

KNOWLEDGE, ATTITUDE AND PRACTICE OF PEDIATRICIANS TOWARD EARLY CHILDHOOD CARIES IN UPPER EGYPT (A CROSS-SECTIONAL STUDY)

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ABSTRACT

Aim of the study: Evaluation of the pediatricians' knowledge, attitude, and practice (KAP) toward early childhood caries (ECC) in Upper Egypt.

Subjects and Methods: A survey was conducted among 215 pediatricians working in 3 governorates in Upper Egypt: Beni Suef, Minia, and Qena. The survey included questions regarding the demographic characteristics of the participants, and questions assessing pediatricians' knowledge, attitude, and practice toward ECC. Both paper-based and online forms of the survey were available to deliver the questionnaire.

Results: Two-thirds of the participants (66.1%) had moderate knowledge of ECC and almost all the participants (99.1%) showed a good attitude. Regarding practices, 98.1% of pediatricians provided dietary habits advice, 66% of them recommended different preventive measures and 93.5% recommended regular tooth brushing. Pediatricians working at educational hospitals showed the highest statistically significant knowledge level ($p = 0.001$, Effect size = 0.082).

Conclusions: Pediatricians in Upper Egypt had moderate knowledge, a good attitude, and a satisfactory level of practice toward ECC.

KEYWORDS: knowledge, early childhood caries, attitude, pediatricians, and practice

INTRODUCTION

Oral health is an integral component of general health that plays a major role in the child's development. Good oral health is essential for nutrition, speech acquisition, psychological behavior, and

positively influences children's physical, mental, and social well-being (WHO, 2022).

Early childhood caries (ECC) is defined by the American Academy of Pediatric Dentistry (AAPD, 2022) as the presence of one or more decayed,

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missing due to caries, or filled tooth surfaces in any primary teeth in children under 6 years of age. It has multiple predisposing factors, such as dietary factors, oral hygiene factors, sociodemographic factors, and factors related to oral bacterial flora and breastfeeding/bottle feeding (Aburahima et al., 2020).

ECC constitutes an aggressive form of dental caries that has a great influence on the oral and general health of the child. ECC, if not properly and timely managed, can lead to pain, difficulties in mastication and speech, high treatment costs, psychological problems, and negatively impacts children's growth, development, and quality of life (AAPD, 2022).

To mitigate the potential consequences of ECC, preventive measures should be implemented early in a child's life. Pediatricians, as the primary healthcare providers for infants and their parents, have a pivotal role in promoting children's oral health by educating and counseling parents and caregivers on preventive strategies (Sogi et al., 2016).

The prevalence of early childhood caries (ECC) exhibits significant variation across different populations, with higher rates observed in developing countries, including the Middle East (Hamza et al., 2021). Egypt, in particular, faces a considerable challenge as ECC continues to be a prevalent issue, affecting over half of the country's children (Abbass et al., 2019). Unfortunately, recent studies indicate a lack of awareness among pediatricians regarding ECC, and their preventive attitudes and practices require reinforcement (El Bayoumi, 2021). Remarkably, there is a notable scarcity of data concerning the knowledge, attitudes, and practices (KAP) of pediatricians specifically regarding ECC in Upper Egypt. This research gap signifies the need to address this crucial area to obtain a comprehensive understanding of the current situation and to effectively enhance oral healthcare practices in Upper Egypt. Therefore, the current study was conducted to assess pediatricians' KAP toward ECC in Upper Egypt.

SUBJECTS AND METHODS

Study Design, setting, and ethical approval:

A cross-sectional survey was performed to assess KAP regarding early childhood caries among pediatricians. The questionnaire was distributed among pediatricians working in 3 governorates of Upper Egypt: Beni Suef, Minia, and Qena (from February 2023 to April 2023). The Survey form was written in English and presented in two forms: paper-based and online forms.

This study was approved by the Research Ethics Committee - Faculty of Dentistry - Minia University (reference # 575/2022). The eligible pediatricians were informed about the aim of the study and that survey data would be presented anonymously in the form of group data. Participation in the study was voluntary and participants' information was kept strictly confidential and protected.

Sample size and distribution

Depending on (Hegazy & Abdellatif, 2019), using **PASS 11 release (Hintze, 2011)** and setting the margin of error for 95% target width=10.0% ($\pm 5.0\%$), the sample size was 215 pediatricians. Multistage cluster sampling was performed. First, a simple random sample from Upper Egypt governorates resulted in the selection of Beni Suef, Minia, and Qena, then, in the second stage, a convenience sample from the selected governorates was enrolled in the survey. According to the registries of physician syndicates, the numbers of pediatricians in Beni Suef, Minia, and Qena were 250, 399, and 180 respectively, so their relative percentages were 30.2%, 48.1%, and 21.7% respectively. Accordingly, 215 pediatricians were selected with the same relative percentages to be 65, 103, and 47 pediatricians from Beni Suef, Minia, and Qena respectively.

Survey form and scoring

The present survey was conducted through a self-administered questionnaire adapted from the previous study of Lewis et al., (2000) and Hegazy & Abdellatif, (2019). The questionnaire comprised

four sections. The first section included 8 questions about the demographic data. The second section assessed pediatricians' knowledge of ECC. It consisted of 11 questions with response categories: true, false, and not sure. While, the third section consisted of 4 questions evaluating the pediatricians' attitude with the responses (agree, disagree, and not sure), and the fourth section (8 questions) evaluated pediatricians' practice toward ECC.

Knowledge score: Each correct answer was scored (2), selecting not sure was scored (1) and false answers were scored (0). **Attitude scores** were (3) for agree, (2) for not sure, and (1) for disagree. **Knowledge and attitude levels** were classified according to the percentage of correct answers as good (>75%), moderate (50 – 75 %), and poor (<50%).

Data analysis

The statistical analysis was performed with IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp. Qualitative data were presented as frequencies and percentages. For univariate analysis; the Chi-square test and Fisher's exact test were used for comparisons and associations regarding qualitative variables. Kruskal-Wallis test followed by Dunn's test were used to study the association between different variables and knowledge score. The significance level was set at $p \leq 0.05$.

RESULTS

Sociodemographic data

The pediatricians who participated were 98 males (45.6%) and 117 females (54.4%). 21.9% of the participants were 24 – 30 years old, 54.9% were 31 – 40 years old, 12.1% were 41 – 50 years old, 10.2% were 51 – 60 years old and only 0.9% were over 60 years old. The most common educational degree obtained by the participants was a master degree (43.3%) followed by a bachelor degree (23.3%), fellowship (13.9%), and diploma (12.1 %) while 7.4% had doctor degree and consequently more than half of participants (57.2%) were specialists, approximately one-quarter of participants (23.3%) were residents while (19.5%) were consultants.

As regards workplace, 34.9% worked at Ministry of Health hospitals, 13.5% worked at educational hospitals, 8.4% worked at health insurance hospitals and 43.3% of the participants had private clinics in addition to their job at other governmental hospitals. In addition, 42.8% had 6 – 10 years of experience, 36.3% had more than 10 years of experience and 20.9% had 1 – 5 years of experience. The majority of participants (80%) examine more than 20 children per day, (19.1%) of participants examine 11 – 20 children per day while only (0.9%) of participants examine 5 – 10 children per day.

Knowledge assessment regarding ECC

More than one-quarter of participants (27.4%) had good knowledge, about two-thirds of participants (66.1%) had moderate knowledge while (6.5%) had poor knowledge. Answers to knowledge questions are presented in Table (1).

TABLE (1) Frequencies (n) and percentages (%) for correct answers to knowledge questions (N = 215)

Knowledge questions	n	%
1. Eruption of the first primary tooth occurs at 10 – 6 months.	193	89.8
2. Children should have their first dental visit after the eruption of their first primary teeth or about 1 year.	102	47.4
3. Dental caries is due to bacteria that can be transmitted from the mother to her child.	63	29.3
4. Breastfeeding and bottle feeding can develop early childhood caries.	65	30.2
5. Cleaning children's oral cavities should start from birth time after each feed.	83	38.6
6. Toothpaste amount and fluoride content differ with age.	114	53
7. Sweetened pacifiers can affect the development of caries.	209	97.2
8. White spots are the first sign of dental caries in primary teeth.	113	52.6
9. Primary teeth have a significant role in a child's health and development	163	75.8

Attitude assessment regarding ECC

The majority of participants (99.1%) showed a good attitude while (0.9%) showed a moderate attitude toward oral health. Almost all participants (96.3%) agreed that ECC could be prevented and that they had to participate in promoting oral health. Similarly, participants agreed that they should perform an oral examination (94.9%) and inform parents about the relationship between diet and dental caries (89.3%).

Practice assessment regarding ECC

Regarding practice, there were statistically significant differences between pediatricians working at educational hospitals, and pediatricians from Minia governorate in performing oral examination for caries detection ($p \leq 0.05$). However, practices toward ECC displayed no statistically significant differences with gender, age, educational level, and highest degree. Answers to practice questions are presented in Table (2).

TABLE (2) Frequencies (n) and percentages (%) for responses to practice questions (N = 215)

Practice questions	n	%
1. Provide dietary habits advice.	211	98.1
2. Recommend different preventive measures such as using toothpaste with fluoride.	142	66
3. Recommend tooth brushing regularly.	201	93.5

Practice questions	n	%
4. Examine children for caries detection.		
Regularly	133	61.9
On parental request	79	36.7
Never	3	1.4
5. Advise the parents to dentally examine their child.		
Regularly	152	70.7
On parental request	61	28.4
Never	2	0.9
6. Provide parents/children with educational tools such as books, pamphlets, or toothbrushes.		
Yes	66	30.7
Sometimes	104	48.4
Never	45	20.9

A linear regression analysis model was constructed to determine significant predictors of ECC knowledge. The dependent variable was knowledge scores while the independent variables were the statistically significant variables obtained from univariate analysis namely: age, educational level, and workplace. Model fit was confirmed by the statistically significant ANOVA test with p -value = 0.001. The results showed that the workplace was the only statistically significant positive predictor of knowledge score. Pediatricians working at educational hospitals showed the highest statistically significant knowledge score. The results of linear regression analysis are presented in Table (3).

TABLE (3) Results of linear regression analysis to determine significant predictors of ECC knowledge

Variables	B	SE	Standardized regression coefficient	95% CI for β		p-value
				Lower limit	Upper limit	
Age	0.409	0.334	0.124	-0.250	1.067	0.223
Educational level	0.296	0.478	0.065	-0.646	1.238	0.536
Workplace	0.376	0.155	0.170	0.070	0.682	0.016*

β : Unstandardized Regression coefficient, SE: Standard error, *: Significant at $p \leq 0.05$

DISCUSSION

ECC is a widely prevalent disease among children worldwide, and pediatricians play a crucial role in promoting general and oral health, including early identification of oral diseases and appropriate referrals (AAPD, 2022). Therefore, this survey aimed to assess the knowledge, attitude, and practices (KAP) of pediatricians in Upper Egypt regarding ECC.

Surveys provide a convenient means of collecting both quantitative and qualitative information, allowing researchers to gather data efficiently within a short period (Ikart, 2019; Tillyard & DeGennaro, 2019). To enhance participation and convenience for respondents, the survey was available in both paper-based and online forms, presented in English (Ball, 2019).

The findings of this study revealed that 66.1% of pediatricians had moderate knowledge regarding ECC, with less than half of them recognizing the causes associated with ECC. These results align with a similar survey conducted in Kuwait by Alanzi et al., (2023) revealed that 56.1 % of pediatricians had moderate knowledge. In contrast, Kumar et al., (2014) conducted a survey involving 88 pediatricians in India and found that 39.7% of pediatricians had moderate knowledge and lacked proper awareness about ECC. It is worth to mention that the difference in results between their study and the present study may be attributed to the difference in sample size, as their sample size was smaller. The lack of knowledge among pediatricians may be attributed to inadequate oral health education during medical school, residency, and continuing education, as noted by Lewis et al., (2009). However, Hegazy et al., (2022) revealed that 94.3% of pediatricians had good knowledge among pediatricians surveyed in Abu El-Reesh and El Demrdash pediatric hospitals, which are renowned university hospitals with highly qualified pediatricians. These results emphasize the importance of enhancing dental and preventive education for pediatricians through

pediatric residency programs and continuous dental education programs (Prathima et al., 2020).

Moreover, healthcare workers should receive training in oral health risk assessment, diet counseling, preventive dental measures, and appropriate timing for referrals. The current study revealed insufficient knowledge among pediatricians regarding important aspects of ECC prevention, such as dental home, appropriate toothpaste amount, and fluoride content suitable for different ages, as well as vertical transmission of cariogenic bacteria from mothers to their children (Kirthiga et al., 2019).

Research on medical residency programs had shown that improved oral health knowledge directly correlates with the behaviors and practices of pediatricians concerning oral health (Herndon et al., 2015). This may explain why only 30.7% of pediatricians in Upper Egypt provided educational tools to parents and children regarding oral health. Similar findings were reported by Chouchene et al., (2021), indicating that pediatricians with poor knowledge exhibited inadequate oral health practices. In contrast, Di Giuseppe et al., (2006) found that 76.1% of Italian pediatricians engaged in preventive oral health practices due to efficient training in children's oral health. Variations in the KAP of pediatricians toward ECC may be attributed to differences in their educational levels, working environments, and variations in curricula related to oral health across Egyptian medical schools (Abdelaziz et al., 2018).

Linear regression analysis revealed that the workplace was the only statistically significant positive predictor of knowledge score, with pediatricians working in educational hospitals exhibiting the highest knowledge scores. This finding aligns with Hegazy et al., (2022), who reported good knowledge among pediatricians working in educational hospitals. Pediatricians in educational hospitals benefit from access to continuous education opportunities through journals, collaboration with dental colleagues, research opportunities, and specialized medical training (Safarani et al., 2018).

Encouragingly, the majority of pediatricians 99.1% demonstrated a good attitude toward ECC prevention in the current study. These results are consistent with the findings of **Alshunaiber et al., (2019)** showed that 86.1% of pediatricians had a good attitude and **Hegazy et al., (2022)** revealed that 95% of pediatricians had a good attitude. When combined with improved knowledge, this positive attitude among pediatricians can translate into effective practices (**Andrade et al., 2020**).

To the best of our knowledge, this study is the first to shed light on the KAP of pediatricians regarding ECC in Upper Egypt. The findings concluded that pediatricians had an overall moderate level of knowledge, a good attitude, and a satisfactory level of practice regarding ECC. It is recommended to incorporate oral health education into the curricula of pediatricians and offer continuous education programs to further enhance their knowledge and skills.

Furthermore, conducting a nationwide survey to assess the KAP of Egyptian pediatricians is recommended. Additionally, future studies should evaluate the KAP of other healthcare professionals, such as family practitioners and nurses in maternity and childhood care centers, regarding ECC and other dental issues affecting children.

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