

**ORIGINAL RESEARCH**

# Maternal awareness and practices about the effect of nursing bottle induced dental Caries in Preschoolchildren in Chennai district - A Cross-sectional study

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Received date: 21 January, 2024

Acceptance date: 27 February, 2024

### ABSTRACT

**Introduction& Aim:** Early childhood caries, often known as nursing bottle caries, increases the risk of caries throughout the permanent dentition and lowers quality of life children. This study was contemplated to assess the knowledge, attitude and practices about nursing bottle caries among mothers of pre-school children. **Methodology:** This cross sectional study was conducted among the 300 mothers of Pre-school children who visited the Out Patient of Pedodontics department of Ragas Dental College and Hospital were recruited for the study conducted for a period of May 2023 to November 2023. Pre validated Questionnaire consists of three parts (Knowledge, Attitude and Practices), each part consist of 6 closed end questions. This investigator administered questionnaire was distributed the participants and responses were collected and analyzed by using SPSS software. **Results:** Mean age of the participants was  $25.44 \pm 3.48$ . Among the total mothers. 52.6% were from rural background 64.9% of the mothers were aware the term nursing bottle caries, 65.5% of the mothers doesn't know when to consult the dentist for very first consultation, 46.7% of mothers bottle fed their children more than two years. 92% of the mothers used bottle as a pacifier when your baby falls asleep. **Discussion and Conclusion:** Based on our study results, it was concluded that 64.3% mothers of preschool children's were aware about nursing bottle caries. But the attitude towards nursing bottle caries and various practices methods to prevent the nursing bottle caries was significantly less.

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### INTRODUCTION

The American Association of Paediatric dentistry defines Early childhood caries (ECC) or nursing bottle caries is the incidences of one or more cavitated or non-cavitated lesions, missing resulting from caries in the primary tooth of children under the age of 71 months which result in rapid destruction of normal teeth<sup>1</sup>.

Early childhood caries, often known as nursing bottle caries, increases the risk of caries throughout the permanent dentition era and lowers quality of life childrens in later half of the life<sup>2</sup>. Nursing bottle caries comprises three distinct phases in its etiology. The streptococci mutans infection begins in the first phase.

The second stage occurs when the level of pathogenicity is elevated by extended exposure to the cariogenic agent. The third stage, known as the demineralization phase, is characterized by the enamel's quick deterioration, leading to widespread dental cavities<sup>3</sup>. In preschoolers and infants, prolonged exposure to milk, sugary drinks, or other cariogenic substances before bed has been demonstrated to be the most common cause of nursing caries<sup>4</sup>. However, the pathogenesis depends on oral physiology, genetic predisposition, the pattern of eruption, and cariogenic feeding habits<sup>5</sup>. Milk's lactose content has led to its classification as non-cariogenic. On the other hand, it has been demonstrated that extended bottle feeding

that comes into touch with the tooth surface can cause dental caries<sup>6</sup>. Because of the buildup of bottle milk or liquid around the teeth, the afflicted site—which typically includes the buccal surface of the maxillary central incisor and the occlusal surface of the first deciduous molars—determines the diagnosis of nursing bottle caries. The submandibular gland's flushing and buffering solution, together with the bottle head's positioning beneath the maxillary incisor and over the tongue, contribute to the lower incisor region's decreased incidence of Nursing bottle caries. Previous studies have shown the relationship between feeding habits and the incidence of dental caries<sup>7</sup>. According to AZ Wright's pedodontic triangle, a child's general health is the responsibility of both their parents (the mother) and the dentist. With this background, this study was contemplated to assess the knowledge, attitude and practices about nursing bottle caries among mothers of pre-school children in Chennai district.

## MATERIALS AND METHODS

### STUDY DESIGN AND STUDY SETTING

This cross sectional study was conducted among the mothers of Pre-school childrens those who are visiting the out patients of Pedodontics department a Ragas Dental college and hospitals in Chennai district, Tamilnadu. Informed consent was obtained from all the participants after providing information sheet. The ethical committee of the Ragas dental college gave its approval for the study's ethical clearance and permission to proceed.

### INCLUSION AND EXCLUSION CRITERIA

Mothers of pre-school childrens ( Less than 3 years), as well as subjects who had given their written agreement to participate in the study. Participants who were unwilling to engage were excluded.

### STUDY SAMPLE

The study was conducted for a period of May 2023 to November 2023. Sample size was calculated by using G power software, with respect to effect size = 0.04, power = 0.8 and  $\alpha = 0.05$ , the sample size was calculated as 285 individuals ( Roundoff to 300 participants). Based on the simple random sampling, 300 patients who visited the Out Patient of Pedodontics department of Ragas Dental College and Hospital were recruited for the study.

### QUESTIONNAIRE DEVELOPMENT

A standard methodology of questionnaire development was used that included item development, content validation, pilot testing. A investigator-administered questionnaire for knowledge, attitude and practices about nursing bottle caries among mothers of pre-school children was developed in English language which was then translated into local language, i.e., Tamil, in a

standardized manner, using previous literature evidence by Fatani B et al<sup>4</sup>.

Questionnaire consists of three parts ( Knowledge, Attitude and Practices), each part consist of 6 closed end questions. The validity of this questionnaire has been tested with experts in the field. The questionnaire was pretested among randomly selected 10 individuals. The internal consistency and reliability of the questionnaire was tested with a pilot study with 10 participants. The values are indicating good reliability and consistency. Cronbach's alpha  $\alpha = 0.85$ . The questionnaire included background characteristics of the respondents (age, socio economic status, living in urban or rural areas)

### DATA COLLECTION

This investigator administered questionnaire was distributed the participants and responses were collected and stored.

### STATISTICAL ANALYSIS

Statistical analysis was performed using a personal computer in IBM corp. Statistical Package For social sciences software for windows; version 22.0 (Armonk, NY). In order to determine the statistical significance of the acquired results, a data comparison was conducted using specific statistical tests. Detailed descriptive statistics was calculated and a simple frequency distribution table is tabulated.

### RESULTS

**Table 1** shows, the characteristics of the study participants based on demographic pattern and social characteristics. In the present study, 300 mothers of preschool childrens were participated. Mean age of the participants was  $25.44 \pm 3.48$ . Among the total mothers, 52.6% were from rural background & 48.3% were belongs to upper lower class of socio economic classes.

**Table 2** shows, distribution of study participants based on the knowledge regarding nursing bottle caries. Among the total participants, 64.9% of the mothers were aware the term nursing bottle caries, and 48.3% mothers stated that, bacteria could be the reason for nursing bottle caries. 75.7% mothers were stated no genetic background for nursing bottle caries. In this study 76.6% mothers brush their children's teeth after eruption of primary tooth only.

**Table 3** shows, distribution of study participants attitude towards nursing bottle caries. Based on this, 90.3% mothers stated that, primary teeth doesn't require good care. 65.5% of the mothers doesn't know when to consult the dentist for very first consultation & 75.5% mothers not aware about any prevention strategy towards prevention and care of nursing bottle caries. Only 27.6% of mothers stated that, cleaning of gum pads before the teeth eruption is necessary.

**Table 4** shows, distribution of study participants practice methods towards nursing bottle caries. Based

on this results, 97% of mothers bottle fed their children and 46.7% of mothers bottle fed their children more than two years. 92% of the mothers

used bottle as a pacifier when your baby falls asleep and 93% of mothers never visited a dentist for any treatment/consultation for their children's.

**Table 1 – Demographic details of the participants**

Variable	Total Participants ( Frequency percentage) = 300
Age (Mean ± SD)	25.44 ± 3.48
<b>Location</b>	
Rural	158 ( 52.6% )
Urban	142 ( 47.4 % )
<b>Socio economic status</b>	
Upper Middle	29 (9.6 % )
Lower Middle	59(19.9%)
Upper Lower	146 (48.3%)
Lower	66(22.1%)

**Table 2 - Frequency distribution knowledge about nursing bottle caries among mothers.**

Variables ( Questions)	Total Participants ( Frequency percentage) = 300
1. Are you aware of the term “Nursing bottle caries”? <b>Yes</b> <b>No</b>	<b>193 (64.3%)</b> <b>107 ( 35.7%)</b>
2. If yes to the above question, do you know the reason for nursing bottle caries? a)bacteria b)diet including milk/non milk product c)all of the above d)none of the above	<b>145 ( 48.3%)</b> <b>131 ( 43.6%)</b> <b>24 8%)</b> <b>0</b>
3. Do you think nursing bottle caries has genetic background? <b>Yes</b> <b>No</b>	<b>73 ( 24.3%)</b> <b>227 ( 75.7%)</b>
4. Do you think sugar in any form can cause dental caries? <b>Yes</b> <b>No</b>	<b>122 ( 40.6%)</b> <b>178 ( 59.4%)</b>
5. Is breast/bottle feeding advisable before sleep? <b>Yes</b> <b>No</b>	<b>81 (27%)</b> <b>219( 73%)</b>
6. Do you know when to start brushing your baby teeth? a) Before eruption b)after tooth eruption c)1 year after eruption d)2 years after eruption	<b>17 ( 5.6%)</b> <b>230 (76.6%)</b> <b>33( 11%)</b> <b>20 ( 6.8%)</b>

**Table 3- Frequency distribution of attitude towards nursing bottle caries among mothers.**

Variables ( Questions)	Total Participants ( Frequency percentage) = 300
Do you think milk teeth do not require good care? <b>Yes</b> <b>No</b>	<b>271 (90.3%)</b> <b>29 ( 9.7%)</b>
Do you know when to consult the dentist for very first consultation? <b>Yes</b> <b>No</b>	<b>104 ( 34.6%)</b> <b>196 ( 65.4%)</b>
Is it necessary to take your child for dental visit every 6 months even without any dental problem? <b>Yes</b>	<b>222 (74%)</b>

<b>No</b>	<b>78 (26%)</b>
Do you think frequent(1.5-2 years) breast/bottle feed will lead to dental caries? <b>Yes</b>	<b>177 ( 59%)</b>
<b>No</b>	<b>123 (41%)</b>
Is it necessary to clean gum pads before the teeth eruption? <b>Yes</b>	<b>83 (27.6%)</b>
<b>No</b>	<b>217 ( 72.4%)</b>
Do you know how to prevent nursing bottle caries? <b>Yes</b>	<b>76 ( 25.3%)</b>
<b>No</b>	<b>224 ( 74.7%)</b>

**Table 4- Frequency distribution of practices of nursing bottle caries among mothers.**

<b>Variables ( Questions)</b>	<b>Total Participants ( Frequency percentage) = 300</b>
Do you bottle feed your baby? <b>Yes</b>	<b>291 ( 97%)</b>
<b>No</b>	<b>9( 3%)</b>
Years of Duration of bottle feeding? a)0-1 year	<b>102 ( 34%)</b>
b)1-2 years	<b>58 ( 19.3%)</b>
c)more than 2 years	<b>140 (46.7%)</b>
Do you clean the gum pad of your baby after every feeding? <b>Yes</b>	<b>88 ( 29.3%)</b>
<b>No</b>	<b>212 ( 70.7%)</b>
Do you use bottle as a pacifier when your baby falls asleep? <b>Yes</b>	<b>276 ( 92%)</b>
<b>No</b>	<b>24 (8%)</b>
Have you ever visited a dentist for any treatment/consultation ? <b>Yes</b>	<b>21 ( 7%)</b>
<b>No</b>	<b>279 ( 93%)</b>
Have you tried any preventive method for oral care? <b>Yes</b>	<b>99 ( 33%)</b>
<b>No</b>	<b>201 ( 67%)</b>

## DISCUSSION

There is strong scientific evidence to support the theory that nursing caries is a communicable illness. This data provides compelling evidence to support the theory that infants with feeding habits that involve frequent and prolonged oral exposure to cariogenic substrates and are colonised by mutans streptococci are likely to experience a sharp rise in oral mutans streptococci populations, which in turn causes nursing bottle caries to develop.

Our study was contemplated to assess the knowledge and practices about nursing bottle caries among mothers of preschool children. Based on our study results, Among the total participants, 64.9% of the mothers were aware the term nursing bottle caries, and 48.3% mothers stated that, bacteria could be the reason for nursing bottle caries.75.7% mothers were stated no genetic background for nursing bottle caries. It was similar to the study done by **fatani B et al<sup>4</sup>**, based on this Overall the awareness about the incidence of Nursing bottle caries in the study population is highly significant (90.4%). Also, 61.7%

of the population acknowledged the most common leading cause of early childhood caries was bacteria and milk products.

In the aspect of mothers attitude towards nursing bottle caries, 90.3% mothers felt that primary teeth doesn't require good care. Only 34.5% of the mothers knew about when to consult the dentist for very first consultation, which is similar to the study done by **Elkarmi et al<sup>8</sup>** showed that only 12% of mothers knew that the first dental visit for a child should be at an age of one.75.5% mothers not aware about any prevention strategy towards prevention and care of nursing bottle caries. It is similar to the study by **Suprabha BSet al<sup>9</sup>** showed that parents faced challenges in applying proper home oral hygiene and the lack of knowledge about the type of toothbrush and toothpaste for their children.

In the aspects of mother practices to prevent nursing bottle caries, 97% of mothers bottle fed their children and 46.7% of mothers bottle fed more than two years. 93% of mothers never visited a dentist for any treatment/consultation for their children's. Similarly,

another study by **Al sane M et al**<sup>10</sup> proved that only 8% of women knew that 6–12 months is the recommended age for the first dental visit. Another study by **Fatani B et al**<sup>4</sup> denoted that, Only 33% of parents believe that the follow-up with the children oral hygiene should start before the age of 1 year.

## CONCLUSION

Based on our study results, it was concluded that 64.3% mothers of preschool children's were aware about nursing bottle caries. But the attitude towards nursing bottle caries and various practices methods to prevent the nursing bottle caries was significantly less. The oral health of nursing children may be drastically improved if mothers receive health education information on oral hygiene and caries prevention strategy & beginning good oral hygiene even before the first tooth erupts & scheduling a timely first dental appointment when the toddler turns one year old. This crucial element may help policy legislators enhance procedures that promote improved oral health for young children while maintaining breastfeeding.

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