Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 32s (2025)
https://www.jneonatalsurg.com

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Parental Knowledge, Attitude and Practices Regarding Oral Health in Children Under 6 Years of Age

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Cite this paper as: Dr. S. Aravind Kumar, (2025) Parental Knowledge, Attitude and Practices Regarding Oral Health in Children Under 6 Years of Age. *Journal of Neonatal Surgery*, 14 (32s), 5273-5280

ABSTRACT

Background: Early childhood caries is a prevalent chronic condition among young children, heavily influenced by parental knowledge, attitudes, and behaviors. Assessing these factors is vital for designing effective preventive strategies in primary dental care.

Objectives: To evaluate parental knowledge, attitudes, and practices (KAP) related to oral health in children under 6 years of age and to analyze the interrelationships among these domains.

Methods: A cross-sectional survey was conducted from May to July 2025 at a tertiary care hospital in India. One hundred and fifty parents of children aged 6 months to 6 years were enrolled consecutively from the pediatric outpatient department. A prevalidated 25-item questionnaire assessed knowledge (10 items; score 0–10, adequate ≥7), attitude (8 statements on a 5-point Likert scale; score 8–40, positive ≥32), and practices (7 questions on hygiene and dietary habits). Scores were summarized as mean ± SD or percentages. Pearson's correlation tested associations between KAP domains. Statistical significance was set at $p \leq 0.05$.

Results: Participants had a mean age of 29.8 ± 5.4 years; 72% were mothers. The mean knowledge score was 7.1 ± 1.8, with 68% achieving adequate knowledge. The mean attitude score was 34.2 ± 3.6, and 74% exhibited a positive attitude toward preventive oral care. Practice assessment revealed that 81% assisted their child with toothbrushing twice daily, while only 28% had arranged a dental visit by age 2. The mean practice index was 5.2 ± 1.1. Knowledge correlated positively with practice ($r = 0.35$, $p < 0.001$) and attitude ($r = 0.42$, $p < 0.001$); attitude also correlated with practice ($r = 0.29$, $p = 0.002$).

Conclusion: While most parents demonstrated moderate knowledge and positive attitudes toward their children's oral health, gaps remain in early professional dental care and consistent hygiene practices. Targeted educational interventions are recommended to bridge these gaps and promote optimal oral health behaviors.

Keywords: *Parental knowledge; Attitude; Practices; Oral health; Early childhood caries.*

1. INTRODUCTION

Early childhood caries (ECC) remains one of the most prevalent chronic diseases affecting young children worldwide. Characterized by the presence of one or more decayed, missing, or filled tooth surfaces in any primary tooth in children under six years of age, ECC can lead to pain, infection, impaired nutrition, and adverse effects on growth and development. In addition to immediate oral health consequences, untreated ECC may contribute to long-term problems with permanent dentition, self-esteem, and school performance [1,2].

Parental influence plays a pivotal role in shaping children's oral hygiene habits and dietary behaviors. From the earliest months of life, parents make critical decisions regarding feeding practices, bottle use, and the timing of the first dental visit [3]. Their own knowledge about causes of caries, attitudes toward preventive care, and day-to-day practices such as supervising toothbrushing and limiting sugary snacks directly affect children's risk of developing ECC. Moreover, parents serve as role models: children whose caregivers maintain regular oral hygiene routines are more likely to adopt similar behaviors [4].

Despite the well-established importance of parental involvement, studies have documented substantial gaps in knowledge and inconsistent practices across diverse settings. Some caregivers remain unaware of the cariogenic potential of prolonged

bottle feeding, night-time milk or juice exposure, and inadequate brushing techniques [5]. Attitudes toward professional dental care vary widely; for many families, a first dental visit occurs only after pain or obvious decay, rather than as a preventive measure. In turn, inadequate preventive practices perpetuate a cycle of disease and treatment, placing a significant burden on families and healthcare systems [6].

In the Indian context, cultural practices and socioeconomic factors further influence parental behaviors. Traditional remedies, beliefs about teething, and limited access to pediatric dental services in some regions may delay or discourage early preventive visits. Urbanization and changing dietary patterns have also increased children's exposure to processed, sugar-containing foods and beverages. Yet, systematic data on parents' oral health knowledge, attitudes, and practices in tertiary-care populations remain scarce, hindering the design of tailored educational interventions [7,8].

Given these considerations, a comprehensive assessment of parental KAP regarding young children's oral health in an Indian tertiary-care setting is warranted. By quantifying knowledge gaps, identifying attitudinal barriers, and documenting routine practices, this study aims to generate actionable insights. Such information will inform the development of culturally appropriate, evidence-based educational programs, strengthen anticipatory guidance during pediatric visits, and ultimately contribute to the reduction of ECC prevalence and its sequelae in early childhood.

2. AIM AND OBJECTIVES

Aim

To assess parental knowledge, attitudes, and practices regarding oral health in children under six years of age at a tertiary care hospital in India.

Objectives

1. To determine the level of parental knowledge about early childhood caries, oral hygiene techniques, and dietary risk factors.
2. To evaluate parental attitudes toward preventive dental care, including timing of first dental visit and perceived importance of regular check-ups.
3. To document oral health practices, such as frequency of supervising toothbrushing, use of fluoride toothpaste, and dietary habits related to sugar exposure.
4. To categorize parents into adequate versus inadequate knowledge and positive versus negative attitude groups based on prevalidated score thresholds.
5. To analyze associations between parental demographics (age, education level, socioeconomic status) and KAP domains.
6. To explore correlations among knowledge, attitude, and practice scores to identify whether higher knowledge translates into better attitudes and practices.
7. To identify key gaps in KAP that can inform the design of targeted educational interventions for improving early childhood oral health.

3. MATERIALS AND METHODS

Study Design and Setting

A descriptive, cross-sectional survey was carried out from May to July 2025 at the pediatric outpatient department of a tertiary care hospital in India.

Ethical Approval

The study protocol was approved by the Institutional Ethics Committee of the hospital. Written informed consent was obtained from all participating parents.

Sample Size and Sampling

Based on feasibility and outpatient flow, 150 parents of children aged 6 months to 6 years were enrolled consecutively during the study period.

Inclusion and Exclusion Criteria

- **Inclusion:** Parents or primary caregivers of children under 6 years attending the pediatric clinic; able to understand and respond to the questionnaire in English or Local language.
- **Exclusion:** Parents of children with congenital oral anomalies or underlying chronic illnesses; unwilling to provide informed consent.

Questionnaire Development and Validation

A 25-item questionnaire was adapted from previously published KAP studies and prevalidated in a pilot of 20 parents (Cronbach's $\alpha = 0.82$). It comprised three domains:

- **Knowledge (10 items):** Causes and prevention of early childhood caries, oral hygiene techniques.
- **Attitude (8 items):** Beliefs about timing of first dental visit, importance of preventive care; rated on a 5-point Likert scale.
- **Practices (7 items):** Supervision of toothbrushing, use of fluoride toothpaste, dietary habits (e.g., sugary snacks, bottle feeding).

Data Collection

Trained research assistants administered the questionnaire via face-to-face interviews in a private setting. Demographic information (parental age, gender, education level, socioeconomic status) was recorded.

Scoring and Cutoffs

- **Knowledge:** Total score 0–10; score ≥7 classified as adequate knowledge.
- **Attitude:** Total score 8–40; score ≥32 classified as positive attitude.
- **Practices:** Seven items scored 0 or 1; total practice index 0–7; higher scores indicate better practices.

Statistical Analysis

Data were entered into SPSS v25.0. Continuous variables are presented as mean ± SD; categorical variables as frequencies and percentages. Group comparisons by demographic variables used independent-samples t-test or one-way ANOVA for continuous scores, and chi-square test for categorical categories. Pearson's correlation coefficients assessed relationships among knowledge, attitude, and practice scores. A two-tailed p-value ≤ 0.05 was considered statistically significant.

4. RESULTS

An overview of key findings is provided below, followed by detailed tables. Of the 150 parents surveyed (mean age 29.8 ± 5.4 years; 72% mothers), 60% held a graduate degree and 40% had completed up to high school. Socioeconomic status (SES) was classified as high (33%), middle (40%), or low (27%). The mean knowledge score was 7.1 ± 1.8 (adequate in 68%), mean attitude score was 34.2 ± 3.6 (positive in 74%), and mean practice index was 5.2 ± 1.1. Key practices included assisting children with toothbrushing twice daily (81%), use of fluoride toothpaste (68%), and dental check-ups by age 2 (28%). Knowledge correlated positively with attitude ($r = 0.42$, $p < 0.001$) and with practice ($r = 0.35$, $p < 0.001$); attitude also correlated with practice ($r = 0.29$, $p = 0.002$).

Table 1: Demographic Characteristics of Participants

Table 1 summarizes age, gender, education, and socioeconomic status of the 150 parents.

Characteristic	Value
Age, years (mean ± SD)	29.8 ± 5.4
Mothers, n (%)	108 (72%)
Fathers, n (%)	42 (28%)
Education – Graduate, n (%)	90 (60%)
Education – Up to High School, n (%)	60 (40%)
SES – High, n (%)	50 (33%)
SES – Middle, n (%)	60 (40%)
SES – Low, n (%)	40 (27%)

Table 2: Knowledge Domain Scores

Table 2 presents mean knowledge scores and the proportion with adequate knowledge.

Parameter	Value
Knowledge score (0–10), mean ± SD	7.1 ± 1.8
Adequate knowledge (≥7), n (%)	102 (68%)

Table 3: Attitude Domain Scores

Table 3 details mean attitude scores and the proportion with positive attitudes.

Parameter	Value
Attitude score (8–40), mean ± SD	34.2 ± 3.6
Positive attitude (≥32), n (%)	111 (74%)

Table 4: Practice Domain Scores

Table 4 shows mean practice index and key practice frequencies.

Parameter	Value
Practice index (0–7), mean ± SD	5.2 ± 1.1
Assisted brushing twice daily, n (%)	122 (81%)
Fluoride toothpaste use, n (%)	102 (68%)
Dental visit by age 2, n (%)	42 (28%)

Table 5: Knowledge by Education Level

Table 5 compares knowledge scores and adequacy by parental education.

Education Level	Score mean ± SD	Adequate knowledge, n (%)	p-value
Graduate (n=90)	7.5 ± 1.6	70 (78%)	
Up to High School (n=60)	6.5 ± 1.9	32 (53%)	<0.001

Table 6: Attitude by Socioeconomic Status

Table 6 presents attitude scores and positivity by SES.

SES Group	Score mean ± SD	Positive attitude, n (%)	p-value
High (n=50)	36.8 ± 2.4	45 (90%)	
Middle (n=60)	34.1 ± 3.6	45 (75%)	0.002
Low (n=40)	31.6 ± 4.1	21 (55%)	<0.001

Table 7: Practice Index by Gender

Table 7 compares mean practice index between mothers and fathers.

Gender	Practice index mean ± SD	p-value
Mothers (n=108)	5.3 ± 1.0	
Fathers (n=42)	4.9 ± 1.3	0.12

Table 8: Practice Index by Attitude Category

Table 8 contrasts practice indices based on attitude positivity.

Attitude Category	Practice index mean ± SD	p-value
Positive (n=111)	5.5 ± 0.9	
Negative (n=39)	4.2 ± 1.0	<0.001

Table 9: Knowledge vs. Practice Categories

Table 9 shows practice index by knowledge adequacy.

Knowledge Category	Practice index mean ± SD	p-value
Adequate (n=102)	5.6 ± 0.8	
Inadequate (n=48)	4.6 ± 1.1	<0.001

Table 10: Correlation Matrix of KAP Domains

Table 10 presents Pearson's correlation coefficients among knowledge, attitude, and practice scores.

Correlation Pair	r	p-value
Knowledge vs. Attitude	0.42	<0.001
Knowledge vs. Practice	0.35	<0.001
Attitude vs. Practice	0.29	0.002

Table 11: Knowledge Scores by SES

Table 11 displays mean knowledge scores stratified by SES.

SES Group	Knowledge score mean ± SD	p-value
High (n=50)	7.8 ± 1.5	
Middle (n=60)	7.0 ± 1.7	0.01
Low (n=40)	6.4 ± 1.8	<0.001

Table 12: Attitude Scores by Education Level

Table 12 compares mean attitude scores between education groups.

Education Level	Attitude score mean ± SD	p-value
Graduate (n=90)	35.4 ± 3.0	
Up to High School (n=60)	32.3 ± 3.8	<0.001

Table 1 outlines participant demographics, showing a predominance of mothers (72%) and a majority with graduate education (60%). **Table 2** reports a mean knowledge score of 7.1 with 68% adequate knowledge. **Table 3** indicates a mean attitude score of 34.2 and 74% positive attitudes. **Table 4** shows a mean practice index of 5.2, with high rates of brushing assistance (81%) but lower rates of early dental visits (28%). **Table 5** reveals significantly higher knowledge among graduates versus non-graduates ($p < 0.001$). **Table 6** demonstrates a gradient in positive attitudes across SES groups, highest in high SES (90%) and lowest in low SES (55%) ($p < 0.001$). **Table 7** shows no significant gender difference in practice index. **Table 8** and **Table 9** highlight that positive attitudes and adequate knowledge are each associated with better practices ($p < 0.001$). **Table 10** presents significant positive correlations among all KAP domains. **Table 11** and **Table 12** further confirm that higher SES and education levels are linked to better knowledge and attitudes ($p < 0.001$).

5. DISCUSSION

This study provided a comprehensive assessment of parental knowledge, attitudes, and practices (KAP) regarding oral health in children under six years of age at a tertiary care hospital in India. The overall finding of moderate knowledge (mean score 7.1/10) and generally positive attitudes (mean score 34.2/40) aligns with previous surveys that have shown caregivers are aware of basic oral health concepts yet harbor gaps in specific preventive behaviors. Despite this awareness, actual practices particularly early professional dental visits were suboptimal: fewer than one-third of parents had taken their child for a check-up by age two [9,10].

The strong positive correlations observed among knowledge, attitude, and practice domains suggest that higher parental knowledge was associated with more favorable attitudes and, in turn, better practices [11]. This cascade underscores the potential value of educational interventions that not only impart information but also shape positive beliefs, thereby translating into improved daily behaviors. The gradient of KAP scores across education and socioeconomic strata further highlighted that parents with higher education and SES demonstrated significantly better knowledge and attitudes, reflecting wider access to health information and preventive resources [12,13].

Primary strengths of the study included its use of a prevalidated questionnaire with good internal consistency, face-to-face administration to minimize misunderstanding, and inclusion of a broad demographic spectrum. The sample size of 150 parents provided adequate power to detect meaningful differences across subgroups, and the high response rate mitigated the risk of nonresponse bias [14].

However, several limitations should be acknowledged. First, the cross-sectional design precluded inference of causality; whether improved knowledge would directly lead to sustained practice changes remains to be tested in longitudinal or interventional studies [15]. Second, self-reported practices may have been influenced by social desirability bias, potentially overestimating optimal behaviors such as brushing assistance. Third, the single-center setting limits generalizability to other regions with different cultural or healthcare contexts. Finally, although the questionnaire was administered in English and Hindi, nuances in comprehension may have varied among participants with differing literacy levels [16,17].

These findings carry important implications for oral health promotion. Educational programs targeting parents should prioritize reinforcing specific preventive actions such as initiating dental visits by age one or two and address common misconceptions (e.g., the benign nature of night-time milk feeds) [18]. Integrating such counseling into routine pediatric visits could capitalize on existing healthcare contact points. Moreover, tailored strategies to reach lower-SES and less-educated parents through community outreach or multimedia tools may help narrow disparities in both knowledge and practices [19].

Future research should evaluate the impact of structured educational interventions on actual behavioral outcomes and dental health status in children. Randomized trials comparing didactic education versus interactive, skill-based training (e.g., supervised brushing workshops) could clarify the most effective modalities. In addition, qualitative studies exploring parents perceived barriers to early dental care would inform the design of culturally sensitive, feasible programs [20].

While parents demonstrated reasonable awareness and positive beliefs about children's oral health, a clear gap persisted between these domains and preventive practices especially professional dental visits. Addressing this disconnect through targeted, context-specific education and health-system integration may substantially reduce the burden of early childhood caries.

6. CONCLUSION

Parents of children under six years exhibited moderate knowledge and generally positive attitudes toward oral health, yet key preventive practices particularly early professional dental visits were lacking. Educational interventions integrated into pediatric care, tailored to lower-SES and less-educated groups, are recommended to bridge the gap between knowledge and practice. Such targeted efforts may contribute to a meaningful reduction in early childhood caries.

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