

Final Report

Survey Of Oral Health Status Of Maryland's Head Start Children 2000

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Executive Summary

Knowledge of the prevalence of dental caries, dental utilization and pain-associated dental caries among U.S. preschool children is limited. Most published studies of caries prevalence among preschool children have examined three to five-year old children enrolled in Head Start. An overview of six studies in the last 15 years of non-Native American Head Start enrollees indicates that more than half of these children have caries experience, with approximately 4.5 decayed, filled surfaces (dfs) per child (1). The high prevalence of dental caries in Head Start children is compounded by the low level of care. Although Head Start is mandated to provide dental care for all enrolled children, in more than half of the surveys of Head Start children, the percentage of children with untreated caries is greater than 50 percent. Moreover, most Head Start children, because of their family income, are eligible to receive Medicaid benefits, which include the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) of medical, dental, vision, and hearing conditions. However, only 20 percent of Medicaid eligible children receive dental care.

Head Start in Maryland serves approximately 10,000 children in 225 sites (Office of Children, Youth and Families, 2001 General Assembly Budget Presentation). The purpose of the present study was to examine the distribution of dental caries and its consequences as indicated by report of dental pain, dental care utilization, and

perceived barriers to dental care in rural and urban Maryland Head Start children.

Furthermore, this study aimed to gain insights regarding caries status, risk factors, and behaviors of these children, and the oral health literacy of their parents/guardians'.

This survey of preschool children attending Head Start centers in Maryland, conducted between April and June 2000, included a dental examination of 482 children from randomly selected Head Start centers. A self-administered questionnaire was sent to a sample of the children's parents/guardians. A total of 562 questionnaires were returned for a response rate of 46.8 percent; 80 families who returned the questionnaire did not return a signed consent form and, therefore, could not be examined. The study was reviewed and approved by the University of Maryland's and Department of Health and Mental Hygiene's Institutional Review Boards (IRB).

The following are the major findings:

- More than half (54.6percent) of the examined children had caries experience (decayed or filled teeth), with strong gradient by age and rural residence.
- Almost all the caries experience among these Head Start children was represented by untreated decay, with 95.8 percent of children with caries experience having untreated decay.

- A child's complaining from dental pain was reported by the parents or guardians in 9.7 percent of the children. If only those children who had caries experience were considered, the percentage was almost twice as high (16.6 percent).
- Of all children, 4.9 percent reportedly had cried from pain; but considering only those children who have had caries experience, the percentage of children who have cried from dental pain doubled to 8.9 percent.
- Even though 52.3 percent of all examined children had untreated decay, only 16.7 percent of the adult respondents were aware that their child had untreated cavities.
- 77.6 percent of the parents reported a highly cariogenic beverage as the drink most frequently used by their children.
- Children whose teeth were brushed at least daily were less likely to have caries experience than children whose teeth were brushed a couple of times per week. Who brushes the child's teeth was not associated with caries experience.
- More than half of Maryland Head Start children reportedly had visited the dentist at least once in their lives. Of those children with at least one

dental visit, most children had their first visit when they were between two and four years of age (71.3 percent).

- For those children who had never seen a dentist, the most common reason for not having dental visits given by respondents were that the child is too young (42.0 percent) and lack of perceived dental problem (29.3 percent).

The present cross-sectional study presents the prevalence of dental caries, caries risk factors, oral health knowledge of parents, access to care, and dental pain in Maryland Head Start children. This study clearly illustrates that government agencies and organized dentistry must respond to the health needs of underserved preschool children by addressing dental workforce inadequacies, geographic accessibility, dental knowledge of the parents, adequacy of public insurance programs, and developing effective protocols for early intervention and disease suppression.

Introduction

Knowledge of the prevalence of dental caries, dental utilization and pain-associated dental caries among preschool children in the United States is limited. Most published studies of caries prevalence among preschool children have examined three to five-year old children enrolled in Head Start, a federally funded preschool educational and child development program for low-income children and families. An overview of

six studies in the last 15 years of non-Native American Head Start enrollees indicates that more than half of these children have caries experience, with approximately 4.5 decayed, filled surfaces (dfs) per child (1). The high prevalence of dental caries in Head Start children is compounded by the low level of care. Although Head Start is mandated to provide dental care for all enrolled children, in more than half of the surveys of Head Start children, the percentage of children with untreated caries is greater than 50 percent (2). Moreover, most Head Start children, because of their family income, are eligible to receive Medicaid benefits, which include the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) of medical, dental, vision, and hearing conditions. However, only 20 percent of Medicaid-eligible children receive dental care (3). A number of specific access issues in the dental Medicaid programs have been identified and summarized by the American Dental Association that include: insufficient public funding of the program, problems with public and private dental delivery systems that treat these children, dental workforce sufficiency and distribution, and issues of culture and communication (4). Little is known, however, about reasons why preschool children have not been to the dentist from their parents/guardians perspective.

In Maryland, a 1994 survey of 3,500 school-aged children found that 60 percent experienced caries. Even more alarming was the finding that Maryland children participating in free lunch programs had 70 percent untreated decay compared to 46

percent for those not participating (5). Similar to other States, the poor level of oral health utilization and its related effect on the oral health status of Medicaid -eligible children in Maryland is due, in part, to under funding for dental services under the Medicaid program (6, 7). In the mid 1990's, the dental care portion of the Maryland Medicaid budget represented only one -fourth of 1 percent of over a \$1 billion budget.

Head Start in Maryland serves approximately 10,000 children in 225 sites (Office of Children, Youth and Families, 2001 General Assembly Budget Presentation). The purpose of the present study was to examine the distribution of dental caries and its consequences as indicated by report of dental pain, dental care utilization, and perceived barriers to dental care in rural and urban Maryland Head Start children. Furthermore, this study aimed to gain insights regarding caries status, risk factors, and behaviors of these children, and their parents/guardians' oral health literacy.

Methods

This survey of preschool children attending Head Start centers in Maryland, conducted between April and June 2000, included a dental examination and a self -administered questionnaire sent to the children's parents/guardians. The study was reviewed and approved by the University of Maryland's and Department of Health and Mental Hygiene's Institutional Review Boards (IRB).

To obtain estimates representative of Maryland Head Start children, a sample of children was proportionally drawn from all counties in Maryland, including Baltimore City. Head Start sites were randomly selected from each county to obtain a final sample size of 1,200 children. Children in the selected sites were given a consent form that fully explained the risks or discomfort and possible benefits associated with the examination. Only those children who returned a signed consent form were examined. After starting the data collection, a very low return of consent forms required inclusion of other Head Start centers (for a total of 37 centers) to increase the sample size; the new centers were randomly selected from Baltimore City and added to the sample. Data from two counties could not be collected (Baltimore and Carroll counties). Final response rate was 46.8 percent (n=562) for questionnaires and 40.2 percent (n=482) for examination.

All dental examinations were performed by the same pediatric dentist (N. M.) at each selected Head Start site using a headlight and disposable mirrors. No dental explorers or x-rays were used. Before examining the teeth, the dentist brushed the child's teeth with a dry toothbrush to clean plaque from the teeth. Each tooth surface was classified as decayed, sealed, filled or missing by trauma or by caries. A surface was considered decayed by the presence of cavitation, stained pits and fissure with adjacent opacity, or shadowing with trans-illumination. Presence of dental sealants

were recorded; however, sealants were not included in the outcome variables because of their low prevalence in this population (2.9 percent). After the exam, children were given a report card indicating whether there was need for dental treatment and providing contact information for referrals.

The examiner dentist was calibrated with an expert examiner (N. T.). Calibration consisted of review of written examination criteria for caries and sealants, conjoint examination of 10 children with discussion of decisions, and repeated independent on-site examination of 20 children attending a non-participating Head Start center.

A self-administered questionnaire was sent home with the children to collect demographic and oral health information. The 30-item questionnaire asked for child's oral health risks and behaviors, having ever complained or cried of dental pain, and dental care utilization. The questionnaire also included items on respondent -adult's oral health literacy and dental care utilization (Questionnaire is available from the authors upon request).

The outcome variables in this study are caries experience, dft/dfs, report of having complained or cried from dental pain, dental behaviors, parent or guardian's dental literacy/knowledge, and dental care utilization. Outcome variables related to caries were stratified by demographic characteristics. Age was classified as age at the beginning of the school year. Urban/rural classification was based on the Census

Bureau's definition; counties were considered rural if more than 70 percent of its population reside in towns with less than 2,500 persons (8). Missing data for race/ethnicity (21.8 percent) and gender (15.0 percent) precluded inclusion of these variables in analyses.

Statistical analyses of the data consisted of bivariate associations calculated for outcome and stratification variables. Differences between groups were approximated with 95 percent confidence intervals (CI) using the formula $95 \text{ percent CI} = \text{estimate} \pm (1.96 * \text{standard error})$. Associations between presence of caries and behaviors were tested with Chi-Square statistic. To maximize the use of the data collected, considering the high rate of incomplete answers, all data available are included in analyses; cases with missing data are excluded from analyses of the particular missing variable.

The effect of children's clustering by Head Start site on results was determined with logistic regression models. Separate logistic regression models were fit for caries experience and report of dental pain; results from logistic models including the "site variable" and models without it were compared and found essentially similar. Therefore, design effects associated with Head Start site are not included in the final analyses.

Results

A total of 562 questionnaires were returned for a response rate of 46.8 percent; 80 families who returned the questionnaire did not return a signed consent form and therefore, could not be examined. Of the returned questionnaires, 21.8 percent did not provide information on race/ethnicity and 15 percent did not provide information on gender.

The demographic characteristics of children examined who attended Head Start in Maryland are shown in Table 1. Children were evenly distributed by gender and age; just under a quarter of participant children live in rural areas. Close to half of the Head Start children examined were non-Hispanic African-American, reflecting the overrepresentation of non-Hispanic African-American children in low socioeconomic levels.

The distribution of children by their caries experience and the presence of decayed or filled teeth is shown in Table 2 and Figure 1. More than half (54.6 percent) of the examined children had caries experience (decayed or filled teeth), with strong gradient by age and rural residence. Children four years of age and children residing in rural counties were almost 30 percent more likely to have caries experience than their three-year old (64.2 percent v. 45.6 percent) and urban (66.4 percent v. 50.6 percent) counterparts. Almost all the caries experience among these Head Start

children was represented by untreated decay, with 52.3 percent of all children or 95.8 percent of children with caries experience having untreated decay (data not shown). Conversely, the percentage of children with filled teeth was very low (7.9 percent). Overall, four-year-old children were more than twice as likely to have at least one filled tooth than 3-year-old children (11.2 percent v.4.0 percent).

Figure 1 shows that children attending Head Start in Maryland had an average 3.64 decayed and/or filled surfaces, with 2.90 (80 percent) of these surfaces recorded as decayed. Age was a factor in the dfs as shown by four-year olds having twice as many decayed and filled surfaces as the three-year olds (5.09 v. 2.44). Even though the difference in dfs between rural and urban children did not reach statistically significant, there was a trend indicating that rural children had a higher dfs than urban children; most of the difference was in the decayed component (3.72 v. 2.62) (data not shown). Analyses of dfs among children who had caries experience indicate that their dfs was almost twice that of all children (6.67 v. 3.64); however, the dfs composition resembled that of all children: 80 percent of the dfs was decayed surfaces and only 20 percent of the dft was filled surfaces. Children who had caries experience also had higher dfs at 4 years of age than at 3 years of age (7.93 v. 5.35).

The distribution of children by dental location of untreated decay is presented in Table 3. A full 86.3 percent of children with untreated caries had lesions in posterior

surfaces, with a mean of 3.64 decayed posterior surfaces. Most of the decayed surfaces were pit and fissures (85.5 percent); almost a quarter of the lesions were in smooth surfaces (22.8 percent). Untreated carious lesions in anterior maxillary surfaces were found in 36.1 percent of the children with untreated caries; these lesions were evenly divided between proximal and buccal/lingual.

Prevalence of children ever complaining or children crying of dental pain are presented in Table 4 and Figure 2. A child's complaining from dental pain was reported by the parents or guardians in 9.7 percent of the children. Yet, if only those children who have had caries experience were considered, the percentage was almost twice as high (16.6 percent). Furthermore, older children and children from rural counties were more likely to complain from dental pain than younger children and children from urban counties. We estimated the prevalence of severe dental pain by asking whether the children have cried from dental pain. Of all children, 4.9 percent reportedly had cried from pain; but considering only those children who have had caries experience the percentage of children who have cried from dental pain doubled to 8.9. Differences by age or rural residence among all children were not significant, but older children and children from rural counties tended to be more likely to have cried from dental pain.

Basic knowledge and oral health behaviors are presented in Table 5. Almost all respondents (92.5 percent) thought that giving a child a bottle with sugared drinks could cause caries. Consistently, only 1.5 percent of adult respondents reported that their children currently take naps with a bottle; a full 41.4 percent reported that their children never used a bottle to take naps. Even though 52.3 percent of all examined children had untreated decay, only 16.7 percent of the adult respondents were aware that their child had untreated cavities; moreover, 33.1 percent of parent/guardian of children with untreated decayed were aware of the presence of untreated decay (data not shown). On the other hand, the awareness about untreated caries of 81.3 percent of adult respondents whose children were diagnosed with caries was confirmed by clinical examination (data not shown).

Regarding behaviors that can affect dental health, parents responded that the drinks most frequently used by their children now included juice (64.2 percent), followed by milk alone (41.6 percent) and water alone (34.7 percent). However, 47.2 percent of adults reported the more frequent drink of their children to be Kool-Aid or similar beverage, soda, or milk with sugars. Overall, 77.6 percent of preschool children reported a highly cariogenic beverage as the more frequently used drink (Figure 3). Two thirds of all children reportedly had their teeth brushed more than once a day and almost a third reportedly had their teeth brushed at least once a day.

The rest of the children (4.5 percent) had their teeth brushed a couple of times per week. Most parents said that their children participate in brushing their teeth with an adult (61.5 percent); however, a considerable percentage of children reportedly were left to brush alone (8.6 percent) or do not participate in brushing their teeth (29.9 percent). Children whose teeth were brushed at least daily were less likely to have caries experience than children whose teeth were brushed a couple of times per week ($X^2, P=0.034$) (not shown). However, who brushes the child's teeth was not associated with caries experience ($X^2, P=0.603$) (not shown).

Table 6 presents issues of child's dental care utilization. More than half (57.9 percent) of Maryland Head Start children reportedly had visited the dentist at least once in their lives. Of those children with at least one dental visit, most children had their first visit when they were between two and four years of age (71.3 percent). Almost half of children who reported previous dental visits reportedly saw a dentist every six months and a third saw a dentist every year; but 18.3 percent saw dentist when needed, i.e., when the caregiver was aware that there were problems that needed to be treated by the dentist. For those children who had not seen a dentist, the most common reason for not having dental visits given by respondents were that the child is too young (42 percent) and lack of perceived dental problem (29.3 percent). Access problems, such as cost, paucity of dentist who treat preschool children, distance, or

other priorities were each mentioned by approximately 10 percent of the respondents (Figure 4). There were no responses to the question that the reason for no dental visits was that they expect the problems to go away.

Discussion

Dental caries and access to oral health care is a major health problem in U.S. preschool children, especially low socio-economic populations (9). However, there is surprisingly little information for this age group regarding the prevalence of the disease, the associated risk factors, and oral pain associated with caries. This lack of data hinders understanding of the disease process and impedes the development of evidence-based policies regarding caries prevention and dental treatment for preschool children. The present cross-sectional study describes and discusses the prevalence of dental caries, caries risk factors, access to care, and dental pain in Maryland Head Start children.

The subjects of this study were three- and four-year-old children from 37 Head Start programs across Maryland. Head Start is a federally funded program whose eligibility requirements include being under 185 percent of federal poverty level. Therefore, the present study should be interpreted recognizing that the children are all from low socioeconomic settings. All children enrolled in Head Start are supposed to

receive comprehensive health services, including medical, dental, nutrition and mental health services. In addition, since most Head Start children are from low-income groups, they are eligible to receive Medicaid and its EPSDT services.

The low response rate is the main limitation of this study; just 40.2 percent of the children included in the sample returned the consent form and 46.8 percent returned the questionnaire. Therefore, the generalizability of our results is an issue; however, the consistency between our results and results published from Head Start populations in other states suggests that the data could well represent Head Start children in Maryland. Another study limitation, derived from the field conditions for examination, is the lack of air to dry off the teeth before examination, especially when explorers are not used. If anything, field conditions and lack of radiographs would underestimate the true caries prevalence. Despite these limitations, this study presents valuable data on children's oral health risks and behaviors, dental pain, and dental care services utilization.

In the present study, 54.6 percent of the children had decayed or filled tooth surfaces, with a mean dfs of 3.64 (Table 2 and Figure 1). Such high caries prevalence in three and four-year-old children is similar to other reports from Head Start children in the U.S., with reported dfs scores in Head Start children ranging from 2.19 in Hartford, Connecticut (10) to 6.35 from sites in the Southwestern U.S. (11). Prior

studies, however, did not characterize dental caries prevalence based on urban or rural locations. We observed a 16 percent greater caries experience and a 27 percent greater numbers of decayed surfaces in those children from rural Maryland locations (Table 2, differences not show). Such finding may be due to the fact that those children living in rural locations (less than 2,500 residents and not part of an urban area) are less likely to benefit from water fluoridation in a similar fashion to those residing in urban centers, since the major metropolitan areas of Maryland are fluoridated; whereas, the rural areas generally are not. Besides the greater caries prevalence in rural locations, less dental access appeared to be available for these children. In rural locations the filled component of the dfs (fs/dfs) is 16.0 percent while it is 21.9 percent in urban areas. Lower access to dental care for children residing in rural areas, areas (58.9 percent v. 65.3 percent) (Third National Health and Nutrition Examination Survey, NHANES III, unpublished data, tabulated by CM Vargas, 2001), is associated with the concentration of dentists in urban areas and lower dental insurance coverage among children residing in rural than in urban.

The present study also confirms reports that those children with any caries experience have greater intensity of disease than the general population (2). The traditional format for reporting caries prevalence data, using average number of decayed teeth across all children, masks the extent of caries among those children

with decay. The mean dmfs score of 6.67 for those Head Start children with caries experience versus the mean dfs score of 3.64 for all children show the extent of caries in affected children.

It is interesting to note that 86.3 percent of the children with dental caries have disease in the pits and fissures of their molars, and these children have an average of 3.64 affected molar surfaces. This finding suggests that an important preventive strategy for preschool children at high caries risk could be the provision of dental sealants for primary molars (12). The other location of high caries prevalence area in these Head Start children was on the maxillary anterior teeth, with more than one third of the children with caries experience having lesions on the anterior teeth. Fluoride varnish has recently gained popularity as a method to prevent and suppress caries in preschool children (13, 14), and such strategies should be explored to see its effect on maxillary anterior caries among these high-risk populations.

A new contribution to the dental literature is the information that 9.7 percent of these preschool children have complained of dental pain. Dental pain is an important issue in preschool children, yet the only data collected have been indirectly extrapolated from emergency visits or from clinical examinations that were suggestive that dental caries was significant enough to possibly cause pain (15). The potential

importance of dental pain in preschool children is also suggested from studies of growth retardation in children with severe dental caries (16, 17).

In the present cohort of Head Start children with caries experience, many of them had suffered from dental pain, with 16.6 percent of them reportedly complained of dental pain and 8.9 percent reportedly cried because of dental pain. This high prevalence of pain might be associated with the fact that parents may have difficulty in finding dentists for their children. General dentists frequently elect not to treat these children because they do not have enough experience with this age group.

Additionally, a significant proportion of dentists do not accept children enrolled in Medicaid in their practice. There is little, if any, information on history of dental pain among children. The current findings should provide convincing evidence of the seriousness of oral disease in certain preschool children. Programs to prevent and treat dental caries among Head Start children need to be vigorously explored in order to prevent episodes of dental pain. As E. Fox, former HRSA administrator, said "We have the knowledge, skills and tools to eliminate the suffering of dental disease for most children, yet somehow we have failed to put the pieces together for our nation's most vulnerable children." (18).

The finding from the survey of oral health knowledge and behaviors survey suggests that the parents generally have understanding of how to prevent dental caries

as reflected by their reported knowledge of about the causes of caries, their reported behaviors of never allowing their child to use a bottle for naps and their overwhelming response that the children brush their teeth, with supervision, once or more per day. In contrast to these positive health behaviors, parents report that drinks most frequently used by their children had high sugar content. The high percentage of parents reporting juice as the most frequent beverage for the children is of concern. Fruit juices/drinks contain between 10-13 percent sugar and their frequent consumption, with or without a bottle, is considered a high caries risk factor for preschool children (19).

This study also asked parents to respond to questions regarding access to care. Almost 60 percent of the parents reported that their child had a dental visit, with most children having their first dental visit when they were between three and four-years of age. Of those parents who have not taken their child to the dentist, access issues (e.g., the parent could not find a dentist, do not have insurance, can not get an appointment, dental care is too expensive, and the dentist is too far away) were frequently cited. However, almost half of the parents said that their child was too young to visit the dentist and a third of the parents said that their child did not have dental problems. The high frequency of these two last responses indicates that there is still need to

educate parents about the first year dental visit (20) and about the importance of dental visits for preventive purposes.

Results from this cross-sectional study of children attending Head Start programs in Maryland are similar to those of other recent reports (2, 10, 11, 21) showing that these three and four-year-old children have significant dental needs and significant barriers to care. Our results also indicate that caries prevalence is greater among rural children; caries severity in those children that have disease is much greater than the overall means generally reported; caries is greatest in the molar pit and fissure surfaces which may be prevented by dental sealants; many of these children have dental pain; a risk factor for caries may be the high use of juice and sodas; and lack of awareness of early and preventive dental visits account for most of the reasons that children have not had a dental visit.

This study clearly illustrates that government agencies and organized dentistry must respond to the health needs of underserved preschool children and assure that dental care is readily available, by addressing dental workforce inadequacies, geographic accessibility, assuring that public insurance programs for children are adequate, and by developing effective protocols for early intervention and disease suppression.

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Table 1. Demographic distribution of Head Start children in Maryland, 2000 (n=560).

	Percentage	Standard Error
Age		
3 years	52.8	2.15
4 years	47.2	2.15
Gender		
Boys	43.6	2.10
Girls	41.4	2.02
Missing	15.0	1.51
Location		
Rural	24.3	1.81
Urban	75.7	1.81
Race/Ethnicity		
NH [€] white	20.5	1.70
NH African-American	49.5	2.11
Hispanic	6.1	1.01
Other	2.0	0.06
Missing	21.8	1.74

€NH: Non-Hispanic

Table 2. Percentage of children with caries experience, decayed and filled teeth by demographic characteristics (n=482).

	Caries experience Percentage (C.I. €)	Decayed teeth Percentage (C.I.)	Filled teeth Percentage (C.I.)
Age			
Total	54.6 (50.2, 59.0)	52.3 (47.9, 56.7)	7.9 (5.5, 10.3)
3 years	45.6 (39.4, 51.8)	43.5 (37.3, 49.7)	4.0 (1.6, 6.5)
4 years	64.2 (57.8, 70.6)	61.9 (55.4, 68.4)	11.2 (7.0, 15.4)
Rural			
Total	66.4 (58.0, 74.8)	63.9 (55.4, 72.4)	10.7(5.2, 16.2)
3 years	57.7 (46.1, 69.3)	53.5 (41.8, 65.2)	*
4 years	78.6 (66.1, 91.1)	78.6 (66.1, 91.1)	*
Urban			
Total	50.6 (45.4, 55.8)	48.3 (43.1, 53.5)	6.9 (4.3, 9.5)
3 years	40.7 (33.4, 48.0)	39.5 (32.3, 46.7)	*
4 years	60.7 (53.4, 68.0)	57.8 (50.4, 65.2)	11.0 (6.3, 15.7)

€ CI:

95percent confidence interval

* small sample size, unreliable data.

Table 3. Distribution of caries lesions among preschool children with untreated decay (n=263).

	Percent children	Mean surfaces

Posterior surfaces	86.3	3.64
Pit and fissure [€]	85.5	3.00
Smooth [¥]	22.8	0.63
Maxillary anterior surfaces	36.1	1.49
Proximal	27.0	0.70
Buccal/lingual	28.9	0.78

[€] Pit and fissures include occlusal surfaces of molars as well and lingual surfaces of maxillary second molars and buccal surfaces of mandibular second molars.

[¥] Smooth surfaces of molars includes mesial and distal surfaces of molars as well as buccal and lingual surfaces not included as fissure surfaces.

Table 4. Report of dental pain by demographic characteristics.

	Complained of pain		Cried of pain	
	Percent	SE	Percent	SE
All children (n=391)	9.7	1.5	4.9	1.1
Age				
3 yr	6.6	1.7	3.4	1.3
4 yr	13.5	2.6	6.7	1.9
Residence				
Rural	15.2	3.8	7.7	2.8
Urban	8.0	1.6	4.0	1.1
Children with caries experience (n=205)	16.6	2.6	8.9	2.0
Age				
3 yr	14.1	3.7	*	
4 yr	18.7	3.7	10.6	2.9
Residence				

Rural	22.4	5.5	12.5	4.4
Urban	14.3	2.9	7.5	2.1

* small sample size, unreliable data.

€ Standard error.

Table 5. Oral health knowledge and behaviors (n=460).

	Percentage	SE [€]
Dental literacy		
Taught how to care for baby's teeth	71.3	2.18
Think bottle can produce caries	92.6	1.24
Think child has untreated caries	16.7	1.90
Behaviors		
Never used bottle for naps	41.4	2.31
Use bottle for naps now	1.5	0.57
Use a sippy cup now	13.7	1.61
Drinks frequently used		
Milk alone	41.6	2.30
Milk and sugar	7.8	1.25
Juice	64.2	2.23
Soda	16.1	1.71
Kool-Aid	20.8	1.89
Tea	11.5	1.49
Water alone	34.7	2.21
Tooth brushing		
Never	0.0	0.00
Couple times/week	4.5	1.00
Once a day	30.7	2.14
More than once/day	64.7	2.21
Who brushes child's teeth		
Child alone	8.6	1.30
Adult alone	29.9	2.12

Child and adult	61.5	2.26
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€ SE: standard error

Table 6. Characteristics of dental care utilization.

	Percentage	SE [€]
Has visited the dentist	57.9	2.30
Age first dental visit		
Less 2 yrs	14.3	2.19
2 yrs but less than 3 yrs	32.7	2.91
3 yrs but less than 4 yrs	38.6	3.02
4 yrs but less than 5 yrs	14.3	2.13
Frequency of care		
6 months	48.7	3.14
Every year	33.1	2.96
As needed	18.3	2.40
Reasons for no dental visit * (n=181)		
Child is too young	42.0	3.68
No problem	29.3	3.39
Cannot find dentist	16.0	2.73
No insurance	3.8	2.57
Cannot get appointment	10.5	2.28
Too busy	9.9	2.23
Too expensive	8.8	2.11
Dentist too far	3.9	1.43
Problem will go away	0.0	0.00

* total is more than 100percent because parents could check multiple reasons.

€ Standard error

Fig. 1 Percentage of children with caries experience by age and location.

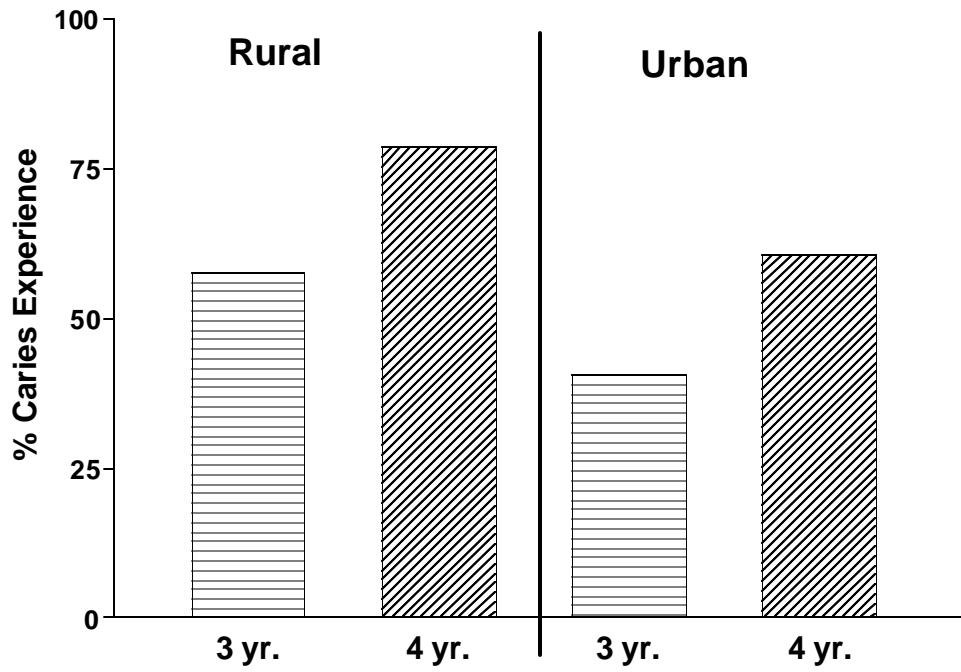


Figure. 2 Four-year-old Head Start Children that reportedly complained of dental pain or cried from dental pain.

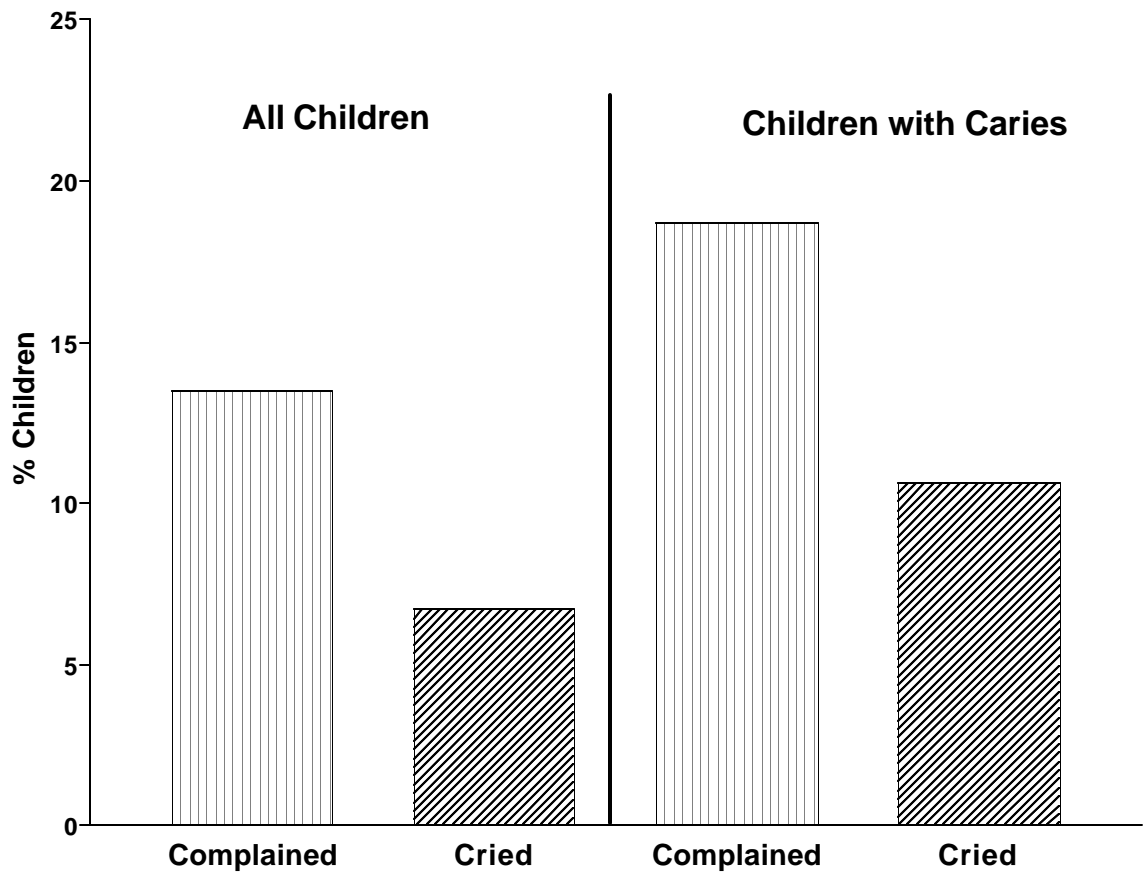


Fig. 3 Reported percentage of most frequently used drinks by Head Start children

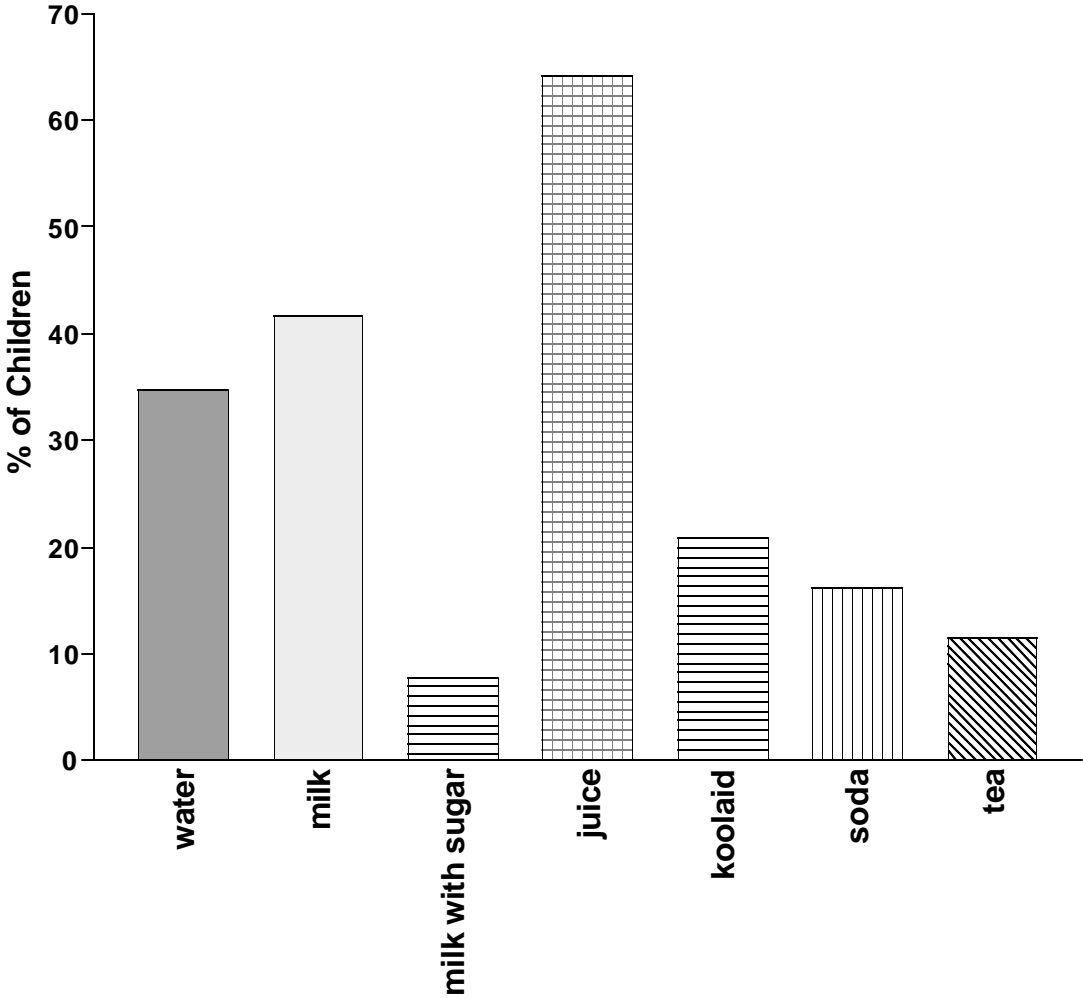


Figure 4. Reason that parent reports that child has not had a dental visit.

