

Predictors of Oral Health Counseling by WIC Providers

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ABSTRACT

Purpose: The purpose of this study was to assess selected predictors for the inclusion of oral health counseling by Illinois Women, Infants, and Children (WIC) providers.

Methods: A questionnaire was developed and mailed to all 166 WIC sites to assess attitudes towards oral health counseling. Variables that revealed significant associations in bivariate analysis ($P \leq .05$) were considered as candidates for building a final logistic regression model in which frequency of oral health counseling was the outcome.

Results: A response rate of 76% was achieved after 1 mailing, with 27% of the WIC providers having some form of oral health training. There were no statistically significant differences in the frequency of WIC providers discussing oral health with their clients by age, gender, and level of education of the provider. In the final logistic regression analysis, variables significantly associated with the frequency of WIC providers' discussing oral health with their clients were having: (1) oral health training; and (2) nursing training.

Conclusions: The results suggest that Women, Infants, and Children (WIC) providers, who have had some oral health training, are more likely to provide counseling about dental disease and its prevention. This information was used to develop an educational tool for these nondental, health care providers. (J Dent Child 2006;73:146-151)

KEYWORDS: WIC, DENTAL CARIES, ORAL HEALTH, HEALTH EDUCATION, DENTAL, NURSES, NUTRITIONISTS, COUNSELING, ORAL HYGIENE, CHILD, PRESCHOOL

Dental caries is a common chronic disease of childhood. It is 5 times more common than asthma and 7 times more common than hay fever in children.¹ An estimated 80% of the disease is seen in approximately 20% of the population.² Factors commonly associated with children at higher risk of developing dental disease are:

1. children from low-income families;
2. children with no or limited dental insurance coverage;
3. children from ethnic minority groups;
4. parental education;
5. parental age; and
6. child's gender.^{3,4}

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Children from low-income families suffer more than twice the decay and pain as their affluent peers, but they are only half as likely to visit a dentist.⁵ Dental decay seen in very young children is often severe and rampant (commonly referred to as Early Childhood Caries [ECC]).⁶

ECC incidence can be consequential to: growth; function; ability to attend to learning; and self-image.⁷

ECC has also been reported to inhibit attainment of normal height and weight in toddlers, leading to a condition commonly known as "failure to thrive."⁸ Caries provides a reservoir for future abscesses, cellulitis, and systemic spread of disease.⁹ Neglected dental caries can be very costly in physical, psychological, and financial terms.^{10,11} Thus, ECC prevention seems to be a logical approach to reduce the burden of the disease. Children from low-income families are at higher risk of developing ECC and are often enrolled in the special supplemental nutrition program for Women, Infants, and Children (WIC) and Head Start programs in the United States. Such programs provide a unique op-

portunity to reach high-risk children.¹² *The US Surgeon General's Report on Oral Health* describes both a marked improvement in the nation's oral health in the past 50 years and the simultaneous silent epidemic of oral disease affecting most of the United States' vulnerable citizens.¹³ Illinois mirrors the nation in the oral health status of its people. That is, dental disease remains pervasive among: (1) families with lower incomes or less education; (2) the frail elderly; (3) those with disabilities; (4) those who are underinsured; and (5) minority groups. To address this silent epidemic, the Division of Oral Health, Illinois Department of Public Health (IDPH), recommended development of an ECC prevention program through a series of collaborative efforts with other public health departments in the state. This program consisted of:

1. data collection on ECC prevalence;
2. communicating messages on ECC prevention in appropriate settings; and
3. piloting programs that demonstrate effective ECC prevention strategies.¹⁴

In 2002, the Division of Oral Health, IDPH, collected data on ECC prevalence at 8 WIC sites thought to mirror the state's oral health status. The data revealed that one third of the children 5 years old and younger enrolled in WIC had at least 1 carious lesion upon visual inspection using only a head light and no dental diagnostic instruments, as examined by calibrated, nondental WIC personnel.¹⁴

The purpose of this study was to determine predictors of oral health counseling by Illinois Women, Infants, and Children providers. Survey results would be used to develop a manual that facilitates discussion of oral health topics between WIC providers and clientele. This paper presents the survey findings and discusses the implications of the findings.

METHODS

An 11-item survey instrument was developed using Total Design Method guidelines.¹⁵ Items included:

1. demographic information about WIC providers:
 - a. age;
 - b. gender;
 - c. education level; and
 - d. special vocational training;
2. oral health training of the providers; and
3. specific questions regarding the provider's:
 - a. knowledge;
 - b. attitude; and
 - c. practices related to oral health counseling.

The survey was piloted at a WIC site in Iowa City, Iowa, for content validity and reading level. The survey instrument was provided by the authors. The survey instrument and methodology for this study were approved by the Institutional Review Board (IRB) at the University of Iowa, Iowa City, Iowa, and by an internal review committee at the IDPH. The office of the Illinois Department of Human Services (IDHS), which oversees the WIC program in the

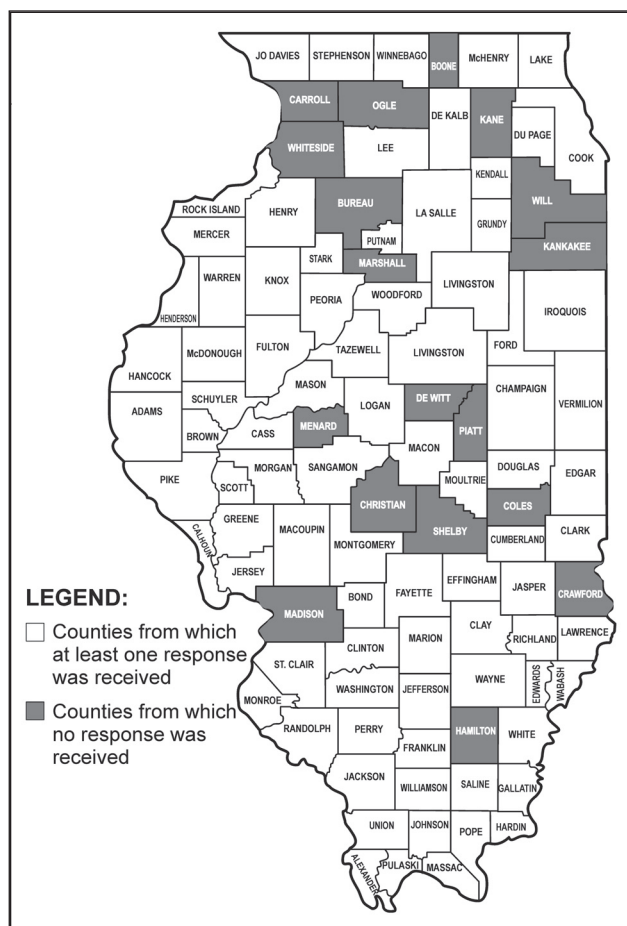


Figure 1. Map of Illinois showing counties that responded to the survey.

state, provided a list of all WIC sites in the state with the names of the site coordinators and administrators.

The single page (double-sided) survey was mailed to all state WIC site coordinators, along with a postage-paid return envelope and a cover letter explaining the study and its purpose. The cover letter included instructions on selecting any one certified health professional (CHP) involved with discussing health and nutrition issues with clients from their site at random to complete the survey. As an incentive for completing the survey, the WIC sites were to receive posters related to ECC. In instances where more than one completed survey was received from a WIC site, only one completed survey was selected at random.

The data were analyzed using SAS (version 9.1) Inc. software.¹⁷ Descriptive analyses were performed for all the questions on the survey. Bivariate analyses were performed using Mantel-Haenszel chi-square statistics or Fisher's exact test if the sample sizes were small. Variables showing statistical significance ($P \leq .05$) in bivariate analyses were considered as candidates for the final multiple logistic proportional odds regression model. Forward step-wise logistic regression analysis was used, and it was verified using backward elimination ($P < .05$). All possible 2-way interactions were considered and examined.

RESULTS

Surveys were mailed to all 166 Illinois WIC sites in March 2002. After one mailing, 126 (76%) completed surveys were returned. The location of respondents and nonrespondents are shown in Figure 1. This mapping revealed that the respondents were fairly uniformly distributed throughout the state. All respondents except one were females. One third of the respondents were between 36 to 45 years of age. More than 70% had either a 4-year college degree or higher, and only 4 respondents had high school diplomas. Most respondents were nutritionists (67%), followed by nurses (43%). Other special vocational trainings of the respondents were: (1) health education (9%); (2) lactation consultant (6%); and (3) social work (2%). The aggregate percentage exceeds 100% because several CHPs had dual or multiple educational credentials.

Twenty-seven percent (34/126) of all those who completed the survey had some form of oral health training, mostly through continuing education programs sponsored by either the IDHS or IDPH. Still, 61% of all respondents (77/126) reported feeling either "very comfortable" or "comfortable" in discussing oral health issues with their clients. Reasons attributed for being "somewhat comfortable" or "not comfortable at all" were:

1. lack of knowledge (80%);
2. busy workplace (45%);
3. lack of confidence (35%);
4. inadequate referral resources (31%);
5. parents not interested in oral health care issues (8%);
6. cultural and ethnic differences (8%); and
7. lack of interest in oral health issues (2%).

When asked "how often in the last 3 months was any time spent discussing oral health," 60% reported spending at least some or little time discussing oral health with their clients. Also, only 13% of the respondents reported having oral health discussions with all their clients, whereas 32% had discussions with mostly all and 25% with a majority of their clients. A summary of responses to questions on oral health training and counseling practices are presented in Table 1.

The predictor variables analyzed—with the same frequency these providers discussed oral health with their clients—were:

1. age;
2. gender;
3. educational level;
4. nursing training;
5. oral health training;
6. comfort level in discussing oral health issues; and
7. percentage of clients with whom WIC providers discussed oral health issues.

Table 2 summarizes the results from bivariate analyses (unadjusted) for those variables which had statistically ($P < .05$) significant findings. All variables reported in Table 2 were included in a step-wise multiple logistic proportional odds regression analysis. The response variable considered was the frequency of counseling on oral health with patients, which has 3 ordered categories:

Table 1. Summary of Responses to Questions Related to Oral Health Training and Counseling Practices

Training in oral health counseling? (n=126)	
Yes	34 (27%)
No	92 (73%)
Comfort level in discussing oral health issues (n=126)	
Very comfortable	17 (13%)
Comfortable	60 (48%)
Somewhat comfortable	40 (32%)
Not comfortable at all	9 (7%)
Reasons for being "somewhat comfortable" or "not comfortable at all" Check all that apply (n=49)	
Lack of knowledge about dental health	39 (80%)
Busy workplace	22 (45%)
Lack of confidence discussing dental health	17 (35%)
No place to send children who have dental problems	15 (31%)
Parents are not interested in children dental health	4 (8%)
Cultural/ethnic differences	4 (8%)
Lack of interest in oral health issues	1 (2%)
Other	1 (2%)
How often was any time spent discussing oral health issues? (n=126)	
Every time	13 (10%)
Most of the time	33 (26%)
Some of the time	53 (42%)
A little of the time	23 (18%)
None of the time	4 (3%)
With what percentage of the clients was oral health discussed? (n=126)	
All (100%)	16 (13%)
Mostly all (75-99%)	41 (32%)
Majority (51-74%)	30 (24%)
Some (25-50%)	27 (21%)
Few (<24%)	10 (8%)
Didn't response	2 (2%)

1. high frequency (every time or most of time, N=46);
2. medium frequency (some time, N=53); and
3. low frequency (little or no time, N=27).

Table 3 summarizes these results. These analyses revealed that oral health training ($P=.0247$) and nursing training ($P=.0138$) were significantly associated with the frequency of oral health counseling with patients, controlling for

all other variables. The possibility of 2-way interaction between oral health training and nursing training was examined, and no evidence of such interaction was found ($P=.6070$).

The odds ratio for the CHPs who had oral health training was 2.44 times more likely to provide oral health counseling compared to those who had no oral health training. Also, the odds ratio for the CHPs who had nursing training was 2.36 times more likely to discuss oral health issues compared to those who had no nursing training.

The present study found the following not to be significant factors in the final logistic regression model after adjustment for other variables:

1. education level;
2. comfort with oral health counseling;
3. percentage of the clients with whom CHP discussed child's dental health.

These three preceding variables did, however, have a significant bivariate relationship. The additional analyses indicated that there were significant associations between oral health training and;

1. feeling comfortable in counseling ($P=.0029$);
2. percentage of clients with whom CHP discussed child's dental health ($P=.0078$); and
3. nursing training ($P<.0001$).

Therefore, the authors believe that oral health and nursing training subsumes the influence of the other three variables as they relate to oral health counseling.

DISCUSSION

Oral health studies relating to WIC-eligible clientele have primarily emphasized either caries prevalence¹⁸⁻²⁰ or utilization of treatment services.²¹⁻²³ While this study may not be the first to address parental education about oral health in WIC clinics, it is the first to report findings about WIC provider predictors for the inclusion of oral health counseling.

The survey response rate was higher than anticipated, especially since there was only one mailing. This may be due, in part, to the co-signatures from the Departments of Human Services and Public Health. The high response

Table 2. Bivariate Analysis Summary of Frequency of Certified Health Providers (CHPs) Discussing Oral Health With Their Clients and Predictor Variables (n=126)

Variable name	Frequency of CHPs discussing oral health with their clients			P value
	None or little time	Some time	Every or most of time	
Education				
<3 ys college	20%	23%	57%	.0457*
≥4 ys college	22%	51%	27%	
Nursing training				
Yes	16%	33%	51%	.0077*
No	26%	49%	25%	
Oral health training				
Yes	15%	29%	56%	.0145*
No	25%	46%	29%	
Comfort with oral health counseling				
Yes	9%	42%	49%	<.0001*
No	41%	43%	16%	
Percentage of your clients with whom CHP discussed child's dental health				
0-50%	47%	53%	0%	<.0001*
51-100%	12%	37%	52%	

rate, coupled with several unsolicited comments on the completed surveys, suggested that individual sites were eager for additional subject material about oral health. Even though a high response rate was achieved, a nonresponse rate of 24% cannot be overlooked. There was no way of identifying whether the nonresponders were similar or dissimilar to the responders. The responses from the state were well distributed, and no particular region in the state could be identified that did not return completed surveys. The fact that the surveys were addressed to the site coordinator—who was asked to select any one WIC provider at random to complete the survey—could have introduced bias. This bias was unavoidable, however, because the State

Table 3. Multiple Logistic Proportional Odds Regression Model for Comparing Frequency Counseling on Oral Health for CHPs*

Parameter	Logistic regression coefficient ±(SE)	P value	Odds ratio estimate*
Having dental oral health training			
Yes vs no	0.89±0.40	.0247	2.44
Having nursing training			
Yes vs no	0.86±0.35	.0138	2.36

*Score test for the proportional odds assumption ($P=.3593$). Deviance and Pearson goodness-of-fit test ($P=.7447$ and $P=.7427$).

WIC Directors' Office required this protocol.

Nurses were more likely to discuss oral health issues when compared to other WIC providers. This was an unexpected finding, as the investigators had previously believed that nutritionists would more likely be actively involved in discussing risk factors for dental caries. Possibly, nurses are more involved in assisting clientele with follow-up health care services; thus, they may be more attuned to preventing dental disease.

Statistically significant associations observed between the CHP's comfort level and the time spent and the frequency of oral health discussions suggests that the CHPs more likely to provide oral health counseling to their clients are the ones who feel comfortable discussing oral health issues. Therefore, providing appropriate training to the CHPs would likely increase their comfort level in discussing oral health issues and would encourage them to provide oral health counseling.

Research has documented a positive influence of oral health programs with caries prevention among WIC enrollees.^{13,18,20,24} Findings from this study corroborate that CHPs who routinely interact with high-risk children could potentially be an important and efficient partner in dissemination of messages regarding ECC prevention.

Information gathered from the survey, especially information related to knowledge and attitudes about oral health, served as the basis for the development of an educational adjunct for WIC providers. A prototype of the educational tool that would familiarize the CHPs with risk factors associated with dental caries has been developed. The contents of the educational tool include: (1) ECC; (2) feeding practices; (3) brushing; (4) diet; and (5) risk factors for caries. Since the development of the prototype of the educational tool, the Division of Oral Health, IDPH, has held focus groups with WIC and Head Start to get feedback. The original educational tool has been modified and also translated into Spanish. It is also being complemented with typodonts, toothbrushes, and other educational tools to assist the CHP in their presentation. The state is currently preparing to implement an oral health counseling component at all WIC and Head Start sites.

CONCLUSIONS

Based on this study's results, the following conclusions can be made:

1. Women, Infants, and Children personnel recognize that Early Childhood Caries is a serious public health problem among their clients.
2. These personnel recognize the important role they can play in reducing the burden of the disease.
3. Certified health providers with some oral health training and those with a nursing background were more likely to counsel patients about oral health.
4. It is important to provide appropriate training to certified health providers so they are more comfortable and attuned to current concepts for improving the oral health status of their WIC clients.

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