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Pediatricians' knowledge in children's oral health: A systematic review

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Abstract---Background and Objective: There have been requests for physicians to address children's oral health for more than a decade; yet oral health screening, referral, and oral healthcare are still underdeveloped in pediatric practice. Therefore a systematic review was required to understand the pediatricians' existing knowledge and practice for developing action to strengthen their role in children's oral health. Study Design: The electronic MEDLINE, Embase, Cochrane, and PubMed databases were searched. Additionally, the bibliography of all relevant articles and textbooks were manually searched. The terms included ("Knowledge" [MeSH] AND ("Attitude" [MeSH]) AND ("Pediatricians" [MeSH] AND ("Children" [MeSH] AND ("Oral Health" [MeSH]. The expanding international interest in pediatricians' role in children's oral health is highlighted in this review. Results: The findings show that doctors have insufficient knowledge and awareness in key areas such as early clinical symptoms of dental caries, suggested age for first dental visit, etiology of dental caries, and fluoride use recommendations. Inadequate education and training, time restrictions in practice, and a lack of referral mechanisms are all obstacles for pediatricians. Conclusion: Inadequate education and training, time limits in practice, a lack of referral pathways, and cost concerns, which are sometimes compounded by convoluted medical/dental insurance schemes, are all barriers to pediatricians practicing oral health. Hence gaps in education and training, as well as action on other barriers, must be prioritized.

Keywords---Children; Knowledge, Oral Health; Pediatrician

Introduction

There is an increasing focus on the non-dental workforce's involvement in improving oral health outcomes, particularly for children, globally [1, 2]. Oral health is vital for interprofessional practice in primary care, according to the World Health Organization (WHO) [3]. While oral health promotion should be part of the work of a variety of health providers, pediatricians have played a critical role in children's oral health for more than a decade [4, 5]. Screening, anticipatory guidance, and referral to dental services before the age of 12 months have all been suggested for the role [5, 6]. Despite role recognition, pediatricians' routine oral health screening and referral are inadequate [7–10].

One of the most frequent chronic disorders affecting children is dental caries (tooth decay). It is a major public health issue in early childhood, with long-term deleterious consequences [11–15]. Dental caries affect 60–90% of children worldwide, with rates of dental caries being higher than childhood asthma [5, 15]. Dental caries is a progressive condition that can be cured if treated early, but it grows more complex over time if left untreated [9]. Untreated dental caries leads to cavities, which have a significant impact on a child's health and well-being, including discomfort, eating and chewing skills, body weight, growth, self-esteem, and communication [14]. Chronic pain/discomfort associated with dental caries has been shown to have a negative impact on a child's cognitive development, with low school attendance and lack of concentration being common outcomes [16].

Social disadvantage, socioeconomic level, age, gender, geographic location, and lifestyle factors are also drivers of poor oral health in children [3, 17, 18]. While childhood dental caries rates have decreased in developed nations, children in developing countries and children from disadvantaged households in developed countries continue to have unacceptable levels of dental caries [18–20].

In the United States (US), the first nationwide survey on pediatricians' role in child oral health was undertaken in 1998 to examine knowledge, attitudes, and professional experience [9]. Despite the fact that pediatricians believed oral health might be an essential part of their practice, only a small percentage of them reported any oral health activities. A prevalent complaint was a lack of training. Some have claimed that including oral health in medical schools and pediatricians' roles, as well as adequate funding, would improve access to dental care for all children [7, 9]. Pediatricians' role in improving children's oral health was mentioned in a national call to action for oral health in the United States in 2003 [4]. Since then, physicians' role in oral health has been bolstered, with recommendations for pediatric oral health risk assessments beginning at 6 months of age [7–10]. However, research suggests that the integration of oral health into pediatric practice is still lacking [21].

Despite international recommendations to improve oral health in pediatric practice, no systematic assessments of the data on pediatricians' knowledge and practice in this area have been published. Our goal was to identify all accessible

studies, provide commentary on those studies, and identify critical knowledge gaps, as recommended by Munn and colleagues [22].

Aim and Objectives

Aim

To evaluate the knowledge and practice of pediatricians in children's oral health.

Objectives

To assess:

1. Knowledge of Pediatricians regarding Children's Oral Health.
2. Attitudes of Pediatricians regarding Children's Oral Health.

Materials and Methods

This study was carried out in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analyses Statement.

Eligibility Criteria

Inclusion Criteria

The following types of studies were considered:

1. KAP studies regarding children's oral health published in English language peer reviewed scientific journals from April 2009 to September 2021.
2. Studies in which the outcome was defined in terms of KAP.
3. All the articles published till 31 September 2021 were included
4. Full articles in English were included

Exclusion Criteria

The exclusion criteria included the following:

1. case reports, case series,
2. cross-sectional studies,
3. Reviews
4. Abstracts,
5. Articles with incomplete data were excluded.

6. Articles in any other language except English. The references of selected articles were also analyzed for additional studies and any study that did not meet the inclusion criteria.

Search Strategy

The electronic MEDLINE, Embase, Cochrane, and PubMed databases were searched. Additionally, the bibliography of all relevant articles and textbooks were manually searched. Based on the inclusion and exclusion criteria, 2 reviewers independently selected the relevant articles. Any disagreement was discussed between the 2 reviewers until a consensus was reached.

Using the PICO-format question, methodological Medical Subject Heading (MeSH) terms were generated to make the search strategy more sensitive in the identification of studies. These terms included ("Knowledge" [MeSH] AND ("Attitude" [MeSH]) AND ("Pediatricians" [MeSH] AND ("Children" [MeSH] AND ("Oral Health" [MeSH]. Studies that met these inclusion criteria underwent critical analysis. The qualities of the included studies were evaluated according to a proposed specific quality assessment scale

Selection

The study selection was done in a three step process. All the titles were reviewed and based on the inclusion and exclusion criteria, appropriate studies were selected. For all the selected titles, abstracts were obtained and reviewed, from which appropriate abstracts were selected based on the criteria. For all the selected abstracts, full text articles were obtained and analyzed, and the final set of articles were obtained keeping in mind the selection criteria which is shown in table 1.

Table 1
Selection Of Articles

Initial search	190
Duplicates and non-relevant	81
Case reports and series	13
Reviews	65
Abstract	14
Language other than English	11

Finally 6 articles were selected for the study.

Data Extraction

Data extraction was done using the data extraction forms. The following parameters were extracted: authors, year of study, study design, knowledge questions, and attitude questions.

Quality Assessment

The Cochrane Collaboration Tool for Assessing Risk of Bias in RCTs was used to assess the studies' quality. To ensure the accuracy of this data analysis in this systematic review, the Cochrane Collaboration's tool for assessing risk of bias, the Oxford Systematic Review Appraisal Sheet, Critical Appraisal Skills Programme, Newcastle-Ottawa Quality Assessment Form for Cohort Studies, and the Grading of Recommendations Assessment Development and Evaluation (GRADE) system for grading evidence were used. The following items were evaluated: Random sequence creation and allocation concealment, performance bias, attrition bias, reporting bias, and any other prejudice detected were all examples of selection bias. Each prejudice was given a high, low, or uncertain risk rating. Three observers separately examined the situation, and any discrepancies were resolved through conversation. Following recognised principles, the protocol for this systematic review was created. Using the PICO (patient population, intervention, comparison, and outcome) paradigm, a well-defined review question was also created.

Results

On initial search 190 articles were obtained. Out of a total of 190 articles of the database search, after removal of duplicates and elimination based on eligibility criteria, a total of 6 studies were included for analysis. The PRISMA flowchart for the inclusion of studies is shown in Fig.1

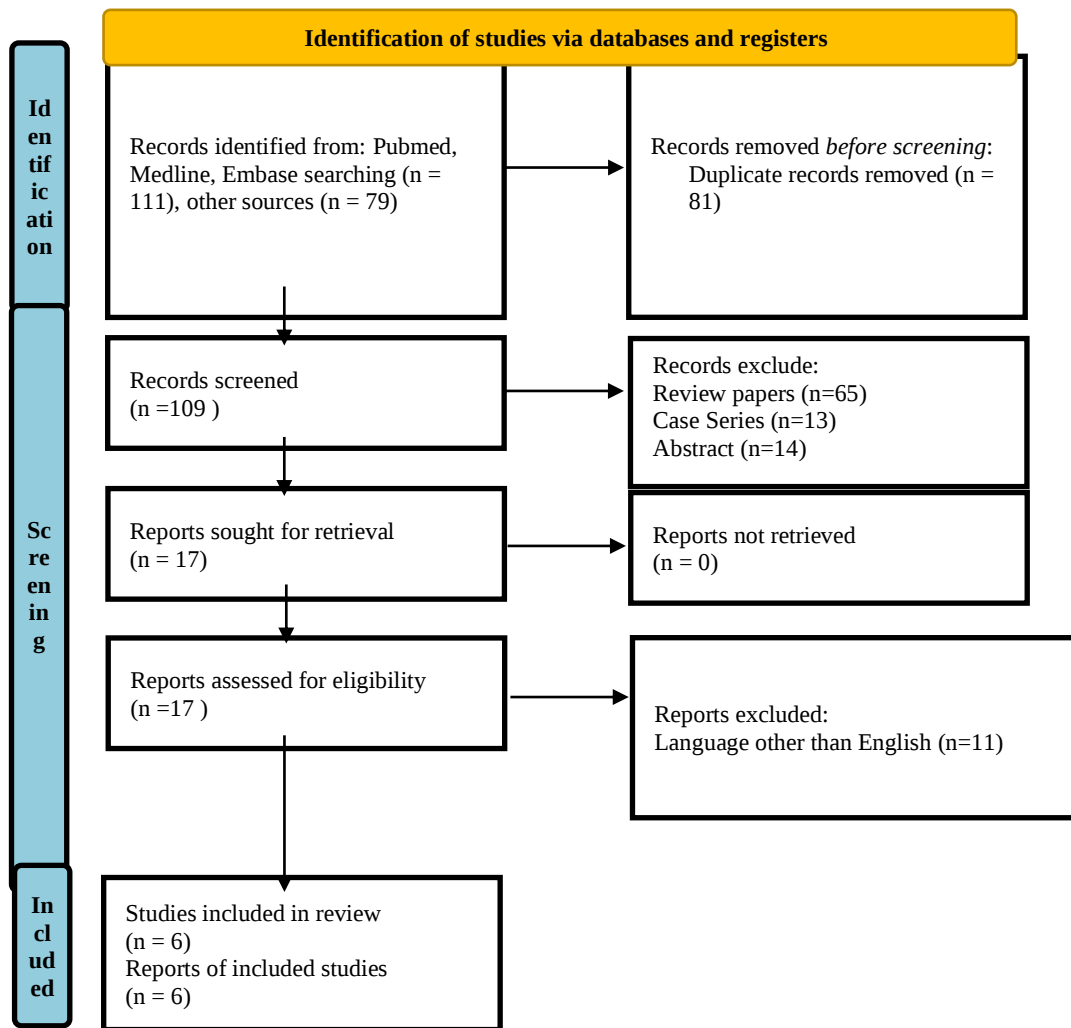


Figure 1: PRISMA flowchart

Synthesis of Results

Narrative synthesis has been provided for the findings obtained from the studies. The data extracted has been presented in the tabular form as mentioned below. Table 2 showed the included studies and table 3 showed the positive findings of the study.

Table 2
Included Studies

Author	Type of Study	Country	KAP
Alrashdi M et al, 2021[23]	Questionnaire based study	Saudi Arabia, USA, Greece	Yes
Aburahima N et al, 2020[24]	Cross-sectional	UAE	Yes

Alshunaiber R et al, 2019[25]	Cross-sectional	Saudi Arabia	Yes
Hadjipanayis et al, 2018[26]	Questionnaire based study	Europe	Yes
Nassif N et al, 2017[27]	Cross-sectional	Lebanon	Yes
Sezer RG et al, 2013[28]	Cross-sectional	Turkey	Yes

Table 3
Positive Findings Of The Included Studies

Author	Questions included	Positive response of pediatrician
Alrashdi M et al, 2021[23]	1. Oral Health is an essential part of overall health 2. I recommend wiping or brushing after breastfeeding or bottle feeding with milk, particularly at nighttime, as the first primary tooth begins to erupt 3. I recommend the consumption of healthy snacks between meals and reduction of the sugar-containing snacks	81% 63% 74%
Aburahima N et al, 2020[24]	1. The best time to give a child a sugary snack is in between meals 2. The appropriate age for a child's first dental visit is 6–12 months	71.4% 51.4%
Alshunaiber R et al, 2019[25]	1. Bottle feeding at night for sleep might cause teeth decay 2. Children should start using fluoridated toothpaste at age of 6 months 3. Bacteria that are responsible of teeth decay can be transmitted from the mother to her child	55% 56.5% 54.2%
Hadjipanayis et al, 2018[26]	1. Only bottle-fed babies are affected by early childhood tooth decay 2. Fluoride toothpaste should not be given to children younger than 3 years 3. Bacteria that cause decay can spread from mother to child	20% 36% 68%
Nassif N et al, 2017[27]	1. Believe that overnight bottle-fed children gets ECC	94.3% 64.4%

Hadjipan ayis et al, 2018[26]	Low risk	Unclear	Low risk	Low risk	Low risk	Unclear	Low risk
Nassif N et al, 2017[27]	Low risk	Low risk	Low risk	Low risk	Unclear	Unclear	Low risk
Sezer RG et al, 2013[28]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk

Discussion

This is the first study to map and consolidate research on pediatricians' knowledge and practise in the area of children's oral health. Our goal was to find all papers that were available without rejecting any based on research design or quality. A systematic review's purpose is to find and synthesize papers, with a particular focus on quality assessment. Meta-analysis is a method of combining data from studies with a high degree of evidence, such as randomized controlled trials, to find a common effect [29]. This review's strength is that it documents all relevant studies on physicians' knowledge and practice addressing children's oral health.

The majority of the studies in this review were cross-sectional and relied on self-reported surveys to assess pediatricians' knowledge and practice. Only two of the research looked at used observational methods. While self-reported knowledge and practice surveys are useful, practice self-reports may differ from actual practice. Studies involving observation of actual practice and audits of client records might help enhance understanding in this area.

The sample sizes in these research vary, and just a handful included power calculations. The creation of a well-designed, validated measure to evaluate pediatricians' oral health knowledge and practise is a critical first step. The American Academy of Pediatrics (AAP) guidelines for caries-risk assessment and anticipatory advice for newborns and young children were used in certain research [30]. It may appear rational to use known principles in survey development; nevertheless, attaining international consensus on a consistent tool would allow for evidence pooling and within-country and cross-country comparisons.

In some of the studies, there is evidence of risk-based referral. This may be suitable if children's risk status is appropriately assessed, but we weren't able to determine this from the study data. In many cases, rather than a risk assessment, the presence of existing irreversible disease (i.e. cavitation) was likely the catalyst for referral. The findings of Long et al. [31] demonstrated that pediatricians were not referring to children graded at high risk if they were not yet demonstrating clear clinical disease, despite the fact that there was limited information presented in these trials. Although existing (clinically evident) disease

is the strongest predictor of future disease [32], it should not be utilized entirely as a risk indicator [33].

The majority of respondents in studies that looked into whether pediatricians gave oral health advice to parents said yes. The most often mentioned stumbling block was a lack of time during routine sessions. Health practitioners confront difficulty allocating resources (including time) while maximizing health outcomes regardless of setting or funding systems [34]. If evidence-based interventions (and the degree of their impact) are poorly understood, or if remuneration for oral health is minimal or non-existent, the value of time spent on oral health, as compared to more normal and familiar activities, may not be acknowledged. If pediatricians are to incorporate oral health into their treatment, great consideration should be made to how doctors will be motivated and supported to do so.

Conclusion

Pediatricians play a vital role in the dental health of children. However, there have been no systematic evaluations that have compiled evidence on pediatricians' knowledge and practice in the area of children's oral health. The findings show that doctors have insufficient knowledge and awareness in crucial areas such as initial clinical indications of dental caries, suggested age for first dental visit, bacteria transmission from mother to child in the pathogenesis of dental caries, and fluoride use recommendations. Inadequate education and training, time limits in practice, a lack of referral pathways, and cost concerns, which are sometimes compounded by convoluted medical/dental insurance schemes, are all barriers to pediatricians practicing oral health. Gaps in education and training, as well as action on other barriers, must be prioritized. The creation of a well-designed, validated method to assess knowledge and practise is required.

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