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Original Research Article

Knowledge and practices of mothers towards oral health of their 3-5 years children: a rural and urban comparative study

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ABSTRACT

Background: Mothers are responsible for developing novel behaviors in children. The negligibility given to the primary dentition by the mothers in developing good oral hygiene practices was due to the lack of knowledge on its importance. The study aimed to compare the difference in knowledge and practices among rural and urban mothers towards the oral health of their children in the Kanchipuram and Chennai districts of Tamil Nadu.
Methods: A community-based comparative cross-sectional study was carried out among 140 rural and 140 urban mothers of children between three to five years of age. The analysis of the study was carried out based on a 45-item questionnaire. The results used for comparison were based on descriptive statistics, chi-square test, independent t-test, one-way analysis of variance, and column proportion test (z test) using the statistical package for social science version 16.0. The significance level of all the tests was set at ($p \leq 0.05$).
Results: The 37.1% of the rural and 79.3% of the urban mothers were found to have high knowledge. While only 6.4% of the rural and 22.1% of the urban mothers were found to have high practice. Also, there was a significant difference in knowledge (p=0.000) and practice (p=0.008) among different educational groups of rural and urban mothers as well.
Conclusions: The majority of urban mothers have adequate knowledge regarding the oral hygiene of their children when compared with rural mothers. But the practices of both groups were drastically very low concerning their knowledge. The educational status of the mother had proved their advantage in their knowledge and practice.

Keywords: Knowledge, Practice, Mothers, Child, Oral health

INTRODUCTION

Primary teeth are the significant resources of a child. For children, the primary teeth are responsible for mastication, speech perfection, esthetics, and also paves the way for permanent dentition. The foundation of these vital functions is laid during the initial period of a child's life, and hence continuous care is very much important. On the contrary, if the oral hygiene measures are not systemized along with unhealthy eating habits at an improper frequency of diet will positively show the evidence of tooth decay.[1-3]

According to the previous studies done 60-90% of the school children worldwide have experienced dental caries and are most prevalent in Asian countries.[4] The prevalence of caries in Indian preschool children was estimated to be in the range between 40-70%, which affected the child's quality of life in the long term. Early childhood caries (ECC) have been alarming in many countries and created a noteworthy medical issue particularly in a socially distraught population. ECC is characterized when there is one or more decayed, absent, or restored deciduous teeth when a child is at 71 months of age or younger.[5]

According to Riedy et al maternal factors such as knowledge, attitude, practice, and health belief towards oral hygiene are accountable for high caries incidence in the socially disadvantaged group and also stated that socio-demographic and environmental factors are the significant determinants of oral health.[6]

The role of a mother plays a responsible role in installing adequate oral hygiene practices. But unfortunately, the mother responsible for the early childhood caries feels that the primary teeth which inevitably sheds, do not require much consideration in giving adequate oral hygiene. Ogunbodede et al stated that there is persistent inequality in oral health between rural and urban communities and also stated that lack of knowledge and practice contributes to this existence.[7]

The present study aims at the comparison of knowledge and practices of mothers towards the oral health of their children (3-5 years) between rural (Kanchipuram) and urban (Chennai) districts of Tamil Nadu.

METHODS

The present study is a community based Analytical cross-sectional study, approved by the institutional ethical Committee. The sample for the study was drawn on purposively selected respondents of mothers of children between 3-5 years of age, equally from the residents of Chennai district (urban) and Kanchipuram district (rural). Totally 280 participants were included. Participants were explained about the purpose and confidentiality of the study and requested to answer the self-administered questionnaire after giving verbal consent. The study was conducted in the context of a time frame of 3 months from May to July 2019.

The sample size is calculated using the formula:

$$N=(Z_{\alpha/2}+Z_{\beta})^2 \times (P_1(\quad)1-p_1)+p_2(1-p_2))/(p_1-p_2)^2$$

For a confidence level of 99%, α is 0.01 and the critical value is 2.576, for a power of 80%, β is 0.2 and the critical value is 0.84. The sample proportion of group one (p_1=60%) and group two (p_2=40%) respectively. A sample size of 280 is obtained which includes 140 in each group.

A self-administered questionnaire comprising of three parts; the first consisting of demographic details which included questions on age, sex, family size, mother's occupations, and mother's education. The second part consists of 27 questions for assessing knowledge and the third part consists of 10 questions to evaluate practices. The factors promoting oral health in children including oral hygiene, sugar intake, fluoride utilization, and awareness regarding infant oral health knowledge and practices were addressed. The proforma was developed in English, which was explained to the respondents in the local language. Face validation of the questionnaire to check for its feasibility, clarity, comprehensiveness, acceptability, and understanding of the questions was done among 20 participants. These people were not counted for the final evaluation.

The 27 questions were used to assess the knowledge, which was scored as follows: 0→ for the wrong answer and 2→ for the right answer. Based on the number of questions answered correctly the overall knowledge score was calculated. The total score is calculated as 54: 1. Good knowledge when the total score lies between 37-54, 2. An average knowledge when the total score lies between 19-36 and 3. Poor knowledge when total score lies between 1-18.

The 12 questions that assessed mothers' practice, which was scored as follows: 0→ for the wrong answer and 2→ for the right answer.

Based on the number of questions answered correctly practice scores were calculated. The total score is calculated as 24:1. Good practice if the total score lies between 17-24, 2. Moderate practice if the total score lies between 9-16 and 3. Poor practice if the total score lies between 1-8.

The data collected were transferred to the excel sheet and analyzed using SPSS version 16.0. Mean, standard deviation, and chi-square test was used to describe the quantitative and categorical variables respectively. Statistical significance of $p<0.05$ was taken into consideration.

RESULTS

A total of 280 respondents (rural=140, urban=140) were included in the study. All of them were mothers of children (3-5 years old) from the age group of 19 to 39 years. The demographic characteristics concerned to the mothers are given in the Table 1.

The 27 questions were asked to rural and urban mothers to assess the knowledge of their child's oral health. The proportion of positive answers by rural and urban mothers for each knowledge questions is shown in Table 2. The 81.4% of mothers from urban and 65% of rural had good knowledge on healthy teeth are very important to general health. On the aspect of dietary knowledge that sweets, chocolates, and sugary foods causes tooth decay is significantly higher 92.9% of urban and 67.9% of rural mothers (p=0.000). Knowledge with regard to the importance of fluoridated toothpaste in preventing caries again found to be higher (65%) in urban than (45%) in rural mothers. The mean knowledge score was found to be 35.62±4.728 and 40.44±5.266 for rural and urban mothers respectively.

Of the 12 questions asked to rural and urban mothers pertaining to the practices of their oral hygiene

behavior.47.9% of the rural mothers and 75% of the urban mothers assisted their child while brushing. When they were asked about the quantity of toothpaste used (r=54.3%) of rural and (u=58.6%) of urban mothers reported smear layer, r=20%, u=25.7%pea sized and r=25.7%, u=15.7% mothers reported full brush length. On assessing the practice of mouth examination, 39.3% of rural and 61.4% of urban mothers examined their child's mouth more often. The percentage of mothers who answered correctly for each practice questioning comparison to the knowledge response is shown in the Table 3. The mean practice score is found to be 12.55±2.382, 14.55±2.336 for rural and urban mothers respectively.

Table 4 shows the mean knowledge scores and practice scores with standard deviation on the knowledge and practices of mothers towards the oral health of their children (3-5 years) by their rural and urban location of residence. An independent sample t-test was done to compare the mean. The test shows that there is a significant difference in knowledge and practice between the mothers who reside in rural and those who reside in urban regions with t=-8.049, p=0.000, and t=-7.093, p=0.000 respectively. Thus, the null hypothesis of no difference between the mean is rejected, and state that there was a statistically significant difference in knowledge score, and practice score between rural and urban populations.

To examine whether educational status as a determinant of knowledge and practice of mothers towards the oral health of their children (3-5 years), a one-way ANOVA test was carried out. One-way analysis of variance for the educational status of mothers. The results of One way ANOVA test was highly significant for knowledge f (3, 276)=15.885, p=0.000, a significant difference in knowledge between mothers with different educational status was revealed. There was a significantly higher mean knowledge score in the postgraduate group (39.84±5.134) followed by the graduate group (39.08±5.388), higher secondary education group (37.54±5.041), and secondary education group (33.13±4.578). Similarly, one way ANOVA for practice scores comparing with the educational status of the mothers was carried out. The results stated significance, f (3,276)=3.989; p=0.008. There was a significant difference in practice between mothers with different educational status. The difference is shown with significantly higher mean practice score in the postgraduate group (13.87±2.45) followed by the graduate group (13.86±2.73), higher secondary education group (13.44±2.327), and secondary education group (12.33±2.240).

Table 1: Demographic characteristics of the study participants.

Demographic characteristics	Rural mothers, (n=140)		Urban mothers, (n=140)	
	N	%	N	%
Age (years)				
19-25	28	20	21	15 .0
26-30	78	55.7	69	49.3
31-35	9	6.4	28	20
35-39	25	17.9	22	15.7
Education				
Post-graduation	22	15.7	33	23.6
Graduation	46	32.9	72	51.4
Higher secondary education	46	32.9	22	15.7
Secondary education	26	18.6	13	9.3
Occupation				
professional worker	26	18.6	59	42.1
self-employed	12	8.6	17	12.1
daily worker	37	26.4	9	6.4
unemployed	65	46.4	55	39.3
unemployed	65	46.4	55	39.3
Monthly income (INR)				
<12,000	34	24.3	8	5.7
12,000-25,000	38	27.1	17	12.1
25,000-50,000	57	40.7	70	50
>50,000	11	7.9	45	32.1
Total number of children				
One	37	26.4	66	47.1
Two	71	50.7	54	38.6
Three	32	22.9	20	14.3

Table 2: Distribution of responses of the participants to the questions relating to knowledge (Rural n=140; urban n=140).

Mothers' knowledge related questions on child's oral health	Rural mothers		Urban mothers		P value
	N	%	N	%	
It is very important to have healthy teeth to have good general health	91	65	114	81.4	0.001
Can decay(caries) affect child's teeth below 5 years?	85	60.7	116	82.9	0.001
The first milk teeth appear in the child's mouth when the child is at 6 months of age	58	41.4	74	52.9	0.153
There are 20 milk teeth in a child's mouth	52	37.1	75	53.6	0.006
Complete toothing of milk teeth is seen by the age of 2.5 to 3 years	48	34.3	66	47.1	0.056
Weaning from a baby bottle to a sipping cup should be planned when the child is between 6-9 months of age	73	52.1	93	66.4	0.016
Dietary intake of sweets, chocolates, sugary foods causes tooth decay	95	67.9	130	92.9	0.001
Brushing your child's teeth can prevent tooth decay	85	60.7	115	82.1	0.001
Tooth decay is a common oral disease seen in a child	68	48.6	92	65.7	0.009
Does tooth paste contain flouride?	65	46.4	92	65.7	0.015
Flouride in tooth paste is important in preventing caries	63	45	91	65	0.001
Brushing of child's teeth should begin after the eruption of the first milk teeth	44	31.4	66	47.1	0.001
Thumbsucking, tongue thrusting, and mouth breathing leads to irregular teeth	68	48.6	85	60.7	0.124
Malaligned teeth can be aligned to the proper position	69	49.3	86	61.4	0.094
Avoidance of teeth loss due to caries is possible	72	51.4	97	69.3	0.004
Tooth filling can be done to save the tooth	68	48.6	90	64.3	0.001
It is necessary to maintain the good oral hygiene of milk teeth to have healthy permanent teeth	71	50.7	100	70.4	0.001

*P value calculated using chi-square test; p<0.05 is statistically significant.

Table 3: Comparison of knowledge and practices of mothers towards oral health of their children (3-5 years old) (Rural, n=140; urban, n=140).

Knowledge	Rural		Urban		P value
	N	%	N	%	
Indicator					
Child's first dental visit done at 6th month	56	40	72	51.4	0.041
Commencement of cleaning child's teeth done at 6th month	61	43.6	78	55.7	0.044
The child brushes the teeth twice daily	74	52.9	105	75	0.001
The child brushes the teeth for 2-3 mins	64	45.7	97	69.3	0.001
The child's tooth brush is changed for every 3 months once	81	57.9	103	73.6	0.007
Child rinses the mouth after every feed	44	31.4	55	39.3	0.038
Routine dental checkup done once in 6 months	25	17.9	39	27.9	0.127
Practice					
Child's first dental visit done at 6th month	15	10.7	18	12.9	0.198
Commencement of cleaning child's teeth done at 6th month	22	15.7	32	22.9	0.130
The child brushes the teeth twice daily	66	32.9	83	59.3	0.004
The child brushes the teeth for 2-3 mins	21	15	43	30.7	0.007
The child's tooth brush is changed for every 3 months once	40	28.6	64	45.7	0.005
Child rinses the mouth after every feed	28	20	36	25.7	0.1
Routine dental checkup done once in 6 months	10	7.1	15	10.7	0.052

*P value calculated using chi-square test; p<0.05 is statistically significant.

Table 4: Mean knowledge scores and practice scores with standard deviations on knowledge and practice of mothers towards the oral health of their children (3-5 years) by their residence.

Indicator	Rural, mean ± SD, (n=140)	Urban, mean ± SD, (n=140)	T	P value
Overall knowledge	35.62±4.728	40.44±5.266	-8.049	0.001
Overall practice	12.55±2.382	14.55±2.336	-7.093	0.001

*P value calculated using independent sample t test; p<0.05 is statistically significant.

The column proportion test (z test) was used for comparing two proportions (rural and urban population) for knowledge rank and practice rank. The test resulted as the urban mothers were inclined to high knowledge and rural mothers were inclined to moderate knowledge. Good practice was exhibited by the urban mothers and moderate practice was exhibited by the rural mothers. None of the population exhibit poor practice and knowledge.

DISCUSSION

Oral health knowledge of the mother is related to the oral health of the children as oral health-related propensities are set up amid the earliest stages and kept up all through their early childhood. Mothers are responsible for shaping up their child's behavior. The propensities embraced amid childhood when the child is completely subordinate to the mother are capable implies of setting up novel practices in children, for example, tooth brushing. Subsequently, mothers themselves ought to have a good knowledge of oral health so that they can instill adequate oral health practice in their children. Good oral health knowledge deciphers into good oral health practice and diet intake that have advantageous impacts on oral wellbeing.[1,7]

The results of this cross-sectional study on children's oral health provide a unique opportunity to analyze the difference in knowledge and practice of mothers in rural and urban regions that replicates the importance of primary dentition of their children. 27 questions were asked to assess the knowledge and 12 questions to assess oral health practices. The study mainly focused on the mothers of children 3-5 years of age since mothers of this age group are commonly attached to the children and also the period in which the complete eruption of primary teeth had been taken place. About 140 mothers from rural and 140 mothers from urban areas participated in this study. In the present study, it was seen that there was a difference in knowledge and practice among rural and urban mothers towards the oral health of their children.

A good percentage of more than half the proportion of urban (u=81.4%) and rural (r=65%) mothers answered that healthy teeth are very important to general health. The American academy of pediatric dentistry (AAPD) recommends that the child ought to be seen by a dental practitioner by 6 months of age after toothing of the first primary tooth and not more than 12 months of age. So early intercessions are required to teach mothers on oral health, avoidance of dental wounds, and prevention of early childhood caries. Consequently, a dental visit when the child is at 6 months is suggested.[8] In the present study, the knowledge between rural and urban mothers for the child's first dental visit at 6 months of age was rural r=40.0% and urban u=51.4% whereas, the practice of taking the child to the dentist by 6 months of age was only r=10.7%, u=12.9%.

A vital aspect of oral hygiene practice is brushing. In the present study, a major proportion of mothers accepted that their child's mouth ought to be cleaned to avoid tooth decay r=60.7%, u=82.1%. The knowledge of mothers on commencement of brushing the child's teeth after the eruption of 1st primary tooth was r=31.4%, u=47.1%. The results were comparable to the studies by Nagarajappa et al where more than half the proportion of the parents (58.7%), Shivaprakash et al (70%), and Suresh et al stated that the brushing the child's teeth ought to take place only after the eruption of all primary teeth.[7,9,10] But the practice of mothers on brushing the child's teeth from 6 months was only r=15.7%, u=22.9%.

The practice of child being bushed twice daily was r=32.9%, u=59.3%. But their knowledge was in higher proportion than the practice with r=52.9% and u=75%. When they were asked about the quantity of toothpaste used r=54.3%, u=58.6% reported smear layer, r=20%, u=25.7% pea sized and r=25.7%, u=15.7% reported full brush length.

In the study, most of the parents had a good understanding that diet plays a significant role in oral health and they believe that sugary foods contribute to tooth decay. It was revealed that there was r=67.9%, u=92.9% of mothers who believed that caries was caused due to sugar-containing food products. The study was comparable with the study conducted by Chandran et al, Suresh et al and Lin et al also stated that preschool children's parents had good knowledge of diet and its consequences in oral health.[1,10,11]

Although most of the mothers from the rural and urban regions had good knowledge about the diet that can cause tooth decay, obscurity was evident concerning the time of intake of sugary diet. The result was in harmony with the result of the study done by Jain et al which showed that there was constrained knowledge among the respondents concerning the frequency of sugar intake that can cause tooth decay.[12] Thus when the adults were asked that how often does the child takes sweet food in a day, only r=27.9%, u=40% of mothers give 1-2 times a day and the rest gives more than 3 times.

The knowledge of mothers when asked about cleaning the child's teeth every time after feeding was r=31.4%, u=39.3% but the practice of cleaning after every feed was only r=20%, u=25.7%

When the mothers were asked about the significance of fluoride toothpaste in the prevention of dental caries r=45%, u=65%, an average proportion of participants knew its purpose. A study carried out by Reddy et al showed that the knowledge regarding the role of fluoride was poor.[13]

When the mothers were asked that is it necessary to fill the decayed baby's teeth, founded that r=48.6%, u=64.3% of mothers agreed to it. These results were not in union

with the study carried out by Mani et al where 62% of the parents in the study disagreed to do fillings in deciduous teeth.[14]

When they were interviewed that how often do they examine their child's mouth, r=36.4%, u=27.9% of mothers agreed very less often they examined their child's teeth, r=39.3, u=61.4% answered more often and r=24.3%, u=10.7% occasionally.

A commendable proportion of guardians (97.5%) acknowledged that children ought to be accompanied and looked after while brushing in the study by Naidu and Davis. They described the Trinidadian population and stated that the supervision of brushing was seen as essential because manual adroitness was lacking in children and unsupervised brushing would be ineffective.[15] On the contrary in a study by Gussy et al, half the proportion of the respondents stated that by 4 years of age the children could brush their teeth.[16] In a study by Wong et al, the parents expected the child below 5 years should brush on his or her own.[17]

The AAPD states that the high prevalence of caries among the children has a significant association with the low educational status of mothers. Many studies such as Retnakumari and Cyriac and Kuriakose et al, Jain et al, Thakare et al and Suresh et al all stated an affiliation between dental caries incidence in children and the education status of parents especially mothers.[2,3,10,12,18] These statements are in support of the results of this study, which states that the educational status of the mother was significantly associated with knowledge and practice in maintaining adequate oral hygiene in children.

Shivaprakash et al stated that there was no difference between rural and urban parents' knowledge of the dental health of preschool children.[9] In our present study, both the rural and urban mothers had an appreciable proportion of knowledge, but the urban mothers had considerably higher knowledge than rural mothers. The results of practice showed a significant difference among rural and urban mothers, where moderate practicing was prevalent among the rural population and high practice was prevalent among the urban population. These results were comparable with the results of Thakare et al which showed that the majority of the participants had an appreciable amount of knowledge and followed good oral hygiene practices for their children.[18] On the contrary, Wong et al found that there were poor practices among Chinese parents who considered primary dentition does not deserve any attention as the permanent dentition, and these observations were replicated in declined dental treatment in children.[17]

The plausible elucidation for the difference in knowledge and practice among rural and urban mothers may be due to awareness deficiency on the importance of primary dentition among the mothers and on how to competently decipher that knowledge into day-by-day practices. Another reality as expressed by Glick et al was the uneven dispersion of practicing dental specialists in different locations which brought about in excess within a few urban areas, with a basic deficiency within the rural areas.[19]

CONCLUSION

The majority of urban mothers have adequate knowledge when compared with rural mothers. the practices of both rural and urban mothers towards the oral hygiene of their children are drastically very low related to their knowledge. Also, the educational status of the mother had proved their advantage in their knowledge and practice. Awareness programs on the importance of primary dentition focusing on oral hygiene practices should be inculcated in both rural and urban areas.

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