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Knowledge, Attitudes, and Practices towards Early Childhood Caries among Affluent Parents of Lahore

Ammara Chaudhry[1], Sadia Shakeel[2*], Tayyaba Nayab Shahid[1], Malik Adeel Anwar[3], Khaloud Tariq[4], Fatima Rehman[5] and Adrish Azhar[5]

[1]Department of Oral Biology, University College of Medicine and Dentistry, The University of Lahore, Lahore, Pakistan
[2]Department of Oral Biology, De'Montmorency College of Dentistry, Lahore, Pakistan
[3]Department of Oral Pathology, University College of Medicine and Dentistry, The University of Lahore, Lahore, Pakistan
[4]Department of Community & Preventive Dentistry, University College of Medicine and Dentistry, The University of Lahore, Lahore, Pakistan
[5]University College of Medicine and Dentistry, The University of Lahore, Lahore, Pakistan

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***Corresponding Author:**
Sadia Shakeel
Department of Oral Biology, De'Montmorency College of Dentistry, Lahore, Pakistan
sadiaumer4@gmail.com

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ABSTRACT

Parents influence oral hygiene practices and children's health behaviours as young ones lack the comprehension and dexterity to maintain oral health. **Objectives:** To evaluate the knowledge, attitudes, and practices about early childhood caries among affluent parents of Lahore. **Methods:** A cross-sectional study was conducted from August 2024 to October 2024 using non-probability sampling with 203 participants. Revalidated questionnaires inquiring about knowledge, attitude, and practice were distributed to parents with children under 5 years old, enrolled in affluent schools within the city. Frequency and percentage distributions were obtained for each qualitative variable and mean, and standard deviation were acquired for quantitative variables. The differences between genders were analyzed using chi-squared statistics. A p-value of less than 0.05 was considered statistically significant. **Results:** Among 203 participants, the majority were mothers 56.2% and the sample comprised of most male children in age group 3-5 years. Among the participants, more than half of the parents had graduated from university; some had graduated from high school. Only a few had completed their primary-level education. The overall mean knowledge score was 52.77 ± 21.59, whereas the mean score for attitude and practice was 61.24 ± 25.49 and 65.61 ± 26.66 respectively. Mothers had significantly greater overall knowledge (p=<0.001), better attitudes (p=0.164), and practices (p-value=0.112) towards early childhood caries as compared to fathers. **Conclusions:** It was concluded that although affluent parents of 5-year-old children had good knowledge regarding the Early Childhood Caries, their attitude and practices were still lacking in keeping up with the recommended standards.

INTRODUCTION

The oral health of young children is threatened by early childhood caries (ECC), which is a complicated and multidimensional problem in pediatric dentistry [1]. Early childhood caries, which is defined as one or more primary teeth that are decaying, missing, or filled in children younger than six years old, is still a common and worrisome condition. This condition is significant not just because it affects dentition but also impacts on a child's general health. In this context, the roles that parents play become increasingly important in shaping their child's views and their habits toward oral hygiene [2]. Effective preventive measures and treatments depend critically on an understanding of the complex interactions between parental attitudes, knowledge, and ECC practices [3]. In addition to causing tooth pain and discomfort, ECC harms a child's general well-being, diet, and standard of living [4, 5]. Epidemiological studies highlight the prevalence rates of ECC around the world, which vary depending on factors such as access to oral healthcare, dietary patterns, and socioeconomic differences [6]. This article takes a critical

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look at the complex connection between parental involvement and the avoidance of early childhood development. It explores the nuances that affect parents' choices, actions, and perceptions about their children's oral health, going beyond the boundaries of simple statistics and clinical research. A child's early behaviours, including dental hygiene routines, are mostly shaped by their parents. A child's dental care regimen is based mostly on the interaction of parental attitudes, and actions [7]. Health can be understood in both macro and micro contexts. Aspects of behaviour, development, and biology are included in the micro context. While the community's structure and politics generate the macro context, which is influenced socially by the family, community, and environment. When it comes to ECC prevention, parents use different approaches, which are impacted by cultural, social, and educational variables, even if dental information is widely available [8,9]. Developing tailored interventions requires an understanding of the factors influencing parental knowledge and attitudes regarding early childhood education [9]. Moreover, parents' exposure to and assimilation of dental information may not result in the adoption of practical preventative actions. Even though parents have access to information, there are differences in how parents put oral hygiene routines into practice. These differences can be attributed to several impediments, including time restraints, budgetary limits, and contradicting information from several sources [10, 11]. Studies have shown differences in awareness of ECC among parents and their choice pf preventive actions. Fluoride use, dietary choices, tooth brushing regimens, and parental oral health behaviours are important contributions to preventing ECC. Furthermore, a variety of parental actions targeted at ECC prevention are influenced by misconceptions, a lack of knowledge about preventative strategies, and conflicting objectives [12, 13]. Parental attitudes toward early childhood education impact more than just one home. They are felt in the domains of public health campaigns, educational programs, and legislative frameworks designed to lessen the incidence of ECC in local communities. When creating focused interventions and customized strategies that appeal to a range of parental viewpoints, it is essential to acknowledge the complex interactions that exist between parental knowledge, attitudes, and practices [8, 14]. This research study begins a thorough investigation of the complex processes influencing parental involvement in ECC prevention. Even if the frequency and severity of ECC have been emphasized in earlier research, a deeper comprehension of parental attitudes, actions, and knowledge is required to create customized therapies that are acceptable in a range of parental circumstances. The topic of early childhood caries has become increasingly popular in the vibrant metropolis of Lahore, particularly among wealthy parents. As protectors of their offspring's health and welfare, these parents understand the significance of dental hygiene and how it affects their young charges. But even with their awareness and access to resources, there is still much to learn about the complex interactions between early childhood career knowledge, attitudes, and practices. This paper explores the complex attitudes and actions of wealthy parents in Lahore concerning this common dental issue, illuminating their convictions, routines, and the underlying causes that influence how they prevent and treat early childhood caries. The variables that affect parents' perceptions of early childhood caries (ECC) and how those perceptions affect the oral health of their kids. It seeks to comprehend the extent of parental knowledge and the elements influencing their perspectives regarding the use of dental hygiene products. To contribute to a more thorough approach to ECC prevention, the study seeks to close the knowledge, attitude, and practical implementation gap among parents.

This study aims to support a more all-encompassing strategy for preventing early childhood caries, one that recognizes and takes into account the many realities and viewpoints that parents have while attempting to protect their kids' oral health.

METHODS

The cross-sectional study was conducted from August 2024 to October 2024 using non-probability sampling with a sample size of 203 to comprehensively investigate the knowledge, attitude, and practices surrounding early childhood caries (ECC) among affluent parents in Lahore, Pakistan. After the approval, The Institutional Research and Ethics Committee provided ethical approval (UCD/ERCA/24/339). The study specifically targeted parents with children under the age of 5 who were enrolled in affluent schools within the city. The data for this study were collected using a self-administered questionnaire based on existing literature. To maintain data integrity, inclusion criteria required participants to be parents of children aged less than 5, and willing to actively participate in the study. On the other hand, language barriers and incomplete surveys were recognized as exclusion criteria, ensuring a rigorous analysis process. Utilizing a non-probability purposive sampling technique, participants were deliberately chosen to guarantee participation from a range of affluent schools. The self-administered questionnaire was adopted from the study by Al-Jaber et al., [15]. The sample size of 196 was calculated using a 95% confidence interval, a 50% prevalence of knowledge, attitudes, and practices (KAP), and a 5% margin of error [15]. The survey included thirty questions in all, organized

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into four categories. The initial section of the survey collected data on the participants' sociodemographic attributes, which included the gender of the parent, gender of the child, age of the child, age of parent, and level of education of the parent. In the second section of the questionnaire, thirteen questions concerning oral health knowledge of the parents were included and seven questions addressing attitudes toward professional dental care were included in the questionnaire's third section. Five items that analyzed oral hygiene practices and behaviours made up the fourth component. Information about aims and objectives was provided to the parents and informed consent was obtained before administration of the questionnaire. For analysis, each right response in the knowledge sections of the questionnaire received a score of "1", while incorrect and do not know answers obtained a score of "0". The level of knowledge was related to the correct answers and was classified as poor (<50%), moderate (50-75%), and good (>75%). Frequency and percentage distributions were obtained for each qualitative variable and mean, and standard deviation (SD) were acquired for quantitative variables. The differences between genders were analyzed using chi-squared statistics. A p-value of less than 0.05 was considered statistically significant. The data management and analysis were carried out, using the statistical software SPSS version 25.0

RESULTS

Total 203 responses were included in this analysis. The majority of participants in the study were mothers (56.2%) whereas participants who were fathers were 43.8%. More than half of parents (55.7%) had graduated from university, 29.6% had got higher education followed by 9.9% who had completed high school and lastly, 4.9% had done primary level. Male children included in this study were 51.20% and 48.80% were females. Out of these children, 51.7% were 3-5 years old followed by 34% of 1-2 years old, and lastly, 14.3% who were less than one year of age. The results were divided into three categories of questions asked about knowledge, attitudes, and practices. Regarding the first category "Knowledge" there were more than 70% "correct responses for the following questions: "Do you have knowledge or information about children's oral health", "Controlling the frequency of sugary intake can affect a child's dental decay" and "Proper care of oral hygiene is important for the health of permanent teeth". The overall mean knowledge score was 52.77 ± 21.59 (Table 1).

Table 1: Knowledge of Participants about Early Childhood Caries

Knowledge	Yes	No
	n (%)	n (%)
Do you have knowledge or information about children's oral health	156 (76.85%)	47 (23.15%)
The quantity of toothpaste in children <3 years is the size of a rice grain	99 (48.77%)	104 (51.23%)
Quantity of toothpaste in children >3 years is pea-sized	86 (42.36%)	117 (57.64%)
Effect on development of baby's teeth by Mother's diet during pregnancy	108 (53.20%)	95 (46.80%)
You can give canned juice regularly to your child	37 (18.23%)	166 (81.77%)
A dental checkup in your child's first year of life is essential even if the child does not suffer from tooth pain or dental caries	116 (57.14%)	87 (42.86%)
Bottle feeding at nighttime influences the child's baby teeth	133 (65.52%)	70 (34.48%)
Fluoridated toothpaste helps in preventing your child's dental decay	102 (50.25%)	101 (49.75%)
Controlling the frequency of sugary intake can affect a child's dental decay	150 (73.89%)	53 (26.11%)
The first signs of dental caries are the appearance of white spots or lines on the surfaces of teeth	98 (48.28%)	105 (51.72%)
Germs of dental caries can be transmitted from mother to her child by kissing on his/her lips or munching food herself before giving it to her child	88 (43.35%)	115 (56.65%)
Decay in baby teeth can harm the permanent teeth	111 (54.68%)	92 (45.32%)
Proper care of oral hygiene is important for the health of permanent teeth	159 (78.33%)	44 (21.67%)
Dental caries in children is inherited	57 (28.08%)	146 (71.92%)

The overall mean score for attitude was 61.24 ± 25.49. Approximately 80% correct responses were collected for the questions; "It is the parent's responsibility to maintain the child's oral health" and "Parents/caregiver should guide and help their children at the age of less than or equal to 5 years during brushing of their teeth" (Table 2).

Table 2: Attitude of Participants Towards Early Childhood Caries

Attitude	Yes	No
	n (%)	n (%)
It is the parent's responsibility to maintain the child's oral health	178 (87.7%)	25 (12.3%)
Your child's teeth get harmed if breast-feeding is done frequently and for a prolonged period	62 (30.5%)	141 (69.5%)
Providing fresh juices frequently during the day can harm your child's teeth	83 (40.9%)	120 (59.1%)
As soon as baby teeth erupt they should be cleaned	126 (62.1%)	77 (37.9%)
Dental check-up of your child as soon as his/her teeth erupt	124 (61.1%)	79 (38.9%)
Parents/caregivers should guide and help their children at the age of less than or equal to 5 years during brushing of their teeth	173 (85.2%)	30 (14.8%)
The overall mean of Attitude	61.24 ± 25.49	

Results related to practice depicted that more than 80% "correct" responses were collected when asked about questions, such as "Your child's oral health depends on a balanced diet" and "Parents should make an effort to improve their awareness about oral health". The overall mean practice score was 65.61 ± 26.66" (Table 3).

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Table 3: Information associated with child's oral health practices of parents

Practices	Yes	No
	n (%)	n (%)
Your child's oral health depends on a balanced diet	169 (83.25%)	34 (16.75%)
Providing breastfeeding/bottle feeding during bed-time could harm your child's teeth	98 (48.28%)	105 (51.72%)
Dental caries can be transmitted by sharing the utensils (i.e., spoons, forks)	80 (39.41%)	123 (60.59%)
Parents should make an effort to improve their awareness about oral health	175 (86.21%)	28 (13.79%)
Cleaning and brushing your child's teeth after each meal is necessary	144 (70.94%)	59 (29.06%)

Participants with higher education levels had significantly better overall knowledge scores than less educated ones (p=0.002)(Table 4).

Table 4: Comparison of Knowledge, Attitude, and Practice Score with Education level of Parents

Variables		n	Mean ± SD	p-Value*
Knowledge Score Percent	University	113	48.67 ± 22.08	0.002*
	Primary Level	10	71.42 ± 22.08	
	High School	20	59.64 ± 24.00	
	Higher Education	60	55.11 ± 17.25	
	Total	203	52.77 ± 21.59	
Attitude Score Percent	University	113	58.40 ± 25.88	0.116
	Primary Level	10	75.00 ± 25.15	
	High School	20	68.33 ± 32.39	
	Higher Education	60	61.94 ± 21.28	
	Total	203	61.24 ± 25.49	
Practice Score Percent	University	113	65.30 ± 26.99	0.185
	Primary Level	10	76.00 ± 18.37	
	High School	20	74.00 ± 33.77	
	Higher Education	60	61.66 ± 23.94	
	Total	203	65.61 ± 26.66	

Mothers had significantly better overall knowledge scores than fathers as shown in figure 1. Similarly, mothers showed a better attitude towards early childhood caries as compared to fathers however, the results were statistically insignificant (p=0.164). Also, more educated parents lacked the practices to prevent early childhood caries (p=0.185). Moreover, mothers were practicing preventive care for early childhood caries as compared to fathers (Figure 1).

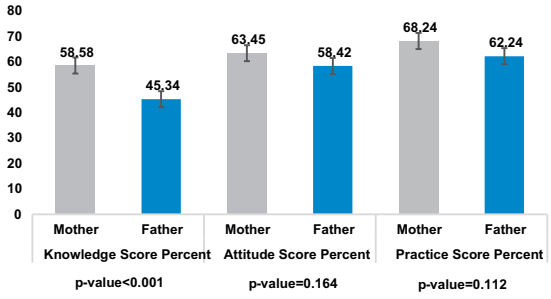

Figure 1: Comparison of Mean Scores of Knowledge, Attitude and Practice in Relation to Gender of Parents

DISCUSSION

The study provides valuable insights into the knowledge, attitudes, and practices of affluent parents in the Lahore region, regarding early childhood caries. These findings align with prior research that highlights the pivotal role of parents in influencing children's oral health behaviors. The mean knowledge score of 52.77% ± 21.59 reflects moderate awareness among parents about ECC. While many participants recognized the importance of controlling sugary intake (73.89%) and maintaining oral hygiene, critical gaps were observed in areas such as the appropriate amount of toothpaste for children under 3 years (48.77%) and over 3 years (42.36%). Interestingly the mothers in this study demonstrated higher knowledge scores than fathers (p<0.001). This is Gurunathan et al., findings suggesting that fathers are less involved in the daily care of their children and therefore less informed about their children's oral health practices [16]. Moreover, over half of the parents did not recognize white spots or lines on teeth as early indicators of dental caries [16]. In addition, parental education played a significant role, as those with higher education levels demonstrated better knowledge scores. This result is supported by studies such as Patil et al., which attributed higher knowledge levels to greater access to oral health resources through modern technology and the Internet [17]. However, contrary to findings from Qatar where 64% of the mothers were unaware of the recommended time for a child's first dental visit [18]. Our study found greater awareness among affluent parents in Lahore. Similarly, Saudi Arabian research reported that nearly half of the parents did not recognize the importance of a dental checkup for one-year-olds, whereas our study revealed better awareness in this demographic [18]. Parents exhibited a relatively positive attitude toward ECC prevention with a mean score of 61.24% ± 25.49. A majority (80%) agreed that maintaining oral health is the parents' responsibility and acknowledged the importance of assisting these children under 5 years of age during tooth brushing. These findings are consistent with studies in similar contexts where parents agreed that children's oral health is primarily a parental responsibility [18]. However, only 25% of the parents recognized that frequent and prolonged breastfeeding could harm a child's teeth aligning with findings from Muhammad et al., indicating a lack of awareness about specific ECC risk factors [3]. Similarly, only 50% correctly identified that regular intake of fresh juices could harm children's teeth. Although juices with added sugars are known to cause caries even natural juices can lead to demineralization and tooth wear when consumed excessively. Highly educated parents displayed more positivity compared to less educated ones, consistent with findings from a study conducted in Saudi Arabia [18]. The results point out the

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need for targeted interventions to address these attitudinal gaps and promote actionable preventive behaviours. Apart from the moderate knowledge and positive attitudes, parental practices towards ECC prevention showed mixed results. The majority of study parents recognized the importance of cleaning their child's teeth after every meal and maintaining a balanced diet which was consistent with other findings [19, 20]. However, some practices such as scheduling an early dental visit (57.14%) and avoiding nighttime bottle feeding (65.52%) require improvements in our population. A unique observation in this study was that the primary-level educated parents demonstrated better compared to other education categories. These findings contrast with Mohammed et al., which reported a direct correlation between higher education and better practices [3]. The difference may be that working parents in nuclear family's delegate childcare responsibilities to caregivers, resulting in less focus on oral hygiene. The suboptimal practice scores among educated parents indicate gaps in translating knowledge into behaviour, necessitating targeted interventions. The significantly better knowledge scores of mothers ($p<0.001$) highlight the role of maternal influence in shaping children's oral health behaviors. This underscores the need to improve fathers' knowledge through targeted interventions. Although the differences in attitude ($p=0.164$) and practice ($p=0.112$) scores between mothers and fathers were not statistically significant, the observed trends suggest a need for further exploration. These trends could inform targeted educational programs aimed at increasing fathers' involvement in oral health practices and the need for tailored educational campaigns targeting affluent parents to address knowledge gaps and encourage effective practices. Initiatives should highlight the importance of fluoride toothpaste, early dental visits, and recognizing early signs of dental caries. Purposive sampling is justified because it ensures that the study focuses on the most relevant participants, aligns with research objectives, and addresses practical constraints. However, the limitations (e.g., potential selection bias) should be discussed in the discussion section, emphasizing that the findings apply specifically to affluent parents in Lahore and may not be generalizable to all socioeconomic groups. Moreover, the results indicate a need for promoting cultural adaptation to enhance parental practices especially fathers and working parents.

CONCLUSIONS

It was concluded that affluent parents of 5-year-old children had a good knowledge of how to prevent ECC but their attitudes and practices fell short of recommended standards. Mothers were found to be significantly more knowledgeable than fathers. This study emphasized the need to improve father's involvement and knowledge regarding oral health.

Authors Contribution

Conceptualization: AC, KT
Methodology: AC, SS, MAA, KT, FR
Formal analysis: TNS, MAA
Writing review and editing: SS, AA

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

The authors declare no conflict of interest.

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