about oral health care and associated preventive measures, better positive attitudes can always be achieved at every step. Education on effective tooth brushing to prevent oral diseases and its impact on their newborns. Therefore, PW should be a target group for oral health education. The potential of poor oral hygiene during pregnancy should be understood to protect the oral health of the mother as well as of the unborn.

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