

Preparation and beliefs of graduates of a predoctoral infant oral health clinical program

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Abstract

Purpose: The aim of this study is to evaluate the effects of a predoctoral clinical educational program on preparation and beliefs of participants related to infant oral health.

Methods: Questionnaires were constructed and mailed out to four classes of past dental students, two of which had attended the program.

Results: Significant differences were detected between groups regarding their feelings of preparation for examination procedures in children younger than 36 months and their beliefs regarding appropriate age of the initial dental visit. (Pediatr Dent 20:5 331-335, 1998)

Despite declines in caries prevalence in the permanent dentition of the pediatric population, national surveys demonstrate stabilization of previously recorded decreases in primary teeth.^{1,2} Early childhood caries (ECC) contributes to deciduous dentition disease and is a form of rampant decay that affects infants and toddlers. The disease commonly presents as initial caries on maxillary incisors and may progress to widespread dental destruction.³ Prevalence varies among populations, with culturally unique and marginalized communities experiencing higher levels than other groups; for example, Native American and Alaskan populations have reported prevalence ranging from 15 to 85% and urban indigent populations reported from 5 to 12%.^{4,5} Factors associated with the onset of ECC include frequent ingestion of sweetened beverages, nap-time bottle use, and high maternal streptococcal loads.^{3,6} Lesions are typically detected between 18 and 24 months and characterize a severe and rapidly progressive disease process. Financial, health, and professional service costs involved in the treatment of ECC are high and often irrevocable.⁷⁻⁹ Educational and preventive programs for parents and families of very young children have been shown to be successful in high-risk populations resulting in long-term reductions in prevalence.^{10,11} Indeed, the American Academy of Pediatric Dentistry (AAPD) endorses infant oral examinations around the first birthday as a method to identify and intercept hazardous dental behavior, perform a caries risk assessment and provide anticipatory guidance.^{12,13}

Pediatric Dentistry—20:5, 1998

In a survey of AAPD members, 44% of respondents reported providing infant examinations as recommended by the policy and 37% assessed or discussed risk assessment.¹⁴ Reasons for not practicing infant oral health (IOH) among those responding to the survey included: 1) parents not seeing the value and 2) existing conditions, as opposed to age, being the determinant for oral examination.

In a survey of general dentists in Indiana, more than 40% recommended and initially examined children between 25 and 35 months and another 30% beyond the age of 3 years. Fewer than 5% of respondents provided care to children 12 months and younger.¹⁵ As the majority of the pediatric population is seen by general dentists and in consideration of the ramifications of ECC, it is incumbent on predoctoral dental training programs to educate and prepare professionals to deliver infant oral care. However, there are few reports and no standard national policy on IOH inclusion in predoctoral clinical curricula. Resultant disparities in predoctoral training may account for varied IOH beliefs and practices of general practitioners.^{14,15}

The aim of this article is to describe a predoctoral clinical IOH program and to evaluate the effect of this program on preparation and beliefs of graduating dentists.

Since 1984, a few dental schools have taught IOH at the predoctoral level.^{16,17} In 1994, The University of Michigan School of Dentistry introduced the Young Patient and Preventive Clinic (YPPC) as part of the senior pediatric dentistry curriculum. The rationale for this included the persistence of ECC in young children, emerging knowledge in caries risk assessment, and increasing demands for early care by the public.^{2,3,18} Through the YPPC, graduating dental professionals would be equipped with a foundation clinical experience in oral care for the very young child and would cater to diagnostic and preventive needs of this age group.

Expected student competencies after attending the YPPC are:

1. Performance of infant and toddler oral examinations

2. Identification of ECC and associated risk factors
3. Prescription of risk-based preventive treatment plans
4. Provision of anticipatory guidance
5. Appropriate referral of infants and toddlers requiring specialty care.

Students rotate through YPPC in small groups of two or three attended to by one specialty faculty member. Half-hour preclinic seminars include demonstration of methods of oral examinations, specifically knee-to-knee examination, and detailed discussion of risk-assessment and anticipatory guidance for the very young patient. Each student is assigned two patients for the 3-h session and the examinations are conducted in the presence of the accompanying caregiver allowing for delivery of appropriate patient education.^{13, 16} Radiographs, prophylaxes, fluoride treatment, and sealant therapy may be performed accordingly. Caries risk assessment is completed for each patient using a computer-generated form that necessitates identification and recording of problems, risk categorization, and appropriate preventive treatment planning. Bacterial testing is not routinely used as a diagnostic tool due to economic and temporal cost effectiveness despite high correlation between *Streptococcus mutans* counts and caries risk in very young children.¹⁸ However, such tests have been used selectively for student-group demonstration purposes and educative incentives for parents of high-caries and high-risk children to complete preventive treatment plans. Immediately after the clinic session, cases are presented and discussed with student peers and supervising faculty.

The preclinic seminar of the second rotation session constitutes review of clinical issues related to IOH and scheduled patients. Patient care is again completed on two patients and the closing seminar mirrors the first session.

Methods

To evaluate preparation for procedures and beliefs of students completing the course, a questionnaire was developed and mailed out to all predoctoral graduates from the preceding 4 years. The two most recent-year groups had rotated through the YPPC. Bases of questionnaire structure were YPPC program content, course objectives, and student competencies. Questionnaires were anonymous and were not pretested. Stamped, return-addressed envelopes were provided to each questionnaire recipient.

Responses were dichotomized into "BeforeYPPC"

TABLE 1. RESPONSE RATE AND PRACTICE DISTRIBUTION

	Number Surveyed	Response Rate (%)	General Practice (%)	Other (%)	Pediatric Dentistry (%)
BeforeYPPC	170	43	86	12	2
AfterYPPC	168	48	70	28	2

Student's *t* test not significant at $P < 0.01$.

and "AfterYPPC" pools. Student's *t* test and chi-square analyses compared groups and responses respectively.

Results

Response rates and practice distribution for both groups are shown in Table 1. Overall response rate was 45%. Significant differences were detected in some areas of preparation and beliefs using chi-square analysis (Tables 2 and 3). Clearly more members from the AfterYPPC group were more likely to feel prepared to examine younger patients than were respondents in the BeforeYPPC group. Additionally, the AfterYPPC group was more prepared to address dietary and oral hygiene needs for young patients as well as evaluate caries risk (Table 2).

Beliefs concerning age for first dental examination were significantly changed in the AfterYPPC group (Table 3), with 54% of respondents believing that the first dental exam should occur before age 2 while only 14% of the BeforeYPPC group agreed.

Discussion Responses

Although practice distribution of each responding group did not present statistical differences, the low response rates for both groups may have contributed to response bias. This may have been based on a favorable or negative attitude by either participants or nonparticipants. Due to the anonymous mailing of the questionnaire, it was not possible to follow up to elucidate this. The probable response bias is given due consideration in the discussion and interpretation of the results.

Preparation for examinations and preventive care

More than 60% of BeforeYPPC respondents (BEFORE) felt poorly or very poorly prepared to examine children 24 months and younger. By contrast 69% or more of AfterYPPC respondents (AFTER) felt average or better prepared to conduct the same. Considering curricular material offered in germane years, it is probable that the YPPC contributed to these differences.

Despite this improvement, AFTER still had 30% or fewer who felt poorly prepared to provide oral examinations in the very young patient. This may be

TABLE 2. AREA OF PREPARATION

	Very Well (%)	Well (%)	Average (%)	Poorly (%)	Very Poorly (%)
*1. Examine children 0 to 12 mo.					
BeforeYPPC	3	6	17	28	46
AfterYPPC	13	26	31	15	15
*2. Examine children 12 to 24 mo.					
BeforeYPPC	4	6	24	32	34
AfterYPPC	16	32	27	14	11
*3. Examine children 24 to 36 mo.					
BeforeYPPC	6	15	32	25	22
AfterYPPC	20	39	27	6	7
4. Provide education to parents on nursing bottle decay					
BeforeYPPC	20	44	29	7	0
AfterYPPC	44	36	18	2	0
*5. Provide preventive care related to diet in children 0 to 36 mo.					
BeforeYPPC	11	18	27	31	13
AfterYPPC	19	26	39	12	4
6. Provide topical and systemic fluoride therapy in children age 0 to 36 mo.					
BeforeYPPC	13	25	31	20	13
AfterYPPC	23	27	35	10	5
*7. Address oral hygiene needs in children age 0 to 36 mo.					
BeforeYPPC	10	18	43	17	13
AfterYPPC	25	36	30	6	3
*8. Evaluate risk (caries risk assessment) in children 0 to 36 mo.					
BeforeYPPC	9	11	35	24	21
AfterYPPC	20	37	32	7	4

* Chi-square significant at $P < 0.01$.

TABLE 3. BELIEFS

	0-1 Yr (%)	1-2 Yrs (%)	2-3 Yrs (%)	3-4 Yrs (%)	4-5 Yrs (%)
*1. Age for initial dental visit					
BeforeYPPC	3	11	32	48	6
AfterYPPC	30	24	19	27	0

* Chi-square significant at $P < 0.01$.

attributed to patient attendance failures or initial clinic inability to fill all clinic appointments with appropriately aged children that resulted in sub-optimal clinical contact early in the program. Patient attendance data indicates that there were many more 36- to 48-month children seen than any other age group during a portion of the period corresponding to AFTER. This may account for the respondents who felt poorly and very poorly prepared. The same group recorded 25 and 13% with similar responses regarding 12- to 24- and 24- to 36-month age groups respectively.

Conversely, almost 50% of BEFORE were poorly or very poorly prepared to examine 24- to 36-month children. Moreover, low numbers of respondents who had no YPPC experience felt well prepared to examine 0- to 24- (10%) and 24- to 36-month (21%) children. This may reflect the patient-age ranges during their clinical training. Those who felt prepared may have developed this level of comfort through practice, continuing education courses, discussions with peers, observations of colleagues, or from the literature.

There may have been individuals who had provided infant oral care and yet felt inadequately prepared within the AFTER group. A rotation longer than the current two sessions may better prepare students to examine 0- to 24-month children. A longer rotation has been requested by many YPPC course participants.

The AFTER group felt better prepared to provide preventive care related to diet in infants and toddlers with 84% feeling average or better prepared. Seminar time is dedicated to discussion of cariogenicity of beverages, sugar content of popular snack foods, dietary counseling, and analysis procedures including substitution of cariogenic dietary components.

Preparation for oral hygiene for patients 0 to 36 months parallels dietary preventive care as discussed above. Specific review of oral hygiene for infants and toddlers is included in group discussion. Prior to the inception of this program, senior students were commonly exposed only to children older than 60 months and clinic instruction pertaining to 0- to 36-month ages was nonexistent. However through the YPPC, students examined children as young as 8 months.

Respondents who received YPPC training felt better prepared to evaluate caries risk, illustrative of learning outcomes of the program. YPPC students are provided with risk assessment experiences through mandatory documentation of risk category for each patient—making it an integral part of patient care. Very young children were not included in the patient pool of BEFORE

students and caries risk assessment was not a formal component of clinical diagnosis. Postclinic case-based discussions conducted in YPPC included risk assessment. These discussions may have supplemented clinic experiences and may further explain the disparity between the groups.

Provision of parent education related to ECC and topical and systemic fluoride did not reflect significant differences. However, a trend for better preparation in the AFTER group was noted and may be explained by access and clinical exposure to the 0- to 36-month age group with concomitant didactic preparation. Historically, the pediatric curriculum has comprehensively addressed fluoride. As the supplementation schedule includes all ages, the BEFORE graduates may base their perception of adequate preparation on this experience. Similarly, nursing bottle decay or ECC was a constituent of the established didactic syllabus. In addition, both areas are common topics within the dental community and the public. It is probable that both BEFORE and AFTER groups had topical discussions with instructors, colleagues, members of health care professions, patients, and personal contacts leading to a sense of preparation similar for the two groups.

Beliefs

Marked differences in beliefs for the appropriate age for the first dental visit were registered with 86% of BEFORE stating that it should occur after 24 months versus 43% of AFTER. A previous study reported numbers similar to the BEFORE figures with more than 70% of surveyed respondent generalists in Indiana who recommended initial appointments after 24 months.¹⁵

In the AFTER group, 54% believed that the first exam should be before 24 months in contrast to 14% of the BEFORE group and 20% of general dentists in Indiana. Antithetical to AAPD recommendations, previous philosophies of pediatric dental care were geared towards oral examination only on identification of problems or on attainment of cognitive skills, ideas similarly supported by 54% of the BEFORE group who believe that children should be 36 months or older before making their first visit for dental care. The same group contained 32% who favored the first appointment between 24 and 36 months. The Indiana survey shows 42% of dentists recommending the initial appointment between 24 and 36 months and 31% after 36 months.¹⁵ Although the BEFORE group included individuals more recently trained than respondents in the Indiana survey, a higher total percentage believed that children should be older than 24 months before the initial dental appointment.

Although 24 to 36 months conforms to cognitive development, it is also the age at which many children with ECC seek dental care.^{3,5} The BEFORE group may

have been exposed to a representative group in their practice experience and therefore concluded that this is a common, if not appropriate age for commencement of dental care.

Despite the majority of children being attended to by generalists, many children younger than 3 years of age seek care or are referred for specialty care, leaving an older group to be attended to in general practice. This may contribute towards 54% of BEFORE and 27% of AFTER groups' beliefs that children should be older than 3 years for their first dental visit. A goal of the YPPC is to change this belief and prepare general practitioners to accept younger children. The issue continues to be emphasized in the program.

Conclusions

1. Respondents who attended the YPPC program felt better prepared than those with no YPPC experience to conduct oral examinations in children aged 0 to 36 months. They also felt better prepared to address oral hygiene, dietary issues, and caries risk assessment in children 36 months and younger when compared to respondents graduating without this training.
2. YPPC course participants' beliefs regarding age for the first dental visit differed significantly from practitioners who had not attended the YPPC and were more consistent with the AAPD policies.
3. This study emphasizes the importance of clinical contact with very young patients for predoctoral dental students.
4. From data gathered in this study, respondents who attended the YPPC felt better prepared in areas of infant and toddler oral health care. Despite this, a cause and effect relationship of the YPPC on participants cannot be established from the available data.
5. The YPPC may serve as an effective predoctoral teaching model that enhances infant oral health care in general dental practice.

This research was supported by the Samuel D. Harris Fund.

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