

Research Article

Oral Health Awareness Among Pregnant Women: A Cross-Sectional Study

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ABSTRACT:

Background: Health education regarding prevention of oral and dental diseases and their adverse effects during pregnancy may be possible through self-awareness, life style modification and proper hygiene practices. This study aims to find the awareness of oral hygiene and its associated conditions among pregnant women presenting to a tertiary care hospital in Karachi, Pakistan.

Methods: This cross sectional study was conducted from June 2023 to July 2024, among pregnant women presented to Alkhidmat hospital Shah faisal Colony Karachi, Pakistan. After getting ethical approval from Baqai dental Hospital (Ref# BDC/ERB/2023/052) and permission from respective hospital administration, pregnant women after their informed consent were interviewed by the principal investigator consecutively. A pre-designed written questionnaire was used. The first section included 6 questions on demographic characteristics of study participants and the second section of the questionnaire included 15 questions of awareness of pregnant women regarding the dental hygiene and conditions associated with it. After data gathering pregnant women were given oral health education and brochure were distributed among them by the principal investigator. The sample size of 281 was estimated by using the Open epi calculator, 24% prevalence of lack of oral health awareness among pregnant women, keeping drop off rate 20% total 392 participants were approached. The data was entered in SPSS version 22.0. The Shapiro-Wilk test was used to check for normality of data. The data was non-parametric therefore Kruskal Wallis test was applied to see the association between demographic variables and oral health awareness among pregnant women. The level of significance was $p < 0.05$.

Results: The mean age of study participants was 26.09 ± 5.45 years. Approximately (33.7%) were intermediate/graduates followed by (31.4%) matriculate. Majority of them (84.7%) were housewives and (93.4%) from urban areas. 172(44%) were in their third trimester and 255(65%) were Multipara (2-4 birth). Out of 392 pregnant women more than half 269(68.6%) had inadequate awareness and only 123(31.4%) showed adequate awareness regarding oral health while pregnancy. There was statistically a significant difference between different categories of age, employment status, trimester of pregnancy, parity ($p=0.00$ each) and geographic area ($p=0.007$) and awareness of oral health among pregnant women.

Conclusion: This study concluded that a majority of the pregnant women 269(68.6%) showed inadequate awareness of oral health and its associated conditions during pregnancy. Moreover demographic factors were associated with oral health awareness among them.

Keywords: Awareness, Pregnant Women, Oral Health, Demographic Factors.

INTRODUCTION

Hormonal changes during pregnancy can lead to increased periodontal inflammation and a higher risk of dental caries. Maintaining proper oral hygiene is crucial during this period. ¹

Pregnancy causes physiological and hormonal changes that can negatively impact oral health. Elevated levels of estrogen and progesterone, combined with poor oral hygiene, can increase the risk of oral diseases

such as gingivitis and periodontitis.² In recent times Dental professionals has explained on possible ways in which oral health may affect to general health and well-being. Women's oral health can be influenced physiologically during pregnancy, puberty, menstrual cycle, and menopause and non-physiologically by hormonal contraception and hormonal therapy.³ World health organization, world health Day theme of 1998 "safe motherhood pregnancy is precious-let's make it special" attracts us to take special care of this special group of special importance.⁴

High levels of progesterone may cause pregnancy gingivitis which is manifested by increased redness, edema and increased occurrence of bleeding from gums. In addition, research keeps on showing a link between periodontitis and adverse pregnancy outcomes (premature birth and low birth weight); it is documented in some studies that there is increased risk of caries during pregnancy and mothers may transmit infection to their children through cariogenic bacteria by neglected and poor feeding routine.^{5,6}

Pregnancy induced gingivitis is most common condition accompanied with other changes such as chloasma, facial telangiectasia, sialorrhea, tooth surface loss which is usually due to vomiting when severe (hyperemesis gravidarum), increased mobility of teeth, changes in severity of oral apthae.^{7,8} A few other remarks are less definite and may be an element of general condition of health. These may consist of changes in oral mucosa linked with anemia e.g. pallor. Excessive mucosal/gingival bleeding which may or may not be linked with DIC (disseminated intravascular coagulation) may take place.⁹

Mannem and Chava studied 104 pregnant women residing in Andhra Pradesh, India measuring their Plaque Index, Bleeding Index and Birth weight of the newborn. They concluded that there exists a noticeable relationship between periodontal health and duration of pregnancy, and that periodontal disease could be a risk factor for preterm labor. Hence, oral hygiene maintenance should be a part of prenatal care protocol.¹⁰

A cross-sectional question based study conducted at Kulsoom Bai Valika Hospital Karachi showed a sound level of oral health knowledge and positive attitudes towards oral health among most of the respondents. However, there were gaps in the health knowledge of the women surveyed. In addition, the women's knowledge and attitude

towards oral health was not reflected in their oral hygiene practices. There is a need to provide oral health education for pregnant women during antenatal care.¹¹ A systematic review revealed that pregnant women lacked knowledge and awareness about oral health. Therefore, it is imperative that pregnant women receive oral health education and motivation through a variety of health promotion initiatives.¹² another study reported that most pregnant women need more information about oral health and disease prevention. It would be prudent to compile and consider their knowledge, attitudes and practices along with socio-cultural characteristics, so that health education programs are customized to different sectors of the population.¹³

Women still don't know enough about how dental health affects pregnancy development and the fetus. Pregnant women's self-evaluation of their oral health may be the first step towards stepping up their efforts to promote their health.¹⁴ Maternal health education programs should incorporate this kind of promotion and culturally competent care.¹⁵ To lessen the burden of diseases, primary prevention of oral diseases in expectant mothers must be improved.¹⁶ To promote oral health, expectant mothers should be aware of disease symptoms and encouraged to practice healthy oral habits. Healthcare professionals and community workers who provide antenatal care for pregnant women should promote these activities.¹ This study aimed at determining the awareness of oral hygiene and its associated conditions among pregnant women presenting to a tertiary care hospital in Karachi, Pakistan.

METHODS

This cross sectional study was conducted from June 2023 to July 2024 after taking ethical approval from Baqai Dental College Karachi (Ref # BDC/ERB/2023/052). This awareness based study was conducted among pregnant women presenting to Alkhidmat hospital shah Faisal colony Karachi, Pakistan. Prior to data gathering written permission from the hospital administration was obtained. Pregnant women after their informed consent were interviewed by the principal investigator consecutively. A pre-designed written questionnaire was used. The questionnaire was developed in English. Self-structured closed-ended questions were adopted from different sources after literature search and review which are done on studies

design and are modified according to the target sample and to the study. The questionnaire was divided into two sections. The first section included 6 questions on demographic characteristics of study participants i.e., age, education level, employment status, geographical area, trimester of pregnancy and parity. The second section of the questionnaire includes 15 questions of awareness of pregnant women regarding the dental hygiene and conditions associated with it as well as the regular hygiene practices they follow. The questionnaire was adopted from previous study.¹⁷ After data gathering pregnant women were given oral health education and brochure were distributed among them by the principal investigator. The sample size $n = 281$ was estimated by using the Open epi calculator by using 24% prevalence of lack of oral health awareness among pregnant women¹⁶ keeping drop off rate 20% total 392 participants were approached. The data was entered in SPSS version 22.0. Mean and SD was calculated for

quantitative variable Age. Moreover categorical variables like employment, education level, and geographical area were presented as frequency/percentage. The Shapiro-Wilk test was used to check for normality of data. The data was non-parametric therefore Kruskal Wallis test was applied to see the association between demographic variables and oral health awareness among pregnant women. The level of significance was $p < 0.05$.

RESULTS

The mean age of study participants was 26.09 ± 5.45 years. The participants were divided into three groups of age; 18-28 years were (72.1%), 29-38 years were (23.5%) and 39-48 years were (4.4%). Approximately (33.7%) were intermediate/graduates followed by (31.4%) matriculate. Majority of them (84.7%) were housewives and (93.4%) from urban areas. 172(44%) were in their third trimester and 255(65%) were Multipara (2-4 birth)

Table 1. Demographic Characteristics of Pregnant Women

Variable n=392	Frequency (%) Mean
Age in years	
18-28	283(72.1%)
29-38	92(23.5%)
39-48	17(4.4%)
Mean±SD of Age	26.09 ± 5.45
Education Level	
Illiterate	64(16.3%)
Primary	73(18.6%)
Secondary	122(31.4%)
Other	131(33.7%)
Employment status	
self employed	11(2.8%)
Govt. jobs	12(3%)
Private jobs	35(8.9%)
House wives	332(84.7%)
Others	2(0.6%)
Geographical area	
Rural	26(6.6%)
Urban	366(93.4%)
Trimester of pregnancy	
First trimester	75(19%)
Second trimester	145 (37%)

3rd trimester	172 (44%)
Parity	
Nullipara(0 Birth)	10(2.5%)
Primipara(1 birth)	92(23.5%)
Multipara(2-4 Births)	255(65%)
Grand Multipara(5 and above)	35(8.9%)

Table 2 shows awareness of oral hygiene and its associated conditions among pregnant women presenting to a tertiary care hospital in Karachi. A majority 344(87.8%) women clean their teeth using brush with paste and they were aware while 48(12.2%) were not aware. 376(96%) women knew about the use of dental brush but 16(4%) didn't know about it. About 239(61%) were aware of dental floss while only 153(39%) knew about the use of dental floss. 269(68.6%) pregnant women were of the opinion that teeth should be brushed once in a day whereas 117(30%) were of the opinion that teeth should be brushed daily twice and 6(1.4%) said there is no need to brush. 128(32.7%) women responded they floss their teeth and 264(67.3%) responded they never do it. A majority 318(81.1%) pregnant women are in habit of rinsing mouth after meals whereas 74(18.9%) didn't rinse their mouth after meals. Most of the respondents knew about dental decay/or dental caries which is 276(70.4%) but 116(29.6%) didn't know about the dental caries. A majority 304(77.6%) knew about gum disease or gingivitis while 88(22.4%) were unaware

about the gum disease. 276(70.4%) pregnant women responded X-rays are safe during pregnancy while 116(29.6%) denied. 200(51%) women said that bleeding from gums during pregnancy is normal whereas 192(49%) women said that bleeding from gums is not normal during pregnancy. 229(58.4%) women responded that dental treatment are not safe during pregnancy and 163(41.6%) thought they are safe. Only 83(21.2%) pregnant women thought that a visit to dentist is important during pregnancy whereas 309(78.8%) replied that it's not important. 199(50.8%) were aware of oral health conditions are not worsened during pregnancy whereas 193(49.2%) considered they do worsen. Only 17(4.4%) responded that pregnancy is the cause of losing teeth and 375(95.7%) replied that pregnancy is not the cause of losing teeth. 170(43.4%) had consulted to dentist for bleeding gums during pregnancy while 222(56.6%) never consulted for bleeding gums during pregnancy. Hence out of 392 pregnant women more than half 269(68.6%) had inadequate awareness and only 123(31.4%) showed adequate awareness regarding oral health during pregnancy.

Table 2. Frequency Distribution of Awareness among Pregnant Women

Variable n=392		n (%)
Awareness of method of cleaning teeth?	Yes	344(87.8%)
	No	48(12.2%)
Awareness of dental brush?	Yes	376(95.9%)
	No	16(4.1%)
Awareness of dental floss?	Yes	153(39%)
	No	239(61%)
Awareness of brush your teeth per day?	Once	269(68.6%)
	Twice	117(30%)
	Never	6(1.5%)
Awareness of clean your teeth with floss?	Yes	128(32.7%)
	No	264(67.3%)

Awareness of rinsing mouth after meals?	Yes	318(81.1%)
	No	74(18.9%)
Awareness of dental caries/decay?	Yes	276(70.4%)
	No	116(29.6%)
Awareness of gingivitis/gum disease?	Yes	304(77.6%)
	No	88(22.4%)
Awareness of do pregnant women believe that X-rays are safe during pregnancy?	Yes	276(70.4%)
	No	116(29.6%)
Awareness of do you think bleeding from gums is normal during pregnancy?	Yes	200(51%)
	No	192(49%)
Awareness of do pregnant female thinks that dental treatment is safe during pregnancy?	Yes	163(41.6%)
	No	229(58.4%)
Awareness of do you think visit to dentist is important during pregnancy	Yes	83(21.2%)
	No	309(78.8%)
Awareness of do you think oral health conditions worsen during pregnancy?	Yes	193(49.2%)
	No	199(50.8%)
Awareness of do you think that pregnancy is the cause of losing teeth?	Yes	17(4.3%)
	No	375(95.7%)
Awareness of have you ever consulted a dentist for your bleeding gums during pregnancy?	Yes	170(43.4%)
	No	222(56.6%)
Total awareness score	Adequate	123(31.4%)
	Inadequate	269(68.6%)
	Total	392(100%)

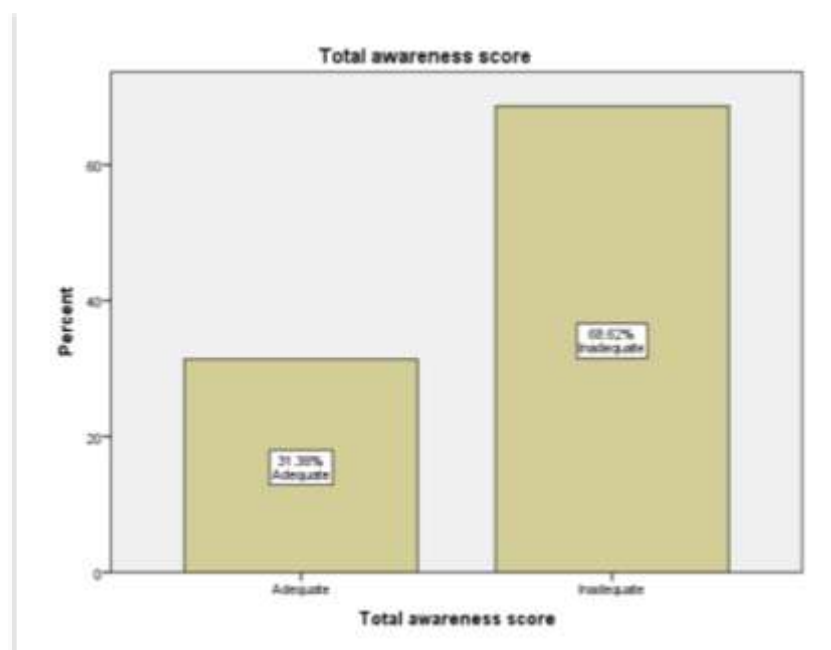


Figure 1. Awareness of Oral Hygiene and Its Associated Conditions among Pregnant Women

Table 3 shows association of demographic variables with the awareness of pregnant women and it was reported that there was statistically a significant difference between

different categories of age, employment status, trimester of pregnancy, parity($p=0.00$ each) and geographic area($p=0.007$).

Table 3. Association of Demographic Characteristics of Pregnant Women and Their Awareness

Variable n=392		Age				p-value
		18-28 Years	29-38 years	39-48 years		
Total awareness score	Adequate	56	51	16		0.00*
	Inadequate	227	41	1		
		Educational Qualification				0.171
		Illiterate	Primary	Secondary	Graduate and above	
Total awareness score	Adequate	18	35	33	37	
	Inadequate	46	38	91	94	
		Employment status				0.00*
		Self employed	Govt. jobs	Private jobs	House wives	
Total awareness score	Adequate	0	0	1	122	
	Inadequate	11	12	34	212	
		Geographical area				0.007*
		Rural		Urban		
Total awareness score	Adequate	2		121		
	Inadequate	24		245		
		Trimester of pregnancy				0.00*
		1st trimester	2nd trimester		3rd trimester	
Total awareness	Adequate	71	35		17	

score	Inadequate	4	110	155	
		Parity			
		Nullipara(0 Birth)	Primipara(1 birth)	Multipara (2-4 Births)	Grand Multipara (5 and above)
Total awareness score	Adequate	0	18	80	25
	Inadequate	10	74	175	10

Kruskal wallis test applied
Statistically significant $p > 0.05^*$

DISCUSSION

Despite being a physiological process, pregnancy alters hormones, which may have an impact on the oral cavity as well. Pregnancy raises the risk of tooth decay and gum disease inflammation, which may have an impact on the developing fetus. Mothers' awareness is linked to the good oral health for both the mother and her children.¹⁴

This study was an effort to assess awareness of pregnant women about oral hygiene and its associated conditions. The mean age of study participants was 26.09 ± 5.45 years. The participants were divided into three groups of age 18-28 years were (72.1%) 29-38 years were (23.5%) 39-48 years were (4.4%). Approximately (33.7%) were intermediate/graduates followed by (31.4%) matriculate. Majority of them (84.7%) were housewives and (93.4%) from urban areas. 172(44%) were in their third trimester and 255(65%) were Multipara (2-4 birth).

In the present study, A majority 344(87.8%) women clean their teeth using brush with paste and they were aware while 48(12.2%) were not aware. 376(96%) women knew about the use of dental brush but 16(4%) didn't know about it. About 239(61%) were unaware about dental floss while only 153(39%) knew about the use of dental floss. 269(68.6%) pregnant women were of the opinion that teeth should be brushed once in a day whereas 117(30%) were of the opinion that teeth should be brushed twice daily and 6(1.4%) said there is no need to brush. 128(32.7%) women responded they floss their teeth and 264(67.3%) responded they never do it. A majority 318(81.1%) pregnant women are in habit of rinsing mouth after meals whereas 74(18.9%) didn't rinse their mouth after meals. Contrary to our findings a previous study found none of the respondents ever used dental floss and only a few (1.4%) had heard about it and they brushing only once daily.¹⁴ Contradictory findings showed

68% brushed their teeth twice a day.¹⁴ Another dissimilar study showed all the pregnant women brushed at least twice daily. However, only 40.9% flossed daily, 31.2% brushed after meals.¹⁸ Another study found 100 (51.5%) of pregnant women brushing at least twice daily, 84 (43.8%) sometimes flossing and 92 (47.7%) sometimes using miswak.¹⁷

Most of the respondents were aware of dental decay/or dental caries which is 276(70.4%) but 116(29.6%) didn't know about the dental caries. A majority 304(77.6%) knew about gum disease or gingivitis while 88(22.4%) were unaware about the gum disease. 276(70.4%) pregnant women responded X-rays are safe during pregnancy while 116(29.6%) denied. In contrast, an Indian study found that 89.10% of respondents were not aware that gum disease is common during pregnancy. Just 19.87% of mothers knew that high radiation exposure could harm their baby.²⁰

In present study 200(51%) women said that bleeding from gums during pregnancy is normal whereas 192(49%) women said that bleeding from gums is not normal during pregnancy. 229 (58.4%) women replied that dental treatment are not safe during pregnancy and 163(41.6%) thought they are safe. Only 83(21.2%) pregnant women thought that a visit to dentist is important during pregnancy whereas 309(78.8%) thought that it's not important. In line with current findings a previous study observed infrequent visits of pregnant women to the dentist¹⁴a study conducted by Shipra Gupta and Ashish Jain in india showed that majority of studied population feel that there is no need to visit a dentist.¹⁹ In a study on 95 pregnant women of Darussaleem, Bamaniker and Kee reported that although 96.8% of the respondents agreed that women should have a dental check-up during pregnancy, only 55.9% actually practiced this.¹⁸ Unlike present

study around half the participants knew that dental visits can be scheduled during pregnancy (53.6%) and that pregnancy hormones can affect oral health (44.7%). 34 (18.1%) reported regular dental visits before and after pregnancy.¹⁷

Current findings reveal 199(50.8%) agreed that oral health conditions are not worsened during pregnancy whereas 193(49.2%) considered they do worsen. Only 17(4.4%) were aware that pregnancy is the cause of losing teeth and 375(95.7%) thought that pregnancy is not the cause of losing teeth. 170(43.4%) had consulted to dentist for bleeding gums during pregnancy while 222(56.6%) never consulted for bleeding gums during pregnancy. Out of 392 pregnant women more than half 269(68.6%) had inadequate awareness and only 123(31.4%) showed adequate awareness regarding oral health during pregnancy. Similar to our findings up to 24% of women reported not knowing how important it is to maintain good oral hygiene while pregnant and the majority (87.2%) were not aware of the importance of oral hygiene and its probable association with adverse pregnancy outcomes.¹⁴ Another study reported the knowledge related to dental care was also poor among the pregnant women.¹⁸ Sajjan P et al., discovered nearly identical outcomes in the Bagalkot District of Karnataka, India. Overall, the findings point to the need for significant improvements in pregnant women's practices and knowledge.²⁰

This study found the relationship between the level of oral health awareness and different categories of age, employment status, trimester of pregnancy, parity ($p=0.00$ each) and geographic area ($p=0.007$) were statistically significant whereas for level of education ($p=0.171$) it was insignificant. A previous study showed similar findings as the majority of mothers demonstrated a reasonably adequate understanding of the significance of oral health during pregnancy, which was closely correlated with both living in a large city.¹⁴ Alike this study a previous study showed varying findings as oral health awareness and level of education ($p=0.179$)¹¹ Contradictory to current study insignificant association was seen for level of education¹⁴ age category ($p=0.166$), and trimester of pregnancy (0.219).¹¹

CONCLUSION

This study concluded that a majority of the pregnant women 269(68.6%) showed

inadequate awareness of oral health and its associated conditions during pregnancy. Moreover demographic factors were associated with oral health awareness among them. There is a need to improve the awareness by dental health professionals and primary care providers about the importance of a sound dental health for mother and baby. Preventive, routine and emergency dental procedures are safe and beneficial for pregnant women. Besides, counseling about oral hygiene and diet, for example, are simple measures and can have an important impact on the pregnant woman's oral health. During pregnancy women are normally open to new information about the best health and wellbeing for themselves and their babies.

Limitation

This was a Single centre study.

Ethical Approval

Ethical approval was obtained before study initiation by the institutional review board of Baqai Dental College Karachi. All procedures performed in studies involving human participants were in accordance with the ethical standards of the Helsinki declaration.

Consent for Publication

Prior to data collection, verbal informed consent was taken from each participant of the study.

Availability of Data

Data cannot be shared publicly because it is intellectual property of Baqai Dental College. Data are available from the Baqai Dental College Karachi.

Conflict of Interests

All authors do not have any conflict of interest.

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DISCLAIMER

This article is extracted from one of the principle author's thesis.

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