

**Nursing Caries in Pediatric Dental Practices
and Teaching Clinics in Oregon**

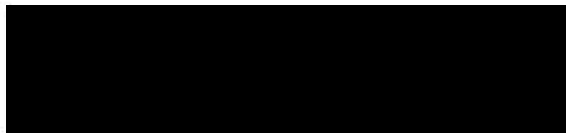
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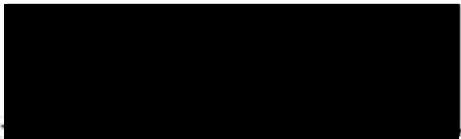
**Submitted in partial fulfillment of
the requirements for a specialty**

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APPROVAL



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ABSTRACT

Sata, C. L. Nursing Caries in Pediatric Dental Practices and Teaching Clinics. Portland, The Oregon Health Sciences University, School of Dentistry, 1989. 1 -58 p. typed thesis.

Whether parents of children with nursing caries differ from those of other children in factors which effect oral health of infants and preschool children is the focus of this study. Parameters evaluated include age at which children are brought for dental care, ethnic background, prior knowledge and sources of information and referral. Subjects were 386 parents and their children under five, who presented for initial examination with pediatric dentists during an eight week period. Data was collected from a questionnaire completed by the parents. Clinical findings were transposed to a chart used for categorizing children and parents into Group A (nursing caries), Group B (caries free), and Group C (general caries). X^2 test of independence at $p \leq 0.05$ was used to determine significance. Children in Group A presented at the youngest age and had the highest frequency of fractured teeth. Most children in Group B were between 25 and 36 months. Children in Group C were oldest. Dentists and pediatricians were the most common referral source after self-referrals. Less than half of Group A parents had prior information on nursing caries. Children in Group A represented 25% of pediatric dentists' new patients under 5 years of age.

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INTRODUCTION

Nursing caries, the rampant caries of infancy caused by the inappropriate feeding of babies, is preventable. The discomfort and infection brought on to these early toddlers as well as the guilt and expense for parents can be avoided. Health care providers, aware of the morbidity of this disease, have been shown to have a significant impact on the prevalence of nursing caries. These providers of course include dentists physicians and ancillary professionals. Among the professionals, nurses who interact with the mothers of infants during the first year of life would be expected to be particularly appropriate educators in the prevention of nursing caries because they have access to parents before the caries problem begins.

The purpose of this study is to determine if parents of children with nursing caries differ from parents of other children in factors which effect the oral health of infants and preschool children. Parameters evaluated include the age at which children are first brought in for dental care, ethnic backgrounds, prior knowledge and varying sources of information concerning nursing caries and differing sources of referral to pediatric dentists.

Literature Review

PATTERN OF NURSING CARIES

The manner in which nursing caries effects the teeth is distinct in its pattern¹⁻¹⁵. Early nursing caries presents as white chalky areas first on the lingual and later on the facial enamel surfaces of maxillary incisors along the free gingival tissue margins^{1,10,13,14}. This chalky appearance is due to demineralization of the enamel. These changes occur before the posterior teeth erupt. In this affliction, the maxillary incisors are not only the first teeth to decalcify but they also are the most severely affected. The maxillary and mandibular first molars are next to be involved. The canines, then second molars follow in severity of involvement in order of their eruption into the mouth. Carious involvement of the dental pulp of the maxillary incisors and primary first molars is common. All surfaces of the maxillary incisors and the occlusal surfaces of the molars are typically involved in 18 to 22 month old children with nursing caries (see Figures I-III). The facial, lingual, mesial and distal surfaces of the canines may be decalcified or carious in more advanced cases. The mandibular incisors, protected by the tongue, are usually spared.



Figure 1: A 27 month old child with nursing caries.



Figure II: Intraoral photograph of the child in Figure I.

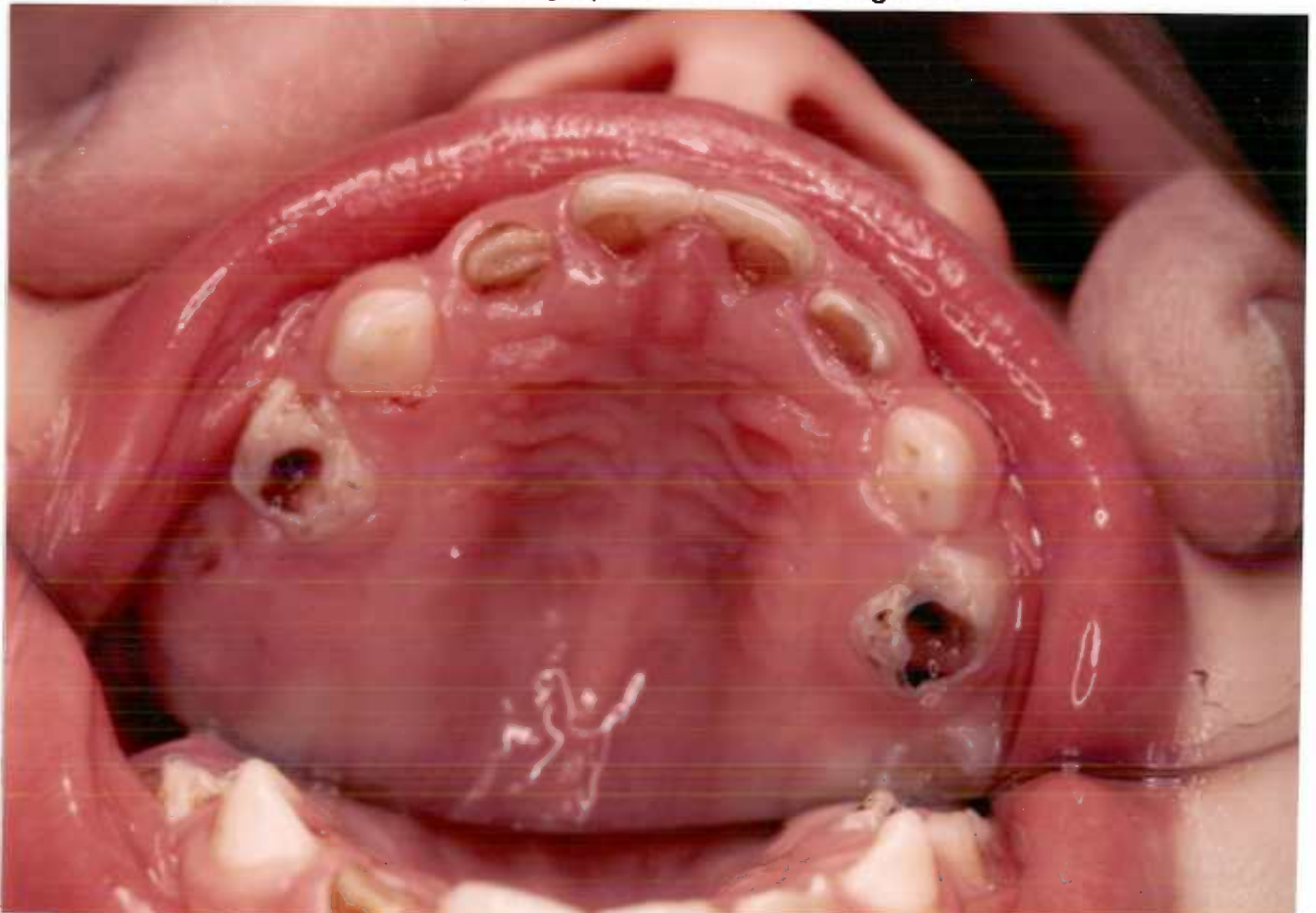


Figure III: Occlusal view of the child in Figure I.

ETIOLOGY

Nursing caries is related to numerous factors which include the frequency and duration of feeding, the pattern of the infant suckling, decreased salivary output and oral muscular activity during sleep, and the age and sequence of eruption of the primary teeth^{3,4,5,9,13,14}. The longer the deleterious nursing pattern persists, the more serious the breakdown of the teeth and the greater number of teeth to be affected. Following eruption of the incisor teeth, at will breast feeding or night and naptime bottles provide the child with a cariogenic substrate that pools around the child's teeth. As the child sleeps, decreased salivary flow impairs the child's ability to clear the mouth and oral bacteria have access to an almost unlimited supply of carbohydrate substrate. This carbohydrate is lactose in mother's milk, infant formula, and cow's milk, fructose in fruit juices, and sucrose in sweetened drinks and soy formulas. The metabolic acids produced by these bacteria drop the pH of plaque on the teeth. With repeated and frequent exposure to this increased acidic environment, the enamel of the teeth is demineralized, and eventually is destroyed by dental caries.

The chronology of tooth eruption plays an important role in the pattern of tooth decay seen in nursing caries(see Table I). The first teeth to erupt into the mouth tend to be more seriously involved, with the exception of the mandibular incisors^{5,11}. The mandibular incisors, the centrals erupting at 8 ± 2 months and

laterals at 13 ± 2 months, are protected by tongue and a pooling of saliva during suckling. Meanwhile the maxillary central incisors which erupt at 10 ± 2 months, and the maxillary lateral incisors at 11 ± 2 months have the substrate held against the lingual surfaces and the dorsal of the tongue during suckling. The maxillary and mandibular first molars erupt at 16 ± 2 or 3 months. The maxillary canines which follow at 19 ± 3 months and the mandibular canines erupting at 20 ± 3 months are subjected to shorter periods of demineralization. The last primary teeth to erupt, the mandibular second molars at 27 ± 3 or 4 months, and the maxillary second molars at 29 ± 4 months may escape caries if care is sought early and prevention instituted¹⁶.

Table I: Chronology of Primary Tooth Eruption

Primary Tooth	Eruption (mean age in months \pm 1 SD)
Maxillary	
Central incisor	10 (8-12)
Lateral incisor	11 (9-13)
Canine	19 (16-22)
First molar	16 (13-19) boys, (14-18) girls
Second molar	29 (25-33)
Mandibular	
Central incisor	8 (6-12)
Lateral incisor	13 (10-16)
Canine	20 (17-23)
First molar	16 (14-18)
Second molar	27 (23-31) boys, (24-30) girls

Table from Lunt, R.C. and Law, D.B.
JADA Vol. 89 October 1974

PREVALENCE OF NURSING CARIES

Louis Ripa, in an extensive review of the prevalence of nursing caries stated, " it is probable that the prevalence of BBTD (Baby Bottle Tooth Decay) in the United States and other Western-type countries is no higher than 5 percent"¹⁴. Appendix I presents a summary of the various nursing caries prevalence studies reported by Ripa¹⁴. He noted that establishing true prevalence of nursing caries in the preschool population is difficult due to the lack of accessibility of children in the early preschool ages. When children were examined at a public health clinic (Currier and Glinka 1977, Derkson and Ponti 1982, Brown 1985) or in Head Start programs (Johnsen 1984, Kelly and Breurd 1987), the samples tended to be biased by disproportionate numbers of certain socio-economic groups. If data is gathered at a dental clinic (Powell 1976, Aldy 1979) or from dental offices the bias will be toward children with parents aware a problem exists¹⁴. Differences in education of the parents, and their ethnic and cultural patterns influence feeding traditions. These differences have been shown to affect prevalence figures¹⁴. Criteria for the diagnosis of nursing caries and method used for examining the children will also affect the prevalence rates. Investigator's criteria ranged from a minimum of one (Cleaton-Jones) to three (Kelly and Breurd) carious maxillary incisors, while other investigators used less specific criteria. Hence prevalence of

nursing caries data vary and differences in methods of sample selection and diagnostic criteria may invalidate comparisons. Attention is drawn to the wide variances in prevalence among the reported studies (range: 1.0 to 53.1%) in Appendix I, as well as the differing diagnostic criteria used to identify nursing caries (see Appendix I).

MICROBIOLOGY

It has been shown that dental caries is due to the interaction between microorganisms, tooth structure and carbohydrates. All three factors must be present simultaneously and be present for a sufficient time for the pathology to progress to detection. Principle studies demonstrating this relationship include Orland's investigation¹⁷ which found that dental caries could not be demonstrated in germ-free rats when fed a cariogenic diet. Later, Kite et al.,¹⁸ demonstrated an absence of dental caries in rats colonized with caries-producing bacteria while being tube-fed cariogenic diets.

The principal microorganism involved in nursing caries is Streptococcus mutans. Prior to the eruption of the teeth, the mouth is free of S. mutans¹⁹. Berkowitz²⁰ found in his study of 138 children, ranging in age from 3 weeks to 14 months, that 91 predentate infants were without S. mutans. Of forty of these children with erupted incisors, nine were found to have S. mutans.

Two of ten predentate infants who wore obturators were similarly infected. These findings support the premise that S. mutans requires a nonshedding surface for initial colonization.

Adherence of bacteria to a clean tooth surface is preceded by deposition of a thin layer of salivary proteins. S. sanguis adheres to this layer earlier than S. mutans because it is present in the saliva in higher concentrations than S. mutans, and has a higher affinity for the tooth²¹. S. sanguis is thought to aid in establishment of an environment suitable for the adherence of S. mutans. The ability of S. mutans to adhere to the tooth is enhanced by its ability to produce extracellular glucans in the presence of sucrose. As a consequence, colonies of bacteria and their products, salivary proteins and foodstuffs accumulate on the teeth forming plaque²¹. The plaque matrix shields the enamel from the saliva, which has buffering and cleansing ability, thus allowing metabolic acids produced by plaque-forming bacteria to demineralize the enamel²².

Mothers have been implicated as the source of S. mutans for infecting their infants by bacteriocin typing studies. Bacteriocin typing is an epidemiological tool used to trace bacterial infections by measuring bacteriocins produced by bacteria²³. Berkowitz²³ took saliva and plaque samples from four mother-infant pairs. He found the four matched in five, seven, nine, and ten of the ten bacteriocin types investigated. Davey²⁴ studied intrafamilial transfer of S. mutans using bacteriocin typing and also found a high

frequency of coincident bacteriocin patterns among mothers and their infants.

In an investigation of 36 preschool children and their parents, Kohler and Bratthall²⁵ found a correlation between levels of S. mutans in saliva of parents and their children. Children were at low risk for obtaining high levels of S. mutans if their primary caretaker had less than 10^5 Colony Forming Units per milliliter (CFU/ml) of saliva. They also found a potential for transfer of S. mutans from a person to a flat spoon-like metal plate when the concentration was 13×10^6 CFU/ml of saliva. Two hundred CFU/ml were found on the metal plate immediately after oral inoculation, and 73 CFU/ml were still present on the metal surface after seven hours. Kohler and Bratthall²⁵ suggested that a mother feeding her infant with her own spoon could repeatedly introduce hundreds of colony-forming units each time the spoon entered the infants mouth.

Goepferd²⁶, in a paper presenting rationale for an infant oral health program, suggests S. mutans transmission occurs from the maternal saliva during kissing or when infants place their fingers into their mother's mouth, and then their own. The more highly infected the mother, the more likely the child will be infected. Berkowitz²⁸ detected S. mutans in 38 of 156 infants studied in Philadelphia. The mean salivary level of S. mutans for the 38 mothers of the infected infants was 1.16×10^6 CFU/ml. Noninfected infants had mothers with a mean salivary level of

S. mutans of 2×10^5 CFU/ml. Thus, the critical level of infection is thought to be 10^6 CFU/ml^{25,27,28} of saliva.

Svanberg²⁹ investigated the contamination of toothpaste and toothbrushes by S. mutans when used by subjects with S. mutans salivary counts of 10^6 CFU/ml. Two of ten toothpaste tubes were shown to harbor S. mutans one hour after use. Toothbrushes were found to be highly infected and harbored S. mutans twenty-four hours after use with regular storage. Svanberg suggests shared toothbrush tubes and toothbrushes are a mode of intrafamilial transfer of Streptococcus mutans.

PARENTAL KNOWLEDGE CONCERNING NURSING CARIES

Johnsen³¹ surveyed parents of 224 children under 3.5 years of age who presented for dental care. One hundred thirty four children had carious incisors and 90 were caries-free. Johnsen asked questions regarding the parents level of education, attitudes towards keeping their own teeth, use of fluoride, bottle-feeding patterns and parents ability to say "no". Parents of caries-free children were found more likely to have attended college than parents of children with carious incisors. Mothers of caries free children were more optimistic about keeping their own teeth past the age of 65. Parents of caries-free children were more likely to have given their children fluoride supplements than parents of children with carious incisors. More parents of children with

carious incisors (78 percent) had attempted to substitute water in the nursing bottle than had parents of caries-free children (56 percent). This difference was thought to demonstrate greater awareness of the nursing caries problem existed and an attempt to stop progression of the problem. Parents of caries-free children were more successful at substituting water in the bottle than were parent's of children with carious incisors. Johnsen stated that this lack of success probably demonstrated a lack of persistence by the parent. Johnsen³⁰ also found the parents of the caries-free children ranked themselves higher on their ability to say "no" and were more aware of the cariogenic potential of the nursing habit. On the other hand, forty percent of the parents of children with carious incisors were also aware of the hazard of inappropriate nursing.

In a survey of 374 expectant parents participating in a prenatal class given by the Vancouver Health Department in Canada, Lee³² found 27 percent of the parents did not understand the importance of the primary dentition. Many parents were confused concerning fluoride supplements. Only 23 percent of the women and twelve percent of the men knew that fluoride supplements should be given once daily, and only 37 percent of the women and 40 percent of the men knew that Vancouver's water was not fluoridated. Women in this sample consistently demonstrated a higher level of dental health knowledge, and reported preventive dental health behavior patterns more frequently than did the men.

Lee concludes that efforts to develop preventive dental health behavior for infants are best directed toward mothers.

PREVENTION OF NURSING CARIES

In order to prevent nursing caries, parents of infants must be aware of the potential problem, its cause and how to prevent its occurrence. Holst and Kohler³³ evaluated the effectiveness of a Swedish dental health program begun in 1967-1968. A dentist met with parents of children 5 to 6 months old and gave advice about good oral health. The dentist again met with the parents when the children were 9 to 12 months old, and 18 to 24 months old. Clinical exams were completed at this time and dental health advice and oral hygiene instruction was repeated. Children that reached four years of age in 1967 whose parents had not participated in a dental health program served as a control group to compare the effect of educating parents about oral health of their children with the effect of parents who had not received repeated oral health instruction. Children whose parents had participated in the dental health program were examined when they reached four years of age in 1973. The control group was 26.4 percent caries free, compared with children of participating parents who were 60.6 percent caries free. The mean number of decayed teeth in

four year old children dropped from 4.6 in the 1967 group to 1.6 in the 1973 group. It was concluded that parental education on preventive oral health procedures when instituted early in their infants lives resulted in a dramatically decreased incidence of dental caries in these Swedish children.

Holm et al³⁴ compared 187 four year old Swedish children born in 1967 whose mothers were given advice concerning diet, oral hygiene, and fluoride at Child Health Centers with 196 four year old children born in 1963 whose mothers had not been given advice. They found a significant decrease in caries incidence (5.31 deft vs 3.23 deft) and an increase in the percent of caries free children, from 17 percent to 33 percent between 1967 and 1971. They attributed the changes to increases in the consumption of fluoride and decreases in cariogenic foods between meals. These changes could be attributed to mothers following advice given at the Child Health Centers. The four year difference in time probably had an affect on the caries rate due to an increase in oral health awareness by the general public.

In a subsequent study, Holt et al³⁵ examined three groups of children at 5 years of age. Mothers of children in Group I received home advice when their children were 2 to 12 weeks, 6 to 8 months, and 14 to 18 months of age. The use of fluoride drops was assessed at subsequent visits. Parents of children in Group II were sent dental health education literature in the mail according to the same time schedule as parents were seen in Group I. Fluoride drops

were also offered to these parents. Parents of children in Group III were not contacted in the initial periods of the study. Clinical examinations were performed on 324 children in the three groups, and the mothers were interviewed. They found 69 percent of the children whose parents had been given home advice to be free of dental caries. Children of the parents who received leaflets in the mail were found to be 54 percent caries free. Among children of those parents who had been given no advice, 58 percent were caries free. It was noted that children with highly motivated mothers demonstrated the greatest benefit from education.

MATERIALS AND METHODS

The subjects in this study were parents and their children under five years of age who were presenting for initial dental examination with participating pediatric dentists during an 8 week period from February 24, to April 20, 1989.

A questionnaire was developed to acquire information from parents of these preschool children concerning the child's dental history, feeding habits, and parents knowledge concerning nursing caries. Data was also requested regarding sources of information concerning prevention of and treatment for nursing caries. The questionnaire was pre-tested with mothers who had children less than five years of age. The questionnaire was reviewed by a psychologist and a nutritionist for comment and suggestion.

Forty pediatric dentists in Oregon and southwestern Washington were asked to participate in this investigation. Each dentist was mailed a packet containing a letter requesting their participation, instructions for them and their staff, 100 parent questionnaires, and 100 primary tooth charts (Appendix II-V). The dentist's receptionists were instructed to coordinate the project by placing a chart with the routine office chart and to request parents of new patients under five years of age to complete the questionnaire in the office waiting room. The dental assistants were instructed to transfer the clinical findings of the examination from the office chart to the chart provided for each

child. Receptionists in each of the offices were contacted by telephone a few days prior to the arrival of the packet to request their participation. The purpose of the project, and instructions for implementation were also discussed at this time. One to two weeks into the project, staff at the offices were again contacted to encourage participation, confirm qualifications for the sample and specifications for the questionnaire.

The raw data consisted of 386 questionnaires and dental charts from twenty pediatric dentists in Oregon, and from pediatric dental residents and faculty at the Oregon Health Sciences University Graduate Pediatric Dental Clinic, and the Hospital Dental Service of Oregon Health Sciences University. Information from the questionnaires and dental charts were tabulated using the Microsoft Excel 2.2 spreadsheet program (Appendix VI).

The sample was divided into three groups on the basis of the caries pattern shown on each child's dental chart. Group A consisted of children with nursing caries (n=113). Nursing caries was defined as a minimum of two maxillary incisors with labial or lingual caries. This criteria for nursing caries was adopted from prevalence investigations by Winter et. al. (1966,1971), and Holt et. al. (1982, 1988). Caries free children, Group B (n=186), included children with no decayed, missing, or filled teeth (dmft). Children not included in Groups A and B were placed in the general caries category, Group C (n=82). Five surveys, returned without

charts, could not be placed in a group category.

Within Groups A, B, and C, children were placed in the following categories: 1) Generally healthy (as determined by parent) or unhealthy, 2) Age; 0 to 12 months, 13 to 24 months, 25 to 36 months, 37 to 48 months, and 49 to 60 months, 3) Ethnic Origin; white, black, hispanic, or other (includes asian, middle eastern and native american), and 4) Sex; male or female.

The following questions were selected from the questionnaire, Appendix IV, to investigate whether parents of children with nursing caries differ from other children in their knowledge and experience. Number 1, "What is the reason for today's dental visit?" Number 2, "Who referred you to seek dental care for your child?" Number 21, "When you first noticed your child had a problem with his/her teeth, what did you think was the cause of the dental problem?" Number 23, "Have you ever received information on nursing/bottle caries? If yes, by whom? Please indicate when you received this information."

The statistical test used for significance of differences was the Chi Square Test of Independence⁴⁰. Differences having a probability of less than five percent were considered significant.

FINDINGS

Most parents indicated that their children were generally healthy (Table II). The children were predominantly white (Table III), and approximately equal in ratio of male to female (Table IV).

Table II: Health of Total Sample

HEALTH	SAMPLE	
	Number of patients	Percent
Generally healthy	376	97
Unhealthy	3	1
No response	<u>7</u>	<u>2</u>
Total	386	100

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Table III: Distribution of Ethnic Origin in Total Sample

Ethnic Origin	SAMPLE	
	Number of patients	Percent
White	307	79
Black	26	7
Hispanic	22	6
other	29	7
no response	<u>2</u>	<u>1</u>
Total	386	100

Table IV: Distribution of Sex in Total Sample

Sex	SAMPLE	
	Number of patients	Percent
MALE	189	48.9
FEMALE	196	50.8
no response	1	0.3
	<u>386</u>	<u>100</u>

Of the total sample (see Figure IV), 113 children had nursing caries (Group A), 186 were caries free (Group B), 82 had caries in a pattern inconsistent with nursing caries (Group C) and 5 children could not be placed in a group (no chart).

Figure IV: Distribution of Groups A, B, and C

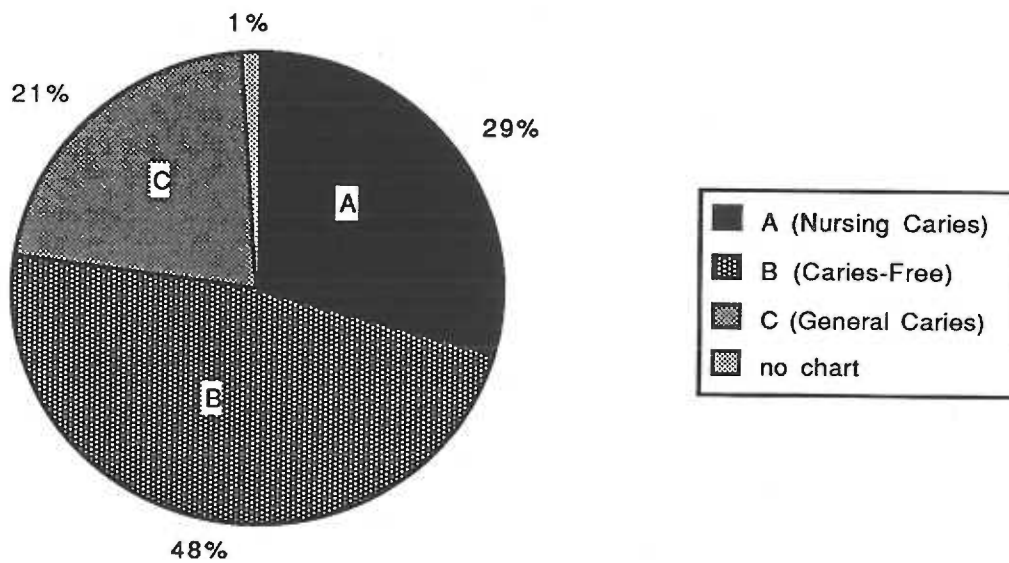


Table V: Age distribution of Total Sample

AGE in months	SAMPLE	
	Number of patients	Percent
< 12	4	1
13-24	40	10
25-36	123	32
37-48	132	34
49-60	80	21
unknown ages	<u>7</u>	<u>2</u>
Total	386	100

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Tables VI presents the age distribution of children in Groups A (Nursing Caries), B (Caries-Free), and C (General Caries). Figures V, VI, and VII compare the age distributions of the Groups A, B, and C against the Total sample, respectively. In the less than 24 month age group there is a disproportionate number of children in Group A when compared to the total sample. Children with nursing caries presented for treatment at an earlier age than either the caries-free children or children with general dental caries. Children who were caries-free presented for examination more frequently during the 25 to 36 month age period than did children

with general caries. Children with general caries were more frequently found in the older age groups at initial examination. These differences were found to be statistically significant using the chi square test of independence. ($X^2_{\text{calculated}} = 33.33$, $X^2_{\text{table value}} = 18.467$, degrees of freedom = 4, $p \leq .001$).

Table VI: Percentage Distribution of Groups by Age

Age in months	GROUP							
	A		B		C		Total	
	%	(#)	%	(#)	%	(#)	%	(#)
≤ 24	20*	(23)	9	(17)	5	(4)	11	(44)
25-36	32	(36)	40*	(74)	16	(13)	32	(123)
37-59	47	(53)	48	(89)	79*	(65)	55	(212)
unknown	<u>1</u>	<u>(1)</u>	<u>3</u>	<u>(6)</u>	<u>0</u>	<u>(0)</u>	<u>2</u>	<u>(7)</u>
	100	(113)	100	(186)	100	(82)	100	(386)

* Differences significant at the $p \leq 0.001$, 4 degrees of freedom.

The unknown category was not included in statistical evaluation.

Figure V: Percentage Distribution of Group A and Total Sample by Age

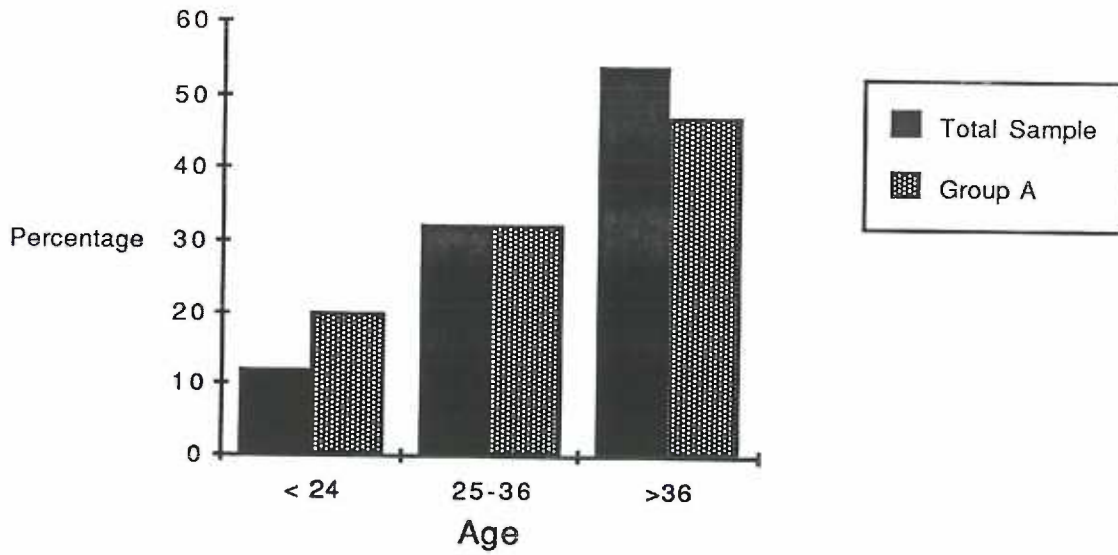


Figure VI: Percentage Distribution of Group B and Total Sample by Age

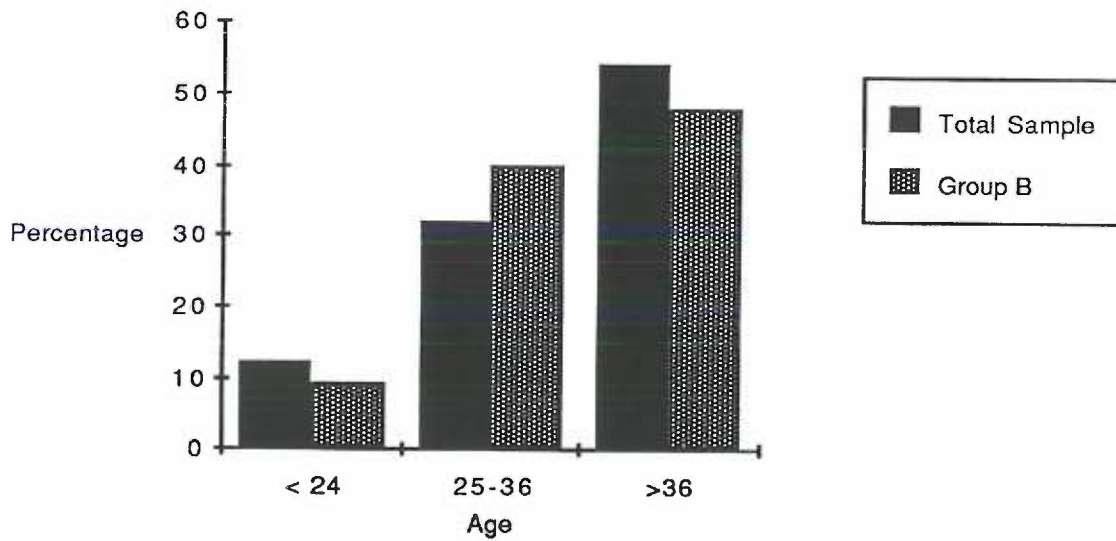
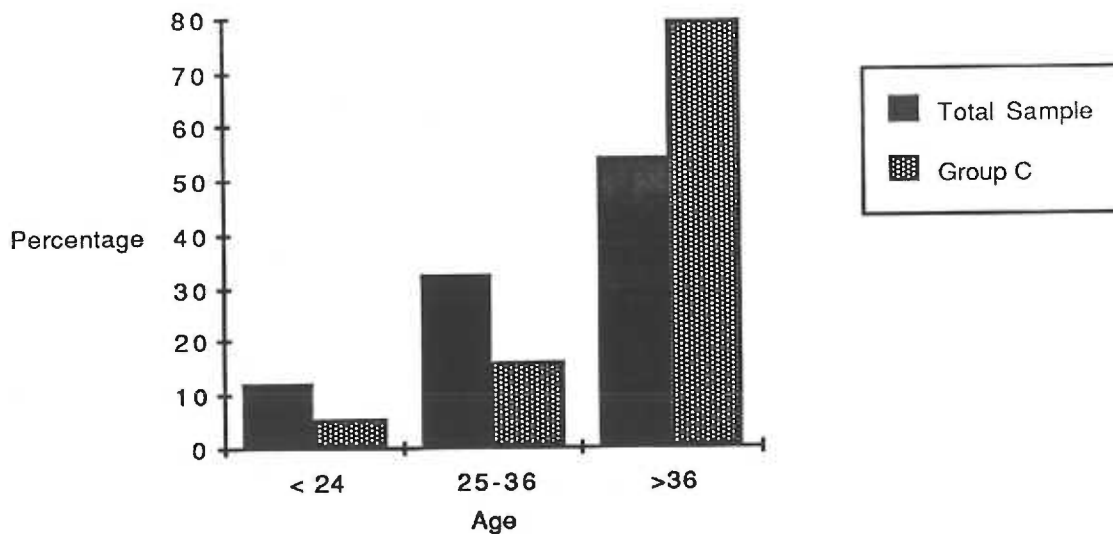


Figure VII: Percentage Distribution of Group C and Total Sample by Age



Only 22 of the children were of hispanic ethnic origin. The proportion of hispanic children in Group A is twice that of the hispanic children in the total sample (Table VIII). The twelve percent hispanic children in Group A is higher than expected, and two percent hispanic children in Group B is lower than expected when compared to the total population. These variations from expected are statistically significant. ($X^2_{\text{calculated}} = 12.346$, $X^2_{\text{table value}} = 11.668$, degrees of freedom = 4, $p \leq .02$).

**Table VII: Percentage Distribution of Ethnic Origin
within Groups A, B, and C**

Ethnic Origin	GROUP							
	A		B		C		Total	
	%	(#)	%	(#)	%	(#)	%	(#)
White	69	(79)	85	(159)	78	(64)	82	(307)
Black	6	(7)	8	(14)	6	(5)	7	(26)
Hispanic	12*	(13)	2*	(4)	6	(5)	6	(22)
Other	12	(13)	4	(8)	10	(8)	5	(29)
no response	<u>1</u>	<u>(1)</u>	<u>1</u>	<u>(1)</u>	<u>0</u>	<u>(0)</u>	<u>2</u>	<u>(2)</u>
	100	(113)	100	(186)	100	(82)	100	(386)

* Differences significant at $p \leq 0.02$, degrees of freedom = 4.

Parents were asked "What is the reason for today's visit?" (see Appendix IV; question 1). Table VIII lists the number of responses for each reason within Groups A, B, and C. Parents of caries-free children predominantly presented to dental offices and clinics for checkups. Parents of children with nursing caries were more likely to indicate their child had a cavity, a toothache, or a broken tooth not associated with trauma, than were parents of

caries-free children. The number of parents who sought care for a broken tooth, or cavity was significantly larger for children in Group A when compared to Groups B, and C. The number of parents seeking care for their children because of toothaches were significantly higher when compared to Group B. ($X^2_{\text{calculated}} = 148.90$, $X^2_{\text{table value}} = 22.457$, degrees of freedom = 6, $p \leq .001$).

Table VIII: Reason for Dental Visit

Reason	Number of responses within each group		
	A	B	C
Checkup	36	153*	42
Cavity	60*	3	39
Broken Tooth	19*	7	6
Toothache	15*	2	13*

Note: Reasons are not mutually exclusive.

*Differences significant at $p < 0.001$, degrees of freedom = 6

Parents were asked to indicate the source of their referral to the pediatric dental office or teaching clinics (see Appendix IV-question 2). Most parents (57% of the total sample) indicated they had sought care from the pediatric dentist on their own.

Dentists and pediatricians were the next most common sources of referral for pediatric dental care. Nurses and family practice physicians were infrequently noted as referral sources. The percentage distribution of each group by the referral source is presented in Table IX.

Table IX: Sources of Referral to Pediatric Dental Care

Number of responses for each referral source
(percent of total sample N=386)

Referral Source	A #(%)	B #(%)	C #(%)	no chart #(%)	Total #(%)
Parent/self	52 (13)	121 (31)	45 (12)	4 (1)	222 (57)
Nurse	2 (.5)	4 (1)	0 (0)	0 (0)	6 (1.5)
Pediatrician	9 (2.3)	20 (5.2)	59 (1.3)	1 (.2)	35 (9)
Dentist	34 (8.8)	19 (5)	25 (6)	1 (.2)	79 (20)
Family doctor	5 (1.3)	8 (2.1)	2 (.5)	0 (0)	15 (3.9)
other	14 (3.6)	15 (3.9)	4 (1)	0 (0)	33 (8.5)
no response	2 (.5)	6 (1.5)	3 (.8)	0 (0)	11 (2.8)

.....

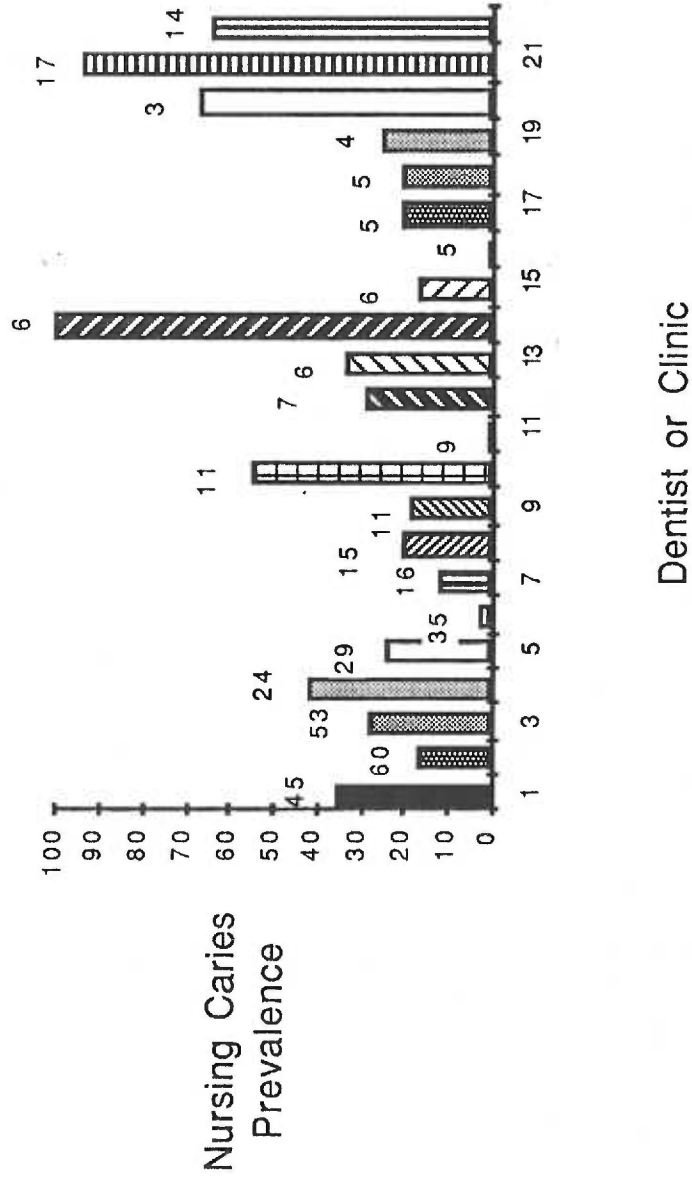
Note: Referral sources are not mutually exclusive. Percentages are calculated of the total sample. Example: 52 parent/self referrals divided by 386 total number of samples= 13%.

Prevalence of nursing caries in children under five years of age presenting for examination in pediatric dental practices in Oregon was found to be 25 percent (see Table X). The prevalence rates of children with nursing caries among individual private offices during this study ranged from 0 to 100 percent (see Figure VIII). The prevalence of nursing caries among children seeking care at the university clinics was significantly different from the proportion seen in private practices ($X^2_{\text{calculated}} = 17.43$, $X^2_{\text{table}} = 10.827$, degree of freedom = 1, $p \leq 0.001$).

**Table X: Prevalence of Nursing Caries
among New Preschool Patients**

Location	Group A n=113	Total N=386	Prevalence
Ped. Dental Practices	88	355	25 %
Teaching Clinics	25	31	81%

Figure VIII: Nursing Caries Prevalence
for each office or clinic



Superscripts refer to the number of surveys returned by each dentist or clinic.

Question 23 (Appendix 1V) asked parents "Have you ever received information on nursing/bottle caries. Parents of children with nursing caries reporting they had not received prior information about nursing caries (see Table XI) at a significantly greater rate than that of parents with caries-free children. This difference was also significant for parents receiving information in the caries free group ($X^2_{\text{calculated}} = 13.17$, $X^2_{\text{table}} = 11.668$, degrees of freedom = 4, $p \leq .02$).

Table XI: Parental Report on Receipt of Information on Nursing Caries

	Group			Total
	A	B	C	
	# (%)	# (%)	# (%)	# (%)
Received information	39 (35)	97* (52)	35 (43)	171 (45)
Did not receive info	59* (52)	60 (32)	32 (39)	151 (40)
no response	<u>15 (13)</u>	<u>29 (16)</u>	<u>15 (18)</u>	<u>59 (15)</u>
Total	113 (100)	186 (100)	82 (100)	382 (100)

.....
Differences significant at $p < 0.02$, degrees of freedom = 4

Of those parents responding affirmatively to the question 23, "Have you ever received information on nursing/bottle caries?", parents reported pediatricians and dentists as the most common source of this information (Table XII). Other physicians that may have contact with these young children, and nurses were less frequently a source of information on this problem. Other reported sources were magazine articles, books, WIC, friends, relatives and co-workers, nursing school, hospitals, and the La Leche League.

Table XII: Parental Reports of Source of Information on Nursing Caries

Source	GROUP			no response	Total
	A # (%)	B #(%)	C #(%)		
Dentist	11 (2.8)	16 (4.2)	9 (2.3)	0 (0)	36 (9.3)
Pediatrician	15 (3.8)	56 (14.5)	21 (5.4)	1 (.25)	93 (24)
Family doctor	7 (1.8)	15 (3.9)	4 (1.0)	0 (0)	26 (6.7)
Nurse	0 (0)	6 (1.6)	4 (1.0)	0 (0)	10 (2.6)
OB/GYN	3 (.7)	11 (2.8)	2 (.5)	0 (0)	16 (4)
other	8 (2.1)	26 (6.7)	7(1.8)	3 (.7)	44 (11.3)
no response	78 (20.2)	92 (23.8)	48 (12.4)	2 (.5)	220(56.9)

.....
 Information sources are not mutually exclusive. Percentages are calculated of the total sample. Example: 11/386 = 2.8%.

**Table XIII: Time of Parental Receipt of
Nursing Caries Information**

Time	Group		
	A # (%)	B # (%)	C # (%)
prior to birth	6 (15.4)	23 (23.7)	4 (11.4)
at birth	4 (10.2)	14 (14.4)	7 (20.0)
first year (0-12mo.)	6 (15.4)	20 (20.6)	5 (14.3)
second year (\geq 13mo.)	7 (18.0)	5 (5.2)	4 (11.4)
<u>no response</u>	<u>16 (41.0)</u>	<u>34 (35.1)</u>	<u>15 (42.9)</u>
Total (affirmative answer to question 23)	39 (100)	97 (100)	35 (100)

Among parents indicating they had received information about nursing caries, only 25 percent of the parents with children with nursing caries indicated having received information about nursing caries at or prior to birth compared with 38 percent in the caries-free children (Table XIII). Using the chi square test of independence, these differences were not found to be statistically significant.

Discussion

Children with nursing caries (Group A) were found to present for dental treatment at an earlier age than both caries-free children and children with general caries (Groups B and C). An explanation may be that children with nursing caries have a visible problem or complaints of pain at an early age which prompts their parents to seek care. Parents of caries-free children brought their children for their first dental appointment more frequently at two years of age, than did parents of children in Groups A and C. This behavior which may be an indication that these parents are demonstrating a more preventive dental behavior pattern. Children with general caries tended to present for treatment later, after three years of age.

The higher relative proportion of hispanic children in the nursing caries group is consistent with other reports of a higher incidence of nursing caries in this ethnic group. Parker et al.,³⁷ in an investigation of 753 Head Start children found that hispanic children and native american children had a higher incidence of nursing caries than children of other ethnic groups. The hispanic and native american children were more frequently in need of urgent dental care³⁷.

Parents are advised to call for an emergency dental appointment when their child has a broken tooth. It is interesting that parents of children with nursing caries reported broken teeth more frequently than parents of caries free children and children

with general caries. It may be assumed that this higher frequency is due to incisors being weakened by extensive dental caries.

The majority (57.5 percent of the total sample) of parents reported that they were self-referred in seeking dental care for their children. In Group A, children with nursing caries, 13 percent of the parents were self-referred, 8.8 percent by dentists, and 2.3 percent by pediatricians. Nurses were a referral source in only 0.5 percent of the parents of children with nursing caries. Improvements can be made in referring parents for early preventive dental care by all health professionals, especially nurses, since nurses work with young children and pregnant mothers, they should be an exceptional source.

All health care professionals should be aware that the American Academy of Pediatric Dentistry recommendations are that "infant oral health care begins with oral health counseling for the newborn which include oral examination and preventive health education within six months of the eruption of the first primary tooth and no later than twelve months of age."⁴¹ Suher¹⁵, described a case history of a child with nursing caries at eleven months of age. Although the average prevalence of nursing caries among children under five years of age seeking care from pediatric dental practices was 25 percent (a proportion exceeding estimates among the general population made by Ripa¹⁴), the range varied from zero to 100 percent between different practices. This wide range of nursing caries prevalence may be due to the variations in

the populations served by different pediatric dentists, inconsistencies in implementing the survey by office staff, and/or small sample sizes giving a falsely high or low prevalence. Ten of the twenty contributing pediatric dentists submitted forms for seven or less new patients during the eight week period. The teaching clinics' prevalence of nursing caries was 81 percent. Data from the teaching clinics is biased because the faculty at the Oregon Health Sciences University Graduate Pediatric Clinic screen out low caries or caries-free children. The Hospital Dental Service is a referral clinic in which residents and faculty treat patients referred from dentists all over the state.

Parents who noted having received information about nursing caries, most often reported having received information from pediatricians and dentists. Nurses, who are often thought of as the conveyors of health information, were infrequent source of information about nursing caries. Nurses that work with mothers and their babies, especially public health and pediatric nurses, are best situated for presenting information about preventing nursing caries during prenatal care visits and well baby visits.

Prevention of nursing caries can only be achieved if parents know about the condition, its cause, and its prevention prior to onset. The prenatal/natal developmental periods would seem to be an optimum time to educate the parents concerning the prevention of nursing caries since the problem has not yet developed. Studies in Sweden (Holst and Kohler³³, Holm³⁴, and Holt³⁵) have

demonstrated that early preventive education is effective in decreasing the caries rate and increasing the number of caries free children in four year age groups. In the Holm³⁴, and Holst and Kohler³³ investigations, the difference in time between the control and test samples may have influenced the decrease in caries rate.

Only 25 percent of the parents with children having nursing caries reported receiving information about nursing caries during the prenatal/natal period, compared to 31 and 38 percent of parents of children with general caries or caries free children. It should be noted that this question had a high no response rate and hence the differences were not statistically significant. The low response rate may be attributed to its being the last question on a lengthy questionnaire, or an unwillingness to accept full responsibility for the problem.

Health professionals should be aware of the need to inform new and future parents regarding the problem of nursing caries. The optimal time to educate parents, especially mothers, is during the prenatal period. Pregnant women have a heightened interest in learning about childcare. Deutsch et al.³⁷ investigated the role of information-seeking and maternal self-definition during transition to motherhood. They found that women in anticipation of their first birth actively sought information, which played an important role in developing their self-concept as a mother. During the prenatal period this information is obtained from indirect sources (books and advice). Following birth, the information is gained

mainly through direct experience while caring for their child. Deutsch et al.³⁷ concluded that once a mother's self-definition is crystallized, active information-seeking decreases and new information from indirect sources has less effect. The impact of information given during the prenatal period may be of long-lasting significance. Blinkhorn³⁸ states that pregnant women " by the very nature of their condition, identify themselves as mothers, modelling their behavior in accordance with current societal norms on motherhood, and are anxious to obtain knowledge on child rearing. This phenomenon is termed anticipatory socialization."

Blinkhorn suggests that dental health education programs aimed at expectant mothers would benefit the children's dental health because expectant mothers are particularly interested in and open to information about their child's health at this time. Holt et al.³⁹ interviewed 314 mothers of very young children in London and found mothers to be very receptive and enthusiastic about receiving dental health education. The investigation consisted of three interviews (2-12 weeks, 6-9 months, and 14-19 months post-birth). Only 3 percent refused to take part, and 86 percent willingly participated in the study through the final interview. They concluded that providing mothers with dental health education induces positive changes in the maternal attitudes and practice as demonstrated by increased use of fluoride supplements and decreased use of sweetened dummy and miniature feeders. Prenatal education and early establishment of good home care with children is believed to be effective in preventing caries.

CONCLUSIONS

1. Among children under 5 years of age who presented for dental care in 20 Pediatric Dental Practices in Oregon between February 24, and April 20, 1989:

The prevalence of nursing caries among preschool children seen in pediatric dental practices was about 25 percent.

The prevalence of nursing caries among those seen in one of two University pediatric dental teaching clinics was skewed heavily (81 percent), and far exceeded the prevalence in the pediatric dental offices (25 percent).

2. Hispanic children had a higher frequency of nursing caries, and a lower frequency of caries-free primary dentitions than other ethnic groups seeking pediatric dental care in this study.

3. Parents of children with nursing caries are predominantly self-referred to seek dental care. Among referral sources dentists and pediatricians were frequent sources of referral in contrast to nurses who are rarely a source.

4. Dentists and pediatricians were a primary source of information concerning nursing caries. Nurses and other health professionals were infrequent sources.

5. Educational programs for public health nurses, pediatric nurses, obstetric nurses, nursing students, and for nurses in continuing education courses, need to be developed to inform nurses of the importance of their role in the prevention of nursing caries.

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Appendix I: Summary of Prevalence Studies on Nursing Caries

COUNTRY	YEAR OF PUBLICATION	INVESTIGATOR	SAMPLE	NURSING CARIES CRITERIA	PREVALENCE
ENGLAND	1967	GOOSE	Random selection of 309 1-2 year old children in Cheshire County and Leicester City Borough	Health visitors determined the presence of labial caries by comparing with photographs of mild to advanced labial caries.	6.8%
	1968	GOOSE and GITTUS	Random selection of 5549 1-2 year old children from 72 locations in England and Wales.	Health visitors determined the presence of labial caries by comparing with photographs of mild to advanced labial caries.	5.9%
	1966	WINTER et al.	100 1-5 year old children attending a child welfare center in London.	Minimum of 2 maxillary incisors with labial or lingual lesions.	12.0%
	1971	WINTER et al.	601 12-60 mo. old children attending child welfare centers in London borough of Camden.	Minimum of 2 maxillary incisors with labial or lingual lesions.	8.0%
	1982	HOLT et al.	555 12-60 mo. old children presenting to maternal and child welfare centers in Camden and Islington.	Minimum of 2 maxillary incisors with labial or lingual lesions.	3.1%
	1988	HOLT et al.	565 12-60 mo. old children presenting to maternal and child welfare clinics in Camden.	Minimum of 2 maxillary incisors with labial or lingual lesions.	1.0%

Appendix I (cont.): Summary of Nursing Caries Prevalence Studies

COUNTRY	YEAR OF PUBLICATION	INVESTIGATOR	SAMPLE	NURSING CARIES CRITERIA	PREVALENCE
United States	1976	POWELL	> 4000 children seen at LA Hospital, dental school, clinic, public health service clinics and private offices.	Clinical appearance and history of nursing habit.	1.0%
	1977	CURRIER and GLINKA	180 predominantly black 6-108 mo. old children at a child health clinic in Richmond, VA.	Visual observation with the child lying on a table or held by mother to detect anterior smooth surface caries.	5.0%
	1984	JOHNSEN et al.	200 3.5-5 year old Head Start children/ 2 Ohio communities.	Cavitated facial-lingual compatible with the pattern of nursing caries.	11%
	1987	KELLY and BREURD	514 Native American 3-5 year old Head Start children in 18 locations in Alaska and Oklahoma.	Cavitation of at least 3 maxillary incisors.	53.1%
CANADA	1982	DERKSON and PONTI	Random selection of 594 9mo.-6yr. old children attending public health clinics and community center activities in Vancouver.	Smooth surface caries on the labial and lingual surfaces of maxillary incisors.	3.2%

Appendix I(cont.): Summary of Nursing Caries Prevalence Studies

COUNTRY	YEAR OF PUBLICATION	INVESTIGATOR	SAMPLE	NURSING CARIES CRITERIA	PREVALENCE
AUSTRALIA	1985	BROWN et al.	112 children <2 years of age attending maternal and child health clinics in lower middle class suburbs of Brisbane.	Caries in the Nursing caries pattern	5.4%
SOUTH AFRICA	1978	CLEATON-JONES et al.	499 1-5 year old white urban children in Johannesburg.	Caries on the labial of one or more incisor teeth.	11.4%
	1978	CLEATON-JONES et al.	439 rural black 1-5 year old villagers of Rustenberg, Tlaseng, and Motlatta.	Caries on the labial of two or more incisor teeth.	8.6%
			192 urban black 1-5 year old children from Soweto, Johannesburg	Caries on the labial of one or more incisor teeth	3.1%

Appendix I(cont.): Summary of Nursing Caries Prevalence Studies

COUNTRY	YEAR OF PUBLICATION	INVESTIGATOR	SAMPLE	NURSING CARIES CRITERIA	PREVALENCE
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SOUTH AFRICA	1981	RICHARDSON et al.	437 black rural villagers	Caries on the labial of one or more incisor teeth.	11.7%
			192 urban blacks from Soweto, Johannesburg	Same as above	4.0%
			468 urban whites from Johannesburg	Same as above	12.2%
INDONESIA	1979	ALDY. et al	100 children < 5 years old who visited a hospital clinic.	Caries in the pattern of Nursing Caries.	48.0%

updated table from Ripa, L.W.
Ped. Dent. Vol.10 December 1988

Appendix II

John Smith, D.M.D.
600 East 18th St. Suite D
Portland, Oregon 97214
February 17, 1989

Dear Dr. Smith,

Your assistance is requested with the enclosed questionnaires and dental charts. Data is being sought regarding Nursing Caries or Baby Bottle Tooth Decay which will support development of educational programs for dental students, pediatricians, student nurses, and public health nurses.

A sample of all preschool children seeking dental care from Pediatric Dentists for the first time between February 24th and April 20th is desired for this study.

Help is requested from your receptionist and dental assistants. The receptionist is asked to give parents a questionnaire for each new to your practice preschool child, collect it, attach the dental chart, and return them to OHSU in a self addressed envelope on April 21st. The dental assistant is asked to transfer notations from your examination onto a dental chart.

Please call Dr. Porter or myself if you have questions or need additional supplies. Your assistance with this project will be appreciated.

Sincerely,



Camille Sata
Resident
Pediatric Dentistry

OREGON HEALTH SCIENCES UNIVERSITY

PRESCHOOL DENTAL STUDY

INSTRUCTIONS FOR DISTRIBUTION OF QUESTIONNAIRE

Please distribute this questionnaire from February 24 to April 20, 1989.

RECEPTIONIST


- 1) Have parents of all **NEW PRESCHOOL PATIENTS** who have not reached their 5th birthday complete a questionnaire for each child. The questionnaire may be completed while the parent is filling out new patient forms, or as the parent waits for his/her child to be examined.
- 2) Write the patient's name on
 - a) the questionnaire
 - b) an enclosed dental chart
- 3) Give the enclosed dental chart to the Dental Assistant (along with your usual new patient paperwork) so that she may enter the findings of the New Patient's examination.
- 4) Staple the dental chart to the questionnaire and place it in the enclosed addressed envelope.
- 5) Return the questionnaire and chart in the enclosed addressed envelope on April 21, 1989.
- 6) If you have questions or need more materials, please call me.

DENTAL ASSISTANT

- 1) You will receive a dental chart for preschool children from the Receptionist.
- 2) Please transfer the findings of the New Patient Exam from the child's chart.
- 3) Return the completed dental chart to the Receptionist.

If you have questions or need additional materials, call me at 279-8881 (W), or 246-0021 (H). Thank you very much for your help.

Sincerely,


Camille Sata, D.M.D.
Resident
Pediatric Dentistry

Appendix IV: Parent Questionnaire

OREGON HEALTH SCIENCES UNIVERSITY
PRESCHOOL DENTAL STUDY

This survey is intended to learn more about infant dental problems. Please help us by answering the following questions.

Child's Name: _____ Sex: M F Today's Date: _____

Child's Birthdate: _____ How are you related to the child?
(mom, dad...) _____

Where (city/state) has the child lived (indicate dates)? _____

Ethnic Origin: White, Black, Hispanic, Asian, Native American, (other) _____

Date of child's last physical exam: _____ Is the child generally healthy? yes no
List any medications your child is taking: _____
_____. chewable sweetened syrup capsule (other) _____

1. What is the reason for today's dental visit? checkup cavities broken tooth
 toothache soft teeth injury
 other _____

2. Who referred you to seek dental care for your child? Self Nurse Pediatrician
 Family Dentist Family Doctor (other) _____

3. Has the child ever been denied dental treatment? yes no
Reason: too young behavior management problem (other) _____

4. At what age (yrs months) did your child first visit a dentist? _____

5. What problems were seen at that appointment? cavities discolored teeth
 broken teeth inadequate brushing bottle/nursing caries
 soft teeth (other) _____

6. What changes did the dentist recommend? brushing flossing fluoride supplements
 changes in diet (other) _____

7. At what age (yrs months):
did your child start solid foods? _____
did your child start drinking from a cup? _____
did you first notice a problem with your child's teeth? _____
did your child quit the bottle completely? _____

8. How many meals per day does your child eat? ____

9. How many times per day does your child snack? ____

10. List 3 of your child's favorite snacks. _____

11. Has your child ever used a pacifier? yes, no
If yes, have you ever dipped or flavored the pacifier with a sweetener? yes, no.

12. Was your child breast fed? yes, no
Age started (in months) _____ Age stopped (in months) _____
Number of times nursed per day _____ Number of times nursed at night _____
Average length of each feeding (in minutes) _____

PLEASE TURN OVER AND COMPLETE BACK SIDE

Appendix IV: Parent Questionnaire (continued).

13. The child was breast fed:

at bedtime	-	always	mostly	50/50	sometimes	rarely	never
at naptime	-	always	mostly	50/50	sometimes	rarely	never
and slept with mom	-	always	mostly	50/50	sometimes	rarely	never
and fed on demand	-	always	mostly	50/50	sometimes	rarely	never

14. Was your child bottle fed? yes, no

Age started (in months) _____
 Age stopped bottle use during the day (in months) _____
 Age stopped bottle use at night (in months) _____
 Number of times fed per day (at 9 mo. old) _____
 Number of times fed at night (at 9 mo. old) _____
 Average length of each feeding (in minutes) _____
 Age completely discontinued use of the bottle _____

15. The child received a bottle:

at bedtime	-	always	mostly	50/50	sometimes	rarely	never
and was held while feeding	-	always	mostly	50/50	sometimes	rarely	never
with bottle in bed all night	-	always	mostly	50/50	sometimes	rarely	never
and took the bottle to bed	-	always	mostly	50/50	sometimes	rarely	never
and slept w/ nipple in mouth	-	always	mostly	50/50	sometimes	rarely	never
at night containing milk	-	always	mostly	50/50	sometimes	rarely	never

16. Bottles at night contained:

milk juice water soy formula
 soda koolaid chocolate milk sweetened drinks
 (other) _____

17. Are the child's teeth cleaned following feeding? yes, no

If yes, how? toothbrush, cloth, (other) _____

18. How many times per day are the child's teeth cleaned? _____

19. Who cleans the child's teeth? mom child dad (other) _____

20. Has the child received fluoride supplements? yes, no

If yes, at what ages: _____

21. When you first noticed your child had a problem with his/her teeth, what did you think was the cause of the dental problem? soft teeth teeth came in that way

too many sweets feeding patterns

(other) _____

question does not apply/ no problem

22. When you first noticed your child had a dental problem, did you change how you fed your child? yes, no, child had no dental problems

If yes, how?
 only water in the bottle at night
 stopped bottle/nursing at night
 stopped bottle/nursing at naptime
 completely discontinued bottle or nursing
 began child on fluoride supplements
 began brushing the child's teeth
 (other) _____

23. Have you ever received information on nursing/bottle caries? yes, no

If yes, by whom: Dentist Pediatrician Family doctor
 Nurse OB/GYN (other) _____

Please indicate when you received this information _____

Thank you for your time and cooperation.

OREGON HEALTH SCIENCES UNIVERSITY

PRESCHOOL DENTAL STUDY

Patient's Name _____

KEY

Caries: Red (please draw as seen in the mouth).

Restorations: Blue

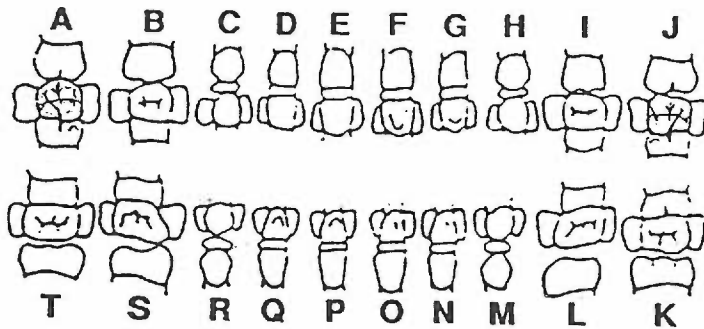
Decalcification: Red dashes ---

Abcess: Red δ above or below tooth

Erupting Tooth: \wedge or \vee over letter

Extracted or Exfoliated Tooth: X through tooth

Congenitally Missing Teeth: indicate



Radiographic Findings: (Chart radiographic caries above, and note other pathology found on radiographs below. If negative, so indicate.)

Appendix VI: Database

Survey	Dentist	Sex	Age	Ethnic Origin	Health	Visit	Referral	First Visit	Info Received	Info Source	Info Date	Group
1	1	M	17	white	yes	checkup, cavity	pediatrician	17	no			nursing caries
2	1	F	18	white	yes	cavity	self	18	yes	pediatrician, other-WIC		nursing caries
3	1	F	19	white	yes	other-discolor	self	19	yes	dentist		caries free
4	1	F	21	white	yes	injury	pediatrician					caries free
5	1	F	22	white	yes	checkup, cavity, brkn tooth	self	22	yes	family doctor, OB/GYN	previous child	nursing caries
6	1	F	26	white	yes	checkup	self	26	yes	dentist		nursing caries
7	1	M	27	white	yes	cavity	self	27	no			nursing caries
8	1	M	27	white	yes	checkup	dentist	24				general caries
9	1	M	28	white	yes	checkup	self	28	no			caries free
10	1	M	28	white	yes	checkup	self	28	no			caries free
11	1	M	28	white	yes	checkup	self	28	yes	family doctor	prenatal	caries free
12	1	M	31	white	yes	checkup	self	31	yes	dentist	first year	caries free
13	1	F	32	hispanic	yes	checkup	self	32	yes	dentist	previous child	nursing caries
14	1	F	33	black	yes	checkup	self	33	no			caries free
15	1	F	34	white	yes	checkup, cavity, brkn tooth	self		yes	pediatrician		nursing caries
16	1	F	34	white	yes	checkup	self		no	pediatrician		caries free
17	1	F	36	white	yes	brkn tooth	self	36	no		birth	nursing caries
18	1	M	36	white	yes	brkn tooth	family doctor	36	no			caries free
19	1	M	36	white	yes	cavity, brkn tooth	other-friend	36	yes	dentist, family doctor	over two	nursing caries
20	1	M	37	asian	yes	toothache	pediatrician	37				general caries
21	1	F	37	white	yes	injury	dentist	35				general caries
22	1	M	38	white	yes	cavity	dentist	36	yes	pediatrician	previous child	caries free
23	1	F	39	white	yes	checkup	self	39	yes	other-self, pediatrician, nurse	previous child	caries free
24	1	M	39	black	yes	other-abcess	dentist	24	yes	other-mothers	previous child	caries free
25	1	F	40	white	yes	checkup	self	39	no			nursing caries
26	1	M	41	black	yes	cavity	dentist	41				caries free
27	1	M	41	white	yes	checkup, cavity, other-crown	dentist	41	no			nursing caries
28	1	F	42	black	yes	checkup	self	36	yes	dentist	first year	general caries
29	1	M	42	white	yes	other-???	dentist					caries free
30	1	M	43	white	yes	checkup	self		yes			caries free
31	1	F	44	white	yes	checkup, injury	self, other-baby sitter	44	no		previous child	nursing caries
32	1	F	44	white	yes	cavity	other-relative		no			caries free
33	1	M	46	white	yes	toothache	other-school		yes	other-literature, relative		nursing caries
34	1	F	47	white	yes	checkup	self	47	yes	pediatrician		caries free
35	1	F	48	other-???	yes	checkup	self					caries free
36	1	F	48	white	yes	cavity	dentist	48	no			general caries
37	1	M	49	black	yes	checkup	pediatrician	48	yes	pediatrician, nurse		general caries
38	1	F	49	white	yes	cavity	pediatrician	48	no			general caries
39	1	M	50	white	yes	checkup, cavity	other-friend	50	no			caries free
40	1	M	51	black	yes	checkup, injury	self		no			general caries
41	1	F	51	other-wht/hisp	yes	other-cross bite	dentist	51	yes	other-hospital	birth	caries free
42	1	F	52	white	yes	checkup	self	52	yes	family doctor		caries free
43	1	F	53	asian	yes	checkup	dentist	48	no			caries free
44	1	M	58	other-wht/hisp	yes	injury	self	24	no			caries free
45	1	F	58	white	yes	injury	dentist	9	yes	dentist		nursing caries
46	2	M	9	white	yes	injury	self	9	no			nursing caries
47	2	M	17	white	yes	cavity	self	17	no			caries free
48	2	F	18	white	yes	brkn tooth	self		no			nursing caries
49	2	F	18	hispanic	yes	checkup, cavity	pediatrician	18	yes	pediatrician	birth	general caries
50	2	M	18	white	yes	brkn tooth	self		no			general caries
51	2	M	19	asian	yes	brkn tooth	self	18	no			nursing caries
52	2	M	19	white	yes	cavity	self	18	no			general caries
53	2	M	19	white	yes	brkn tooth	dentist	19	no			nursing caries
54	2	M	22	white	yes	brkn tooth	self	19	yes	pediatrician	birth	general caries
55	2	M	26	white	yes	other-first visit	dentist	19	yes	family doctor	prenatal	caries free
56	2	F	29	white	yes	checkup	self	26	yes	other-coworker		nursing caries
57	2	F	30	white	yes	checkup	self	28	no	dentist	over two	general caries
58	2	F	30	white	yes	checkup	self	30	no			caries free
59	2	F	32	white	yes	checkup	self	32	no			caries free
60	2	F	32	white	yes	checkup	self	32	no			caries free
61	2	F	34	white	yes	checkup	self	30	no			caries free
62	2	M	34	white	yes	checkup	self	34	yes	pediatrician	first year	caries free
63	2	M	34	white	yes	checkup	self	34	no			caries free
64	2	M	35	white	yes	checkup	self	34	no			caries free
65	2	F	35	white	yes	cavity, toothache	self	34	no			caries free
66	2	M	35	white	yes	checkup	self	35	yes	pediatrician		general caries
67	2	M	35	white	yes	checkup	family doctor	35	yes	family doctor	birth	general caries
68	2	M	37	white	yes	checkup, toothache, brkn tooth	pediatrician	35	yes	pediatrician	birth	general caries
69	2	F	37	white	yes	checkup	other-relative	19	no	pediatrician, OB/GYN	birth	nursing caries
70	2	F	38	white	yes	checkup, other-first visit	self	37	yes	pediatrician	birth	nursing caries
71	2	F	40	white	yes	checkup	self	40	no			caries free

72	2	M	40	white	yes	checkup, cavity	self	40	no	general caries
73	2	M	41	white	yes	checkup, brkn tooth	self	41	no	carries free
74	2	F	42	white	yes	other-first visit	self	42	no	nursing caries
75	2	M	43	white	yes	checkup, other-first visit	other-???	42	no	carries free
76	2	M	42	white	yes	checkup	self	43	no	carries free
77	2	F	43	white	yes	checkup, cavity	self	43	no	carries free
78	2	M	43	white	yes	checkup, cavity	self	42	no	general caries
79	2	F	43	white	yes	cavity	self	43	no	general caries
80	2	F	44	white	yes	checkup	self	44	yes	general caries
81	2	F	45	white	yes	checkup	self	45	yes	general caries
82	2	M	45	black	yes	checkup	other-commercial	45	yes	nursing caries
83	2	F	46	white	yes	checkup	self	30	yes	carries free
84	2	F	46	white	yes	checkup	self	36	no	carries free
85	2	M	47	white	yes	checkup	other-advertisement	45	yes	carries free
86	2	F	47	white	yes	brkn tooth	dentist	45	yes	carries free
87	2	M	48	native american	yes	checkup	self	45	no	nursing caries
88	2	M	48	other-bk/native am	yes	cavity	self	45	no	general caries
89	2	F	50	asian	yes	checkup	self	48	yes	general caries
90	2	F	50	white	yes	other-arms teeth	self	48	no	carries free
91	2	F	50	white	yes	cavity	self	50	yes	general caries
92	2	M	53	white	yes	checkup, other-fillings	self	40	no	general caries
93	2	M	54	white	yes	cavity	self	54	no	general caries
94	2	M	54	white	yes	checkup	self	54	no	general caries
95	2	F	56	white	yes	checkup	self	54	no	carries free
96	2	M	57	white	yes	checkup	self	36	no	carries free
97	2	F	57	white	yes	checkup, toothache	self	12	no	nursing caries
98	2	M	57	black	yes	checkup	self	57	yes	general caries
99	2	F	57	white	yes	checkup	self	36	yes	carries free
100	2	F	58	white	yes	toothache	dentist	19	no	general caries
101	2	M	59	white	yes	checkup	self	54	yes	general caries
102	2	M	59	white	yes	checkup	self	24	yes	carries free
103	2	F	59	white	yes	cavity	self	59	yes	general caries
104	2	M	59	white	yes	injury	family doctor	59	yes	general caries
105	2	M	105	white	yes	checkup	self	12	yes	carries free
106	3	F	12	white	yes	injury	pediatrician	12	yes	carries free
107	3	M	17	white	yes	cavity, brkn tooth	dentist	17	yes	carries free
108	3	F	18	white	yes	cavity, brkn tooth	family doctor	18	no	general caries
109	3	F	19	white	yes	checkup, cavity	family doctor	19	no	carries free
110	3	M	24	white	yes	brkn tooth	self	25	yes	nursing caries
111	3	F	25	hispanic	yes	checkup, other-bottle mouth	self	26	yes	nursing caries
112	3	F	27	white	no	checkup	self	28	yes	carries free
113	3	F	28	white	yes	checkup, other-bad front teeth	self	28	no	carries free
114	3	F	29	white	yes	checkup	dentist	29	yes	nursing caries
115	3	F	29	white	yes	checkup	dentist	29	yes	carries free
116	3	F	30	hispanic	yes	other-brown spots	family doctor	18	yes	carries free
117	3	M	30	white	yes	brkn tooth	self	33	no	carries free
118	3	M	31	white	yes	brkn tooth	self	33	no	nursing caries
119	3	M	33	white	yes	checkup	self	33	yes	carries free
120	3	M	33	white	yes	checkup	self	34	yes	carries free
121	3	M	34	white	yes	checkup	self	35	no	carries free
122	3	F	35	hispanic	yes	checkup, cavity	other-relative	35	no	nursing caries
123	3	F	35	hispanic	yes	checkup, cavity	other-relative	35	no	nursing caries
124	3	F	35	white	yes	checkup	self	35	yes	carries free
125	3	M	35	white	yes	cavity, brkn tooth	self	35	yes	carries free
126	3	M	36	hispanic	yes	checkup, cavity	self	35	no	general caries
127	3	M	36	hispanic	yes	checkup	family doctor, other-friend	35	no	nursing caries
128	3	M	49	white	yes	checkup	self	48	no	general caries
129	3	F	49	asian	yes	checkup	self	48	yes	carries free
130	3	M	49	white	yes	toothache	self	40	yes	carries free
131	3	M	40	other-w/naive am	yes	checkup, cavity	self	40	yes	general caries
132	3	F	41	white	yes	toothache	dentist	41	yes	general caries
133	3	F	41	hispanic	yes	toothache	dentist	41	no	general caries
134	3	F	41	white	yes	checkup, cavity	dentist	18	no	nursing caries
135	3	F	41	white	yes	cavity, toothache	dentist	41	yes	carries free
136	3	F	41	white	yes	checkup	other-friend	41	yes	carries free
137	3	F	44	hispanic	yes	toothache	pediatrician	48	no	nursing caries
138	3	F	44	white	yes	other-fillings	family doctor, other-friend	48	no	nursing caries
139	3	F	49	hispanic	yes	other-bad teeth	self	50	yes	carries free
140	3	M	49	white	yes	cavity	self	50	yes	carries free
141	3	M	50	hispanic	yes	checkup	self	48	yes	carries free
142	3	F	55	white	yes	other-thumb habit	self	48	yes	carries free
143	3	M	45	black	yes	cavity	family doctor	48	no	general caries

144	3	M	47	white	yes	checkup	self	47	yes	dentist, pediatrician, family doctor, nurse	prenatal	caries free
145	3	M	47	white	yes	checkup	dentist	36	yes	pediatrician	first year	caries free
146	3	F	47	white	yes	checkup	self	47	yes	family doctor, other-WIC	over two	general caries
147	3	F	48	white	yes	cavity, toothache	self	48	no	pediatrician	over two	general caries
148	3	M	49	hispanic	yes	checkup, cavity	self	48	no	pediatrician	over two	general caries
149	3	M	49	hispanic	yes	checkup, cavity	self	48	no	pediatrician	over two	general caries
150	3	M	50	white	yes	toothache	self	48	no	pediatrician	over two	general caries
151	3	M	51	hispanic	yes	toothache	self	48	no	pediatrician	over two	general caries
152	3	M	52	white	yes	checkup, other-thumb habit	family doctor, other-friend	51	yes	other-WIC	first year	caries free
153	3	F	52	hispanic	yes	checkup, cavity	self	48	yes	pediatrician	first year	general caries
154	3	F	53	hispanic	yes	checkup, cavity	self	57	no	pediatrician	first year	general caries
155	3	M	57	white	yes	checkup	dentist	36	yes	family doctor	first year	caries free
156	3	M	57	white	yes	checkup	self	30	no	family doctor	first year	caries free
157	3	M	59	asian	yes	toothache	self	33	no	pediatrician, family doctor	first year	general caries
158	3	M	59	white	yes	checkup	self	13	no	pediatrician, family doctor	first year	caries free
159	4	F	13	native american	yes	cavity	self	17	no	dentist, family doctor	first year	nursing caries
160	4	F	17	white	yes	checkup	dentist	17	no	dentist, family doctor	first year	nursing caries
161	4	F	17	white	yes	other-missing teeth	self	17	yes	dentist, family doctor	first year	caries free
162	4	F	22	white	yes	other-stains	self	22	yes	other-literature	first year	caries free
163	4	M	23	white	yes	toothache	self	22	yes	other-literature	first year	caries free
164	4	M	23	white	yes	toothache	self	23	no	pediatrician	first year	nursing caries
165	4	F	25	other-???	yes	checkup, cavity	self	23	no	pediatrician	first year	nursing caries
166	4	M	26	white	yes	checkup	other-friend	25	yes	pediatrician, nurse	first year	nursing caries
167	4	F	26	white	yes	checkup	nurse, other-relative	26	yes	pediatrician, nurse	first year	nursing caries
168	4	F	26	white	yes	checkup	self	26	yes	dentist, other-WIC	previous child	caries free
169	4	F	30	black	yes	checkup	self	12	yes	dentist, pediatrician, OB/GYN, other-literature	previous child	general caries
170	4	M	30	hispanic	yes	cavity	self	30	no	dentist	over two	caries free
171	4	M	30	white	yes	cavity	dentist	30	yes	dentist	over two	nursing caries
172	4	M	30	white	yes	cavity	self	19	no	dentist	over two	nursing caries
173	4	M	33	white	yes	brn tooth	other-advertisement	19	no	dentist	over two	nursing caries
174	4	M	38	white	yes	brn tooth	dentist	35	yes	pediatrician	first year	nursing caries
175	4	M	39	white	yes	checkup	self	38	yes	other-literature	first year	caries free
176	4	F	40	white	yes	cavity	dentist	38	yes	dentist, pediatrician	first year	caries free
177	4	M	40	white	yes	other-black spot	dentist	40	yes	dentist, pediatrician	first year	general caries
178	4	F	44	white	yes	cavity, soft teeth, injury	dentist	43	yes	pediatrician	first year	nursing caries
179	4	F	44	white	yes	cavity	dentist	43	yes	pediatrician	first year	nursing caries
180	4	F	45	white	yes	checkup, cavity	dentist	45	yes	dentist, pediatrician	birth	general caries
181	4	M	46	white	yes	checkup	self	45	yes	pediatrician	birth	general caries
182	4	F	52	white	yes	checkup	self	42	yes	pediatrician	birth	caries free
183	5	F	53	white	yes	checkup, brn tooth, toothache	self	52	no	OB/GYN	previous child	caries free
184	5	F	53	white	yes	brn tooth	dentist	24	no	OB/GYN	previous child	caries free
185	5	F	53	white	yes	brn tooth	dentist	24	no	OB/GYN	previous child	caries free
186	5	M	54	white	yes	checkup	pediatrician	48	no	other-???	first year	caries free
187	5	M	59	white	yes	checkup	nurse	54	no	dentist, pediatrician	first year	caries free
188	5	M	59	white	yes	checkup, cavity	nurse	48	no	OB/GYN	previous child	caries free
189	5	F	22	white	yes	checkup	self	59	yes	OB/GYN	previous child	nursing caries
190	5	F	26	white	yes	checkup	self	22	no	OB/GYN	previous child	caries free
191	5	M	29	white	yes	cavity	self, pediatrician	30	yes	other-???	first year	caries free
192	5	F	30	white	yes	checkup	self	30	yes	dentist, pediatrician	first year	caries free
193	5	M	32	white	yes	checkup	dentist	30	yes	OB/GYN	first year	caries free
194	5	F	32	white	yes	checkup	self	34	no	pediatrician	over two	caries free
195	5	F	34	white	yes	checkup	self	34	no	pediatrician	over two	caries free
196	5	M	34	white	yes	checkup	self	34	no	pediatrician	over two	caries free
197	5	M	34	white	yes	checkup	self	34	no	pediatrician	over two	caries free
198	5	M	34	black	yes	other-first visit	self	37	no	other-infant development specialist	over two	caries free
199	5	M	37	white	yes	checkup	self	37	no	pediatrician	over two	caries free
200	5	M	38	white	yes	checkup	self	38	yes	pediatrician	over two	caries free
201	5	M	39	white	yes	checkup	self	39	yes	pediatrician	over two	caries free
202	5	M	39	white	yes	checkup	self	39	yes	pediatrician	over two	caries free
203	5	M	39	white	yes	checkup	pediatrician	27	no	dentist, pediatrician	prenatal	caries free
204	5	F	42	white	yes	checkup	dentist	5	yes	dentist, pediatrician	prenatal	caries free
205	5	F	44	white	yes	injury	dentist	42	yes	dentist, pediatrician	prenatal	caries free
206	5	F	45	white	yes	checkup, cavity	dentist	32	yes	dentist, pediatrician	prenatal	caries free
207	5	M	50	white	yes	cavity	dentist	32	no	pediatrician, dentist	prenatal	general caries
208	5	F	52	white	yes	checkup	self	36	yes	pediatrician, dentist	prenatal	general caries
209	5	F	52	white	yes	checkup	dentist	52	no	pediatrician, dentist	prenatal	general caries
210	5	F	53	white	yes	checkup	dentist	53	no	pediatrician, dentist	prenatal	general caries
211	5	F	55	white	yes	checkup	other-advertisement	53	no	nurse, pediatrician, OB/GYN	birth	general caries
212	6	F	29	white	yes	cavity	self, pediatrician	32	yes	nurse, pediatrician, OB/GYN	birth	general caries
213	6	F	29	white	yes	checkup	pediatrician	59	yes	pediatrician, family doctor	first year	caries free
214	6	F	29	white	yes	checkup	self	29	yes	dentist	first year	caries free
215	6	F	30	black	yes	checkup	pediatrician	29	yes	pediatrician	birth	caries free
216	6	F	30	white	yes	checkup	self	24	yes	pediatrician, family doctor	birth	caries free
217	6	F	31	white	yes	checkup	pediatrician	31	yes	pediatrician, family doctor	previous child	caries free

216	6	M	33	white	yes	checkup	self	33	yes	pediatrician		carries free
217	6	M	34	white	yes	checkup	self	30	yes		prenatal	carries free
218	6	F	34	white	yes	checkup	self	34	no			carries free
219	6	M	34	white	yes	checkup	self	27	yes	other-literature		carries free
220	6	F	35	white	yes	checkup	self	35	no			carries free
221	6	F	35	white	yes	checkup	dentist	30	no			general caries
222	6	M	37	white	yes	checkup	dentist	38	no	pediatrician, OB/GYN	prenatal	carries free
223	6	M	38	white	yes	checkup	self	39	no			carries free
224	6	F	39	white	yes	checkup	self	39	no			carries free
225	6	F	41	white	yes	checkup	pediatrician	41	yes	OB/GYN	birth	carries free
226	6	M	41	white	yes	checkup	pediatrician	41	no			carries free
227	6	M	41	white	yes	checkup	pediatrician	29	yes	self, other-friend		carries free
228	6	F	42	white	yes	checkup	dentist	42	yes	pediatrician		carries free
229	6	F	44	white	yes	cavity, toothache	dentist	46	no			general caries
230	6	F	46	white	yes	checkup	self	46	no			carries free
231	6	F	46	white	yes	checkup	self	46	no			carries free
232	6	M	51	white	yes	checkup	pediatrician	51	no			general caries
233	6	F	51	black	yes	other-tooth eruption	family doctor	no	no			nursing caries
234	6	F	58	white	yes	checkup	self	24	yes	dentist, pediatrician	first year	carries free
235	6	M	32	white	yes	checkup	self	32	no			carries free
236	6	M	30	white	yes	checkup	pediatrician	30	no			carries free
237	6	F	34	white	yes	checkup	pediatrician	34	no			carries free
238	6	F	35	white	yes	checkup	self	35	yes	pediatrician	prenatal	carries free
239	6	M	35	white	no	checkup, injury	pediatrician	35	yes			carries free
240	6	M	35	white	yes	checkup	self	33	yes	other-literature	prenatal	carries free
241	6	M	38	white	yes	checkup	self	33	yes	pediatrician	second year	carries free
242	6	M	39	white	yes	checkup	self	39	yes	family doctor	first year	general caries
243	6	F	40	white	yes	checkup	self	40	no			carries free
244	6	F	41	white	yes	brn tooth	family doctor	no	no			carries free
245	6	F	41	black	yes	checkup	self	41	no			carries free
246	6	M	53	white	yes	cavity	dentist	36	no			carries free
247	7	F	24	white	yes	other-bottle mouth	pediatrician	19	yes	pediatrician	second year	general caries
248	7	F	29	white	yes	checkup	self	28	yes	dentist, pediatrician	first year	nursing caries
249	7	F	30	white	yes	checkup	other-friend	30	no			carries free
250	7	F	31	white	yes	checkup	self	31	yes	pediatrician	first year	carries free
251	7	M	34	white	yes	checkup	self	34	yes	pediatrician	birth	carries free
252	7	M	33	white	yes	checkup	self	34	no			carries free
253	7	M	34	white	yes	injury	dentist	34	yes	other-work	previous child	carries free
254	7	M	34	white	yes	injury	pediatrician	34	yes	pediatrician		carries free
255	7	M	35	white	yes	checkup	self	35	yes	OB/GYN, other-literature		carries free
256	7	M	37	other-wh/asan	yes	checkup	self	37	yes	pediatrician, family doctor	over two	carries free
257	7	M	37	asian	yes	checkup	pediatrician	37	yes	pediatrician	first year	nursing caries
258	7	M	38	black	yes	checkup	self	38	yes	other-literature	previous child	carries free
259	7	M	46	white	yes	checkup, other-discolor	self	45	yes	pediatrician, other-literature	first year	carries free
260	7	M	48	white	yes	checkup	pediatrician	30	yes			carries free
261	7	M	48	white	yes	checkup	other-teacher	34	yes	other-literature		carries free
262	7	M	11	white	yes	injury	dentist	11	yes			carries free
263	8	M	13	white	yes	injury	nurse	12	no			carries free
264	8	F	13	white	yes	other-milk teeth	dentist	12	yes	dentist	previous child	carries free
265	8	F	14	white	yes	brn tooth	dentist	14	no			nursing caries
266	8	M	24	white	yes	soft teeth, other-dissolving teeth	dentist	24	yes	other-LaLeche league	previous child	nursing caries
267	8	M	27	white	yes	checkup	self	27	no			carries free
268	8	F	28	white	yes	injury	dentist	28	no			carries free
269	8	F	28	white	yes	injury	dentist	28	no			carries free
270	8	M	31	white	yes	checkup	dentist	30	yes	family doctor, nurse, OB/GYN, other-literature	prenatal	carries free
271	8	M	31	hispanic	yes	checkup	dentist	24	yes			carries free
272	8	M	41	white	yes	cavity, toothache	self	4	no			general caries
273	8	M	41	asian	yes	toothache	dentist	30	yes	pediatrician	first year	nursing caries
274	8	F	41	white	yes	checkup	self	36	no			carries free
275	8	M	53	white	yes	checkup	self	36	yes	pediatrician	general caries	general caries
276	8	F	57	white	yes	toothache	dentist	48	no			general caries
277	8	F	57	white	yes	checkup	self	36	yes	pediatrician	first year	general caries
278	9	M	40	white	yes	checkup	pediatrician	37	yes	pediatrician	birth	carries free
279	9	M	37	white	yes	checkup	dentist	32	yes	pediatrician		general caries
280	9	M	32	asian	yes	checkup, other-discolor	pediatrician	47	yes	family doctor		carries free
281	9	F	42	white	yes	checkup	self	47	no			general caries
282	9	F	47	white	yes	checkup	self	36	yes	family doctor		carries free
283	9	F	42	white	yes	cavity	dentist	36	yes			nursing caries
284	9	M	48	white	yes	checkup	self	36	yes			carries free
285	9	M	37	black	yes	checkup	self	37	yes	dentist, pediatrician	previous child	carries free
286	9	F	35	white	yes	checkup	dentist	35	no			carries free
287	9	F	43	white	yes	checkup	self	37	no			carries free

288	9	F	44	white	yes	checkup	self	44	yes	pediatrician		nursing caries
289	10	F	18	white	yes	checkup	self		no		previous child	nursing caries
290	10	F	20	white	yes	checkup	self		yes	dentist		caries free
291	10	F	20	white	yes	cavity, brkn tooth, soft teeth	dentist	13	no			nursing caries
292	10	M	22	other-wn/east indian	yes	other-bottle teeth	dentist	20	no			nursing caries
293	10	F	24	white	yes	cavity	self		no			nursing caries
294	10	M	25	hispanic	yes	checkup	self	25	no	pediatrician	birth	nursing caries
295	10	F	25	white	yes	checkup	self	12	yes	family doctor	second year	nursing caries
296	10	M	26	white	yes	cavity	self	14	yes	dentist		nursing caries
297	10	F	31	other-???	yes	toothache	self	30	no			nursing caries
298	10	M	31	white	yes	toothache	self	15	no			nursing caries
299	10	F	35	white	yes	checkup	self	12	yes	dentist		nursing caries
300	10	F	36	white	yes	checkup	self	36	no			nursing caries
301	10	F	37	white	yes	checkup	self	39	no			nursing caries
302	10	M	39	white	yes	checkup	self	24	yes	dentist, pediatrician, family doctor		nursing caries
303	10	M	45	white	yes	checkup	self	33	no			nursing caries
304	10	F	46	white	yes	other-bottle mouth	dentist	27	no			nursing caries
305	10	M	27	white	yes	toothache, cavity, soft teeth, brkn tooth, inj self	dentist		yes	OBGYN	birth	nursing caries
306	11	M	19	white	yes	brkn tooth	self	30	no			caries free
307	11	F	26	white	yes	cavity	self	36	no			caries free
308	11	M	33	white	yes	cavity	self	36	no			general caries
309	11	F	37	white	yes	checkup, cavity	self	36	no			nursing caries
310	11	F	41	black	yes	checkup, cavity	self	36	yes	other-WIC	first year	nursing caries
311	11	F	41	white	yes	checkup, cavity	self	41	no			nursing caries
312	11	M	41	white	yes	checkup, cavity	self	47	no			nursing caries
313	11	M	47	white	yes	cavity	self	17	yes	other-WIC	birth	nursing caries
314	11	M	48	hispanic	yes	cavity	self	10	yes	pediatrician	second year	general caries
315	11	M	50	white	yes	checkup	self	50	yes	pediatrician		nursing caries
316	11	F	50	white	yes	toothache	self	24	yes	dentist		nursing caries
317	11	F	51	black	yes	checkup	self	48	no			general caries
318	11	F	53	white	yes	checkup	self	12	no			general caries
319	11	F	53	white	yes	checkup	self	53	yes	dentist	previous child	nursing caries
320	12	F	12	black	yes	cavity	self	12	no			general caries
321	12	M	26	white	yes	checkup, brkn tooth, cavity	self	26	no			nursing caries
322	12	M	28	white	yes	checkup, brkn tooth	self	24	yes	pediatrician	second year	caries free
323	12	M	22	white	yes	brkn tooth	self	36	no			caries free
324	12	F	36	black	yes	other-school	self	36	no			caries free
325	12	M	36	white	yes	checkup	self	37	no			caries free
326	12	M	37	white	yes	brkn tooth, injury	self	26	no			nursing caries
327	12	F	38	other-wn/bik	yes	cavity, toothache	pediatrician	38	yes			general caries
328	12	F	38	white	yes	checkup	self	38	no			caries free
329	12	F	46	white	yes	checkup	self	36	yes			nursing caries
330	12	M	15	hispanic	yes	cavity, brkn tooth, toothache	self	36	yes			caries free
331	13	M	15	black	yes	checkup, cavity	self	36	yes	pediatrician		nursing caries
332	13	F	35	black	yes	checkup, cavity	pediatrician	15	no			caries free
333	13	F	38	white	yes	checkup, cavity, brkn tooth	other-Vanias	38	no			general caries
334	13	F	38	white	yes	checkup	self, pediatrician	38	no			caries free
335	13	F	38	black	yes	checkup	self	38	no			caries free
336	13	M	58	white	yes	checkup	self	36	no			general caries
337	13	M	40	white	yes	cavity	self	39	yes	pediatrician		general caries
338	13	F	49	asian	yes	cavity	self	12	no			general caries
339	13	F	49	asian	yes	cavity	self	48	no			general caries
340	14	M	17	other-???	yes	injury	dentist	24	yes	other literature		caries free
341	14	F	32	white	yes	brkn tooth	dentist	17	no			nursing caries
342	14	F	35	white	yes	checkup	self	32	no			caries free
343	14	F	38	white	yes	checkup, cavity, toothache	self	30	no			caries free
344	14	M	48	white	yes	checkup, cavity, toothache	self	36	no			caries free
345	14	M	47	white	yes	checkup, cavity, toothache	self	18	yes	dentist, pediatrician		general caries
346	14	M	49	white	yes	checkup	self	47	yes	other-WIC	prenatal	general caries
347	15	F	25	white	yes	cavity	self	48	yes	OBGYN, family doctor		caries free
348	15	F	26	white	yes	cavity	self	25	no			nursing caries
349	15	F	31	white	yes	checkup	self	31	yes	pediatrician		nursing caries
350	15	F	37	white	yes	checkup	self	37	yes	family doctor	second year	caries free
351	15	F	45	white	yes	checkup	self	45	yes	pediatrician		caries free
352	15	F	35	white	yes	checkup	self	34	yes	pediatrician		caries free
353	16	M	35	black	yes	other-loosing enamel	dentist	34	yes	dentist, pediatrician		general caries
354	16	F	36	black	yes	cavity	family doctor	35	no			nursing caries
355	16	F	39	white	yes	cavity	self	28	no			nursing caries
356	16	F	46	native american	yes	cavity, toothache	family doctor	46	no			nursing caries
357	16	M	49	white	yes	cavity, toothache	other-Kaiser	36	no			nursing caries
358	16	F	52	black	yes	cavity	dentist	52	no			nursing caries
359	17	M	26	white	yes	checkup	self	26	yes	family doctor	birth	nursing caries

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360	17	M	27	white	yes	checkup, injury	self, dentist	12	no			carries free
361	17	M	29	white	yes	cavity	self	29	no			nursing caries
362	17	F	42	white	yes	checkup, cavity	self	42	yes	other-self	previous child	carries free
363	17	M	57	white	yes	checkup, other-pain	self	57	no			carries free
364	17	M	58	white	yes	injury	self	58	no			carries free
365	18	M	25	white	yes	checkup	other-friend	25	yes	pediatrician		carries free
366	18	M	33	white	yes	checkup	self	39	yes	pediatrician	first year	carries free
367	18	F	40	white	yes	checkup	self	34	yes	pediatrician		carries free
368	18	F	45	white	yes	checkup	self	44	yes			carries free
369	18	F	56	white	yes	checkup	self	27	no			carries free
370	19	M	38	white	yes	checkup	self	38	no			carries free
371	19	F	38	black	yes	checkup	self	38	no			general caries
372	19	F	43	white	yes	checkup, cavity	self	42	no			nursing caries
373	19	M	49	white	yes	checkup	self	48	yes	pediatrician, other-literature		carries free
374	19	F	50	white	yes	checkup	self	40	yes	pediatrician		general caries
375	20	M	19	white	yes	checkup	self	19	yes	pediatrician	over two	carries free
376	20	F	34	white	no	checkup	self	34	yes	family doctor	birth	carries free
377	20	F	42	white	yes	checkup, cavity	dentist	38	yes	pediatrician, other-literature	birth	general caries
378	20	M	49	white	yes	checkup	self	49	yes	pediatrician, other-WIC		general caries
379	20	F	58	white	yes	cavity	self	49	yes	pediatrician		carries free
380	21	F	20	white	yes	cavity	dentist	19	no			nursing caries
381	21	M	50	white	yes	checkup	self	19	yes	other-self		carries free
382	21	M	55	white	yes	checkup	self	55	yes	pediatrician, other-friend		carries free
383	21	M		white	yes	injury	dentist		no			carries free
384	22	F	26	white	yes	other-crowns	self	21	yes	pediatrician	first year	nursing caries
385	22	F	39	other-???	yes	brn tooth	dentist	36	yes			nursing caries
386	22	M	35	white	yes	checkup	pediatrician	36	no			carries free