

KNOWLEDGE, ATTITUDES AND PRACTICES OF MACEDONIAN'S PEDIATRICIANS AND PRIMARY HEALTH CARE PHYSICIANS REGARDING PERINATAL AND INFANT ORAL HEALTH

ЗНАЕЊА, СТАВОВИ И ПРАКТИКИ НА МАКЕДОНСКИТЕ ПЕДИЈАТРИ И ЛЕКАРИ ОД ПРИМАРНАТА ЗДРАВСТВЕНА ЗАШТИТА, ВО ОДНОС НА ПЕРИНАТАЛНОТО И ИНФАНТИЛНОТО ОРАЛНО ЗДРАВЈЕ

Lazarova A.¹, Ugrinoska Pandeва A.², Boshkovska Spasovska I.³, Kokoceva Ivanovska O.¹, Gjorgjievska E.¹

¹Department of Pediatric and Preventive Dentistry, Faculty of Dentistry - Skopje, Ss. Cyril and Methodius University in Skopje, Republic of North Macedonia, ²Department for Intensive Care, Institute for Respiratory Disease in Children-Kozle, Skopje, Republic of North Macedonia, ³Primary Health Care, Private Health Institution Dr. Katerina Damevska, Skopje, Republic of North Macedonia

Abstract

Background: A shared approach, coordination and care for oral health as an integral part of general health should be an imperative for every primary health care worker. The aim of this study was to evaluate the knowledge, attitudes and practices, regarding infant's oral health, of pediatricians and physicians who are part of the primary health care in Republic of North Macedonia. **Methods:** The survey was conducted in January 2020 with distribution of an anonymous survey questionnaire, electronically in the form of a Google Document, to 130 pediatricians and primary care physicians. The questions examined early childhood caries knowledge, attitudes about their role in preventing childhood oral health, and practices for promoting good oral health. **Results:** 85.7 percent of doctors believed they need additional oral health education, 93.9 percent of respondents believed that they must educate parents / guardians about the importance of preventive measures to maintain children's oral health, and that they must advise parents in case of suspected caries to visit a dentist / pedodontist. Only 46.9% of respondents knew that cariogenic bacteria can be transmitted vertically from mother to newborn. A small percentage (26.5%) of respondents knew that white spots on baby teeth are early signs of caries. **Conclusions:** A Guide to Perinatal and Infant's Oral Health for all health professionals who are in contact with a child in the first years of life would help properly guide and educate parents in preserving infant's oral health. **Key words:** Knowledge, Early Childhood Caries, Infant's Oral Health, Pediatrician, Family Physicians.

Апстракт

Вовед: Заедничкиот пристап, координацијата и грижата и за оралното здравје, како нераскинлив дел од генералното здравје, треба да е императив на секој здравствен работник од примарната здравствена нега. **Цел:** Целта на оваа студија е да се евалуираат знаењата, ставовите и практиките во однос на оралното здравје на педијатрите и лекарите кои се дел од примарната здравствена нега во Македонија. **Материјал и метод:** Истражувањето е направено во месец јануари во 2020 година со дистрибуција на анонимен анкетен прашалник по електронски пат во вид на GoogleDocument до 130 доктори педијатри и доктори дел од примарна здравствена нега во Македонија. Прашањата ги испитуваат знаењата за кариес во рано детство, ставовите за нивната улога за превенција на детското орално здравје и практиките за промоција на добро орално здравје. **Резултати:** Дури 85.7 проценти од докторите сметаат дека е потребна дополнителна едукација за орално здравје кај доенчиња и мали деца. 93.9 проценти од испитаниците сметаат дека мораат да ги едуцираат родителите/старателите за важноста на превентивните мерки за зачувување на оралното здравје кај децата, и дека мораат да ги советуваат родителите во случај на суспектен кариес кај доенчето/детето за посета на стоматолог/педодонт. Само 46.9% од испитаниците знаат дека кариогените бактерии може да се пренесат вертикално од мајка на новороденче. Мал е процентот (26.5%) на испитаници кои знаат дека белите дамки на млечните заби се рани знаци на кариес. **Заклучок:** Лесно достапен водич и протокол за орално здравје кај доенчиња, наменет за сите здравствени професионалци кои доаѓаат во контакт со детето во првите години од животот, би помогнал секој кој што има активна улога, правилно да ги насочи и едуцира родителите. **Клучни зборови:** Knowledge, Early Childhood Caries, Infant's Oral Health, Pediatrician, Family Physicians.

Introduction

“Dental caries” is an important public health problem and it is the most prevalent oral disease among children¹

which is five times more common than asthma and seven times more common than fever². Dental caries is one of the most common chronic diseases of childhood, affecting between 30% to 50% of children in high-income

countries^{3,4,5,6} and up to 90% in low- and middle-income countries^{7,8}. Early childhood caries (ECC) is the most prevalent infectious disease and major threat to oral health in infants and children as reported by the center for disease control and prevention and the National institute of health⁹. Early Childhood Caries (ECC), according to the American Dental Association, is “The presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries) or filled tooth surfaces in any primary tooth in a preschool-age child between birth and 71 months of age”¹⁰. ECC is considered as a significant public health problem in both developed and developing countries, with prevalence of 1–12% and up to 70%, respectively¹¹. Untreated early childhood caries leads to pain, swelling, infection in the oral cavity, which can lead to difficulty when chewing and nutritional imbalance which, together with changes in child behavior and sleep, lead to reduced quality of life of the child, but also to the whole family. The American Academy of Pediatrics reported that early child caries (ECC) treatment costs \$1,000–\$2,000 per child, which is not affordable in low- and middle-income countries (LMICs)¹². Therefore, preventive measures to preserve oral health need to start much earlier, in the prenatal and perinatal period. Interventions targeted at mothers both during pregnancy and in the first year after birth have the potential to prevent the initiation and progression of caries in young children, and hence reduce the burden of this disease further in life¹³. The AAPD recognizes that infant oral health is one of the foundations on which preventive education and dental care must be built, to enhance the opportunity for a lifetime free of preventable oral disease¹⁴.

The initiation and the application of these preventive measures is significantly associated with the child’s first dental visit, which is recommended within 6 months of the first primary tooth eruption and not later than 12 months¹⁵. The American Academy of Pediatric Dentistry (AAPD) encourages health care providers to use all recommended preventive strategies to prevent early childhood caries, and the implementation of these strategies should begin in the pediatrician’s office¹⁶. A consensus guideline, according to the American Academy of Pediatrics (AAP) and Bright Futures recommended at least eight visits for preventive pediatric health care by 12 months of age¹⁷. As a result, it is crucial for pediatricians and family physicians to recognize their role in the promotion of children’s oral health by several means, such as assessing the child’s risk for developing dental caries, providing basic screening services for early detection of dental problems, parental education, and referral of required conditions¹⁵.

Also, in Macedonia pediatricians, GPs doctors, doctor of family medicine or doctors employed in primary health

care are the first line of health professionals who get in touch with children and their parents/guardians, much earlier than dentists. This is why they can often find themselves in a situation where they need to give advice or properly educate parents/guardians regarding the prevention and preservation of oral health in infants in the first years of life. In Macedonia, since 2008, there is a national strategy and preventive program for preservation of oral health in children younger than 14 years, which includes prevention teams throughout the country, consisting of a dentist/pedodontist and a dental nurse. These teams operate within the health centers, where there are vaccination points, general and family medicine clinics and pediatric clinics, places where the primary health care of infants and young children is conducted. Joint approach, coordination and care for oral health, as an integral part of general health, should be an imperative of every primary care professional, and the inclusion of family doctors and pediatricians in the oral health prevention program would give better results and reduce the rate of caries in our country. For the purposes of full and quality implementation of the National Strategy, the Coordination Body has prepared a Manual that is intended primarily for specialists in pediatric and preventive dentistry as well as general dentists who are involved in prevention teams, but also for all those who are directly or indirectly involved in the implementation of the National Strategy (dentists, primary care gynecologists, pediatricians, preschool educators and primary school teachers)¹⁸.

The purpose of this study

The purpose of this study is to evaluate the knowledge, attitudes and practices regarding the oral health of pediatricians, family medicine specialists, general practice doctors, doctors who are part of the primary health care in Macedonia.

Method

The research was conducted in January 2020 by distributing an anonymous survey questionnaire, electronically in the form of Google Document, to pediatricians, family medicine specialists, residents in the same fields, and general practitioners involved in primary health care throughout the country. The questionnaire was sent to 130 doctors from private and public hospitals, private practices and health centers whose email addresses we obtained through web search and which were publicly available. All other doctors from the target groups, for whom only fixed and mobile contact telephone numbers were publicly available from personal data, were excluded from the research.

The questionnaire was based on questionnaires already used in literature, in the period 2012-2019^{19, 20, 21, 22}. It consists of 28 questions divided into five parts.

1) The first part contains demographic data on gender, age, job, years of work experience and average number of patients (respondents) examined per day.

2) The second part provides data on the level of education, sources of information on oral health, and the need of the respondents for additional oral health education.

3) In the third part, through a total of 7 questions, the attitude of the respondents about their role in preserving oral health in infants and young children is evaluated.

4) The fourth part shows what the respondents practice in their daily practice, in order to eradicate caries and oral disease and raise the improved level of overall health through oral health.

5) The fifth part is composed of 10 questions that assess the level of knowledge about oral health in infants and early childhood. Multiple answers were available for the questions, where the respondents considered it necessary. The answered questionnaires were entered into Microsoft Excel, whereas a summary and simple mathematical data processing was performed.

Results

The final number of respondents who answered positively to the questionnaire is 49, i.e. 37.69% of the total number of respondents. 89.8 percent of them are female and 10.2 percent are male, of which almost half (42.9%) are aged 25-35, 34.7% are aged 35-45, the percentage of respondents aged 45 -55 years is 10.2%, and 12.2% of the respondents were over 55 years old. The largest percentage (44.9%) of the doctors work in one of the state hospitals, 18 (36.7%) work in a private practice, and a small percentage of those are employed in one of the private hospitals (10.2%) or in vaccination points (8.2%) . In everyday practice, 46.9% of doctors examine more than 25 patients daily, 36.7% examine 10-25 patients daily, and 16.3% examine less than 10 patients. These demographic data are shown in Table 1. Table 2 shows data on education and type of oral health education of the respondents. Almost half (42.9%) of the total number of respondents are specialists in pediatrics or family medicine, 26.3 percent are residents of pediatrics or family medicine, the same percentage are doctors of general medicine, and 10.2 percent are doctors with title of research associate or professor. When asked where the sources of oral health information come from, the respondents used multiple answers, so 53.1% of the doctors answered that it is formal medical education, 44.9% said that they continue their medical education, 34.7% use scientific journals as a

Table 1. Demographic data

Demographic data	Number of respondents (%)
Gender	
Male	5 (10.20%)
Female	44 (89.80%)
Age	
23-35	21 (42.9%)
35-45	17 (34.7%)
45-55	5 (10.2%)
Over 55	6 (12.2%)
Working experience(years)	
<5	19 (38.8%)
5-10	5 (10.2%)
10-25	19 (38.8%)
>25	6 (12.2%)
Place of work	
Private practice	18 (36.7%)
Private hospital	5 (10.2%)
Public hospital	22 (44.9%)
Vaccination points	4 (8.2%)
Average number of daily examined patients	
<10	8 (16.3%)
10-25	18 (36.7%)
>25	23 (46.9%)

Table 2. Data on education and type of oral health education

Question	Number of respondents (%)
Educational level	
Doctor of medicine	13 (26,3%)
Specialist in pediatrics or family medicine	21 (42.9%)
Resident doctor	13 (26,3%)
Research fellow, professor	5 (10.2%)
Sources of oral health information come from:	
Formal medical education	26 (53.1%)
Educational course	22 (44.9%)
Scientific database	17(34.7%)
Colleagues	14 (28.6%)
Other sources	12 (24.5%)
I need more information and oral health education in infants and young children:	
Yes	42 (85.7%)
No	7 (14.3%)

source of information, 28.6 percent receive information from colleagues, and 24.5% from other sources. Accurately 85.7 percent of doctors believe that they need

additional oral health education in infants and young children. Table 3 shows the views of pediatricians/family medicine doctors/general practitioners as well as residents of pediatrics and family medicine on preventive measures to preserve oral health, and their attitude towards their involvement in the same. 93.9 percent of the respondents believe that deciduous teeth play an important role in children's health and development, the same percentage believe that pediatricians, GPs, family doctors must educate parents/guardians about the importance of preventive measures to preserve oral health in children, and that they must advise parents in case of suspected caries in the infant/child to visit a dentist/pedodontist. 77.6% of the respondents answered positively to the question whether pediatricians, family doctors play an important role in the prevention of caries and the promotion of good oral health, 24.5% of them answered negatively. Slightly lower percentage, but still more than half, (67.3%) think that pediatricians and family doctors must examine infants and young children and detect caries, the rest (32.7%) are of the opinion that when examining infants and young children they do not have to detect caries. The following answers were given to the question regarding who is responsible for the oral health in infants: pediatrician, pedodontist, family doctor, family medicine doctor and all of the above. Exactly 81.6% answered that all of them are responsible for the oral health in infants, 12.2% think that it is the pediatrician's responsibility, the same percentage think that it is the pedodontist's responsibility, 3 respondents (6.1%) have the opinion that it is the family doctor's responsibility, and only two respondents (4.1%) think that the doctor of family medicine is responsible. The respondents also used the multiple answers for this question.

Table 3 shows the views of pediatricians/family medicine doctors/general practitioners as well as residents of pediatrics and family medicine on preventive measures to preserve oral health, and their attitude towards their involvement in the same. Exactly 93.9% of the respondents believe that deciduous teeth play an important role in children's health and development, the same percentage believe that pediatricians, GPs, family doctors, must educate parents/guardians about the importance of preventive measures to preserve oral health in children; and that they must advise parents to visit a dentist / pedodontist in case of suspected caries in the infant/child. 77.6% of the respondents answered positively to the question whether pediatricians, family doctors play an important role in the prevention of caries and the promotion of good oral health, 24.5% of them answered negatively. Slightly lower percentage, but still more than half, (67.3%) think that pediatricians and family doctors must examine infants and young children and detect caries, the rest

Table 3. Respondents attitudes about infants and young children oral health

Question	Number of respondents (%)
Pediatricians, GPs, family doctors play an important role in the prevention of dental caries and the promotion of good oral health in infants?	
Yes	38 (77.6%)
No	12 (24.5%)
Pediatricians, GPs, family doctors must educate parents/guardians on the importance of preventive measures to preserve oral health in children?	
Yes	46 (93.9%)
No	3 (6.1%)
Pediatricians, GPs, family doctors must examine infants and young children and detect caries?	
Yes	33 (67.3%)
No	16 (32.7%)
Pediatricians, family doctors, family doctors must advise parents to visit a dentist/pedodontist in case of suspected caries in the infant/child?	
Yes	46 (93.9%)
No	3 (6.1%)
Who is responsible for protecting the oral health in infants?	
Pediatrician	6 (12.2%)
Pedodontist	6 (12.2%)
General practice doctor	3 (6.1%)
Family medicine doctor	2 (4.1%)
All of the above	40 (81.6%)
Deciduous teeth play an important role in children's health and development?	
Yes	46 (93.9%)
No	3 (6.1%)
Fluoride-containing pastes are not recommended for children under 3 years of age?	
I agree	23 (46.9%)
Disagree	11 (22.4%)
I partially agree	15 (30.6%)

(32.7%) are of the opinion that when examining infants and young children they do not have to detect caries. The following answers were given to the question regarding who is responsible for the oral health in infants: pediatrician, pedodontist, family doctor, family medicine doctor and all of the above. Exactly 81.6% answered that all of them are responsible for the oral health in infants, 12.2% think that it is the pediatrician's responsibility, the same percentage think that it is the pedodontist's responsibility, 3 respondents (6.1%) have the opinion that it is the family doctor's responsibility, and only two respondents

(4.1%) think that the doctor of family medicine is responsible. The respondents also used multiple answers for this question. When asked whether fluoride-containing pastes are not recommended for children under 3 years of age, 46.9% agreed, 22.4% disagreed and 30.6 percent of doctors partially agreed.

Table 4 shows the respondents' practice of preventive measures to preserve oral health in infants and young children, so 91.8% of them advise parents on oral health, dental caries and regular dental examinations, 87.3 percent of respondents, when noticing the presence of caries, advise parents to take their child to the dentist, 16.3% advise parents to take their child to a pedodontist, as well as to prevention teams in public health centers (16.3%), and 18.4% of doctors choose to advise parents/guardians to take their child to the university clinic for children and preventive dentistry. Regarding their recommendation when to start cleansing the oral cavity, 46.9% of the respondents will recommend to start cleansing after the eruption of more deciduous teeth, 32.7% answered immediately after the eruption of the first deciduous tooth, 20.4% think that cleansing the oral cavity should be cleaned immediately after delivery, just after first feeding of the baby, two respondents (4.1%) answered that their recommendation is to start cleansing the oral cavity only when they have all the baby teeth and one of the respondents (2%) answered

Table 4. Practices among the respondents regarding infants and young children oral health

Question	Respondents number (%)
I advise parents on oral health, dental caries and regular dental examinations	
Yes	45 (91.8%)
No	4 (8.2%)
When I notice the presence of caries, I advise parents to take their child to?	
Dentist	43 (87.8%)
Pedodontist	8 (16.3%)
University clinic for child and preventive dentistry	9 (18.4%)
Prevention teams in public health institution	8 (16.3%)
When Do You Recommend to Start Oral Cleansing?	
Immediately after delivery, after feeding the baby	10 (20.4%)
Immediately after the eruption of the first deciduous tooth	16 (32.7%)
After the eruption of more deciduous teeth	23 (46.9%)
When the child has all its baby teeth	2 (4.1%)
After the age of 5 years	1 (2%)

Table 5. Assessment of respondents knowledge about oral health in infants and young children

Question	Number of respondents (%)
The first baby tooth usually erupts at 6 months of age?	
Yes	45 (91.8%)
No	5 (10.2%)
The first dental examination should be made immediately after the eruption of the first deciduous tooth?	
Yes	12 (24.5%)
No	37 (75.5%)
Can cariogenic bacteria be transmitted from mother to newborn?	
Yes	23 (46.9%)
No	26 (53.1%)
White spots on deciduous teeth are early signs of caries.	
Yes	13 (26.5%)
No	36 (73.5%)
The first visit to the dentist should take place on	
6 months	6 (12.2%)
1 year	38 (77.6%)
Occurrence of caries	4 (8.2%)
Occurrence of toothache	3 (6.1%)
Immediately after delivery	1 (2.0%)
The most cariogenic sugar in the diet is?	
Sucrose	33 (67.3%)
Glucose	14 (28.6%)
Lactose	4 (8.2%)
Can the oral health of the mother during pregnancy and lactation affect the oral health of the infant?	
Yes	37 (75.5%)
No	12 (24.5%)
Can prenatal nutrition affect infant oral health and the development of caries in early childhood?	
Yes	41 (83.7%)
No	8 (16.3%)
Are breastfeeding and the occurrence of caries on deciduous teeth closely correlated?	
Yes	21 (42.9%)
No	28 (57.1%)
Children who use a pacifier bottle at night are more prone to caries on deciduous teeth.	
Yes	42 (85.7%)
No	7 (14.3%)

that after the age of five is the right time Table 5 provides questions and answers intended for assessing respondents' oral health knowledge in infants and young children. 91.8% of doctors gave the correct answer that the

first deciduous tooth usually erupts at the age of 6 months. Only 46.9% of respondents know that cariogenic bacteria can be transmitted vertically from mother to newborn, and a very small percentage (26.5%) of respondents know that white spots on deciduous teeth are early signs of caries. 75.5% of doctors believe that immediately after the eruption of the first deciduous tooth is not the right time for the first dental examination, and 77.6% believe that the first visit to the dentist should be at the age of 1, 8.2% answered that it should be after occurrence of caries, and 6.1% answered that the first visit should occur after the onset of toothache. Slightly more than half of the respondents (57.1%) do not think that breastfeeding and the appearance of caries on deciduous teeth are closely correlated, but 85.7% know that children who use a bottle with a pacifier at night are more predisposed to caries of deciduous teeth. To the question whether the oral health of the mother during pregnancy and lactation can affect the oral health of the infant, 75.5% answered positively; to the question whether the prenatal diet can affect the oral health of the infant and the development of caries in early childhood, 83.7% answered positively. When asked which is the most cariogenic sugar in the diet, 67.3% answered that it is sucrose, 28.6% answered that it is glucose, and 8.2% of the respondents answered that it is lactose.

Discussion

To the best of our knowledge, this is the first study in Macedonia that examines the attitude, practices and knowledge of pediatricians, GPs and family medicine specialists for oral health in infants and young children as doctors who are directly or indirectly involved in the implementation of the National prevention strategy of oral diseases in children up to 14 years old. Also, in the world scientific database and literature, there are few studies that describe the attitude of pediatricians regarding oral health. In Geneva, the World Health Organization, through its Maternal, Child and Adolescent Health programs, is establishing a tool to improve maternal and infant health nationally and internationally¹², and the World Health Organization's antenatal care programs have a vision for every mother and newborn to be provided with the necessary health services, by providing a positive experience during pregnancy, anywhere in the world²³. The World Dental Federation, on the other hand, emphasizes the importance of integrating oral health into all health policies nationally and internationally, in order to prevent the occurrence of oral diseases, by encouraging governments, stakeholders and decision makers to include the promotion of oral health as an integral part of general health policy²⁴. The preventive programs for preservation of oral health, which will start with interventions much earlier, in

the prenatal and perinatal period, will enable growth and development of the child with good oral health as an integral and essential part of general health. It was reported that 89% of children at the age of one visited a pediatric or general practice clinic, and only 1.5% had a visit to the dentist in the same period²⁵. Precisely, because in the first year of life the meetings with the family doctor and pediatrician are more frequent and the possibility to be directly involved in the prevention of oral health is higher, we were motivated to make this study through which we will find out the attitudes, practices and knowledge of this "first line" of health professionals.

In our study, as many as 93.7% of the respondents have a positive attitude and believe that pediatricians, GPs, family doctors must educate parents/guardians about the importance of preventive measures to preserve oral health in children. Also, they must advise parents to visit a dentist/pedodontist in case of suspected caries in the infant/child, which is an approximate percentage compared to the study of Alshunaiber R et al (2019), in which 86.1% of the examined pediatricians and family doctors had a positive attitude regarding this question²². Regarding the question whether pediatricians, GPs and family doctors play an important role in the prevention of caries and the promotion of good oral health, 77.6% of respondents answered positively, compared to a study conducted in Turkey by Sezer et al, (2013) where 96.9% of the respondents had a positive attitude on this issue. Ninety-one percent of our respondents advise parents/guardians on oral health, dental caries and regular dental examinations, which is an excellent percentage compared to their colleagues from Saudi Arabia where, according to Alshunaiber R et al. (2019), only 57.9% of them practice this²². According to the American Academy of Pediatric Dentistry (AAPD), parents/guardians should be encouraged to take their child to the dentist for the first time by the 12th month at the latest in order to make the following interventions²⁶: first visit with registering medical (for infant) and dental (for parent and infant) card, oral examination, education for proper oral hygiene according to the age, fluoride treatment if indicated²⁷. In our study, 89.8% of respondents know that the first appointment with a dentist should be made before the child turns one year, which does not coincide with the study of Hadjipanayis A et al. (2018), according to which 43% of pediatricians in Europe recommend first visit to the dentist after the third year, and only 7 percent before the child turns one year.²⁸ According to Balaban R. et al (2012), the percentage of those who recommended the first meeting with a pedodontist in the first year of life is 63.9%²⁹. Recent studies note a large percentage of pediatricians who do not recommend the first appointment with a dentist to be under one year, which emphasizes the need for additional

education among health professionals on the topic of infantile oral health^{30,31}. According to the American Dental Association, in children under the age of three, if fluoridated paste is used, the amount of paste placed on the brush should not be greater than a grain of rice³². In our study, 46.9% of respondents disagreed with the use of fluoridated toothpaste in children under 3 years of age. In recent study (Hadjipanayis A et al), twenty-four percent of respondents did not know that white spots on the teeth are the first signs of caries²⁸, compared to our study in which 73.5% of respondents did not know that white spots on deciduous teeth are signs of initial carious lesion.

The large percentage do not know that cariogenic bacteria can be transmitted from mother to newborn (53.1%), and a large percentage do not know that the first appointment with a dentist should be immediately after the eruption of a baby tooth (75.5%), despite the positive attitude and practices regarding the oral health of the respondents, may signal the need for additional education of respondents on the topic of oral health prevention in the perinatal period.

During our research, we found that in relation to other studies on this topic, we had a small sample for analysis due to the small number of pediatricians, GPs and primary care physicians who responded positively to our call, and if we had better feedback we believe that we would have had different results, especially in the area of oral health knowledge among the respondents.

Conclusion

We came to the conclusion that pediatricians, family physicians, GPs or physicians involved in primary health care have recognized their role in the prevention of oral health and have a positive attitude and excellent knowledge of certain aspects of early childhood caries. Nevertheless, it was also observed that there is a need for renewing the knowledge, especially in the field of etiology and diagnosis of early childhood caries. An easily accessible guide and protocol for infant oral health intended for all health professionals who come in contact with the child in the first years of life would help anyone in an active role to properly guide and educate parents/guardians.

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