

Oral health knowledge among a cohort of pregnant women in south India: A questionnaire survey

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ABSTRACT

Aim: To assess oral health knowledge of pregnant women visiting Government Maternity Hospital, Hyderabad. **Materials and Method:** A cross-sectional survey was carried out among 606 pregnant women aged 18–40 years old. Oral health knowledge of respondents was assessed using the 14-item self-administered questionnaire and responses were recorded on a dichotomous scale (yes/no). The data were analyzed using Statistical Package for Social Sciences (SPSS) package version 20.0. **Results:** Overall inadequate knowledge regards to oral health was observed among 55.8% pregnant women. Based on knowledge regarding tooth decay, 71.6% of study participants believed that every painful tooth has to be removed and 81% of respondents were unaware of brushing with fluoridated toothpaste prevents tooth decay. Similarly, with respect to gum disease, 77.7% of subjects were not aware of gum disease and around 49.8% unacquainted that bleeding during tooth brushing indicates gum problems. It is enriching to observe, 94.1% of respondents felt oral health is important for general health. On the other hand, a quite alarmingly high percentage (73.9%) of subjects does not know the relationship between oral health and pregnancy. Furthermore, 91.1% and 65.5% of participants were ignorant that pregnancy can increase the tendency of gums to swell or bleed and poor oral health affect their unborn baby, respectively. More than three-fourths of the study participants (84%) had never visited dentist **Conclusion:** The study highlights limited knowledge allied to oral health among pregnant women and problem-oriented dental visits indicating an urge among this group to scale up their knowledge.

Keywords: India, knowledge, oral health, pregnancy

Introduction

Pregnancy is an important milestone in the life course of a female with noteworthy anatomical and physiological changes in the body. Fluctuation in the levels of estrogen and progesterone hormones in expecting mothers increases the risk for oral health issues compared to the normal counterpart of the population.^[1,2]

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Oral problems seen in pregnancy include pregnancy gingivitis, periodontal infections, and pyogenic granuloma.^[3,4] The reported prevalence of pregnancy gingivitis has ranged from 30 to 100%.^[5-7] The early work of Loe and Silness^[8,9] showed that the first clinical signs of gingival inflammatory changes appear in the 2nd month of pregnancy and continue to progress until the 8th month of pregnancy. Moreover, repeated episodes of gingivitis during pregnancy might exacerbate chronic periodontal disease. Literature search^[10-12] revealed that the prevalence of the periodontal disease in pregnant women ranges from 5 to 20% with about 25% of women showing worsening of periodontal condition. Pyogenic granuloma is a benign growth of gingival

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tissues and the prevalence as reported ranges 5–10%.^[13,14] Additionally, changes in dietary habits can also increase the risk of tooth decay during pregnancy. A considerable body of research indicated 74% prevalence rate of dental caries among pregnant women.^[15,16] Moreover, pregnant women with high caries might facilitate the establishment of an oral environment that places the newborn at risk of developing caries.^[17] Therefore, teeth and periodontal structures represent two specialized tissues which account as great importance in the oral cavity of pregnant women.

Apart from the effect of hormonal changes, it is increasingly acknowledged^[18-20] that other factors such as poor oral hygiene, lack of access to dental care, and low knowledge levels about proper oral hygiene maintenance affirmed to worsened periodontal condition during pregnancy. Further, more recent studies^[21-23] indicated these oral alterations have the potential to affect pregnancy outcomes.

Moreover, mothers being primary caregivers to their young ones, it is high time to unfold the oral health knowledge of pregnant women for nurturing good oral habits and kindle in the right direction on their advent.^[24,25] In light of these findings, it is important to solicit women's perceptions of their oral health for planning preventive programs in order to favorably influence both maternal and infant health. Hence, the present study was designed to ascertain the knowledge about oral health among a cohort of pregnant women visiting Government Maternity Hospital in Hyderabad city, India.

Materials and Method

A cross-sectional study was carried out among pregnant women in various trimesters aged 18–40 years visiting the out-patient block of Government Maternity Hospital, Hyderabad. The study encompassed a convenient sample of 606 subjects, ensuring a proportionate number of participants from each trimester. Ethical clearance was obtained from the institutional ethical committee before the start of the study (PMVIDS/PHD/0022-18). The permission to carry out the study was obtained from the Medical Superintendent of Maternity Hospital. Women in the first, second, and third trimesters of pregnancy willing to participate were included in the study. Women with the history of systemic disease (such as diabetes mellitus, hypertension, cardiovascular disease, etc.) and those under medication (like antiepileptic, calcium channel blockers, antibiotics, etc.) which have a significant effect on oral health and those who do not wish to participate were excluded from the study. Participation was voluntary and anonymous. The return of the completed questionnaire signified informed consent.

The study was conducted for a period of 4 months dated from June 2018 to September 2018. The pro forma was designed to collect the information of the demographic details (age, education), personal history (number of pregnancies, trimester), perceived oral health status, and previous dental visits. The oral

health knowledge of respondents was measured using a 14-item self-administered questionnaire which was developed based on previous studies.^[26-28] Of which, five questions were based on understanding and causes of tooth decay, three questions on gum disease, three questions assessing knowledge of the respondent's oral hygiene practices, and three questions on the possible association of poor oral health with adverse pregnancy outcomes. The questionnaire was pretested and validated prior to the commencement of the study (Cronbach's α value of 0.86). All the items in the questionnaire were initially prepared in English followed by translated to local language (Telugu) by Bilingual Scholar. The questionnaire was evaluated by two other subject experts unrelated to study and necessary changes were incorporated. The final version of the Telugu-translated questionnaire was back-translated to English by Bilingual Scholar to verify semantic equivalence between versions. The two English versions proved nearly identical. The questionnaire was designed in both English and local language (Telugu) so that the participants can fill the form in the language they are familiar with. The responses were recorded on a dichotomous scale (yes/no). For each "yes" response it was scored "1" and for each "no" response "0." The cutoff point for an individual level of oral health knowledge was set at 7. Those who scored at or above cutoff points were considered as having adequate knowledge whereas those who scored below the cutoff point have inadequate knowledge regards to oral health.

The data were analyzed using Statistical Package for Social Sciences (SPSS) package version 20.0. A descriptive analysis was done to calculate the prevalence of each variable. A Chi-square test was used to associate knowledge scores of the study population with variables. $P < 0.05$ was considered statistically significant.

Results

A total of 606 pregnant women with a mean age of 22.8 ± 3.09 years constituted the study population. The majority of the study participants completed high school (38%) and primary school (30.9%) education only. A few study subjects (8.7%) possessed a graduation degree. A comparable percentage of women were in the first trimester (33.2%), second (33.5%), and third trimester (33.3%) of pregnancy. The majority (49.7%) of the respondents conceived for the second time and around 71.6% of subjects perceived their oral health status as fair. It was surprising to observe that more than three-fourth of the study participants (84%) had never visited the dentist [Table 1].

When knowledge regarding tooth decay was considered, 81.8% of subjects were cognizant that eating sweets causes tooth decay and 86.3% responded that decayed teeth affect works or other aspects of their everyday life. Almost two-thirds (71.6%) of the participants believed that every painful tooth has to be removed. On the other hand, 81% of respondents were unaware that brushing with fluoridated toothpaste helps to

prevent tooth decay. Similarly, with respect to gum disease, 77.7% of study participants were not aware of what gum disease is and around 49.8% unacquainted that bleeding during tooth brushing indicates gum problems. Knowledge based on oral hygiene practices revealed that though 71.8% of subjects regularly change their toothbrush, yet 90.1% of them are unaware of other oral hygiene aids and 99% do not regularly visit a dentist. It is enriching to observe that in the present study, 94.1% of respondents felt that oral health is important for general health. On the other hand, a quite alarmingly high percentage (73.9%) of subjects does not know that there is a relationship between oral health and pregnancy. Furthermore, 91.1% and 65.5% of participants were ignorant that pregnancy can increase the tendency of gums to bleed, swell, or become red and poor oral health affect their unborn baby, respectively [Table 2].

Distribution of study subjects based on knowledge score according to variables, 55.8% of them had inadequate knowledge (low <7) on oral health. Statistically significant ($P = 0.001$) low knowledge scores regards to oral health was noted in the majority of the participants compared to subjects with high knowledge score based on a number of pregnancies. All the variables showed a significant difference with knowledge scores except for age and perceived oral health status [Table 3].

Discussion

Indeed with the increasing global burden of oral disease, it is optimal to know the oral health knowledge of pregnant women as being prime caregivers their level of knowledge, in turn, reflects the care they render to infant oral health. In addition, the mother's role is a corner in shaping a child's oral health behaviors, which has a positive impact on later life. In the present study, overall inadequate knowledge with regard to oral health was observed among 55.8% pregnant women that constitute a considerable proportion of sample indicating that there is an urge to scale up their knowledge. Moreover, illiterates and participants with primary schooling had low knowledge scores which were in accordance with the study done by Avula *et al.*^[27] and Pentapati *et al.*^[29] Reflecting low educational levels lead to low oral health literacy among the study subjects. Among pregnant women, 81% of respondents did not know that brushing with fluoridated toothpaste could prevent dental caries. This finding was comparably high with a study done by Byanaku and Rwakatema^[28] among Morogoro pregnant women, Tanzania (40.3%). The majority of the study subjects (90.1%) were unaware of other oral hygiene aid which was contrary to George *et al.*'s^[30] study where utilization rate of other oral hygiene aids was 83%. A study by Abiola *et al.*^[31] among Nigerian pregnant women reported that 32% of the subjects agreed that every painful tooth should be removed which was comparatively higher (71.6%) in the present study indicating a need of the hour to enact toward this misconception and admittance to accurate information from reliable sources should be made. In the existing study, 77% and 91.1% of pregnant women were unaware of gum disease and that pregnancy can increase the tendency for gums to bleed or swell, respectively which is similar to a study done by Avula

Table 1: Demographic distribution of study subjects

Variables		n (%)
Age	<20 years	170 (28.1)
	21-30 years	425 (70.1)
	31-40 years	11 (1.8)
Education	Illiterate	136 (22.4)
	Primary school	187 (30.9)
	High school	230 (38)
	Graduation	53 (8.7)
No of pregnancies	First	222 (36.6)
	Second	301 (49.7)
	Three or more	83 (13.7)
Trimester	First	201 (33.2)
	Second	203 (33.5)
	Third	202 (33.3)
Perceived oral health status	Good	145 (23.9)
	Fair	434 (71.6)
	Poor	27 (4.5)
Dental visit	Visited	97 (16)
	Never visited	509 (84)

Table 2: Frequency distribution of study subjects based on response to questions

Questions	Responses	
	Yes n (%)	No n (%)
1 Do eating sweets cause tooth decay?	496 (81.8)	110 (18.2)
2 Decayed teeth will affect people's work or other aspects of their everyday life?	523 (86.3)	83 (13.7)
3 Decayed teeth can make people look bad?	342 (56.4)	264 (43.6)
4 Should every painful tooth be removed?	434 (71.6)	172 (28.4)
5 Are you aware of what gum disease is?	135 (22.3)	471 (77.7)
6 Do you think bleeding during tooth brushing indicates gum problems?	304 (50.2)	302 (49.8)
7 Does pregnancy increase the tendency for your gums to bleed, swell, or become red?	54 (8.9)	552 (91.1)
8 Brushing teeth with fluoridated toothpaste helps to prevent tooth decay?	115 (19)	491 (81)
9 Do you regularly change toothbrushes?	435 (71.8)	171 (28.2)
10 Are you aware of any other oral hygiene aids?	60 (9.9)	546 (90.1)
11 Is oral health important to general health?	570 (94.1)	36 (5.9)
12 Do you know there is a relationship between oral health and pregnancy?	158 (26.1)	448 (73.9)
13 Can poor oral health affect unborn baby?	209 (34.5)	397 (65.5)
14 Do you regularly visit the dentist?	6 (1)	600 (99)

et al. (66% and 75%, respectively).^[27] The current study identified participant's lacuna on the interdependent relationships between pregnancy affecting oral health and vice versa poor oral health affecting pregnancy outcomes. This finding was in line with Gupta

Table 3: Frequency distribution of study subjects based on knowledge scores according to variables

Variables	Knowledge scores		Chi-square	P	
	Low (<7)	High (>7)			
Age	<20 years	103 (60.6)	67 (39.4)	2.22	0.32
	21-30 years	229 (53.9)	196 (46.1)		
	31-40 years	6 (54.5)	5 (45.5)		
Education	Illiterate	113 (83.1)	23 (16.9)	15.12	<0.001
	Primary school	137 (73.3)	50 (26.7)		
	High school	85 (37)	145 (63)		
	Graduation	3 (5.7)	50 (94.3)		
No of pregnancies	First	113 (50.9)	109 (49.1)	14.50	0.001
	Second	163 (54.2)	138 (45.8)		
	Three or more	62 (74.7)	21 (25.3)		
Trimester	First	83 (41.3)	118 (58.7)	31.16	<0.001
	Second	116 (57.1)	87 (42.9)		
	Third	139 (68.8)	63 (31.2)		
Perceived oral health status	Good	71 (49)	74 (51)	3.64	0.16
	Fair	252 (58.1)	182 (41.9)		
	Poor	15 (55.6)	12 (44.4)		
Dental visit	Visited	43 (44.3)	54 (55.7)	6.13	0.01
	Never visited	295 (58)	214 (42)		
Total		338 (55.8)	268 (44.2)	606	

Statistically significant ($P < 0.05$)

et al.^[32] and Avula *et al.*'s^[27] studies, thus, an intensified education paves an important insight into the improvement of knowledge and reduces suffering. The majority of the study subjects had low oral health knowledge scores irrespectively of a number of pregnancies which could be attributed to the low mean age of the respondents. The respondents who never visited dentists had low knowledge scores and in congruent with a study conducted by Byanaku and Rwakatema^[28] among Tanzania pregnant women. Lack of green light about the importance and safety of dental care during pregnancy, an overwhelming number of women have a propensity to postpone their treatment depicting lower utilization of dental services. In addition, developing countries like India where dental insurance is in its infancy might be the barrier for not attending to the dentist.

However, we acknowledge that the study has certain limitations as the study was carried out in a single province so the results have to be generalized with caution to the community. The present study was questionnaire-based which necessitates correlating with the subject's oral health status.

Conclusion

The present study highlights limited knowledge allied to oral health among pregnant women and problem-oriented dental visits sighting that oral health care has not been given sufficient importance. As expecting women are more susceptible to periodontal disease and at a higher risk of tooth decay, failure to treat active infection navigates to pooled factors. Furthermore, in low-income countries, the abysmal gap in oral health knowledge begets to dental neglect which cannot be changed overnight. Thereby, shifting the glance in enriching pregnant women's knowledge has a proactive influence on their oral health behaviors and crucial in transferring healthy habits on

the arrival of the little one. The study results signify the need to structure oral health education programs at regular intervals targeting pregnant women about maternal oral changes during pregnancy, self-actualization on the importance of regular dental visits, and the gravity of primary care toward perinatal oral health.

Practical implications

Poor oral health knowledge among pregnant women indicates a high risk of tooth loss in the future. Therefore, oral health care should be a part of regular antenatal care which plays a pivotal role to limit the in-progress epidemic of dental caries and periodontal disease in the budding years.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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