Original Article

Indian Journal of Forensic Odontology
Volume 15 Number 1, January – June 2022
DOI: http://dx.doi.org/10.21088/ijfo.0974.505X.15122.2

Perspectives of Pregnant Women's Infant Oral Health Knowledge and Beliefs: A Prenatal Survey

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How to cite this article:
K Srinivasan, P Susaana Austine, P Hrushitha/Perspectives of Pregnant Women's Infant Oral Health Knowledge and Beliefs: A Prenatal Survey/Indian Journal of Forensic Odontology. 2022;15(1):15–23.

Abstract

Background: Early childhood caries is a virulent form of dental caries that can destroy the primary dentition of infants and preschool children. ECC is a preventable disease and prevention should begin in pre and perinatal. Mothers with poor oral health may be at greater risk of infecting their children. Biologically, the mother is a primary source of Streptococci and young children are dependent on their mother for oral hygiene.

Aim: The aims of this study were to assess women's knowledge and experiences of dental health in pregnancy and to examine the selfcare practices of pregnant women concerning their oral health.

Methodology: A survey was presented which was designed to assess the knowledge, attitude, and practices of pregnant women regarding infants' oral health. A survey was conducted in and around Vellore at a government and private maternity hospital among pregnant women and new mothers. A self-administered questionnaire consisting of a total of 41 questions concerning basic information on proper infant oral hygiene procedures was given. The statistical analysis was performed.

Results: A greater percentage of women were unaware of the importance of their oral hygiene, infant feeding practices and oral hygiene procedure.

Conclusion: The present study reflects a need for maternal counselling on infant oral health.

Keywords: Infant feeding, Knowledge, Mothers, Oral health.

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Received on: 01-08-2022

Accepted on: 18-08-2022

INTRODUCTION

A mother's knowledge and efficacy play an integral part in an infant's life. The mother needs to have adequate knowledge about the right oral health practices which will be imbibed by the infants. Educating the mother perinatally that is as early as during her pregnancy can facilitate reinforcement of good oral health habits along with vigilant preventive efforts for the infant.[1]

Dental caries is the most common chronic disease in childhood.[2]

It may appear aggressively from an early age, affecting health in general and the development of affected children[3], representing a serious problem for public health.[4]

Good infant oral health is the basis for a lifetime free from preventable oral diseases. To achieve this goal, parental involvement is a must, and ideally, this involvement should start even before birth.[5]

Women with dental caries are twice as likely to have children with dental caries, the most common chronic disease of children. Biologically, the mother is the primary source of oral bacteria, and colonization of mutans streptococci (MS) parallels the emergence of the primary dentition. Furthermore, adverse prenatal events such as preterm birth have been closely linked to a greater prevalence of developmental defects of enamel in children and earlier colonization of bacteria, both risk factors for early childhood caries.[6]

Early Childhood Caries (ECC) is a virulent form of dental caries associated with unusual dietary practices. Defined as the presence of one or more decayed, missing, or filled tooth surfaces in any primary tooth in a preschool-age child between birth and 71 months of age.[7]

The implementation of appropriate oral hygiene practices early in a child's life, immediately after the eruption of the first tooth, the use of fluoride-containing toothpaste, and effective permanent care procedures for a young child's oral cavity, constitute several factors preventing the onset of early childhood caries.[8]

During pregnancy, women are psychologically more motivated and receptive to new knowledge and changes in their habits, leading to the adoption of new and better health practices, which will influence the general health development of the baby. Such knowledge acquired during pregnancy usually benefits the whole family, as mothers act as multipliers of knowledge and information, especially related to health. For this reason, pregnancy is perceived as a moment that favours health education and, during this period, pregnant women should receive prenatal oral health care, including information about the most common oral manifestations.[9]

Mothers are decision makers and play an important role in achieving the best oral health outcomes for their young children. A young child's dental environment is complex because their mothers' and/or caregivers' dental knowledge, attitudes, beliefs, and practices affect the child's oral condition. Very young children are dependent on their mothers to attend to their oral hygiene and feed them. Inappropriate bottle use patterns, such as the addition of sweeteners to the liquid and prolonged exposure to sugary liquids at bedtime, and later age at weaning have been linked to early childhood caries.[10]

American Academy of Pediatric Dentistry (AAPD) recommends that infants should consult the dentist within 6 months of getting their first tooth or by their first birthday. It is the initial visit that recommends regular visits to the dentist, based on the child's oral health.[11]

Taking into consideration the pivotal role a mother plays in an infant's life; the present study assessed the knowledge and awareness about oral health maintenance and practices among pregnant women and new mothers.

AIMS AND OBJECTIVES

- To assess the levels of oral health knowledge amongst pregnant women and new mothers regarding infant oral health.
- To assess the levels of oral health attitude and behaviour amongst pregnant women and new mothers regarding infant oral health.

MATERIALS AND METHODS:

Research Design: The design of this study was descriptive and cross-sectional. The convenience sampling technique was used for this study. An epidemiological survey was conducted from Jan. 2022 to Apr. 2022.

Targeted Population: The study was conducted at Vellore (Tamil Nadu State). The targeted populations were pregnant women and new mothers, who had agreed to participate in the survey. The subjects for the study were selected from the paediatric ward of a private hospital.

The method of performing the study: It was distributed among 160 nursing mothers at a government and private maternity hospital.

INCLUSION CRITERIA AND EXCLUSION CRITERIA

Inclusion criteria

- Participants who were willing to participate in the study
- Pregnant and new mothers who were fit and

healthy.

Exclusion criteria

- Children with congenital anomalies and twins who are medically compromised.
- Participants who were included in the pilot study.
- Subjects were not willing to participate in the study.

Sample size:[12]

For the present study, the sample should be sufficiently large to represent the population yet not so large that the data collection and analysis are prohibitively difficult. At a 95% confidence interval (margin of error = e = 0.1%) and a 5% confidence level, the sample size calculated was 100. The epidemiological study was carried out on 160 subjects in the age range of 20–30 years and above, who were randomly selected.

Ethical Consideration: Consent was obtained from the participants, and they were assured of the confidentiality of the collected data and that the resultant information would be used only for research purposes.

Sample size.[12]

$$\text{Formulae} = \frac{Z\ 1\text{-}/2\ \ 2\ SD^2}{d^2}$$

Z 1-/2 is a standard normal variate (at 5% type 1 error (P 0.01) it is 2.28. p values are considered significant below 0.05, hence 1.96 is used in the formula.

SD = Variable Standard Deviation - a value of standard deviation can be taken from power analysis.

d = Absolute error or precision (in this case, 5% error).

The survey proforma was a self-administered structured questionnaire after which its content and face validity were distributed to assess the oral health knowledge, attitude, and behaviour of pregnant women and new mothers.

A single examiner was trained and calibrated to conduct a cross-sectional study in the Vellore region. The questions were framed both in English and Tamil (regional) language for ease of understanding by the people.

The questionnaire was subjected to linguistic validation to ensure that the questions were translated reliably. The questionnaire was pretested by conducting a power analysis on 10% of the sample size to assess the pregnant women and new mothers' ability to understand the questions and answer them without any help.

A questionnaire containing 41 multiple choice questions was designed, which included general information and education status. The questionnaire also includes knowledge of your oral hygiene and your children's oral hygiene and feeding practices. Questions were about oral hygiene practices, the importance of oral health, causes of tooth decay, dietary information, breastfeeding/bottle feeding, duration, frequency of feeding, contents of the bottle, cleaning of gum pads, importance of deciduous dentition, knowledge about fluoride paste, and first dental visits. The questionnaire was completed by the participants in the presence of one of the investigators. The filled questionnaire was collected from the participants on the same day after 15 to 20 minutes.[13]

Validation of KAB was in the questionnaire in three parts.[13]

Part I: 6 questions Included age, educational level, occupation, gestational age, number of pregnancies, and miscarriage history.

Part II: 17 questions assessed oral health knowledge. A three-point Likert scale (ordinal Agree, disagree, and no comments were used to evaluate the responses.

Part III: 18 questions were included to assess oral health attitudes and practices. A three-point Likert scale (ordinal scale) was used to evaluate the responses to each item.

Six experts did the content validity process.

Statistical Analysis: The data gathered were tallied, encoded, and interpreted using descriptive statistics. Scoring is done, and the data were analyzed using SPSS Version 22 (SPSS Inc., Chicago, USA). The individual scores were summed up to yield a total score. The data obtained were then statistically analysed using the Pearson chi-square test. It was hypothesised that the nursing mothers were not aware of the infant's oral health care practices.

RESULTS

The Profiles of Respondents (Table 1)

A cross-sectional analytical study of 300 was conducted among pregnant women and new mothers to assess oral health knowledge, attitude, and behaviour amongst the participants. The principal investigator excluded 3 participants due to

incomplete surveys. Data from 157 questionnaires were analyzed yielding a response rate of 93%.

According to the mother's ages, the majority 89 (56.6%) were between 20 and 40 years of age.The mean age of all the subjects (in years) was 29.2 years. Almost half of the interviewed mothers had a university education 72 (45.8%) and 86 (54.7%) of them were housewives.

According to the number of children in the family, the majority 98 (62.4%) had one child.

Table. 1: Social-demographic variables of respondents

Individual scenario					
Maternal Variables	**Respondents**	**ANOVA (Inference)**			
		Response rate n (%)	**Mean ± SD Comparisons**	**χ^2**	**Inferential Statistics**
Total number of respondents		**157/160**			
Age group (years)	< 20	7 (4.4)	29.2 ± 30.3	69.1 df=3	p< 0.0001 HS*
	21-25	89(56.6)			
	26-30	33(21.01)			
	Above 30	28 (17.8)			
Mothers Education	Illiterate	22 (14.01)	52.3 ± 21.7	22.03 df=2	p< 0.0001 HS*
	High School/below	63 (40.1)			
	Graduate/Postgraduate	72 (45.8)			
Mother's Profession/ occupation	Housewife	86 (54.7)	52.3 ± 24.7	25.4 df=2	p< 0.0001 HS*
	Nonskilled	44 (28.02)			
	Skilled	27 (17.1)			
Gestational age	First trimester	56 (35.6)	52.3 ± 14.5	9.3 df=2	0.0093 SS*
	Second trimester	68 (43.9)			
	Third trimester	33 (21.01)			
Number of pregnancies	Primigravidae/ First gravidae	98 (62.4)	78.5 ± 19.5	6.5 df=1	0.0108 SS*
	Multigravidae	59 (37.5)			
History of miscarriage	Yes	09 (5.7)	78.5 ± 69.5	89.8 df=1	p< 0.0001 HS*
	No	148 (94.2)			

Data Source: Fieldwork, 2021

Note: Significance level p< 0.0001, *Significant; HS: Highly significant

Table. 2: Oral Health Problems/Attitude

Individual scenario					
Variables	**Respondents**	**ANOVA (Inference)**			
		Response rate n (%)	**Mean ± SD Comparisons**	**χ^2**	**Inferential Statistics**
Bad taste in the mouth	Often	64(40.7)	49 ± 13.1	9.4 df=2	p=0.0089 SS*
	Occasionally	32(20.3)			
	Rarely	61(38.8)			
Broken or chipped natural tooth	Often	30(19.1)	52.3± 17.2	13.1 df=2	p==0.0014 SS*
	Occasionally	55(35.03)			
	Rarely	72(45.8)			
Gums that hurt or bleed	Often	45(28.6)	52.3± 25.03	26.1 df=2	p< 0.0001 HS*
	Occasionally	86(54.7)			
	Rarely	26(16.5)			
Pain/discomfort	Often	70(44.5)	52.3 ± 15.6	10.7 df=2	p=0.0046 SS*
	Occasionally	32(20.3)			
	Rarely	55(35.03)			

Persistent bad breath	Often	68(43.3)			
	Occasionally	53(33.7)	52.3± 13.07	7.4 df=2	p=0.0245 SS*
	Rarely	36(22.9)			
Sores on the tongue or inside the mouth	Often	66(42.03)			
	Occasionally	63(40.1)	52.3 ± 17.2	13.6 df=2	p=0.0011 SS*
	Rarely	28(17.8)			
Tooth Decayed	Yes	102 (64.9)	78.5 ± 23.5	9.4 df=1	p =0.0021 SS*
	No	55 (35.03)			

Citation: Moore S, Ide M, Coward PY, Randhawa M, Borkowska E, Baylis R, Wilson RF: A prospective study to investigate the relationship between periodontal disease and adverse pregnancy outcome. Br Dent J 2004, 197:251-258.

Data Source: Fieldwork, 2021

Note: Significance level p< 0.0001, *Significant; HS: Highly significant

Oralhealth practices (Table 3)

In contrast to the knowledge, the participant generally showed good practice The overall mean practice score was 59.9 ± 11.4.

Results suggested that 84 (53.5%) know the importance of brushing.

The mother prefers bottle-feeding over breastfeeding, 77 (49.04%) and 56 (35.6%) said it because of not sufficient milk. About 86 (54.7%) feeds their child during the nighttime with a bottle. the importance of frequent dental visits since pregnant was 51 (32.4%).

Table 3: Oral Health Practicesz

Individual scenario					
Variables	**Respondents**	**ANOVA (Inference)**			
		Response rate n (%)	**Mean ± SD Comparisons**	**χ^2**	**Inferential Statistics**
During pregnancy, do you receive guidance on oral health?	Yes	48(30.5)	78.5 ± 30.5	16.07 df=1	p< 0.0001 HS*
	No	109(69.4)			
The major source of guidance on oral health information by	Health care providers	85(54.1)	78.5 ± 6.5	0.71 df=1	p=0.039 SS*
	Non-health care providers	72(45.8)			
It is important to know the importance of brushing.	Agreed	84(53.5)			
	Disagreed	41(26.1)	52.3 ± 22.6	20.9 df=2	p< 0.0001 HS*
	Unsure	32(20.38)			
2nd trimester is the best for dental treatment	Agreed	76(48.4)			
	Disagreed	37(23.5)	52.3± 16.9	11.88 df=2	p< 0.0001 HS*
	Unsure	44(28.02)			
If the mother has decayed teeth, the child is likely to have decayed teeth	Agreed	97(61.7)			
	Disagreed	36(22.9)	52.3 ± 31.9	41.01 df=2	p< 0.0001 HS*
	Unsure	24(15.2)			
Prolonged Nocturnal bottle feeding	Agreed	86 (54.7)			
	Disagreed	52 (33.1)	58.3 ± 20.4	6.9 df=2	p=0.0317 SS*
	Unsure	37 (23.5)			
At will, breastfeeding/bottle feeding with sweetened beverages can cause dental caries	Agreed	64 (40.7)			
	Disagreed	42 (26.7)	52.3 ± 9.03	3.4 df=2	p=0.0012 SS*
	Unsure	51 (32.4)			
Optimum feeding (5-7feeds/day)	Agreed	63 (40.1)			
	Disagreed	71 (45.2)	52.3 ± 20.9	20.4 df=2	p< 0.0001 HS*
	Unsure	23 (14.6)			

Mothers prefer bottle feeding over breastfeeding	Agreed	77 (49.04)	52.3 ± 21.7	21.2 df=2	p< 0.0001 HS*
	Disagreed	56 (35.6)			
	Unsure	24 (15.2)			
Dental visit since pregnant	Had gone	51 (32.4)	78.5 ± 27.5	13.02 df=1	p< 0.0001 HS*
	Had not gone	106 (67.5)			
A mother's diet during pregnancy will affect the baby's teeth	Agreed	52 (33.1)			
	Disagreed	43 (27.3)	52.3 ± 7.7	2.8 df=2	p=0.2350 NS*
	Unsure	62 (39.4)			
Overall score				**59.9 ± 11.4**	

Citation: Anup Nagaraj, Sonia Pareek. Infant Oral Health Knowledge and Awareness: Disparity among Pregnant Women and Mothers visiting a Government Health Care Organization. International Journal of Clinical Pediatric Dentistry, September-December 2012; 5(3):167-172

Data Source: Fieldwork, 2021

Note: Significance level p< 0.0001, *Significant; HS: Highly significant; SS: Statistical Non-significant:; NS: Non-significant: df: degree of freedom

Dental health knowledge (Table 4)

The overall mean knowledge score was 7.22 ± 1.42. In general, participants showed good knowledge regarding dental health, especially in areas of the effectof prolonged bottle feeding 82 (52.2%). Almost all mothers answered correctly when asked about the effect of frequent exposure to the Use of a sweetened pacifier on dental health 80 (50.9%).

Concerning the tooth brushing duration for a child's teeth, 104 (66.2%) of the mothers gave correct answers. About the importance of primary teeth, 69 (43.9%) of mothers agreed that the treatment of primary teeth is essential. The role of fluoride in preventing tooth decay was supported by 75 (47.7%). Mothers were largely unaware that bacteria involved in dental caries could be transmitted from mothers to their children, only 79 (50.3%) of subjects agreed to this fact. 26 (16.5%) of the mothers were aware that decayed milk teeth affect a child's permanent teeth.

Most women, 54 (34.3%) preferred a clean cloth (gauze) for cleaning the gum pads. About 77 (49.04%) clean the child's teeth only after the eruption of the first tooth.

While 60 (38.2%) of the mothers dispensed the recommended amount (pea size) of the toothpaste for their children and 48 (30.5%) of the mothers assisted their children during brushing.

Table 4: Knowledge of Infant Oral Health

Variables	Respondents	Individual scenario			
		ANOVA (Inference)			
		Response rate n (%)	Mean ± SD Comparisons	χ^2	Inferential Statistics
Start cleaning your baby's mouth before the first tooth erupts	Agreed	77(49.04)			
	Disagreed	42(26.7)	55.6 ± 18.6	14.6 df=2	p< 0.0001 HS*
	Unsure	48(30.5)			
Methods of cleaning gum pads	With gauze	54 (34.3)			
	With finger	47 (29.9)	39.2 ± 11.6	10.96 df=3	p=0.0119 SS*
	With brush	30(19.10)			
	Any other aids	26(16.5)			
Age of eruption of the first tooth	At 6 months	79(50.3)			
	After 1 year	53(33.7)	52.3 ± 22.05	21.3 df=2	p< 0.0001 HS*
	Unsure	25(15.9)			
Child's first dental visit	When the first tooth erupts	59 (37.5)			
	Only when there is a pain	38 (24.2)	39.2 ± 17.3	26.3 df=3	p< 0.0001 HS*
	unsure	48(30.5)			
	Not required	12(7.6)			

Use of sweetened pacifier	Agreed	80(50.9)			
	Disagreed	42(26.7)	52.3 ± 19.7	15.9 df=2	p< 0.0001 p< 0.0001
	Unsure	35(22.2)			
Age of weaning	< 1 year	34(21.6)			
	> 1 year	39(15.7)	52.3 ± 22.4	20.4 df=2	p< 0.0001 HS*
	Unsure	84(53.5)			
Baby teeth are important	Agreed	69(43.9)			
	Disagreed	56(35.6)	52.3 ± 15.3	10.4 df=2	p=0.0054 SS*
	Unsure	32(20.3)			
Problems with baby teeth will affect permanent teeth	Agreed	78(49.6)			
	Disagreed	38(24.2)	52.3 ± 18.1	13.5 df=2	p< 0.0001 HS*
	Unsure	41(26.1)			
Using fluoride toothpaste helps to prevent tooth decay	agreed	75(47.7)			
	disagreed	61(38.8)	52.3 ± 22.8	24.9 df=2	p< 0.0001 HS*
	unsure	21(13.3)			
Prolonged and frequent bottle feeding (milk or formula) is bad for his/her teeth	Agreed	82 (52.2)			
	Disagreed	29 (18.4)	52.3± 22.09	20.4 df=2	p< 0.0001 HS*
	Unsure	46(29.2)			
Bacteria can be transmitted from mothers' mouths to child's mouth	Agreed	30 (19.1)			
	Disagreed	48 (30.5)	52.3 ± 20.2	17.3 df=2	p< 0.0001 HS*
	Unsure	79 (50.3)			
Do decayed milk teeth affect a child's permanent teeth?	Agreed	26 (16.5)			
	Disagreed	42 (26.7)	52.3 ± 26.7	29.3 df=2	p< 0.0001 HS*
	Unsure	89 (56.6)			
A cavity in a baby tooth does not need to be filled unless it hurts	Agreed	78(49.6)			
	Disagreed	42(26.7)	52.3 ± 18.2	13.6df=2	p< 0.0001 HS*
	Unsure	37(23.5)			
How often teeth were brushed	Once	78(49.6)			
	Twice	42(26.7)	52.3 ± 18.2	13.6 df=2	p< 0.0001 HS*
	thrice	37(23.5)			
Tooth brushing duration for child's teeth	At least 2-3 min	104 (66.2)	78.5 ± 25.5	11.1 df=1	p< 0.0001 HS*
	Unsure	53 (33.7			
Amount of toothpaste	Pea size	60 (38.2)	78.5 ± 18.5	10.3 df=1	p< 0.0001 HS*
	Unsure	97 (61.7)			
Parent supervision	Yes	48 (30.5)	78.5 ± 30.5	16.07 df=1	p< 0.0001 HS*
	No	109 (69.4)			
Overall score				**7.22 ± 1.42**	

Citation: California Dental Association Foundation, American College of Obstetricians and Gynecologists. District IX. Oral Health during pregnancy & early childhood: Evidence-based guidelines for Health Professionals. J Calif Dent Assoc 2010; 38 (6): 391-440.

Data Source: Fieldwork, 2021

Note: Significance level p< 0.0001, *Significant; HS: Highly significant; SS: Statistical Non-significant: NS: Non-significant: df: degree of freedom

DISCUSSION

In a study done by Hashimetal about 94% of the women brushed their teeth at least once a day which is to the present study.[14]

In a study conducted by Hashim et al more than half of the women (58.3%) visited the dentist during their most recent emergency mostly during dental pain and about 40% of women felt that their oral health was poor which is also to this study.[14]

George et al. concluded that 80% noted that their dental health was important/extremely important

compared to their overall health which is also to this study.[15]

In the present study, only 21% and 20% were using dental floss which contrasts with the study conducted by Thomas NJ et al in which 57% used dental floss weekly.[16]

Breastfeeding provides multiple nutritional, immunological and psychological benefits to the infant in its first year of life. WHO recommends that infants be exclusively breastfed for the first 6 months of life, with some breastfeeding continuing for up to 2 years of age. When provided along with appropriate and adequate complementary food, breast milk continues to be an important source of nutrition and provides immunological benefits even after 6 months of age.[17]

In the study done by Anup Nagaraj et al Optimum feeding of 8 to 10 times/day was followed by 12.3% of housewives and only 5% of employed subjects and in the present study, pregnant women, and new mothers about 81% and 89% feeds the child whenever.[8]

In the present study, 45% and 40% reported bottle-feeding during nighttime, on the contrary, in a study done by Mahejabeen R etal bottle feeding was reported to be 8.9%.[18] In the present study, 14% and 15% of pregnant women know the consequences caused due to bottle feeding.

In our study majority (70% and 75%) of mothers used toothbrushes and toothpaste for cleaning their teeth and regarding the frequency of brushing, in the study conducted by ParappaSajjan P et al.[19]

In the study by Gunjan Kumar, 49% of the mothers felt that milk teeth were not as important as permanent teeth but, in this study, 37% and 27% know the importance of primary teeth.[20]

In the present study, only 10% and 8% of pregnant women and mothers know about the usage of fluoride toothpaste in children younger than one year of age but on the contrary study done by Magdalena et al.[6] almost 60% of future mothers believed the use of fluoride toothpaste before the first year of age to be appropriate.

In the present study, 54% and 57% of subjects concluded that a child's teeth should be brushed for 3 minutes which is not the study conducted by Magdalena et al6in which 35.7% to be moms said they would brush their children's teeth no less than 2 minutes.

In the present study, 38% and 30% said that after the eruption of all deciduous teeth starts cleaning a child's teeth which is to the study done on mothers of toddlers in Moradabad, India by Suresh et al, in which most of the mothers reported that they would start brushing their child's teeth only once all the primary teeth erupted.[21]

In the study conducted by Lilian Rigo, a large part of the mothers interviewed took their child to the dentist for the first dental visit during the child's first year of life (64.6%) whereas in this study 15% and 12% took their child to a dentist.[22]

CONCLUSION

Based on these results there is a need for education for mothers and would be mothers.

As pedodontists, we must create awareness by explaining various oral hygiene methods and feeding practices and highlighting the importance of their role in the prevention of ECC.

This can be achieved by conducting camps and educating them through posters, advertisements, audiovisual aids, and dental health programs.

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