Dental Utilization by Low-income Mothers

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Abstract

Objective: *This study examines the influence of predisposing, enabling, and need variables on whether low-income mothers sought dental care during the past year. This report is a substudy of mothers and children on their self-reported health status, utilization, access, and satisfaction with health care in general.* ***Methods:*** *A convenience sample of 502 mothers and youngest child younger than 6 years old was administered a face-to-face questionnaire in four Ohio counties. Information was collected at county human services offices and WIC clinics between November 1995 and July 1996. Using whether or not the mother sought dental care as the dependent variable, logistic regression models were created for the variables within the predisposing, enabling, and need characteristics separately and together.* ***Results:*** *Fewer than one-half of the mothers sought dental care during the past year. Variables associated with the predisposing characteristic explained little about who sought care. Those mothers who have Medicaid coverage are 2.7 times more likely to have a dental visit than those without insurance. Moreover, those mothers who perceive any dental need are several times less likely to have received dental care than those who have no perceived need.* ***Conclusions:*** *Even among a somewhat homogeneous population of low-income women, source of payment for dental services and perceived need for dental care are discriminating variables in determining who seeks dental care. [J Public Health Dent 1998;58(1):44-50].*

Key Words: Medicaid, managed care, women's health services, income, health behavior, health services accessibility.

During the past decade both the private and public sectors have explored alternative health delivery systems. While the private sector has been quite rapid in its adoption of managed health care programs, the public sector also has embarked upon "experiments" with similar delivery models. These new systems could have a profound impact on access, health status, and satisfaction with care received.

In 1995 the Health Care Financing Administration granted a waiver for provisions within Section 1115 of the Social Security Act waiver to the Ohio Department of Human Services. This waiver permitted implementation of mandatory managed care for Medicaid clients. Baseline information about the current levels of health status, access, and satisfaction with care in a population of low-income women and children is essential prior to a major shift in the delivery of services for a substantial portion of this population. While many in this population have been or currently are Medicaid eligible, many mothers are not long-term recipients (i.e., longer than two consecutive years).

When empirical oral health data exist for low-income populations, it is often limited to children, particularly those who are Medicaid eligible (1,2). Even within the Medicaid program, limited dental utilization data are available to guide policy. Without adequate knowledge about how often low-income families access dental care and their satisfaction with the care they receive, evaluators will find it difficult to determine how changes in the health delivery system positively or adversely affect utilization, access, and satisfaction.

The present study addresses variables associated with dental utilization by low-income mothers, using the behavioral model of health services utilization (3,4). Specifically, we anticipate that need characteristics will provide the dominant influence on why low-income mothers seek dental care. Several researchers have applied or adapted the behavioral model for dental utilization (5-13), with most focusing on the elderly population because of the lower utilization rate. While there are newer conceptual models that also address health care utilization and access (14-17), the behavioral model of health services utilization is a well-tested conceptual framework that allows for comparisons.

Methods

The study is based on a convenience sample, using county residence as the level of stratification. The four counties are located in central Ohio and represent urban (Franklin—which includes the city of Columbus), suburban (Delaware, Union), and rural (Morrow) communities. These counties are contiguous, bounded by Morrow in the north and Franklin in the south. Clients were approached at Women Infant and Children (WIC) clinics and county Human Services offices between November 1995 and July 1996 in each of the respective counties. The days selected for data collection conformed to the schedules of the surveyors who conducted the interviews. With the exception of Franklin County, the WIC and Human Services office are at the same location. These

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sites were chosen because they represent those sites where low-income mothers congregate.

Each mother was asked if she would participate in a study examining health status, satisfaction with and use of health services for both herself and one of her children. Inclusion criteria required that the youngest child in the family be younger than 6 years of age and either the child or the mother receive Medicaid or be uninsured. If the woman had multiple children under the age of 6, the index child was the youngest one living in the household.

After training in the protocol of the format and rehearsing the survey with the principal investigator (PJS), the face-to-face questionnaire was administered by graduate nursing students at the local sites. Each mother was informed that participation in the study would not affect services rendered at the facility. The interviews took approximately 20 minutes. The survey addressed both medical and dental issues. The face-to-face survey consisted of five components: sociodemographic, health status, access to care, utilization, and satisfaction with care received. Many of the questions that were asked of the mother were later asked about the youngest child in the family. The sociodemographic items included mother's age, number of children living with her, race, marital status, years of education, family income, and type of insurance.

Health status of the woman was measured using the SF-12 (18), and a mental (MCS-12) and a physical component summary score (PCS-12) were calculated for each woman. The child's health status was measured using a series of questions from the 1988 National Health Interview Survey—child supplement (19). Utilization and access questions from the NHIS were used and excerpts of the Group Health Association of America instrument were used to measure satisfaction (20). Cooperation from prospective survey participants was excellent, with very few individuals declining participation. Also, this population had very few non-English speaking clients, so language was not an impediment.

Oral health questions included: whether or not the mother is presently getting needed dental care (self-perceived); if not, why not; recency of dental care; primary purpose of last visit; type of facility she uses (e.g., private office, public clinic, dental school); self-perceived oral health; self-perceived treatment need; amount of oral pain, if any, she experienced during the past four weeks; importance of keeping her natural teeth; and whether the mother ever had a tooth extracted by a dentist due to pain or a toothache. Additionally, mothers were asked how many of their own teeth had been extracted. This number was then subtracted from 32 to create another variable, number of teeth. No clinical examination was performed.

Whether or not the mother sought dental care within the past year was the dependent variable. Constructs of predisposing, enabling, and need, the three sets of characteristics originally proposed in the behavioral model of health services utilization, served as the predictor variables. Besides the sociodemographic information, only dental variables were used in this analysis. Bivariate analysis was performed for each of the predictor variables using either the likelihood-ratio chi-square statistic or student *T*-test. Then logistic regression models were constructed using predisposing, enabling, and need characteristics separately, followed by a combined model that best described whether or not mothers sought dental care within the past year. All substantive variables, rather than prescriptive *P*-value limits, were included in the appropriate models. The sample selection targeted at least 500 women, an amount projected to allow detection of the prevalence of a population proportion with a margin of error of plus or minus 4.5 percent and a confidence interval of 95 percent (21).

Results

Five hundred two (502) mothers or guardians participated in the face-to-face survey. Twelve women were excluded from further analysis either because a number of questions were omitted (n=6), they were not the birth mother (e.g., grandmother, foster care; n=2), they were receiving Medicare health benefits (n=2), or they were edentulous (n=2).

The mean age of the mothers was 24.5 years (SD=5.4). The youngest two mothers were 14.5 years old and the oldest 47. More than three-quarters of the mothers were white, approximately 18 percent had more than a high school education (range=7–19 years of education), and 42 percent had never been married. Additionally, more than two-thirds of the mothers themselves had Medicaid health coverage within the past year, 57 percent had a household income of less than $10,000, and 48 percent had only one child living in the household (mean=1.8, range=1–6).

Two hundred twenty-six (226) of 490 women (46.1%) sought dental care within the past 12 months. Conversely, 8.1 percent had not sought care during the past five years. Almost an equal number of women answered either affirmatively or negatively to the question, "Do you get the dental care that you need?" Reasons for a negative answer included: no insurance (25.1%), can't afford treatment (16.2%), dentist does not accept Medicaid (15.3%), fear (7.2%), no dentist nearby (4.3%), office hours inconvenient (2.6%), no transportation (1.3%), and other (28.1%). The majority of responses in the "other" category related to "not having the time" because of a myriad of responsibilities.

Regardless of whether the women sought care during the past year, the majority stated that the purpose of the last visit was for "routine care." Almost 75 percent of care was provided in a private dental office. The distribution of self-perceived oral health status scores is as follows: excellent, 11.6 percent; good, 44.9 percent; fair, 28.2 percent; and poor, 15.3 percent. Only 10 percent indicated that they had no need for dental treatment currently. Thirty-eight percent of these women had experienced any degree of dental pain (i.e., great deal, some, or little) within the past four weeks, while 8.4 percent indicated that they had a great deal of pain. Approximately one-half of this population had at least one permanent tooth extracted (mean=1.6, SD=2.6). More than 90 percent indicated that it is either very or extremely important to maintain their remaining natural teeth.

The results of the bivariate analyses are displayed in Table 1, and show differences in dental use during the last year by variables within each of the three characteristics of the health services utilization model. The mother's level of education is the only predisposing variable that is statistically significant at the .05 level. Among the enabling variables, having

TABLE 1
Dental Utilization Within Past 12 Months of Low-income Ohio Mothers, by Sociodemographic and Other Dental Variables (*N*=490)

Characteristic	Variable	Dental Utilization* Yes	Dental Utilization* No	df	Chi-square Statistic†	*P*-value
Predisposing	Age	24.6 (±5.6)†	24.5 (±5.2)		–0.07	.948
	Education	11.8 (±1.6)	11.5 (±1.6)		–2.20	.028
	Number of children	1.84 (±1.0)	1.84 (±1.0)		0.01	.992
	Race‡					
	White	174 (46.2%)	203 (53.8%)	1	0.17	.679
	Black	48 (48.5%)	51 (51.5%)			
	Spouse/partner					
	Yes	98 (46.0%)	115 (54.0%)	1	0.00	.970
	No	127 (46.2%)	148 (53.8%)			
Enabling	Income					
	<$10,000	139 (49.8%)	140 (50.2%)	3	4.99	.172
	$10,000–19,999	65 (44.2%)	82 (55.8%)			
	$20,000–29,999	16 (34.8%)	30 (65.2%)			
	≥$30,000	6 (35.3%)	11 (64.7%)			
	Health insurance					
	Commercial	27 (50.0%)	27 (50.0%)	2	17.73	<.001
	Medicaid	170 (51.2%)	162 (48.8%)			
	None	29 (28.2%)	74 (71.8%)			
	Residence					
	Urban	49 (50.5%)	48 (49.5%)	2	0.95	.622
	Suburban	131 (44.9%)	161 (55.1%)			
	Rural	46 (45.5%)	55 (54.6%)			
Need	Number of teeth	30.2 (±2.6)	30.5 (±2.6)		1.42	.156
	Get care needed					
	Yes	172 (68.8%)	78 (31.2%)	1	110.07	<.001
	No	54 (22.5%)	186 (77.5%)			
	Need treatment now					
	A lot	45 (33.3%)	90 (66.7%)	3	41.27	<.001
	Some	66 (41.5%)	93 (58.5%)			
	Little	74 (50.3%)	73 (49.7%)			
	None	41 (83.7%)	8 (16.3%)			
	Importance of keeping teeth					
	Extremely	104 (50.5%)	102 (49.5%)	4	6.88	.142
	Very	97 (40.8%)	141 (59.2%)			
	Moderately	8 (44.4%)	10 (55.6%)			
	Slightly	4 (66.7%)	2 (33.3%)			
	Not	13 (59.1%)	9 (40.9%)			
	Oral health					
	Excellent	41 (71.9%)	16 (28.1%)	3	24.03	<.001
	Good	107 (48.6%)	113 (51.4%)			
	Fair	50 (36.2%)	88 (63.8%)			
	Poor	28 (37.3%)	47 (62.7%)			
	Dental pain last 4 weeks					
	Great deal	19 (46.3%)	22 (53.7%)	3	1.34	.721
	Some	32 (49.2%)	33 (50.8%)			
	Little	32 (40.5%)	47 (59.5%)			
	None	143 (46.9%)	162 (53.1%)			

*For continuous data, both the mean and standard deviation (in parentheses) are displayed, whereas the actual number (followed by the percent distribution for each subcategory) is presented for categorical data.
†For continuous data, this column reports the student *T*-test.
‡14 women who were neither black nor white were dropped.

no health insurance substantially reduced the chance that the mother sought dental care last year. The following need variables were all highly statistically significant ($P<.001$): whether the woman perceived she gets the care she needs, how much perceived treatment she needs, and self-perceived oral health status. Those who perceive that they get the care they need are more likely to have visited the dentist during the past 12 months. As anticipated, those with self-perceived excellent oral health had a dental visit last year. Conversely, those with no perceived need for treatment now are almost five times less likely to have had a dental visit last year.

Each of the variables except importance of keeping natural teeth and receiving the dental care that she needs was entered into a logistic regression model regardless of the bivariate results. Each of the remaining variables, while not statistically significant at a predetermined level, provided a substantive rationale for inclusion based on previous research. Importance of keeping natural teeth was dropped from further analysis because of its poor discriminatory capability (i.e., individuals overwhelmingly reported either "extremely" or "very important" regardless of dental utilization or perceived need). Likewise, since the responses concerning receiving the dental care that she needs was too closely correlated to the dependent variable to be meaningful (i.e., those who sought care were also those who perceived that they got the dental care that they needed), this variable was not included in the regression models.

Table 2 displays the results of the regression models for each of the three utilization components separately. The two highest levels of income were combined for the regression analysis because few households had incomes above $30,000. While the education variable demonstrates an odds ratio that is statistically significant, holding all of the other predisposing variables constant, the overall predisposing model is not statistically significant.

An interaction variable, education

TABLE 2
Logistic Regression Analysis Between Dependent Variable of Dental Utilization and Predisposing, Enabling, and Need Characteristics, Separately

					95% CI	
Characteristic	Variable	Parameter Estimates	SE	Odds Ratio	Lower	Upper
Predisposing (n=470)	Mother's age	–0.02	0.02	0.98	0.94	1.02
	Race*	–0.05	0.24	0.96	0.60	1.52
	Education	0.13	0.06	1.13	1.00	1.29
	Spouse/partner	0.03	0.19	1.03	0.71	1.51
	Number of children	0.06	0.11	1.06	0.86	1.30
Enabling (n=488)	Income†					
	>$20,000	–0.56	0.32	0.57	0.30	1.08
	$10,000–20,000	0.01	0.23	1.01	0.65	1.58
	Private insurance‡	1.06	0.37	2.89	1.40	6.00
	Medicaid‡	0.95	0.26	2.59	1.54	4.35
	Suburban¶	0.12	0.29	1.12	0.63	2.00
	Urban¶	–0.06	0.24	0.94	0.59	1.52
Need (n=490)	Number of teeth	–0.10	0.04	0.90	0.84	0.98
Need	Little§	–1.52	0.43	0.22	0.10	0.51
	Some§	–1.82	0.44	0.16	0.07	0.39
	Lot§	–2.34	0.50	0.10	0.04	0.25
Self	Excellent+	1.00	0.48	2.72	1.07	6.94
	Good+	0.32	0.37	1.38	0.66	2.86
	Fair+	0.05	0.35	1.05	0.53	2.08
Pain	Great**	0.64	0.39	1.89	0.88	4.06
	Some**	0.76	0.31	2.13	1.17	3.89
	Little**	0.08	0.27	1.09	0.64	1.86

Reference group:
*Black.
†<$10,000.
‡No insurance.
¶Rural.
§No perceived dental need now.
+Poor self-perceived oral health.
**No dental pain in last four weeks.
–2 log likelihood chi-square statistic: predisposing—4.3, df=5, P=.5112; enabling—22.0, df=6, P=.0012; need—59.9, df=10, P=.0001.

combined with whether the mother is married or has a domestic partner, is statistically significant. Those with less education and no partner and those with high education and a partner are more likely to have sought dental care during the past year. This model, however, only approaches borderline statistical significance at the .05 level. For the enabling model, mothers with private health insurance and those with Medicaid coverage were 2.89 and 2.59 times more likely, respectively, to have sought dental care within the past year compared to a combined category that included the other covered group plus those with no health coverage.

The need model alone has several statistically significant findings. Mothers who report they need a little, some, or a lot of dental care are 4.5 (i.e., the reciprocal of the odds ratio, 1÷0.22), 6.2, and 10.0 times less likely, respectively, to have been to a dentist than the other categories plus those who had no self-perceived dental care need. In addition, those mothers who have some dental pain during the past four weeks are 2.1 times more likely to have sought dental care in the past year, holding constant all other variables within the model. There is approximately a 10 percent decrease (i.e., 1÷0.90) in the likelihood of having sought dental care during the past year with each additional loss of a tooth. Two-way interactions did not improve either the enabling or the need models.

Table 3 displays a logistic regression model combining all predisposing, enabling, and need variables used in Table 2. Mothers who said they need a little, some, and a lot of dental care are 5.0, 6.4, and 11.6 times less likely to have been to a dentist in the past year, respectively, than those who thought they had no dental need. Mothers who had some dental pain within the past four weeks were 2.2 times more likely to have sought dental care than those with no pain, holding constant all other variables within the model. Additionally, mothers receiving Medicaid benefits are 2.7 time more likely to have seen a dentist during the past year. Level of education no longer is statistically significant in the combined model. No statistically signifi-

TABLE 3
Combined Logistic Regression Analysis, with Dental Utilization During Past Year as Dependent Variable (*n*=468)

Characteristic	Variable	Parameter Estimates	SE	Odds Ratio	95% CI	
					Lower	Upper
Predisposing	Mother's age	–0.01	0.03	0.99	0.94	1.05
	Race*	0.23	0.29	1.26	0.72	2.22
	Education	0.13	0.07	1.14	0.99	1.32
	Spouse/partner	0.21	0.22	1.23	0.80	1.90
	Number of children	0.05	0.12	1.05	0.84	1.31
Enabling	Income†					
	>$20,000	–0.54	0.36	0.58	0.29	1.18
	$10,000–20,000	–0.03	0.25	1.03	0.63	1.68
	Private insurance‡	0.72	0.42	2.05	0.91	4.66
	Medicaid‡	1.00	0.30	2.72	1.52	4.85
	Suburban¶	–0.11	0.33	0.90	0.47	1.70
	Urban¶	–0.15	0.29	0.86	0.49	1.52
Need	Number of teeth	–0.09	0.05	0.92	0.84	1.00
Need	Little§	–1.60	0.46	0.20	0.08	0.50
	Some§	–1.87	0.48	0.16	0.06	0.40
	Lot§	–2.45	0.53	0.09	0.03	0.25
Self	Excellent+	0.95	0.52	2.60	0.94	7.13
	Good+	0.29	0.39	1.34	0.63	2.87
	Fair+	0.05	0.36	1.05	0.52	2.13
Pain	Great**	0.66	0.41	1.94	0.86	4.37
	Some**	0.80	0.32	2.23	1.19	4.18
	Little**	0.09	0.29	1.09	0.62	1.93

Reference group:
*Black.
†<$10,000.
‡No insurance.
¶Rural
§No perceived dental need now.
+Poor self-perceived oral health.
**No dental pain in last four weeks.
–2 log likelihood chi-square statistic: 78.6, df=21, *P*=.0001.

cant interactions were found in the combined logistic regression model.

Discussion

Dental utilization as it relates to the health behavioral model previously has not been used exclusively for younger adults with children. Although Andersen has suggested that predisposing and enabling variables may be more important than need variables in explaining dental utilization (3), this was not the case for the current study. The difference probably is due, in great part, to the exclusive nature of the population selected (i.e., mothers); thus, it eliminates the influence of predisposing variables, such as sex and whether there are any children. This group also is financially similar (i.e., very few had family income exceeding $30,000 per year), further removing some of the variability within the model. Even so, Medicaid recipients still are more likely to use dental care than the other two categories (i.e., noninsured and those with health insurance). While there is no direct relationship between general health insurance and dental utilization, one would expect an indirect effect because of the availability of additional disposable income as a result of the medical coverage.

Unlike previous findings, there was no statistically significant race difference, either by itself or when included along with other variables in the regression models. Because most of the African-Americans resided in the urban community, a possible explanation for this similar utilization rate could be that participants in our study had social networks that differed from other studies, thus ameliorating any inequity of accessing health care. This study, however, did not explore questions concerning social networking; thus, we can neither corroborate nor dispute this possible relationship. Nonetheless, except for Aday and Forthofer (5), previous studies using the health behavior model for explaining dental utilization have very limited numbers of minorities. This issue deserves further exploration.

The 1989 National Health Interview Study found that 70.9 percent, 62.0 percent, and 66.1 percent of females who were 12–17, 18–34, and 35–44 years-old, respectively, had visited the dentist within the past year (22). The current study, however, found a much lower percentage of recent dental users. This phenomenon is explained partly by lower levels of income, and possibly by education. Other conceptual models, including one based on social exchange theory (14), actually may provide a better approach to disentangling some of the other potential reasons for differences among a more homogeneous group. Unfortunately, there is limited validation of this particular model (23).

Recent evidence suggests that the health behavioral model may not function as well for a changing health care system in which varying levels of service coverage exist (15-17). When financing and delivery of health care were separate components, utilization of services via a behavioral model was a reasonable approach in determining important characteristics. With the merging of the two entities within managed care, there must be a much more robust conceptualization of access that incorporates appropriate care, acceptable quality, and improved patient outcome.

Future research will use other conceptual models. The current findings, however, corroborate those of others using the same conceptual model who note that self-perceived need is important for explaining dental use. Basically, the stronger the perception of current dental need, the less likely the individual was to seek dental care during the preceding year, regardless of dental service type. This perception could be formulated because there may be some expected social norm for regular dental visits and that these individuals did not conform to the norm. Thus, some of these individuals may sense that there should be a self-perceived need. Only an oral examination, however, will provide confirmation of this point.

Because of the nature of cross-sectional studies, it is impossible to interpret cause and effect between the predictor and dependent variables. The issue of dental pain is a good case in point. While those with some dental pain within the past four weeks were more likely to have sought dental care during the past year than those with no pain, it is speculative whether the pain is what initiated the dental visit. In fact, one may counter that the dental visit provided the patient with discomfort or pain because of the nature of the service rendered. However, it is difficult to ignore that 38 percent of this population had any degree of oral pain during the past four weeks. This pain must have some impact on the individual's quality of daily living.

Medicaid eligibility is the only statistically significant determinant from either the predisposing or enabling groups that is statistically significant in the combined regression model. What makes interpretation of this finding complex, however, is that there are different financial eligibility criteria for pregnant and post-partum women within Medicaid (24). Thus, a competing regression model, with a dichotomous variable for whether the child was younger than 1 year old, was computed. This regression model, which could possibly explain the effect of coverage for Medicaid during pregnancy, did not statistically improve the chi-square statistic. Unfortunately, no question concerning current pregnancy status was included in the survey; therefore, one cannot be certain of the extent of episodic (pregnancy) participation in the Medicaid program.

Using a convenience sample limits the generalizability of the findings. However, primary survey research on low-income populations is fraught with many difficulties, including but not limited to contacting many within this population (i.e., lower percent with telephones, transportation problems, etc.). Even among the Medicaid population, there are legal constraints in accessing the client databases. Thus, it behooves other researchers to study similar populations in other locales before determining public policy decisions based on this research. This study, however, provides an initial step in understanding which variables are important in accessing dental care.

As with any interview survey, there is the possibility of response bias and problems with participants' interpretation of the responses. For example, the construction of the variable for number of teeth may contain an unknown directional source of error. However, recent studies of self-reported number of teeth by an elderly population correlated fairly well with the results from a clinical exam (25,26). The validity of self-counting may be higher, however, when there are relatively few teeth. It may be more difficult to ask the individual about the number of missing teeth and then construct a variable that accurately repre-

sents the number of teeth present. Since missing teeth may be an important indicator of oral health status, other studies should be performed to determine whether self-reported tooth counts are valid in younger adult populations.

Another potential confounder is the reason for dental service during the past year. We included any dental visit in the dependent variable, which does not distinguish the regular, preventive users from those who episodically seek relief from symptoms of pain or infection. However, 63.3 and 10.0 percent of respondents last had a dental visit for either routine dental care or to fix cavities, respectively. Only 7.0 percent of those seeking care did so because of emergent pain, while another 7.9 percent had an extraction other than a wisdom tooth. The survey lacks information on the extent of services and the number of visits during the past year. The behavioral model of health services utilization, however, is not clear in its differentiation among types of services. This omission is a shortcoming of the model, particularly when a substantial proportion of the population are episodic users.

One reason for selecting a low-income population of mothers and children for this study was to determine medical and dental utilization prior to proposed changes in welfare reform. Those who receive Medicaid health benefits may have more restrictive eligibility criteria in the future. Thus, this population could approach similar utilization patterns as those without health care coverage. However, the issue has not been sufficiently developed to understand completely how health care coverage will impact mothers as they transition into the work force. Many of the mothers who did not seek dental care during the past year just did not have adequate time or energy to address their own dental health needs. If there is limited health care coverage at organizations and companies where many of these mothers find employment, then we suspect that their opportunity costs will greatly interfere with their ability to seek dental care.

The findings of this study add to the literature concerning the application of the health behavioral model for dental use, addressing a population (i.e., low-income mothers) that has limited previous research. Despite the selection of a more homogeneous population of low-income mothers, source of payment for services is still an important consideration in whether mothers sought dental care. And, regardless of the perceived level of need for dental care, those mothers with any perceived need were less likely to have sought care during the prior year. These findings also provide a potential source for comparisons with expected changes in the health care delivery.

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