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Relationship Between Prevalence of Dental Caries and Parental Knowledge and Practices Toward Oral Health of Children Aged 1 To 17 Years.

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KEYWORDS

Dental caries, Parental knowledge, Oral health, Dental hygiene, Children

ABSTRACT:

Dental caries is one of the most prevalent chronic diseases in children worldwide, affecting 60-90% of this population. It poses significant challenges to healthcare systems, impacting children's health, quality of life, and overall well-being. Understanding the role of parental knowledge and practices in preventing and managing dental caries is crucial for developing effective public health strategies and awareness campaigns that can reduce its incidence and promote better oral health in children. Aims and Objective: To investigate the relationship between the prevalence of dental caries and parental knowledge and practices related to the oral health of children aged 1 to 17 years. Materials and Methods: A prospective cross-sectional study was conducted from March to May 2023, involving 1500 children aged 1 to 17 years. Data were gathered using a modified semi-structured questionnaire based on the WHO Oral Health Assessment for Children, focusing on parental knowledge and practices.Results: The prevalence of dental caries varied, with 42.5% of children having no caries and atleast 11.5% having one caries tooth. Significant associations were found between dental caries prevalence and parental education (p=0.002) and socio-economic status (p=0.001). Additionally, 66.4% of participants did not visit the dentist regularly, and practices like bottle feeding (88.4%) and frequent sugary food consumption (88.6%) were linked to higher caries rates. Brushing frequency (r=0.58, p=0.034) and duration (r=0.51, p=0.046) also correlated with caries prevalence.Conclusion: Parental knowledge and practices significantly impact dental caries prevalence, highlighting the need for targeted public health interventions to reduce dental caries among children.

INTRODUCTION

Dental caries is a prevalent health issue, affecting 60-90% of children worldwide, and can significantly impact their quality of life through pain, discomfort, and serious dental complications if left untreated[1]. As a multifactorial disease, dental caries is linked to several risk factors, including poor oral hygiene, dietary habits, nutritional imbalances, and inadequate fluoride use[2]. These factors make dental caries a complex condition that requires comprehensive preventive measures. Parental knowledge and education are crucial in preventing dental caries, especially during early childhood when proper oral hygiene habits are first established. Early Childhood Caries (ECC) is a particularly severe form of this disease that affects young children, posing significant threats to their physical, psychological, and social well-being[3]. Tooth loss from ECC can impair eating, sleeping, speaking, and socializing abilities.

This study aims to explore the association between parental knowledge, socioeconomic factors, and the prevalence of dental caries among children, with a specific focus on Permanent First Molars (PFMs), which are

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particularly vulnerable to decay. By investigating these factors, the study seeks to provide insights into the key contributors to dental caries and to inform public health strategies that target modifiable risk factors, ultimately reducing the prevalence of this preventable disease in children.

MATERIALS AND METHODS

The study adopted a prospective cross-sectional design, conducted at the Paediatrics Outpatient Department (OPD) of a tertiary care hospital in Southern India from March 2023 to August 2023. The primary aim was to investigate the association between parental knowledge and practices concerning oral health and the prevalence of dental caries among children aged 1 to 17 years. Participants were recruited during their visits to the Paediatrics OPD within this specified timeframe, with a total of 1500 parents accompanying their children being enrolled. The inclusion criteria focused on parents of children aged one to seventeen years who did not have any chronic systemic conditions or drug intake. Conversely, parents of children with systemic diseases or other medical conditions that could influence oral health and those not willing to participate were excluded from the study.

The primary exposure of interest was the level of parental knowledge and practices related to oral health. Data were meticulously gathered using a modified semi-structured questionnaire, which was adapted from the WHO Oral Health Assessment for Children[4]. This questionnaire was designed to evaluate various aspects, including the initiation and frequency of tooth brushing, techniques employed, choice of oral care products, and parental perceptions regarding dental caries and its associated risk factors. Additionally, the questionnaire captured socio-demographic information and the dental history of the children involved in the study.

The main outcome measured was the prevalence of dental caries among children, which was determined through parental reports and dental history. To minimize potential sources of bias, the study employed a standardized questionnaire administered consistently by a single trained personnel. The sample size of 1500 participants was determined based on prior studies, ensuring adequate power to detect significant associations between parental knowledge and the prevalence of dental caries. Data were analyzed using SPSS version 20; with descriptive statistics, including mean, median, standard deviation, and frequency distributions, used to summarize the data. Inferential statistics, specifically chi-square tests and correlation analysis, were applied to explore associations and relationships between variables. Throughout the study, ethical considerations were strictly observed, with prior approval obtained from the Institutional Human Ethics Board (IHEC-I/1786/23) and informed assent obtained from all parents of participants.

RESULTS

A total of 1500 parents were approached during their visits to the Paediatrics Outpatient Department (OPD) at Chettinad Hospital and Research Institute, Chennai, India.

The study population consisted of children aged 1 to 17 years, with a mean age of 8.77 years (SD = 4.17). Among the participants, 42.5% reported no dental caries, while 57.5% had varying degrees of caries experience, with 11.5% reporting one carious lesion. The study also gathered data on oral hygiene practices, with 67% of caregivers initiating tooth brushing after the child turned one year old and 57.8% using adult toothpaste.

The prevalence of dental caries in the study population was 57.53%. Significant associations were found between demographic factors and the prevalence of dental caries. Gender was significantly associated with dental caries prevalence ($p = 0.011$), with female children showing a higher prevalence compared to males. Parental educational status ($p = 0.002$) and socio-economic status ($p = 0.001$) were also significantly associated with dental caries, indicating that higher parental education and income levels were correlated with lower caries prevalence.

The analysis of oral hygiene practices revealed significant associations with dental caries prevalence. Brushing frequency ($r = 0.58$, $p = 0.034$) and brushing duration ($r = 0.51$, $p = 0.046$) were positively correlated with caries prevalence, emphasizing the importance of consistent and effective oral hygiene. Additionally, dietary habits, particularly bottle feeding (88.4%) and frequent consumption of sugary foods (88.6%), were significantly correlated with higher rates of dental caries ($p = 0.046$ and $p = 0.049$, respectively).

The study also identified the timing and reason for the first dental visit as significant factors influencing dental caries prevalence. There was a significant correlation between the reason for the first dental visit ($r = 0.32$, $p = 0.05$) and dental caries prevalence, highlighting the importance of

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early dental care interventions. Furthermore, participants' knowledge about dental caries risk factors varied, with some aspects of knowledge not correlating significantly with caries prevalence. However, awareness of dietary habits and the importance of early dental visits were found to influence oral health outcomes.

The study's cross-sectional design limits the ability to infer causality between the identified risk factors and dental caries prevalence. Additionally, the reliance on self-reported data for some variables may introduce reporting bias. Despite these limitations, the study provides valuable insights into the factors influencing dental caries prevalence among children and highlights the importance of targeted public health interventions.

The findings underscore the critical role of parental knowledge, socioeconomic factors, and oral hygiene practices in influencing dental caries prevalence among children. Implementing strategies aimed at improving oral health education, promoting healthy dietary behaviors, and encouraging early dental visits could significantly reduce the burden of dental caries in this population.

FIGURES AND TABLES

Table 1: Demographic statistics and association with Dental caries :

DEMOGRAPHICS	**Mean (± SD)**		**P value**
Age	8.7707 (± 4.16)		0.169
Gender	**Frequency (n)**	**Percentage (%)**	0.011*
Male	768	51.2	
Female	732	48.8	
Educational background	Frequency (n)	Percentage (%)	0.002*
Mother	810	54	
Father	690	46	
Socioeconomic class	**Frequency (n)**	**Percentage (%)**	0.001*
Upper class	386	25.7	
Upper middle class	492	32.8	
Lower middle class	622	41.5	
First dental visit	5.6173 (± 3.11)		
No. of dental caries	**Frequency (n)**	**Percentage (%)**	
0	637	42.5	
1	173	11.5	
2	321	21.4	
3	267	17.8	
4	102	6.8	

Table 2. Association between Dental hygiene practices and dental caries among participants.

When did you first start brushing your child's teeth?	**Frequency (n)**	**Percentage (%)**	**P value**
As soon as 1st tooth erupts	225	15	0.180
1 year of age	270	18	
> 1 year of age	1005	67	

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Does your child do tongue cleaning?	**Frequency (n)**	**Percentage (%)**	**0.975**
Yes	369	24.6	
No	1131	75.4	
How many times does your child brush per day?	**Frequency (n)**	**Percentage (%)**	**0.034***
0	267	17.8	
1	1035	69	
2	198	13.2	
When is it important to brush?	**Frequency (n)**	**Percentage (%)**	**0.475***
Morning	735	49	
Night	564	37.6	
Both the time	201	13.4	
How long does your child brush?	**Frequency (n)**	**Percentage (%)**	**0.045***
30 seconds	201	13.4	
1-2 minutes	735	49	
2-3 minutes	564	37.6	
How does your child brush?	**Frequency (n)**	**Percentage (%)**	**0.027***
Horizontal	468	31.2	
Vertical	201	13.4	
Circular	570	38	
All directions	261	17.4	
What toothpaste do you use to brush your child's teeth?	**Frequency (n)**	**Percentage (%)**	**0.323**
Adult	867	57.8	
Kids toothpaste	633	42.2	
Who brushes the teeth?	**Frequency (n)**	**Percentage (%)**	**0.043***
Child	288	19.2	
Mother	369	24.6	
Father	267	17.8	
Caretaker	576	38.4	

**P value <0.05 indicates significance. <0.001 indicates very significant association.*

Table 3: Association between dental caries and risk factors with Parental knowledge

How often do you visit the dentist?	**Frequency (n)**	**Percentage (%)**	**P value**
6 months once	135	9	0.862
Yearly	369	24.6	
Never	996	66.4	

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Do you bottle feed your child?	**Frequency (n)**	**Percentage (%)**	**0.046***
Yes	1326	88.4	
No	174	11.6	
Junk food consumption/week	**Frequency (n)**	**Percentage (%)**	**0.049***
Sugary foods	1329	88.6	
Carbonated drinks	171	11.4	
Junk food	0	0	
What do you think is the reason for decay?	**Frequency (n)**	**Percentage (%)**	**0.517**
Bacteria	306	20.4	
Sugar	369	24.6	
Poor oral hygiene	287	19.1	
All of the above	538	35.9	
If your child had signs of decay; what would you do?	**Frequency (n)**	**Percentage (%)**	**0.829**
Try to cope up	369	24.6	
Visit the dentist	294	19.6	
Brush the teeth	837	55.8	
Reason for 1st dental visit	**Frequency (n)**	**Percentage (%)**	0.025*
Caries	606	40.4	
Regular check up	582	38.8	
Others	312	20.8	

Table 4: *Correlation coefficients (r) between knowledge and practices and dental caries among the study participants.*

Variables	**r**	**Asymp. Sig. (2-sided)**
When did you first start brushing your child's teeth?	-0.01	0.627
Does your child do tongue cleaning?	0.34	0.05
How many times does your child brush per day?	0.58	0.034
When is it important to brush?	-0.02	0.475
How long does your child brush?	0.51	0.046
How does your child brush?	-0.06	0.027
What toothpaste do you use to brush your child's teeth?	-0.01	0.783
Who brushes the teeth?	0.01	0.781
How often do you visit the dentist?	-0.007	0.798
Do you bottle feed your child?	0.52	0.046

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Junk food consumption -------/week	0.38	0.05
What do you think is the reason for decay?	-0.004	0.879
If your child had signs of decay; what would you do?	-0.004	0.865
Reason for 1st dental visit	0.32	0.05
Dental caries was identified by	0.017	0.499
First age of visit to the dentist ?	-0.007	0.800

DISCUSSION

The present study found the overall prevalence of dental caries in the study population to be 57.53%, with 42.5% of participants reporting no caries. This finding aligns closely with previous research, such as the study by Karkare et al., which reported a dental caries prevalence of 61.1% among children aged 5-10 years [(5)].Similarly, another study reported a high prevalence of dental caries, with 52% of 5-6-year-olds and 41% of 12-13-year-olds affected [6]. These findings underscore the pervasive nature of dental caries among children and the need for targeted interventions to address this public health concern.

Significant associations were observed between demographic factors such as gender, parental educational status, and socioeconomic status with dental caries prevalence. These findings emphasize the influence of socio-demographic factors on oral health outcomes, as demonstrated in previous studies. For instance, Ellakany et al. Found that higher parental education, particularly maternal education, was significantly associated with a lower prevalence of dental caries in children. Additionally, higher family income correlated with reduced dental caries prevalence, while female children exhibited a higher prevalence of caries compared to male children [7].Similarly, Engelmann et al. Reported that lower educational levels of parents were linked to higher chances of dental caries in children, further highlighting the crucial role of parental education in children's oral health [8].

The current study also explored various oral hygiene practices, including brushing frequency, duration, technique, and type of toothpaste used. Significant associations were found between these practices and the prevalence of dental caries, consistent with findings from earlier studies. Poor oral hygiene practices have been shown to significantly increase the risk of developing caries in children[9]. While some studies have found that dietary and hygiene practices were not statistically significant predictors of dental caries [10], others have emphasized the importance of specific practices, such as rinsing the mouth after eating and using fluoride toothpaste, in reducing cariogenic activity[11].

The participants' knowledge about dental caries risk factors and preventive measures varied, with some aspects of knowledge not correlating significantly with caries prevalence. However, awareness of dietary habits and the importance of early dental visits were found to influence oral health outcomes. A study on the prevalence of dental caries among 11–13-year-old children concluded that while higher oral health knowledge is associated with better outcomes, it does not necessarily guarantee optimal oral health practices or reduced caries prevalence [12].Additionally, studies have shown that children whose caregivers do not recognize the importance of primary teeth or the impact of dental caries on a child's health are more likely to develop Early Childhood Caries (ECC) [13]. In sub-urban Nigeria, research indicated that neither parents' nor children's knowledge of caries preventive measures, nor their actual use of these measures, were reliable indicators of caries presence[14].

Dietary habits, particularly bottle feeding practices and junk food consumption, emerged as significant risk factors associated with dental caries prevalence. These findings highlight the need for promoting healthy dietary behaviors to prevent tooth decay. A study conducted in Southwest Ethiopia concluded that children who did not brush their teeth under parental supervision and who were subject to night feeding were at a higher risk of developing dental caries.

The timing and reason for the first dental visit were identified as significant factors influencing dental caries prevalence. Early preventive dental care interventions were shown to play a critical role in reducing the burden of dental caries. For instance, research conducted in the US among first-generation immigrant children and non-immigrants revealed that immigrant children were more

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prone to dental caries due to poor oral health and a lower tendency to seek dental services [15]. Furthermore, studies focusing on Preventive Dental Visits (PVD) concluded that early utilization of PVD was insufficient and highlighted significant socioeconomic disparities among children [16].Previous research has also established that children who had their first dental visit between 37 to 48 months or 49 to 60 months were less likely to develop caries compared to those who visited by age 24 months, suggesting that children prone to dental disease should receive priority for preventive visits before age three [17].Other studies have consistently demonstrated that the age of the child, timing of the dental visit, and the education level of parents, especially mothers, are significant factors in preventing dental caries in children[18].

The results of this study are generalizable to similar populations in urban and semi-urban settings, particularly where access to dental care and education may vary by socioeconomic status. However, caution should be exercised when applying these findings to rural or underdeveloped regions where cultural practices and healthcare access differ significantly. Further studies in diverse settings are recommended to confirm these findings across broader populations.

In conclusion, the findings from this study provide valuable insights into the multifaceted nature of dental caries and emphasize the importance of addressing modifiable risk factors, promoting effective oral hygiene practices, and enhancing knowledge about preventive measures. Implementing strategies aimed at improving oral health education and fostering early dental visits could significantly improve oral health outcomes among diverse populations.

CONCLUSION

In conclusion, our study contributes to the understanding of dental caries prevalence and associated factors, offering actionable insights for public health interventions. By targeting modifiable risk factors and promoting preventive strategies, significant strides can be made in enhancing oral health and well-being across communities. Addressing dental caries requires a multifaceted approach that integrates preventive measures, oral health promotion, and targeted interventions to address modifiable risk factors. Collaboration among stakeholders, including healthcare providers, policymakers, educators, and communities, is essential for implementing effective oral health strategies.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

ETHICAL APPROVAL AND PATIENT CONSENT:

In this study, involving human participants (i.e., parents and their children), informed consent was obtained, ethical approval was secured from an Institutional Review Board (IHEC-I/1768/23), and confidentiality of collected data was maintained, all of which are key requirements under the Declaration of Helsinki. Therefore, the study adheres to the ethical principles outlined in this declaration.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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REFERENCES

[1] Petrauskienė S, Narbutaitė J, Petrauskienė A, Virtanen JI. Oral health behaviour, attitude towards, and knowledge of dental caries among mothers of 0- to 3-year-old children living in Kaunas, Lithuania. *Clin Exp Dent Res*. 2020;6(2):215-224

[2] Patil AN, Karkare S, Jadhav HS, Damade Y, Punjari BK. Knowledge, Attitude, and Practice of Parents toward Their Children's Oral Health and its Influence on the Dental Caries Status of 5-10-year-old Schoolchildren in Nashik, Maharashtra: A Cross-sectional Study. *Int J Clin Pediatr Dent*. 2022;15(Suppl 2):S126.

[3] Elshebani SB, Huew R, Buzaribah KS, Mansur EK. Parental awareness and attitude about oral health habits of their children and its relation to caries experience in 8–10-year-old children. *Journal of Advanced Education and Sciences*. 2022;2(3):45-52.

[4] Petersen, Poul Erik, Baez, Ramon J, World Health Organization. *Oral Health Surveys: Basic Methods, 5th Ed*. 15th ed. World Health Organization. ; 2013.

[5] Karkare S, Patil AN, Jadhav HS, Damade Y, Punjari BK. Knowledge, Attitude, and Practice of Parents toward Their Children's Oral Health and its Influence on the Dental Caries Status of 5-10-year-old Schoolchildren in Nashik, Maharashtra: A Cross-

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sectional Study. *Int J Clin Pediatr Dent*. 2022;15(S2):S126-S130.

[6] Prasai Dixit L, Shakya A, Shrestha M, Shrestha A. Dental caries prevalence, oral health knowledge and practice among indigenous Chepang school children of Nepal. *BMC Oral Health*. 2013;13(1):20.

[7] Ellakany P, Madi M, Fouda SM, Ibrahim M, AlHumaid J. The Effect of Parental Education and Socioeconomic Status on Dental Caries among Saudi Children. *Int J Environ Res Public Health*. 2021;18(22):11862. doi:10.3390/ijerph182211862

[8] Engelmann JL, Tomazoni F, Oliveira MDM, Ardenghi TM. Association between Dental Caries and Socioeconomic Factors in Schoolchildren - A Multilevel Analysis. *Braz Dent J*. 2016;27(1):72-78.

[9] Kahar P, Harvey I, Tisone C, Khanna D. Prevalence of dental caries, patterns of oral hygiene behaviors, and daily habits in rural central India: A cross-sectional study. *Journal of Indian Association of Public Health Dentistry*. 2016;14(4):389. doi:10.4103/2319-5932.195828

[10] Abiola AA, Eyitope OO, Sonny OJ, Oyinkan OS. Dental caries occurrence and associated oral hygiene practices among rural and urban Nigerian pre-school children. J Dent Oral Hyg. 2009 Dec 31;1(5):64-70.

[11] Kotha S, Alabdulaali R, Dahy W, Alkhaibari Y, Albaraki AM, Alghanim A. The influence of oral health knowledge on parental practices among the Saudi parents of children aged 2–6 years in Riyadh City, Saudi Arabia. *J Int Soc Prev Community Dent*. 2018;8(6):565.

[12] Suprabha BS, Rao A, Shenoy R, Khanal S. Utility of knowledge, attitude, and practice survey, and prevalence of dental caries among 11- to 13-year-old children in an urban community in India. *Glob Health Action*. 2013;6(1):20750.

[13] Schroth RJ, Brothwell DJ, Moffatt MEK. Caregiver knowledge and attitudes of preschool oral health and early childhood caries (ECC). *Int J Circumpolar Health*. 2007;66(2):153-167.

[14] Folayan MO, Kolawole KA, Oyedele T, et al. Association between knowledge of caries preventive practices, preventive oral health habits of parents and children and caries experience in children resident in sub-urban Nigeria. *BMC Oral Health*. 2014;14(1).

[15] Luo H, Wu B, Wu Y, Moss ME. Dental Caries and Preventive Dental Visits Among Children in the U.S.: The Impact of Race/Ethnicity and Immigration. *AJPM Focus*. 2024;3(4):100230.

[16] Qu X, Houser SH, Tian M, Zhang Q, Pan J, Zhang W. Effects of early preventive dental visits and its associations with dental caries experience: a cross-sectional study. *BMC Oral Health*. 2022;22(1):1-9.

[17] Beil H, Rozier RG, Preisser JS, Stearns SC, Lee JY. Effects of Early Dental Office Visits on Dental Caries Experience. *Am J Public Health*. 2014;104(10):1979.

[18] Orhan AI, Alkan A, Orhan K, Tezel A, Karaoglanoglu S, Oztas D. Dental caries and associated factors among Turkish children and adults: Findings from the 3rd National Oral Health Survey. *Community Dent Oral Epidemiol*. 2024;52(4):499-508.