

# Evaluation of the knowledge and attitude of expectant mothers about infant oral health and their oral hygiene practices

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## Abstract

**Background:** Mothers play a crucial role in developing and maintaining their infants' oral hygiene. Maternal oral health, their knowledge and attitude toward infant oral health are strong indicators of their infant's oral health status. **Aim:** The aim of this study is to evaluate the knowledge and attitude of expectant mothers about infant oral health and their oral hygiene practices. **Settings and Design:** This was a cross-sectional questionnaire-based survey conducted among expectant mothers in Mangalore city, India. **Materials and Methods:** Three hundred expectant mothers fulfilling the inclusion and exclusion criteria were randomly selected based on convenience method over a period of 1 month. The data were collected using a self-administered questionnaire addressing the various aspects of expectant mothers' knowledge and attitude about infant oral health and their own oral hygiene practices. The analysis was done using SPSS version 16.0. **Results:** The overall score revealed that majority of the expectant mothers had poor knowledge and attitude toward infant oral health and followed poor oral hygiene practices. Expectant mothers' educational qualification, trimester, and the number of pregnancy had a significant role in their knowledge, attitude, and oral hygiene practices. **Conclusion:** Implementation of educational programs to motivate expectant mothers and bring out awareness about the importance of oral health and their implications must be emphasized.

**Key words:** Early childhood caries, oral health promotion, prevention

## INTRODUCTION

Good oral health during infancy is important for the overall health and well-being of a child, and is one of the building blocks for a disease-free life.<sup>[1]</sup> Studies have shown that infant oral health status is poor in developing nations and dental caries is the most common chronic childhood disease.<sup>[2-4]</sup> Early childhood caries is a severe form of tooth decay that affects the primary teeth and has serious consequences on the

child's general health, future oral health, and quality of life.<sup>[5,6]</sup> Vertical colonization of *Streptococcus mutans* from mother to child, the primary microorganism implicated in dental caries etiology, is well documented in literature, indicating the direct influence of mother's oral health status on their infant's oral health.<sup>[7]</sup> Studies have also shown periodontal disease in expectant mothers as a risk factor for pre-term low-birth-weight deliveries, pre-eclampsia, and other unfavorable

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**How to cite this article:** Thomas A, Jacob A, Kunhambu D, Shetty P, Shetty S. Evaluation of the knowledge and attitude of expectant mothers about infant oral health and their oral hygiene practices. J Int Soc Prevent Communit Dent 2015;5:400-5.

Access this article online	
Quick Response Code:	Website: www.jispcd.org
	DOI: 10.4103/2231-0762.163405

pregnancy outcomes.<sup>[8-12]</sup> This correlation is of great importance because of the prevalence of high infant and maternal mortality rates in the country.<sup>[13]</sup>

Parent/caregiver plays a major role in a child's life, so their knowledge and attitude about infant oral health will have a great impact on the child's oral health. Growing evidence shows that good oral health of mother right from pregnancy could be the key to establishing good infant oral health.<sup>[8]</sup> Most researchers have attributed the inadequate knowledge and attitude about infant oral health among parents and caregivers as the primary reason for the poor oral health status of infants.<sup>[6]</sup> Preventive intervention during pregnancy by providing prenatal oral health education can aid in improving their oral health and instilling a positive attitude toward infant oral health.<sup>[14]</sup> To achieve the goal of optimal oral health in childhood, the American Academy of Pediatric Dentistry (AAPD) recommends that infant oral health care should begin ideally with prenatal oral health counseling for parents.<sup>[15]</sup>

Assessment of the knowledge and attitude of expectant mothers using prevalidated questionnaire helps to formulate an effective infant oral health promotion program.<sup>[2]</sup> Hence, for the healthcare providers to provide adequate information and motivation (address the topics that should be targeted when educating) to the parents and caregivers, a better understanding of the prevalent knowledge and attitude of expectant mothers about infant oral health and their own oral hygiene practices is essential.<sup>[5]</sup> So, the aim of this study was to collect the baseline data to assess the knowledge and attitude of expectant mothers regarding infant oral health and their oral hygiene practices, in Mangalore city.

## MATERIALS AND METHODS

A cross-sectional questionnaire-based survey was conducted among 300 expectant mothers in Mangalore city. The study participants were randomly selected based on convenience method from those reporting to the Department of Gynecology in a government hospital and a private hospital, and also two private maternity clinics in the city during a period of 1 month. This ensured that the study was conducted without any bias among the rich, poor, literate, and illiterate sections of the society. The study was briefed and voluntary consent was obtained from each of the participants prior to conducting the study. The study was conducted upon obtaining approval from the institutional ethical committee, the chief medical officers of the hospitals, and gynecologists of the maternity clinics. The questionnaire was prepared in English and in the

local language (Kannada). Participants who could not communicate in either of the languages and those who required an interpreter were not included in the study.

The questionnaire was prepared by a group of three pediatric dentists in academia. The questions were developed after referring to relevant literature, and were tested for validity and reliability. The questionnaire had two parts. The first part contained questions with respect to the demographic background of the expectant mothers which included the age, educational qualification, trimester, and the number of pregnancies. The second part included a total of 19 questions of which 14 were on knowledge, three on attitude toward infant oral health, and two questions were on the oral hygiene practices of the expectant mothers.

The overall knowledge and attitude of expectant mothers toward infant oral health and their own oral hygiene practices were scored with each correct answer given a value of one. The maximum score that could be obtained was 19 and minimum was 0. The total score was calculated for each participant and the subjects were divided based on the number of correct answers into poor (score <7), fair (score 8–13), and good (score 14 and above). The study was also designed to evaluate the effect and relationship of the demographic factors like age, educational qualification, trimester, and the number of pregnancies on the knowledge and attitude of expectant mothers toward infant oral health and their own oral hygiene practices.

The data were statistically analyzed using Chi-square test, frequency distribution test, and one-way analysis of variance (ANOVA). In all the tests, a *P* value of 0.05 or less was used for statistical significance.

## RESULTS

A total of 300 pregnant women participated in the survey. The mean age of the study subjects was 24 years. The overall score [Figure 1] showed that majority of the expectant mothers had poor knowledge and attitude toward infant oral health and also had poor oral hygiene practices.

Table 1 shows the results with regard to correct answers obtained for the knowledge, attitude, and oral hygiene practice survey items in the questionnaire. Table 2 shows the frequency, valid percentage, and scoring of the participants in each of the demographic subcategories.

Significant differences were found in the expectant mothers' knowledge and attitude toward infant oral health and their oral hygiene practices, based on their educational qualification, the number of pregnancies,

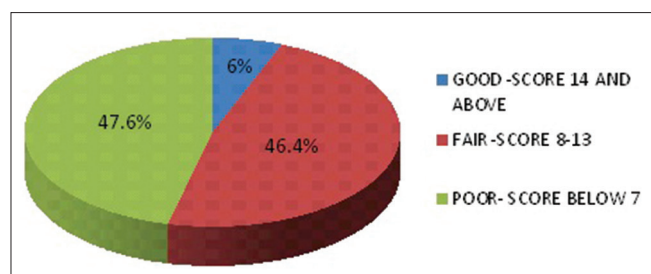


Figure 1: Overall score

and trimester of pregnancy. However, no significant differences were seen in the knowledge ( $P = 0.415$ ), attitude ( $P = 0.536$ ), and oral hygiene practices ( $P = 0.58$ ) in the age category [Figure 2].

On comparison of the educational qualification of expectant mothers with respect to their knowledge, attitude, and oral hygiene practices [Table 3], a significant difference was found in all three domains,

**Table 1: Correct response percentage of expectant mothers to oral health knowledge, attitude and practices**

Survey item	No of correct answers	Percentage
Good health during pregnancy is important for healthy baby teeth	55	19.4
When does the first baby tooth appear in the child's mouth?	195	65
Complete set of 20 baby teeth appear by the age of	107	36.5
Unhealthy diet can affect a child's baby and adult teeth	175	59.7
Frequent and prolonged night time bottle/breast feeding can cause tooth decay	97	32.7
What are the main types of food that can cause tooth decay?	207	70.9
Is tooth decay caused by bacteria that are transmitted from mother to child by kissing or sharing feeding utensils?	64	22.2
Children are more likely to have decayed teeth if their mother has decayed teeth	77	26.2
You start cleaning your baby's mouth after each feeding, even before the teeth erupt	186	63.3
When should you start brushing your baby's teeth?	80	27.2
It is more important to brush the baby's teeth at night than in the morning	104	35.6
How often should you brush your baby's teeth?	193	66.3
Do oral habits such as thumb sucking, if continued for prolonged periods beyond age 4, affect baby's teeth resulting in crooked teeth?	153	52.4
Is it necessary to treat cavities in baby teeth?	76	26
When should you take your child to the dentist for his/her first dental visit?	61	21.9
Can regular dental visits prevent problems in your child's teeth and mouth?	191	65.2
Have you consulted a dentist before?	18	6.1
How often do you brush your teeth?	203	69
Do you use any other oral hygiene aids other than tooth brush?	72	24.4

**Table 2: Percentage of participants in each category with their respective scores**

Demographic characteristics	Frequency	Valid percentage	Good (%)	Fair (%)	Poor (%)	P*
Age, years						0.626 <sup>†</sup>
18-25	134	44.7	7.5	44.7	47.8	
26-30	124	41.3	4.8	47.6	47.6	
>30	42	14	4.8	57.1	38.1	
Educational qualification						<0.001 <sup>‡</sup>
Below 7 <sup>th</sup> standard	38	12.6	0.0	29.7	70.3	
8 <sup>th</sup> to pre-degree	122	40.6	2.5	39.3	58.2	
Degree	119	39.6	10.1	59.7	30.3	
Postgraduates	21	7.0	14.3	61.9	23.8	
Trimester						<0.001 <sup>‡</sup>
First	43	14.3	14	58.1	27.9	
Second	96	32	6.2	31.2	62.5	
Third	161	53.6	3.7	54.7	41.6	
No of pregnancies						<0.001 <sup>‡</sup>
First	157	52.3	9.6	54.8	35.7	
More than one	143	47.6	2.1	39.9	58.0	

\*Chi square, <sup>†</sup>not significant, <sup>‡</sup>highly significant

with graduates and postgraduates showing a better score than those with lower educational qualification.

On comparison of the number of pregnancy with knowledge, attitude, and oral hygiene practices [Table 4], a significant difference was found only in knowledge and attitude and those in their first pregnancy had better scores.

On comparison of the trimesters with knowledge, attitude, and oral hygiene practices [Table 5], a significant difference was found only in knowledge and attitude. However, the oral hygiene practices among expectant mothers showed no significant differences. Expectant

mothers in their first trimester were found to have better knowledge, attitude, and oral hygiene practices, compared to mothers in the other two trimesters.

## DISCUSSION

In a developing country like India, a comprehensive assessment of the maternal oral hygiene practices, knowledge, and attitude about infant oral health is essential to plan an effective antenatal dental health education program. In this context, the results obtained from the study revealed that 47.6% of the expectant mothers had poor knowledge and attitude toward infant oral health and also followed poor oral hygiene practices. The probable reasons could be lack of information or proper access to awareness about infant oral health. This figure brings out the importance of educating the expectant mothers, whose knowledge and attitude not only influences their own oral health but also of their infants. Studies conducted by Shenoy and Chacko<sup>[8]</sup> also report of poor knowledge and practices among pregnant women in Karnataka, India.

65.2% of mothers knew the importance of regular dental visits in preventing dental problems, but only 6.1% of expectant mothers had consulted a dentist before. This was similar to a survey conducted by Ganesh *et al.*<sup>[16]</sup> in India which reported that only 4% of the women had regular dental visits. However, studies conducted by Christensen *et al.*<sup>[17]</sup> in Danish women reported that 90% had regular dental visits as compared to 36% in North London which was reported by Hullah *et al.*<sup>[18]</sup>

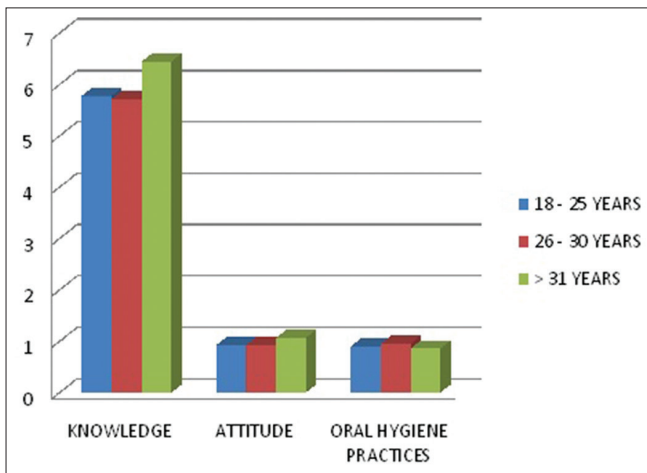


Figure 2: Comparison of age with knowledge, attitude, and oral hygiene practices

Table 3: Comparison of the education qualification with knowledge, attitude, and oral hygiene practices

	Educational Qualification	n	Mean	Mean percentage	Std. deviation	Statistics/ mean squares	df <sup>§</sup> (Welch)/ F(ANOVA)	P*
Total score	Below 7 <sup>th</sup> standard	37	5.57	29.31579	3.176	182.22	13.993	<0.001 <sup>†</sup>
	8 <sup>th</sup> standard to pre-degree	123	6.78	35.68421	3.418			
	Degree	119	9.11	47.94737	3.918			
	Postgraduate	21	9.05	47.63158	3.57			
	Total	300	7.71		3.837			
Knowledge	Below 7 <sup>th</sup> standard	37	4	55.07143	2.718	110.105	11.883	<0.001 <sup>†</sup>
	8 <sup>th</sup> standard to pre-degree	123	5.21	28.57143	2.965			
	Degree	119	6.93	37.21429	3.241			
	Postgraduate	21	6.67	49.5	2.869			
	Total	300	5.85		3.206			
Attitude	Below 7 <sup>th</sup> standard	37	0.73	24.33333	0.693	5.162	9.746	<0.001 <sup>†</sup>
	8 <sup>th</sup> standard to pre-degree	123	0.74	24.66667	0.612			
	Degree	119	1.19	39.66667	0.826			
	Postgraduate	21	1.19	39.66667	0.814			
	Total	300	0.95		0.759			
Oral hygiene practices	Below 7 <sup>th</sup> standard	37	0.84	42	0.501	1.09	3.768	0.011 <sup>‡</sup>
	8 <sup>th</sup> standard to pre-degree	123	0.83	41.5	0.568			
	Degree	119	0.98	49	0.537			
	Postgraduate	21	1.19	59.5	0.402			
	Total	300	0.92		0.545			

\*Chi-square, <sup>†</sup>highly significant, <sup>‡</sup>significant, <sup>§</sup>degree of freedom 2

**Table 4: Comparison of the number of pregnancy with knowledge, attitude, and oral hygiene practices**

	Pregnancy	n	Mean	Mean percentage	Std. deviation	T*	df†	P‡
Total score	First	157	8.66	45.57895	3.925	4.608	298	<0.001§
	More than one	143	6.68	35.15789	3.465			
Knowledge	First	157	6.61	47.21429	3.289	4.425	298	<0.001§
	More than one	143	5.01	35.78571	2.902			
Attitude	First	157	1.08	36	0.784	3.225	298	0.001§
	More than one	143	0.8	26.66667	0.705			
Oral hygiene practices	First	157	0.97	48.5	0.56	1.719	298	0.087¶
	More than one	143	0.86	43	0.525			

\*Paired t test, †degree of freedom, ‡Chi-square, §highly significant, ¶not significant

**Table 5: Comparison of the trimester of expectant mother with knowledge, attitude, and oral hygiene practices**

	Groups	n	Mean	Mean percentage	Std. deviation	Statistics/ Mean squares	df* (Welch)/ F (ANOVA)	P†
Total score	First trimester	43	9.67	50.89474	4.104	10.011	103.24	<0.001‡
	Second trimester	96	6.4	33.68421	4.204			
	Third trimester	161	7.98	42	3.233			
	Total	300	7.71		3.837			
Knowledge	First trimester	43	7.3	52.14286	3.313	8.519	103.727	<0.001‡
	Second trimester	96	4.8	34.28571	3.629			
	Third trimester	161	6.08	43.42857	2.688			
	Total	300	5.85		3.206			
Attitude	First trimester	43	1.4	46.66667	0.849	13.246	106.587	<0.001‡
	Second trimester	96	0.68	22.66667	0.703			
	Third trimester	161	0.99	33	0.703			
	Total	300	0.95		0.759			
Oral hygiene practices	First trimester	43	0.98	49	0.636	0.098	0.329	0.72§
	Second trimester	96	0.92	46	0.556			
	Third trimester	161	0.9	45	0.515			
	Total	300	0.92		0.545			

\*Degree of freedom, †Chi-square, ‡highly significant, §not significant

We found in our study that 64% of the expectant mothers brushed twice daily; however, this figure was lower when compared to the studies conducted in countries like Denmark, London, and Saudi Arabia where Christensen *et al.*,<sup>[17]</sup> Hullah *et al.*,<sup>[18]</sup> and Mansour *et al.*<sup>[19]</sup> reported 96%, 73.7%, and 77%, respectively. However, similar figures as our study were obtained in a survey conducted in Tamil Nadu, India by Ganesh *et al.*,<sup>[16]</sup> which reported that 66% of expectant mothers practiced brushing twice daily. The study also reported that only 24.4% of the mothers used any form of interdental aids.

Mother's oral hygiene, especially during pregnancy, plays an important role as it can have a direct influence on her infant's oral health. In this study, it was found that only 26.2% of expectant mothers were aware of the fact that increased incidence of dental caries in their oral cavity increased the caries risk factor in their infants. This finding was in accordance with the report of Shenoy *et al.*<sup>[18]</sup>

wherein 25.3% were found to have knowledge about this relationship. It was also found that only 22.2% of expectant mothers had knowledge about the transmission of decay-causing bacteria from mother to child by kissing or sharing of utensils. This response was lower compared to the survey conducted by Shenoy *et al.*<sup>[18]</sup> which reported 35.6% of subjects had knowledge about the transmission of bacteria from mother to child by kissing and sharing of utensils.

Surprisingly, the age factor did not produce any statistically significant difference in the expectant mothers' knowledge, attitude, and oral hygiene practices. This may have been due to the wide range of ages included in the study. However, when the knowledge and attitude scores were compared, it was found that expectant mothers in the higher age groups fared better. This response was similar to the finding reported in a survey conducted by Akpabio *et al.*<sup>[5]</sup> in Michigan, USA. This result should enlighten dental care providers to concentrate on younger mothers.



It was found that expectant mothers having a graduate or postgraduate degree had better knowledge, attitude, and oral hygiene practices. This finding was similar to the studies conducted by Sufia *et al.*<sup>[20]</sup> and Mascarenhas.<sup>[21]</sup> This emphasizes on the importance of directing the dental healthcare providers to concentrate more on the illiterate sections of the society.

The common belief is that mother's knowledge and attitude toward infant oral health improves with more than one pregnancy. However, our results revealed that expectant mothers in their first pregnancy and expectant mothers in the first trimester had a better knowledge and attitude and also followed better oral hygiene practices compared to expectant mothers in their second and third pregnancy and trimester. This may be due to the fact that expectant mothers in their first pregnancy and first trimester are more involved and keen to gain information from available sources.<sup>[19]</sup>

Thus, the data available from our survey re-emphasize the importance of providing information to expectant mothers on infant oral health.

## CONCLUSION

Based on the results of the present study, it can be concluded that expectant mothers' knowledge and attitude toward infant oral health and their oral hygiene practices were poor. Lack of advice and information from antenatal healthcare providers could be the primary reason for the poor knowledge and attitude levels among expectant mothers. So, dental health education and awareness through mass media should play an integral role to educate expectant mothers about the importance of infant oral health and good oral hygiene practices.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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