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Pediatricians' Awareness and Knowledge of Young Children's Oral Health: A Cross Sectional Study

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Abstract

Background: Most childhood oral diseases can be prevented, and the indispensable role of pediatricians in childcare uniquely positions them to champion standard oral and dental healthcare for children. This study aimed to evaluate the knowledge, attitudes, and awareness of pediatricians regarding early childhood caries (ECC), oral health, and the treatment needs of their young patients. ***Subject & Methods:*** A total of 449 pediatricians were randomly shared in an online self-reported cross-sectional survey which covered personal details, their approach to pediatric dentistry, and their knowledge of oral health. ***Results:*** Importantly, 67.9% of surveyed pediatricians recognized the significance of pediatric dentistry, and 88.9% reported conducting regular oral examinations. However, only 22.3% demonstrated familiarity with ECC, and a mere 5.6% acknowledged the cariogenic nature of medicated syrups. All pediatricians who participated in this study did not advise bottle feeding, nearly 91.75% of the pediatricians could relate the importance of breastfeeding and oral health, 60.1% of pediatricians reported that health education should be given to mothers about nursing caries starting early in life. ***Conclusion:*** The study highlights a notable deficiency in the surveyed pediatricians' knowledge concerning ECC, oral health, and the dental treatment needs of children. The identified knowledge gaps emphasize the imperative for pediatricians to enhance their understanding by staying current with recent recommendations. Continuous education initiatives, workshops, or other professional development avenues are essential for pediatricians to address these deficiencies effectively, enabling them to contribute significantly to the standardization of oral and dental healthcare for children and ultimately promoting improved overall health outcomes.

Keywords: Oral Health, Pediatrician, Children, Dental Caries.

INTRODUCTION

Early Childhood Caries (ECC) is identified as a particularly aggressive form of dental caries, exhibiting early involvement of the pulp and affecting the primary teeth of infants and toddlers. Recognizing the pivotal role pediatricians play in childcare, it becomes essential for them to diagnose ECC and oral diseases, subsequently referring patients to pediatric dentists. Pediatricians possess the unique ability to assess risks for dental problems, offering counsel to parents and children regarding preventive measures [1].

In the initial years of a child's life, pediatricians conduct regular examinations, commonly known as "well-baby" or "check-up" visits, to monitor developmental milestones, administer vaccinations, offer nutritional guidance, and engage in discussions about cognitive development [2]. Dental caries emerges as a significant public health concern, representing the most prevalent oral disease among children and surpassing the occurrence rates of asthma and fever. Notably, dental caries not only inflicts harm to teeth but also gives rise to various morbid conditions within the oral cavity [3]. The quality of preventive healthcare and future oral health is determined by the first dental visit. Recommendations for early dental visits for children suggest its completion by 12 months of age [4]. Emphasizing the significance of the first dental visit, recommendations advocate its completion by 12 months of age, establishing a foundation for future oral health. The American Academy of Pediatrics (AAP) has formally acknowledged the role of pediatricians in oral health, underlining their responsibility through policies issued in 2003 and 2008 [5]. There was no literature on dental screening and referrals by pediatricians or the

effectiveness of their dental caries preventive activities [6]. The absence of exact statistics on the pediatrician awareness concerning children's caries prevention led us to conduct this study. This study aims to address a gap in literature concerning dental screening, referrals by pediatricians, and the effectiveness of their preventive activities in the realm of dental caries. In the absence of specific statistics on pediatrician awareness regarding children's caries prevention, our research seeks to assess the knowledge, attitude, and awareness of pediatricians toward ECC, oral health, and the treatment needs of their young patients.

SUBJECTS AND METHODS

An online self-reported cross-sectional survey was designed for pediatricians to screen their knowledge in pediatric dentistry and oral health. The data of participants who agreed to enroll was kept anonymous and confidential. All selected pediatricians possessed a postgraduate in pediatrics. They were asked to complete an objective questionnaire which did not require them to provide any oral health information. The questionnaire was structured into three sections as follows:

1. Demographic characteristics of pediatricians, encompassing gender, age and location of practice.
2. Evaluation of pediatricians' knowledge regarding the specialty of pediatric dentistry, the significance of primary dentition, and referral practices.
3. Assessment of practice Knowledge and opinions concerning dental caries and oral health and attitudes toward Early Childhood Caries (ECC) and oral health.

Each question in the knowledge, practice, and attitude sections was assigned scores, with the maximum score given for correct answers and the minimum for incorrect ones. The scoring criteria were categorized as follows:

- Less than 50%: Indicative of poor performance.
- Between 50% and 75%: Reflective of a moderate level of understanding.
- 75% or above: Indicative of a good level of knowledge and comprehension.

The survey was made available online in the period between 24th March and 21st November 2023.

Statistical Analysis:

We aimed for a target sample size of at least 383 participants to ensure a confidence level of 95% and margin of error within ± 5% of the surveyed values [14]. We collected 461 responses to the survey including duplicate responses (n=7), and those who refused to enroll (n=5). We ended up with 449 valid responses. Validated data was tabulated, entered, and analyzed using Statistical Package for the Social Science (SPSS), version 21.0 (SPSS Inc. Chicago, IL, USA). Chi-square $\chi 2$ or Fisher Exact test was used for comparative analysis of categorical variables. $P \leq 0.05$ was considered to be statistically significant.

RESULTS

Demographic Characteristics:

Following the consent to participate in this study, we started exploration of the demographic characteristics of our respondents. A total number of 449 pediatricians responded to the survey from various countries as shown in Figure 1.

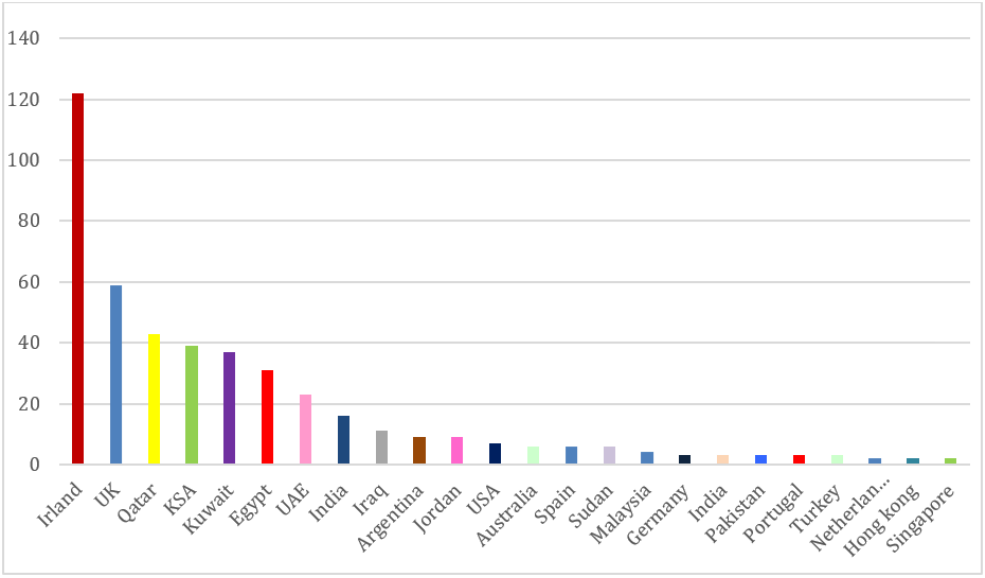

Figure 1: Distribution and numbers of participants according to their country of residence

Demographic data shows participants belong to different age groups with about 61% (n=274) as males and 39% (n=175) as females. As for the age groups of participants, 5% of them were below 30 years old (n=25), more than half of participants' age was between 30-39 years old (n=238), participants with ages from 40-49

years old were less than one third of total (n=133), and those with ages from 50 or above years old were 12% (n= 53) as in Fig 2.

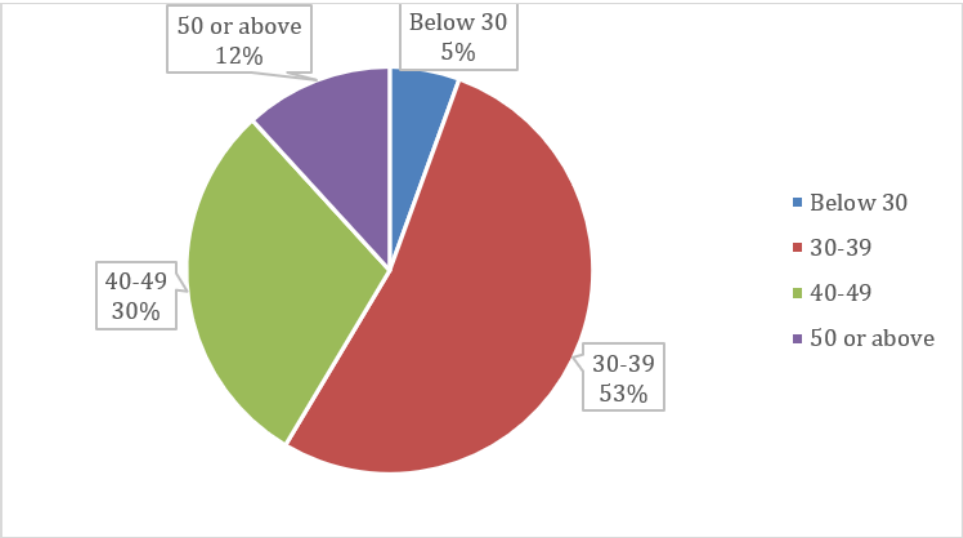

Fig 2: Distribution of ages group characteristics of pediatricians participating in the survey

Knowledge related to pediatric dentistry and referral. [Table 1]

About 67.9% of pediatricians acknowledged the importance of pediatric dentistry, 89.3% pediatricians knew the importance of primary teeth, 88.9% examined them, 95.1% of pediatricians reported that children should be referred to dentist when caregivers/patients report dental problems, and 47% of pediatricians felt that 1 year would be ideal for the first dental visit however, 44.1% thought that 6 month would be ideal for the first dental visit.

Tab 1: Knowledge related to pediatric dentistry and referral

	Number of pediatricians	% of pediatrician
Aware of pediatric dental specialty		
yes	305	67.9%
No	144	32.1%
Importance of primary teeth		
yes	407	89.3%
No	42	10.7%
Examining primary teeth		
yes	399	88.9%
No	50	21.1%
Referral to dentist for pain		
Referred	414	92.2%
Don't refer & self-treat	22	4.9%
Both	13	2.9%
First dental visit		
6 months	198	44.1%
12 months	211	47%
Presences of dental caries	28	6.2%
Presence of dental pain	12	2.7%

Practice knowledge and opinions concerning dental caries and oral health and attitudes toward Early Childhood Caries (ECC) and oral health. [Table 2]

88.9% of pediatricians perform oral examination regularly, 22.3% of pediatricians have knowledge of ECC, 93% of pediatricians restricted sugary food, 5.6% of pediatricians knew that cariogenic bacteria can be transmitted from the mother, and only 5.6% of pediatricians acknowledged the cariogenicity of medicated syrups. All pediatricians who participated in this study did not advise bottle feeding, nearly 91.75% of the pediatricians could relate the importance of breastfeeding and oral health, 60.1% of pediatricians reported that health education should be given to mothers

about nursing caries starting early in life, 66.8% of pediatricians recommended the use of dentifrices routinely, only 16.3% recommended brushing between age 6 and 12 months, and 89.3% of pediatricians provided diet counseling to every patient. About 99.3% of pediatricians agreed to have a role in promoting oral health and 92.7% felt that assessment of dental caries should be a part of routine childcare.

Tab 2: Practice knowledge and opinions concerning dental caries and oral health and attitudes toward Early Childhood Caries (ECC) and oral health

	Number of pediatricians	% of pediatrician
Knowledge of early childhood caries		
yes	100	22.3%
No	349	77.7%
Do you restrict sugary food?		
yes	418	93%
No	31	7%
Cariogenic bacteria can be transmitted between mother and child		
yes	25	5.6%
No	424	94.4%
Cariogenicity of medicated syrups		
Yes	135	30.1%
No	314	69.9%
Advising bottle feeding		
Yes	0	0%
No	449	100%
Relation between breastfeeding and oral health		
Yes	412	91.75%
No	37	8.25%
Health education of mother on prevention of dental caries		
Yes	270	60.1%
No	179	39.9%
Recommendation of use of dentifrices		
Routinely	300	66.8%
Occasionally	75	16.7%
Never	1	0.2%
Depending on age	73	16.3%
Age at which brushing recommended		
6-12 months	73	16.3%
12-18 months	235	52.3%
18-24 months	115	25.6%
>2 years	26	5.8%
).Diet counseling		
Yes	401	89.3%
Sometimes	48	10.7%
No	0	0%
.Do pediatricians have a role in promoting oral health		
Yes	446	99.3%
No	3	0.7%
.Assessment of dental caries be a part of routine well childcare		
Yes	416	92.7%
No	33	7.3%

DISCUSSION

The American Academy of Pediatric Dentistry (AAPD) emphasizes the pivotal role of infant oral health as the cornerstone for fostering a lifetime free from preventable oral diseases [5]. The health professionals including pediatricians and other medical fraternity and community organizations must be involved as partners to achieve this goal [6]. Acknowledging the significance of collaborative efforts, the AAPD advocates for the active involvement of allied health professionals, including pediatricians and the broader medical community, alongside community organizations, in achieving this shared objective. Dental awareness of qualified medical practitioners including pediatricians may be insufficient

with regard to knowledge about ECC, oral health, oral hygiene practice, and specialty treatment rendered by pediatric dentist [6]. Despite the critical nature of their role, our study suggests that qualified medical practitioners, particularly pediatricians, may exhibit insufficient awareness concerning early childhood caries (ECC), oral health, oral hygiene practices, and specialized treatments provided by pediatric dentists. Our findings revealed that 67.9% of pediatricians were aware of the existence of the pediatric dental specialty, a figure lower than reported in some previous studies. Other previous studies by Shetty RM [2], Nammalwar and Rangeeth [4] and Subramaniam *et al.,* [8] showed that 86%, 80.3%, and 91.3%of pediatricians knew the existence of pediatric dental specialty. Notably, a majority of pediatricians reported routinely examining their patients' oral cavities during well-childcare visits, aligning with similar studies. Around 89.3% of participants recognized the importance of primary dentition and the examination of primary teeth. In this study, the majority of pediatricians reported routinely examining the oral cavity of their patients and included anticipatory guidance on oral health in their well childcare visits; the results are similar to other studies [6,8]. Above 54% of pediatricians examined the oral cavity of more than half of the 0 to 3 year olds showed in previous American study.[9] Some of craniofacial abnormalities can be recognized and diagnosed soon after birth, such as Pierre Robin syndrome with characteristics of glossoptosis and cleft lip and/or palate, lesions such as “Bohn’s nodules” and “Esptein’s pearls” being embryonic remnants and neonatal teeth which create difficult along with a risk of aspiration making examination of the oral cavity soon after birth a necessity [10]. However, opinions varied regarding the ideal age for a child's first dental visit, suggesting potential gaps in awareness of AAPD guidelines. Despite 92.2% of pediatricians making referrals to dentists for pain, our study underscores the need to improve the collaboration between pediatricians and pediatric dentists. Furthermore, diverse opinions on the ideal age for the first dental visit highlight potential gaps in familiarity with AAPD recommendations [11]. Pediatricians can encourage motivational interviewing for parents to assess them to prevent ECC and promote proper oral health [12] Streptococcus Mutans is a major bacteria responsible for dental caries [13]. In our study, 5.6% of pediatricians knew that cavity causing bacteria can be transmitted from the mother to child as described by Murthy and Mohandas [3] and Sezer *et al.,* [14] Our result is similar to previous study of (Gupta SK, *et al.,* 2019) [6] Regarding ECC awareness, only 26.15% of pediatricians demonstrated knowledge of this preventable condition. Efforts to enhance awareness and knowledge among pediatricians are crucial, especially since ECC can be prevented and managed through proper information and skills implementation. Notably, the study revealed gaps in understanding the cariogenicity of medicated syrups among pediatricians, reinforcing the need for increased awareness on this issue. Our finding, highlighted variations in recommendations regarding the commencement and completion of bottle weaning, indicating potential deviations from AAP guidelines. The sweetened nature of medicated syrup contributes to development of dental caries mainly because of the frequency of oral prescription of pediatric formulations medicine which are sweetened to make them more acceptable to be taken in the form of “syrup” [6] However, it is of concern as the oral route was the preferred choice of administration. In present study, 30.1% of pediatricians acknowledged the importance of the cariogenicity of sugary syrups. Whereas Gupta SK, *et al.,* [6] showed 32.3% and Nammalwar and Rangeeth [4] showed that only 27% of pediatricians acknowledged the cariogenicity of medicated syrups. AAP Guidelines suggested that pediatricians should advise parents to begin bottle or breast weaning when their child is approximately 9 months and after the first birthday, they are accomplished it soon [5]. Around 95% of the pediatricians did not suggest bottle feeding according to (Indira *et al.,* 2015). [15], Gupta SK, *et al.,* [6] and Koranyi *et al.,* [16] reported that most pediatricians tended to recommend bottle feeding later after beginning and accomplishment of weaning and were not completely in accordance with AAP guidelines. This was similar to our study where weaning beyond the age of 1 year was highly recommended. During breastfeeding, oral muscles of infants are exercised strongly in suckling, an important influence on the thrust and mandible growth, in addition to imparting maternal immunological components. In present study, awareness and understanding of the participants showed that nearly 91.75% of pediatricians could relate the importance of breastfeeding and oral health. This was similar to another study where 73.8% of pediatricians correlate knowledge of breast feeding and oral health [6]. Most of the pediatricians believe diet counseling to be effective in reducing caries. Most of the pediatricians advised mothers/care givers to limit the sugar intake in diet. Few of them prescribed vitamin intake for better oral health. There is a need for these specialists to be informed on other dietary factors and nutritional counseling. Physicians engage in oral health training will promote physicians’ confidence and increase their performing in advising parents and performing oral health screening and risk assessment [17]. Appropriate health-promoting practices, such as breastfeeding, should be encouraged by healthcare professionals [4]. This study indicates that 99.3% of pediatricians agree that they are extremely valuable role in promoting the oral health of children and accessing similar to in the study of (Gupta SK, *et al.,* 2019) which was 92.7% of pediatricians because many of them will see children who dentist do not see. Other studies have documented similar limitations in dental knowledge among pediatricians [3, 6, 8, 9, 18]. The recommendations for improving primary oral healthcare in:

- Inclusion of a dental examination/fitness form in preschool admission documentation.

- Mandatory dental screening and counseling for all children.
- Governmental support of oral health camps specifically designed for children with special healthcare needs.

CONCLUSION

This study indicates that pediatricians play important role in promoting children's oral health. However, it underscores the need for targeted educational interventions to address gaps in knowledge and awareness, especially concerning ECC and oral health. Initiatives such as compulsory dental screening, counseling, and improved collaboration between pediatricians and dentists are recommended to enhance primary oral healthcare.

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