



The impact of WIC dental screenings and referrals on utilization of dental services among low-income children

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Abstract

Purpose: *This cross-sectional study examined whether referrals from nondental health professionals impacted utilization of dental services by low-income populations.*

Methods: *A sample of 309 mothers enrolled in the Women, Infant, and Children (WIC) clinic in Jackson County, Missouri, completed a self-administered, 32-item questionnaire to assess the mother and child's oral health behavior and past use of dental services. Dental utilization, the primary dependent variable, was defined as whether or not the child had ever been to a dentist.*

Results: *Findings showed 27% of the children in the sample had been referred for dental care. Bivariate analysis indicated that a dental referral, age of the child, age of the mother, mother's perceived dental need for the child, household size, number of children in the household, and dental insurance for the child were associated with a child having a dental visit. Logistic regression, however, indicated that only age was significantly related to utilization.*

Conclusion: *The results showed a strong effect of increasing age being related to dental utilization, while additional research is needed to clarify the importance of WIC referrals. (Pediatr Dent 20:3 181-87, 1998)*

A number of studies have indicated that dental utilization has increased significantly over the last 30 years.^{1,2} The increase in utilization rates for dental services has occurred during a time when caries rates have dramatically decreased. Despite these promising trends, a significant number of children experience dental caries and have low utilization rates. Current estimates indicate that 75% of childhood caries is found in just 20% of children, with the level of untreated dental disease being significantly higher among low-income and minority children.³⁻⁵

Studies evaluating factors that affect the utilization of dental services generally have found that gender, race, income, and household size all can have a significant influence on dental utilization.⁶⁻⁹ Factors found to significantly affect the utilization of dental services for children ages 5-18 include race, income, educational level of the parent, working status of the parent,

insurance status of the parent, preventive behaviors of the parent, and access.⁷⁻¹²

Little research has addressed factors that affect the utilization of dental services by children younger than 5 years of age. Income is the only factor that has been associated with dental utilization for this age group.⁹ Many believe it is important to reach children most at risk for developing dental disease at this young age. The American Academy of Pediatric Dentistry (AAPD) recommends that a child's first visit to the dentist should occur by age 1.¹⁴ The Medicaid Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program recommends screening and referral for dental care at age 3.¹⁵ Identifying low-income children with oral health problems is important both for the health of the child and the cost associated with treating children with severe dental decay. A recent study indicated that in a Medicaid population, age 5 and younger, 2% of the children used 35% of all the resources spent on dental care.¹⁶ The high costs were mostly for dental care in a hospitalized operatory room necessitated by baby bottle tooth decay.

WIC oral health screening and referral program

Early dental screenings and referrals have been used to try to improve utilization of dental services by low-income populations. One example is the oral health screenings and referrals conducted by the WIC program. In WIC clinics, physical screenings that include oral health are conducted on a periodic basis for all enrolled children. The intraoral screening examination is part of a standard physical assessment protocol used by all WIC clinics to assess risk factors for children. Examinations continue until the age of 5 when children are no longer eligible.

Clinics use a health professional assistant to conduct the oral health screenings. These assistants are trained in intraoral screenings by the WIC agency and receive annual dental assessment updates. The annual training program teaches them to identify normal tissue color and contour as well as tooth shape and coloration. Any deviation from normal requires a referral to a dentist for evaluation.

Little documentation supports the effectiveness of

TABLE 1. DEMOGRAPHIC INFORMATION

<i>Independent Variable</i>	<i>N* (Percent)</i>
Mother	
Race	
White—not Hispanic	557 (84%)
Black—not Hispanic	67 (10%)
Other (Hispanic, American Indian or Alaskan Native, Asian or Pacific Islander, or mixed-no group)	40 (6%)
Age (mean = 25.1, SD ± 5.90)	
14–18 yrs	60 (9%)
19–25 yrs	330 (50%)
26–35 yrs	225 (34%)
36–47 yrs	41 (7%)
Marital status	
Married	305 (46%)
Single	261 (39%)
Sep/Div/Widowed	99 (15%)
Employment status	
No	417 (63%)
Yes (full time)	150 (23%)
Yes (part time)	98 (14%)
Dental insurance status	
No	227 (34%)
Yes	283 (43%)
I don't know	154 (23%)
Education level	
Less than 8th grade	17 (3%)
8th grade graduate	21 (3%)
Some high school	175 (26%)
High school graduate	244 (37%)
Some college	167 (25%)
College graduate	29 (4%)
Trade/tech school	13 (2%)

TABLE 1. DEMOGRAPHIC INFORMATION, CONT.

<i>Independent Variable</i>	<i>N (Percent)</i>
Child	
Age	
12 mo or younger	231 (38%)
1–2 yrs	120 (19%)
2–3 yrs	107 (17%)
3–4 yrs	84 (14%)
4–5 yrs	75 (12%)
Dental Insurance	
No	110 (17%)
Yes	382 (58%)
I don't know	167 (25%)

* N = 670, full sample.

this type of intervention. One study examined dental referral rates made at a WIC clinic.¹⁷ Of 1850 participants seen during a 2-month period at the clinic site, 27% of the children and 17% of the infants were referred to services outside the WIC clinic. Dental referrals made up 10% of the total number of referrals for infants and children. However, the study only examined the rates of dental referrals, not their outcomes. WIC income eligibility criterion, which is income up to 185% of the federal poverty guidelines, is an established criterion for defining low-income individuals and in this study, helps control for income, the only variable associated with dental utilization among young children in previous research.

The purpose of this study was to evaluate factors affecting the utilization of dental services by low-income children (younger than age 5) enrolled in the WIC program in the Kansas City area, and to determine specifically whether the dental screenings and referrals conducted by the WIC program had an effect on utilization of dental services. In contrast to the earlier study, we evaluated both the rate at which dental referrals were made and their relative effectiveness in getting a child to the dentist for the first time, as reported by the mother.

Methods

To study factors affecting the utilization of dental services for young, low-income children, a 32-item, pretested, self-administered written questionnaire was given to a sample of women attending three different WIC clinics in the Kansas City area. Data collection was completed during 18 working days in the spring

TABLE 2. CHILD'S UTILIZATION OF DENTAL SERVICES

<i>Dental Utilization</i>	<i>N (Percent)</i>
Has child ever been to the dentist	
Yes	134 (23%)
No	443 (77%)
Age at first visit	
< 1	26 (19%)
1-2	28 (21%)
2-3	46 (34%)
3-4	26 (19%)
4-5	8 (8%)
Who recommended first visit	
Parent/guardian	72 (51%)
WIC clinic	9 (6%)
Head Start	11 (8%)
Doctor/nurse	16 (12%)
Family member/friend	9 (6%)
Other	23 (17%)
Main reason for first visit	
Checkup/cleaning	93 (80%)
Emergency/pain	2 (2%)
Fillings	5 (4%)
Tooth extractions	5 (4%)
Other	12 (10%)
Time since last dental visit	
< 6 mo ago	63 (60%)
6-12 mo ago	25 (24%)
1-2 yrs ago	14 (13%)
> 2 yrs ago	3 (3%)
Main reason for last visit	
Checkup/cleaning	70 (74%)
Emergency/pain	3 (3%)
Fillings	15 (16%)
Tooth extractions	1 (1%)
Other	6 (6%)

TABLE 2. CHILD'S UTILIZATION OF DENTAL SERVICES, CONT.

<i>Dental Utilization</i>	<i>N (Percent)</i>
Number of visits in last year	
1-2	88 (89%)
3-4	9 (9%)
> 4	2 (2%)
Child's pattern of dental care	
Visit dentist regularly	94 (70%)
Visit rarely	22 (17%)
Visit only when have problem	17 (13%)

of 1995. Information was collected only for the oldest child in the family then enrolled in the WIC program. WIC clinic personnel distributed the questionnaires to mothers as they checked in for their appointments. Although the WIC personnel were asked to distribute the survey to all women who entered the clinic, time constraints dictated that they gave questionnaires to women only as time allowed.

The questionnaire was divided into two sections. One section requested demographic information about the mother and child including: household size, age and ethnicity of the

mother and child, sex of the child, Head Start enrollment status, highest educational grade achieved by the mother, mother's marital status, working status, and insurance coverage for the child and mother. The second section included questions about the dental care utilization and perceived oral health status of the mother and child, respectively. Included in the mother's information was her regularity of dental visits, perceived oral health status, and perceived need for dental care. Information about the children included the age at which they made their first visit to the dentist and the main reason for this visit, elapsed time since their last dental visit, type of treatment received at their last dental visit, and mother's perception of the oral health status of her child.

Whether a child had been referred from the WIC clinic for dental care was initially determined from the mother's self-reported response on the survey. The reliability of the mother's responses were evaluated by comparing the responses for a subset of children with the child's WIC chart. However, before using the mother's self-reported response, the reliability of these responses were evaluated. A comparison was made for a subset of children at the beginning of the study between the mother's recall of a WIC dental referral and the indication of a referral in the child's WIC health records. Only 52% of the time did the maternal recall match information contained in the child's health record. While some of the differences could be due to inaccurate record keeping, most were determined to be due to poor recollection or social response bias by the mother (the mother did not want to say the child had been referred for care if she was unable to follow up on the referral). As a result of these discrepancies, data from WIC health charts were used to determine whether children had been referred for dental care. The

TABLE 3. FACTORS ASSOCIATED WITH THE CHILD HAVING MADE A DENTAL VISIT

Factor	<i>Whether Child Had Ever Been to The Dentist</i>	
	Yes N (%)	No N (%)
<i>WIC referral*</i>		
Yes	33 (37%)	56 (63%)
No	34 (19%)	146 (81%)
<i>Age of the child*</i>		
< 1	22 (10%)	190 (90%)
1-2	4 (4%)	103 (96%)
2-3	22 (22%)	79 (78%)
3-4	34 (43%)	45 (57%)
4-5	46 (65%)	25 (35%)
<i>Age of the mother*</i>		
14-18	3 (7%)	40 (93%)
19-25	61 (22%)	221 (78%)
26-35	55 (26%)	153 (74%)
36-47	13 (37%)	22 (63%)
<i>Mother's perceived dental need for child*</i>		
Yes	63 (31%)	143 (69%)
No	68 (19%)	294 (81%)
<i>Household size*</i>		
< 4	78 (19%)	332 (81%)
5 or more	53 (35%)	100 (65%)
<i>Number of children in household*</i>		
0-1	25 (10%)	238 (90%)
2	50 (30%)	117 (70%)
3-7	57 (41%)	82 (59%)
<i>Dental insurance for child*</i>		
Yes	100 (28%)	251 (72%)
No	17 (18%)	78 (82%)

* χ^2 , $P < 0.05$.

need to use WIC records required that informed written consent be obtained, which then began from day 6 of the study through day 18. The data collected during the first 5 days of the study that lacked consent forms to abstract information from the WIC charts were not used in the bivariate or multivariate analyses. Data were reviewed for completeness, edited, and entered into SPSS-PC+ for statistical analysis.

Several different measures of dental utilization were evaluated, including the age of the child at first dental visit, the time elapsed since last visit, the number of visits the child had during the previous 12 months, and the general pattern of dental care received by the child. For this age group (5 and younger), the most appropriate measure of dental utilization to be used as the primary dependent variable was whether or not the child had ever been to a dentist. This variable was created by dichotomizing the responses to the question regarding what age the child had made their first dental visit into two categories: 1) the child has never been to the dentist and 2) the child has made a dental visit.

Bivariate analyses using all survey data were conducted between the primary dependent variable (whether or not the child had ever been to the dentist) and each independent variable (demographics of the mother and child, age, race, marital status of the mother, employment status, educational level of the mother, insurance status of the child, and the mother's perception of dental need for her child).

Multivariate analyses using logistic regression were conducted to evaluate the relative importance of the WIC screening to whether the child had ever been to a dentist, while considering the other independent variables. Only responses for individuals for whom WIC chart data were available concerning the dental referral were used in these analyses.

Results

The total number of potential clients scheduled for appointments during the 18-day study period at the three WIC clinics was 2030. Of these, 703 (35%) were asked by the staff to complete a survey, with 670 completing a survey for a participation rate of 95%. Patient consent for WIC record review verification of referral status was given for the 309 surveys conducted from day 6 of the study onward. This limited data set was used for the bivariate analysis to assess the effectiveness of WIC referrals on dental utilization and for the multivariate analyses of factors affecting whether the child had ever been to the dentist.

One evaluation of potential response bias indicated that the ethnic composition of mothers was consistent with a report by the Missouri Department of Health Management Assessment. That report indicated that 86% of the clients at the three WIC clinics between June 1993 to June 1994 were Caucasian, compared to 84% of mothers in this study. No other demographic information is collected by the state that could be used for comparisons of the sample to the general WIC population to indicate a nonparticipation bias.

Demographic information for all mothers who completed a survey is shown in Table 1. The vast majority were between the ages of 19 and 35 (84%). Almost half were married (46%) and reported having dental insur-

TABLE 4. LOGISTIC REGRESSION ANALYSIS FOR FACTORS AFFECTING UTILIZATION (N = 309)

<i>Patient Characteristics</i>	<i>Significance</i>	<i>Odds Ratio</i>
Child's perceived dental need		
Yes	0.66	0.84
No*	—	1.00
Household size		
4 or less	0.96	1.03
5 or more*	—	1.00
Number of children in the household		
1	0.07	0.27
2	0.41	0.55
3–7*	—	1.00
Mothers with dental insurance		
Yes	0.57	1.26
No*	—	1.00
Child's age		
12 mo or younger	0.0001 [†]	0.11
Between 1 and 2 yrs	< 0.0001 [†]	0.04
Between 2 and 3 yrs	0.0001 [†]	0.11
Between 3 and 4 yrs	0.06	0.37
Between 4 and 5 yrs*	—	1.00
Mother's age		
14–18 yrs	0.49	0.45
19–25 yrs	0.31	1.84
26–35 yrs	0.73	0.82
36–47 yrs*	—	1.00
Child's insurance coverage		
Yes	0.20	1.76
No*	—	1.00
Referral status		
Yes	0.20	1.76
No*	—	1.00

*Reference category.

[†] χ^2 , $P < 0.05$ level.

ance (43%). Close to two-thirds were not currently employed (63%). The majority were high school graduates (69%). Twelve percent were currently in

school (7% full time, 5% part time). Most households had between two and five people (2–3 46%, 4–5 40%) and the majority of the households had three or fewer children (92%). As for the children, the largest percentage were 12 months old or younger (38%) and the female/male ratio was 51/49.

About one-fourth of the children (23%) had been to the dentist at least once in their lifetime. For the majority, the first dental visit occurred after they were 2 years old (Table 2). Parents or guardians were responsible for about half of the dental referrals. Eighty percent of the initial dental visits were for preventive care (checkups and cleanings). Eighty-four percent of children who had ever been to the dentist had made at least one visit in the past year. Only 11% of those who had gone to the dentist during the past year, however, had been to the dentist more than twice during that time period. Children in families with five or more in the household were significantly more likely to have reported visiting the dentist regularly (87%) than those in families with fewer than five people (63%; χ^2 , $P < 0.05$).

A number of factors were evaluated in bivariate analyses to determine their association with whether the child had ever made a dental visit (Table 3). Variables found to be associated with the child having been to the dentist include having a WIC referral, older age of the child, older age of the mother, the mother's perceived need for dental care for her child, a higher number of children in the household, larger household size, and the child having dental insurance coverage (χ^2 , $P < 0.05$). For those children who had never been to the dentist, the main reason given by the mother was that the child was not old enough (60%).

Multivariate statistical analyses

The logistic regression model for determining factors associated with whether a child had ever made a dental visit is shown in Table 4. The age of the child was the only variable, significantly related to whether the child had ever been to the dentist, with younger children much less likely to have been. The odds of having been to the dentist for a child younger than 12 months of age was 0.11 times that of a child 4–5 years old. The odds of seeing the dentist for a child between 1 and 2 years old was 0.04 times that of a child 4–5 years old. The odds of seeing a dentist for a child between 2 and 3 years old was 0.11 times that of a child 4–5 years old.

Discussion

The principal strength of this study was that it investigated factors affecting the utilization of dental services by low-income children, an area that has received very little scientific study. The few previous studies in this area only report frequencies of utilization, not outcomes of dental screening and referral

programs at WIC clinics. The use of statistical analyses to assess factors related to dental utilization among children age 5 and younger has also not previously appeared. Another strength of the study was that income, the only factor previously associated with dental utilization among very young children, was controlled by surveying recipients in WIC clinics.

The principal limitation is the large percentage of children younger than age 1, who are significantly less likely to have made a dental visit, thus reducing the ability to identify factors associated with having made a dental visit other than age. A second limitation is the reliance on self-reported data. No clinical data on oral health status was collected which significantly affects the age at which the child first receives dental care. However, the mother's perception of the child's oral health status is a more important factor determining the age at which she first takes her child to the dentist than the oral health status as determined in a clinical evaluation. As shown in our comparison of the mothers' recall regarding whether the children had ever been referred to the dentist, self-reported data has inherent accuracy problems. Further study, including dental chart reviews, would increase the accuracy of the variables used to define utilization. A third issue limiting the generalizability of these results is that all data were collected from clinics in the Kansas City area. Further study with low-income children in other urban or rural areas would be important to validate these results.

As might be expected, the odds a child has ever been to the dentist significantly increase with increasing age. Children between ages 4 and 5 were almost three times more likely to have been to the dentist than those between the age 3 and 4 years, almost 10 times more likely than those children between 2 and 3 years or 12 months or younger, and more than 20 times more likely than a child between age 1 and 2.

The effect of WIC referrals on dental utilization, while only statistically significant in the bivariate analyses, remains important. For 6% of the children, the WIC clinic referral was reported to be the principal referral for the child's first visit to the dentist. In addition, almost 20% more of the children who had ever been to the dentist had been referred by the WIC clinic.

Mothers reported the largest percentage of children being between 2 and 3 years old (34%) when they made their first dental visit. Children between the ages of 3 and 4 years old were more likely than any other age group to be referred, and of those children who had been to the dentist, they were the most likely to have been referred.

The most obvious advantage of using settings such as a WIC clinic to identify children with oral health problems is that they are sites at which many of the children most at risk already receive services. Conse-

quently, no new delivery systems or substantial increases in resources would be required to address the difficult task of identifying the relatively few children who will require resource-intensive dental care in a hospital operatory room.

The effectiveness of using WIC clinics for oral health screenings may be diminished because of the young age of such a large percentage of the clients. As the schedule for frequent general well-child visits decreases with age, the older children are less likely to visit the WIC clinics, thus making these children between 3 and 5 years of age more difficult to screen for dental needs.

The number of children in the family and the number of people in the household have, perhaps, opposite relationships with the utilization of dental services by children compared to what might be expected. Children in families with five or more in the household were more likely to have reported having made a dental visit (35%) compared to those in families with fewer than five (19%). With this population considered to be low income, it might be expected that with more family members present in the household, there would be less time and fewer financial resources available for dental care. However, this study found the opposite situation. Possible explanations could be that as children age, mothers realize the importance of dental care, dental problems become evident or painful and now require attention, or older siblings have had need for dental care in the past.

Conclusions

1. Dental referral from a WIC well-child screening was significantly related to having a dentist visit.
2. Only increasing age was significantly related to having a dental visit in the multivariate analyses.

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