



Physicians' views on pediatric preventive dental care

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Abstract

Physicians who provide primary care for children are considered to be in a unique position to provide dental preventive care to their patients. No literature relates the amount of preventive oral health education that physicians receive during training. The purpose of this study was to assess the knowledge, attitudes, and beliefs of pediatricians and family physicians toward preventive dental care in children. A questionnaire was mailed to 398 pediatricians and 632 family physicians licensed to practice in the state of Alabama. The response rate after one mailing and a reminder was 46%. Physician's knowledge about many aspects of preventive dental care was good, but areas of great concern were identified. Overall, most respondents received 2 hr or less of preventive dental education during medical and specialty training. Pediatricians were better informed than family physicians in the areas of general dental knowledge and prevention counseling related to oral health ($P < 0.05$). (Pediatr Dent 19:377-83)

Contemporary guidelines for oral disease management recommend early professional intervention so that the effects of oral disease can be reduced or eliminated.^{1,2} Specialists in direct child patient care (such as pediatricians and family practitioners) examine children many times during the first 2 years of life. During these visits, developmental progress is evaluated, necessary immunizations are provided, and guidance is given to the parents concerning nutrition and cognitive development of the child.³ Preventive dental counseling, however, is rarely included as part of these visits.⁴

Traditionally, the proper age for the first dental visit was thought to be 3 years. The rationale for this was that children were more manageable at this age and, therefore, treatment was more efficient.⁵ However, by this age, the oral health of children may be compromised.^{6,7} Early intervention provides the opportunity to educate parents in many areas such as proper oral hygiene, prevention of dental injuries, and prevention of nursing caries by establishing proper feeding habits.^{8,9}

Pediatricians are considered to be in a unique position to contribute to the dental health of their young patients because of the early age at which children are

brought to their offices and because parents accept their recommendations.¹⁰ Several studies indicate that pediatricians and family physicians play an important role in preventing oral disease.^{11,12} How prepared are they to assume the challenge of providing comprehensive oral preventive information to the parents? Often the physician's role in oral prevention has been limited to monitoring fluoride intake and supplementation as the only means to prevent dental caries.^{4, 13-18} Gift et al.¹⁴ examined the role of physicians in the provision of caries prevention. They concluded that physicians know they play an important part in caries prevention, especially in young children. They also are aware of the value of some caries preventive measures and often take the initiative in providing them to patients. However, with the exception of fluorides, they are generally misinformed about the relative worth of other caries preventive measures.

Few studies assess how much physicians know about aspects of preventive dental care in children other than fluoride supplementation.^{4, 14, 19} Tsamtouris and Gavris⁴ assessed physicians' attitudes towards pediatric dental health and concluded that, although physicians are the first health professionals to come in contact with expectant parents and parents of infants and young children, they are not well informed in some aspects of dental health. Most pediatricians who participated in this survey recognized the need to improve their dental knowledge. They also favored receiving more information during medical school training, specialty training, or even through continuing education programs.

Preisch¹⁹ conducted a study at the Children's Hospital of Columbus, Ohio, among staff pediatricians and family practitioners providing primary care. He found that most physicians performed oral examinations when a child's physical examination was conducted. Pediatricians performed oral examinations with more frequency than family practitioners. Dental caries elicited more concern among the participants than eruption sequence or malocclusion problems. The majority of the physicians recorded the results of the oral examinations and provided information to the parents concerning oral health verbally but not consistently.

The American Academy of Pediatric Dentistry (AAPD) recommends that infant oral health care begins

with oral health counseling for the newborn's parents and should include oral examination and preventive health education within 6 months of the eruption of the first primary tooth (not later than 12 months of age). Recommendations regarding the periodicity of examination, preventive dental services, and oral treatment for children have also been established.²⁰ No literature exists regarding the knowledge that pediatricians, family physicians, or dentists (other than pediatric dentists) have regarding these recommendations. Likewise, no reports correlate the amount of preventive oral health education that physicians receive during their training with their preventive oral health knowledge. The purpose of this study was to assess the knowledge, attitudes, and beliefs of the pediatricians and family physicians in the state of Alabama toward preventive dental care in children. It is hypothesized that physicians who specialize in direct child primary care such as pediatricians and family physicians are not well informed about some aspects of pediatric preventive dental care and that this deficiency is related to the lack of information they receive during medical or specialty training.

Methods and materials

Names, telephone numbers, and addresses of all the pediatricians and family physicians licensed to practice in the state of Alabama were obtained from the Alabama Medical Association. From the original list of 1423 physicians (561 pediatricians and 862 family practitioners), 393 physicians were eliminated for one or more of the following reasons: 1) incomplete address, 2) practice out of the state of Alabama, 3) in residency program, 4) specialists who do not provide primary care for their patients, or 5) practice osteopathic medicine. A database file containing the names, addresses, and telephone numbers of 1030 physicians (398 pediatricians and 632 family physicians) was constructed. A questionnaire containing 35 multiple-choice questions and an open-ended comment section was designed. The general categories of questions included were: background information (age, gender, medical specialty, institution and location of medical training; year of graduation from medical school and specialty training; area of practice) and overall dental knowledge, including prevention, fluoride supplementation, nutrition, habits, and dental trauma.

The questionnaire was approved by the Institutional Review Board for Human Use (IRB). A letter explaining the purpose of the study and a pre-addressed, stamped envelope accompanied each questionnaire. A reminder was sent 6 weeks after the first mailing. Confidentiality was maintained throughout the study.

A database file and a reference code guide were created for responses to the questionnaire using the program dBase for Windows[®] version 5.0 (Borland International). Data were analyzed using the SAS/STAT 6.03 (Microsoft[®]) statistical software package. Statistical analysis included descriptive statistics and Chi square tests.

Results were considered significant if $P < 0.05$.

Results

Of the 1030 questionnaires mailed, 472 were suitable for evaluation (response rate of 46%). Respondents were physicians who identified themselves as either pediatricians (189, 48%), family practitioners (267, 42%), or other specialists who provided primary care for children (16, 3%). There were 327 (69%) males and 142 (31%) females. Age ranged from 26 to 77 years, with a mean of 43.7 ± 11.4 SD years. Respondents practiced in rural (153, 33%), urban (159, 34%), and suburban (154, 33%) areas. About half of the respondents had completed their medical training (249, 53%) and specialty training (257, 55%) in Alabama.

General dental knowledge

In this study, 277 (59%) of the respondents reported not receiving information about preventive oral health during their medical training. Similarly, 241 (51%) respondents did not receive information during specialty training. Of the 192 respondents who reported receiving information during medical training, 122 (63%) received 2 hr or less of preventive oral education. Similarly, of the 229 respondents who reported receiving information during specialty training, 138 (60%) received 2 hr or less. Therefore, overall, 399 respondents (85%) received 2 hr or less of preventive dental education during medical training, and 379 respondents (80%) received 2 hr or less of preventive dental education during specialty training.

In terms of overall dental knowledge, 16 (3%) felt they had excellent knowledge, 152 (32%) good, 253 (54%) fair, and 49 (10%) poor. The role played in the oral health of their patients was important for 191 (41%), somewhat important for 230 (49%), and not important for 48 (10%) of the respondents.

Information to parents concerning the oral health of their children was provided to parents always by 135 (29%), sometimes by 253 (54%), rarely by 67 (14%), and never by 15 (3%) subjects. The identification of an optimal provider of preventive oral health information was difficult for respondents. Of those who responded, dentists were selected by 211 (45%), physicians by 156 (33%), hygienists by 16 (3%), and nurses by 12 (3%). Twenty-nine respondents (6%) thought that all specialties should be involved, and 25 (5%) thought that both physicians and dentists should be involved. Many respondents (321, 68%) thought that children should visit the dentist for the first time by 3 years of age. Patients were referred to general dentists by 236 (50%) and to pediatric dentists by 214 (46%) of the respondents.

Prenatal counseling was provided by 288 (61%) of respondents. However, 225 (48%) of those did not talk about oral health. Therefore, 409 respondents (87%) did not provide prenatal oral health counseling to the parents. According to respondents, the

provision of preventive oral health information to the parents should start when patients are 6 months of age by 225 (48%), 1 year by 133 (28%), and 3 years of age by 32 (7%). Only 69 (15%) thought the information should be provided prenatally.

Most of the respondents (330, 70%) were not familiar with the AAPD recommendations for pediatric preventive dental care. Of the 140 (30%) who were aware of the recommendations, 96 (69%) were pediatricians.

General prevention counseling related to oral health

Plaque removal activities were recommended to start after eruption of the first primary tooth by 351 (75%) respondents. Only 41 (9%) thought they should begin before eruption of teeth. Only 57 (12%) were confident they fully understood the function and indications of dental sealants.

Thumb sucking or the use of a pacifier were considered harmful to the dentition, depending on the duration, frequency, and intensity, by 305 (65%) respondents. Nutritional counseling was reported to be provided by 81 (17%) respondents to all patients, 113 (24%) to the majority, and 210 (45%) to some patients. Only 66 (14%) said they did not provide any nutritional counseling. In many cases (239, 51%), the counseling was provided by the physicians themselves.

Bottle and/or breast weaning were always discussed with the parents by 300 (64%) respondents. Weaning was recommended to begin at 9 months (249, 53%), 12 months (162, 35%), 15 months (27, 6%), and 18 months (8, 2%). Completion of weaning was recommended by 12 months (194, 41%), 15 months (120, 26%), 18 months (48, 10%), and 21 months (18, 4%).

Most respondents (419, 89%) reported practicing in areas where water is fluoridated. Many respondents (254, 54%) did not write any fluoride prescriptions, 163 (35%) wrote 1–5 prescriptions per month, and 52 (11%) wrote six or more prescriptions per month. Vitamin combinations that contain fluoride were prescribed regularly by 211 (45%) of respondents. In this study, the criteria most commonly considered when prescribing dietary fluoride supplements were: age of the child (352, 76%), amount of fluoridated water ingested by the child (437, 93%), whether the child is breast fed (308, 66%), and adequacy of the child's diet (285, 61%). Only 137 (29%) were confident they understood the concept of dental fluorosis.

TABLE 1. SIGNIFICANT DIFFERENCES AS RELATED TO PREVENTIVE ORAL EDUCATION RECEIVED DURING MEDICAL TRAINING

| Questions | Received Oral Education | Did Not Receive Oral Education | P value* |
|---|--------------------------|--------------------------------|----------|
| Perceived overall dental knowledge | Good 48% [†] | Fair 60% | < 0.001 |
| Physicians as providers of preventive information | Yes 56% | No 59% | < 0.01 |
| Provision of nutritional counseling to patients | Some patients 40% | Some patients 48% | < 0.05 |
| Knowledge about dental sealants | Have an idea 37% | Have an idea 50% | 0.01 |
| Begin use F-containing dentifrice | 0-1 year 40% | 1-3 years 47% | < 0.001 |
| Discuss bottle or breast weaning | Always 71% | Always 59% | 0.01 |
| Familiar with AAPD recommendations | No 63% | No 76% | < 0.01 |

* P value obtained from Chi square analysis for each question.

[†] Category with highest percentage of indicated response.

Correlations

Each question was correlated with the education received about preventive oral health during medical and specialty training, specialty, area of practice, age group, and geographical region of specialty training. Also, fluoride supplementation practices were correlated with the responses of physicians that reported practicing in areas with fluoridated drinking water.

Differences among physicians who received preventive oral health education during medical and specialty training and those who did not were statistically significant for most questions. These findings are summarized in Tables 1 and 2. Similarly, significant differences among specialties were also found for most questions when pediatricians were compared to family practitioners. Most notable differences are summarized in Table 3. Pediatricians received significantly more preventive oral health education (288, 61%) than family practitioners (184, 39%) during specialty training ($P=0.001$).

There were several significant differences found between the responses of rural, urban, and suburban physicians. Physicians in rural areas recommended earlier delivery of preventive oral health information and a later time for weaning ($P < 0.001$). They also recommended general dentists more frequently when referring their patients, whereas urban and suburban area physicians more frequently recommended pediatric dentists ($P < 0.001$).

Significant correlations between physicians who reported practicing in areas where drinking water is fluoridated and the provision of fluoride supplementation were found. Physicians who reported practicing in areas where water is fluoridated wrote fewer fluo-

TABLE 2. SIGNIFICANT DIFFERENCES AS RELATED TO PREVENTIVE ORAL EDUCATION RECEIVED DURING SPECIALTY TRAINING

| Question | Received Oral Education | Did Not Receive Oral Education | P value* |
|--|---------------------------|--------------------------------|----------|
| Perceived overall dental knowledge | Good [†] 48% | Fair 65% | < 0.001 |
| Perceived role played in oral health of patients | Important 48% | Somewhat important 51% | < 0.001 |
| Physicians as providers of oral preventive information | Yes 59% | No 64% | < 0.001 |
| Referral of patients | Pediatric dentists 56% | General dentists 61% | < 0.001 |
| Provision of nutritional counseling | Some patients 35% | Some patients 54% | 0.001 |
| F ⁻ prescriptions written per month | None 44% | None 60% | 0.001 |
| Understand the concept dental fluorosis | Yes 61% | Yes 39% | 0.001 |
| Discuss bottle or breast weaning | Always 76% | Always 53% | < 0.001 |
| Familiar with AAPD recommendations | No 60% | No 80% | < 0.001 |

* P value obtained from Chi square analysis for each question.

† Category with highest percentage of indicated response.

TABLE 3. SIGNIFICANT DIFFERENCES AMONG SPECIALTIES

| Questions | Pediatricians | Family Physicians | P value* |
|--|---------------------------------|-----------------------------|----------|
| Physicians' role in oral health of patients | Important [†] 52.6% | Somewhat important 53.6% | < 0.001 |
| Physicians as main providers of oral information | Yes 59.1% | No 61.1% | < 0.001 |
| Dentists as main providers of oral information | No 51.8% | Yes 64.8% | < 0.001 |
| Referral of patients | Pediatric dentists 75.1% | General dentists 73.3% | < 0.001 |
| Provision of nutritional counseling | All patients 30.8% | Some patients 56.9% | < 0.001 |
| F ⁻ prescriptions written per month | 1-5 45.6% | None 68.8% | < 0.001 |
| Begin use F ⁻ -containing dentifrice | 1-3 years 45.4% | 0-1 years 54.6% | < 0.001 |
| Begin weaning | 9 mo. 68.5% | 9 mo. 45.9% | < 0.001 |
| Accomplish weaning | 12 mo. 68.5% | 12 mo. 37.9% | < 0.001 |

* P value obtained from Chi square analysis for each question.

† Category with highest percentage of indicated response.

ride prescriptions per month (252, 53% wrote no prescriptions) as compared to those who reported practicing in areas where water is not fluoridated (245, 52% wrote 1-5 prescriptions per month). Of those physicians who reported practicing in areas where water is not fluoridated, 65% (187) prescribed vitamin combinations that contain fluoride, whereas most of the physicians who reported practicing in areas where water is fluoridated did not (232, 55%, $P < 0.001$).

There were no significant correlations between the responses to the questionnaire and age groups or areas of specialty training.

Discussion

Physicians are considered by the medical and dental communities to be responsible for the oral health of infants.^{4, 11, 21} The results of this study showed only a slight preference for dentists (45%) over physicians (33%) as providers of preventive oral health information. Preventive oral health education received by physicians during medical or specialty training influenced their knowledge and attitudes, confirming the hypothesis that pediatricians and family physicians are not well informed in some aspects of pediatric preventive dental care and that this is related to the information they receive during training. Physicians who received no preventive oral health education had less relevant oral knowledge and felt worse about their overall dental knowledge than those who received some information (see Tables 1 and 2).

The data suggest that physicians understand the importance of oral

health. Most physicians recognized that their overall dental knowledge is fair and almost unanimously indicated the need for increasing their knowledge through medical and specialty training or continued education courses (no particular preference was found among these options). Findings from previous studies agree with these findings, reporting that most pediatricians have little instruction or training in oral health guidance and dental treatment and feel insufficiently trained to provide pediatric preventive dental care.^{4,14} Another study of pediatricians demonstrated that the perceived level of insufficiency of training in the area of dentistry has not changed significantly since 1978.²² In the same study, the most recently trained pediatricians perceived a significant increase in sufficiency of their training in the area of dentistry as compared to older pediatricians. In our study, preventive dental education did not seem to be a consistent part of the curriculum of medical school or specialty training programs. However, physicians believe that they should be involved in providing preventive dental information to patients and parents.

The majority of respondents (70%) were not familiar with the AAPD recommendations for pediatric preventive dental care. It has been proposed that the increasing number of children with special care needs, the persisting number of children with nursing caries (mainly in minority populations), and the inability of nondental health providers to recognize dental caries and provide effective counsel for caries prevention mandate the need for a dental visit during the first year.²³ In 1977, a committee of pediatric dentists serving as American Academy of Pediatrics consultants recommended the first referral to the dentist by 18 months.²⁴ However, they recommended that the pediatricians inquire among the pediatric and general dentists in their community as to what ages they wished to see children, as some preferred a later age. Contemporary AAP Guidelines for Health Supervision recommend the first referral to the dentist by 36 months of age.²⁵ The American Academy of Family Practice follows the AAP recommendations for preventive dental care. Many of the physicians surveyed (68%) recommended the first visit to the dentist at 3 years of age, following the popular belief that behavior at this age is more manageable.⁵ There seem to be diverse opinions among pediatricians and family physicians regarding the ideal age for referring patients to the dentist the first time. These differences may be due to the absence of common guidelines.

Many physicians in the present study recommended starting the use of a fluoride-containing dentifrice at 1–3 years of age (44%). However, a substantial number of physicians (30%) recommended fluoride dentifrice use before 1 year of age. Previous studies have shown that toothpaste use and ingestion are substantial sources of systemic fluoride.^{26–28} Fluoride toothpaste ingestion is considered a risk factor for dental fluoro-

sis.²⁷ The age at which children start brushing with a fluoride-containing toothpaste has been reported to be directly correlated to the prevalence of fluorosis.²⁹ Simard³⁰ concluded from that parents should be advised to delay the use of fluoride dentifrice until the child is older than 24 months.

Physicians in this study referred patients to general dentists (50%) with more frequency than to pediatric dentists (46%), especially family physicians and physicians who practice in rural areas. The limited availability of pediatric dentists in rural areas may account for some of these differences. Preisch¹⁹ reported that most pediatricians recommended pediatric dentists, whereas most family practitioners recommended general dentists. In this study, similar results were found, with 75% of pediatricians and 25% of family physicians referring to pediatric dentists ($P < 0.001$).

The majority of physicians (83%) always perform oral examinations during children's physical examinations. However, the scope of this study did not allow us to determine specific focus areas of physicians when they perform oral examinations. Preisch¹⁹ reported that dental caries and pathoses elicited more concern among physicians than dental developmental issues such as malocclusions or abnormal eruption patterns.

Systemic and topical fluoride is one of the most effective preventive measures in reducing dental caries.^{31–33} About 81% of Alabamians are served by a public water supply with fluoridated water.³³ In this study, most physicians surveyed did not prescribe any fluoride. A substantial group (35%) wrote 1–5 prescriptions per month. Pediatricians wrote more prescriptions than family physicians ($P < 0.001$). A substantial group of respondents (45%) regularly prescribed vitamin combinations that contain fluoride. It has been recommended that practitioners who prescribe fluoride supplements should adhere to a minimum protocol of 1) inquiring as to the fluoride content of the child's drinking water; 2) performing fluoride analysis of the water prior to writing the prescription; and 3) continuing fluoride supplementation until at least 10 years of age.¹⁶

In this study, the criteria most commonly considered by the physicians surveyed when prescribing fluoride supplements were 1) the amount of fluoridated water ingested by the child; 2) the age of the patient; and 3) whether the child was breast fed. The respondents also considered the adequacy of the child's diet. Although this can indirectly affect the consumption of fluoride, it is not considered a criterion for the need for fluoride supplementation. This study did not inquire if the drinking water was analyzed before writing the prescription; therefore, this factor cannot be addressed.

Other preventive measures such as prenatal counseling, nutritional counseling, and sealants were not consistently favored by respondents in this study. Physicians provided some information to patients regarding oral health. However, it was not provided consistently. Most physicians provided prenatal counseling;

however, a high percentage did not deliver oral health education to the parents during prenatal counseling. Few respondents (12%) understand the function and indications of pit and fissure sealants adequately.

Guidelines prepared by the AAP suggest that pediatricians should advise parents to begin bottle or breast weaning when their child is approximately 9 months of age and accomplish it soon after the first birthday.³⁴ Koranyi et al.³⁵ found that most pediatricians tended to recommend later dates for the beginning and accomplishment of weaning and were not completely in accordance with the AAP guidelines. The results of our study demonstrated that most physicians were aware of the AAP recommendations for the beginning and accomplishment of weaning. Pediatricians were in agreement with the recommendations of the AAP with more frequency than family physicians. Also, rural physicians recommended later weaning dates as compared to urban and suburban physicians ($P < 0.001$).

Most of the relevant differences found in this study were between pediatricians and family practitioners. This finding elicits concern, because although both specialties provide primary care for children, their knowledge and opinions about pediatric preventive dental care differ. It was found that pediatricians received more preventive oral health education than family physicians in both medical and specialty training (see Table 4), which may account for the differences.

It has been previously reported that intense educational programs can improve physicians' knowledge and attitudes towards fluoride supplementation.¹³ The results of this study show that there is a need for education about preventive oral care other than fluoride supplementation among physicians who provide primary care for children. Our results also suggest that the curricula of medical and specialty training programs should be evaluated to assure ample time to educate physicians about oral health prevention.

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TABLE 4. SUMMARY OF RESULTS

| <i>Areas of Adequate Knowledge Most Physicians</i> | <i>Areas of Concern Most Physicians</i> |
|--|--|
| <ul style="list-style-type: none"> • Feel they play a role in the oral health of their patients. • Think preventive oral information should be delivered by 6 months or earlier. • Always perform oral examination during child physical examination. • Do not write many prescriptions per month and do not prescribe vitamin combinations that contain fluoride frequently.* • Know that oral habits (e.g., thumb sucking) can be harmful depending on intensity, duration and frequency. • Think plaque removal should start after the eruption of the first tooth. | <ul style="list-style-type: none"> • Are not familiar with AAPD recommendations. • Receive ≤ 2 hours oral health education during training. • Recommend first visit to the dentist at 3 years. • Do not provide information about oral health and nutritional counseling consistently. • Do not talk about oral health during prenatal counseling • Do not consider preventive measures other than fluoride supplementation. • Do not feel confident dealing with trauma involving the dentition. • Feel only somewhat confident about overall dental knowledge. |

* 81% of Alabamians are served by a public water supply receiving fluoridated water.

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