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7-1-2016

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Accepted version. *Journal of Public Health Dentistry*, Vol. 76, No. 3 (Summer 2016): 167-170. DOI. ©
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Abstract

Objectives: Home visiting programs promote the education and health of Early Head Start (EHS) children and pregnant women. However, EHS's oral health component is unevenly implemented. We conducted an educational intervention to improve oral health knowledge and motivational interviewing techniques among Wisconsin EHS home visitors.

Methods: A questionnaire assessing oral health-related knowledge and confidence was administered to home visitors before and after an educational session. Changes between pre/post-responses were analyzed with McNemar's test and Wilcoxon Signed Rank test.

Results: After the intervention there were increases in both knowledge and confidence related to oral health communication. Knowledge increases were observed in such topics as fluoridation, dental caries, and caregivers' role in assisting and supervising children's tooth brushing.

Conclusions: A brief educational intervention was associated with increased home visitor knowledge and confidence in communicating oral health messages to EHS caregivers and pregnant women.

Introduction

Dental caries is a common disease of childhood and the most prevalent pediatric unmet treatment need.¹ Children from low-income families are disproportionately affected by caries and have limited access to dental care.² Early Head Start (EHS) is a federally-funded program that addresses social, educational, and health needs of low-income pregnant women and children three years of age or younger. EHS programs can be based in centers or in families' homes. Home-based EHS programs employ home visitors, who regularly visit parents to provide health-promoting services related to such topics as nutrition, safety, and child development. EHS has incorporated oral health materials into home visitor training, but these materials are not uniformly utilized^{3,4} and there is little documentation of home visitors'

oral health knowledge or how they communicate with families about oral health. Uneven implementation of oral health material has been partly attributed to difficulties in communication between home visitors and families.⁵ Motivational interviewing (MI), a set of techniques for provider-patient interaction in which providers elicit and explore patients' internal motivations and beliefs, can improve patients' motivation to change behavior⁶ and could improve the efficacy of oral health counseling.

The goal of this project was to conduct and evaluate an educational intervention that improved oral health knowledge and communication techniques among Wisconsin EHS home visitors. We hypothesized that the intervention would increase home visitors' knowledge about oral health in early childhood and pregnancy and would also increase their confidence in communicating these topics to families.

Methods

Study design

The study consisted of a 3-hour educational session for home visitors with oral health knowledge and MI components. The knowledge component consisted of a slide show addressing such topics as dental caries, toothbrushing technique, fluoride, and when children should visit dentists. The MI component consisted of viewing and discussing three MI-focused videos and a role-playing exercise. Videos displayed portrayals of a) poor MI technique (closed-ended questions, overly directive); b) good MI technique (asking, listening, informing, offering choices); and c) using a 1–10 scale to assess how important patients think health goals are and how confident they feel in achieving these goals. Videos were developed by a 2014 National Oral Health Conference workgroup in collaboration with Kansas Head Start. The role-playing exercise focused on open-ended questions/listening without interrupting. A questionnaire administered before the session assessed confidence in advising about oral health and knowledge about oral health for children <3 years old and pregnant women. A post-session questionnaire assessed changes in knowledge and confidence. The study was approved by the Medical College of

Wisconsin's Institutional Review Board as part of the Wisconsin "Earlier Is Better" (EIB) program. The EIB project manager asked all 22 Wisconsin EHS programs to participate in the study, of which 14 agreed. Two thousand, two hundred and twelve children <3 years old are enrolled in these 14 programs, representing 75% of Wisconsin EHS-enrolled children. Data were collected from participating sites from December 2012 to January 2015. Each site required its home visitors to attend the session. Participants were given a meal at the session and an educational toolkit containing: oral health education curriculum and flip chart; hands-on tooth brushing model; goal-setting magnet; oral hygiene supplies for entire family; oral health activities for children; and take-home educational materials. Participating programs were given toothbrushes and toothpaste for enrolled families. No other incentives were given for participation.

Data collected

Data collected included: a) true/false questions related to oral health in early childhood and pregnancy; b) confidence in educating caregivers on oral health (5-point Likert scale, *Not at all – Completely confident*); c) opinions on session's usefulness (4-point Likert scale, *Strongly disagree – Strongly agree*); and d) likelihood they would discuss oral health with families as a result of the training (5-point Likert scale, *Very unlikely – Likely*). Educational topics and questionnaire items were adapted from the *Pre-Training Questionnaire for Healthcare Providers*, obtained from the Maine CDC's Oral Health Program's *Kids Oral Health Partnership*. Knowledge topics included: use of fluoride; assisting children with tooth-brushing; putting babies to bed with bottles; cause of dental caries; and dental care in pregnancy. Confidence topics included: recognizing and evaluating risk of tooth decay; advising about dental visits/fluoride toothpaste; and making dental referrals for young children and pregnant women.

Statistical analysis

A McNemar's exact test was used to evaluate changes in knowledge before and after the educational session. Confidence in educating caregivers was reported as median and interquartile range (IQR). A Wilcoxon Signed Rank test was used to compare changes in

confidence before and after the educational session. Descriptive statistics were used to summarize home visitors' opinions on the session's usefulness. Statistical analyses were performed using SAS 9.2 (SAS Inst., Cary, NC) and SPSS 20.0 (Armonk, NY: IBM Corp). $P < 0.05$ is considered significant.

Results

One hundred and eighteen Wisconsin EHS home visitors participated in the intervention and completed pre/post-questionnaires. No questionnaires were excluded. A minority of home visitors had previous training in infant/child oral health (39.3%) or maternal oral health (25.9%).

Knowledge about oral health

After the session, there were statistically significant improvements in short-term knowledge for five out of fourteen questions related to oral health in pregnancy and early childhood (Table 1). Significant improvements were observed in questions related to: a) effectiveness of community water fluoridation in reducing tooth decay; b) fluoride toothpaste use in children with high risk for tooth decay; c) bacterial nature of dental caries; d) adults' role in supervising children's brushing until age 8 years; and e) children still needing help brushing after age 2 years.

Table 1. Home Visitor Knowledge Before and After an Educational Intervention

	% Correct before	% Correct after	<i>P</i>-value*
* A McNemar's exact test was used. N/A, not applicable.			
Community water fluoridation reduces tooth decay	42	71	<0.001
Children with high tooth decay risk can use fluoride toothpaste	61	93	<0.001
Dental caries are caused by bacteria	80	99	<0.001
Adults should help children brush teeth until age 8	86	97	<0.005
Children need help brushing teeth after age 2	92	99	<0.01
Primary tooth development begins before final trimester	36	47	<0.08
Oral disease may progress more quickly in children with special healthcare needs	87	93	>0.11
Children need dental exams before permanent teeth come in	97	95	>0.50

	% Correct before	% Correct after	P-value*
Caregivers should not clean pacifiers in own mouths	97	98	>0.99
Babies should not be put to bed with bottles	99	98	>0.99
Putting children to bed with milk/formula/juice harms their teeth	97	98	>0.99
Caregivers should wipe infants' gums with soft cloth	99	99	>0.99
Tooth decay is important in young children	100	100	N/A
Pregnant women should not wait until after giving birth to see dentist	97	100	N/A

High preknowledge without significant improvement was observed in questions related to: a) caregivers cleaning pacifiers in their mouths; b) babies being put to bed with bottles; c) dental risks of putting children to bed with milk/formula/juice; d) children needing dental exams before permanent teeth come in; e) benefits of wiping infants' gums with soft cloth; f) oral disease progressing more quickly in children with special health care needs; g) importance of tooth decay in young children; and h) pregnant women not waiting to see dentists until after delivery. Low preknowledge without significant improvement was seen in a question related to primary tooth development beginning before the final trimester.

Confidence in educating caregivers about oral health

After the session, there were significant improvements in eight out of eight questions related to confidence in educating caregivers about oral health (Table 2). In addition, nearly all home visitors after the session *Agreed* or *Strongly Agreed* that they: knew how to access community oral health resources (97.5%); could assist families with identifying oral health barriers and goal setting (97.4%); and had acquired useful knowledge and skills from the training (96.9%). Most indicated they would be *Likely* to: help families connect with local dentists (85.3%); regularly discuss oral health with families (85.5%); and encourage families to discuss oral health with medical providers (85.3%).

Table 2. Home Visitor Confidence Before and After an Educational Intervention

	Median (IQR) confidence before	Median (IQR) confidence after	P- value*
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*A Wilcoxon Signed Rank test was used.

(1 = Not at all, 2 = not very, 3 = somewhat, 4 = very, 5 = completely).

	Median (IQR) confidence before	Median (IQR) confidence after	<u>P- value*</u>
Recognizing early childhood tooth decay	3 (2, 3)	4 (4, 4)	<0.001
Evaluating a child's risk of future tooth decay	3(2, 3)	4 (3.75, 4)	<0.001
Advising caregivers about children's oral hygiene	3 (3, 4)	4 (4, 5)	<0.001
Advising caregivers about children's dental visits	4 (3, 4)	4 (4, 5)	<0.001
Advising caregivers about children's use of fluoride toothpaste	3(2, 4)	4 (4, 5)	<0.001
Making dental referrals for infants/children	4 (3, 4)	4 (4, 5)	<0.001
Making dental referrals for pregnant women	4 (3, 4)	4 (4, 5)	<0.001
Advising pregnant women about their oral health	3 (3, 4)	4 (4, 5)	<0.001

Discussion

Community-based oral health programs that utilize pre-existing home visitors can provide cost-effective oral health support and education to families with young children who do not receive dental care.⁷ This project assessed a brief educational intervention that educated home visitors about oral health and motivational interviewing techniques, with the goal of improving home visitors' capacity to provide oral health support to families. We observed a significant increase in home visitors' knowledge and confidence related to oral health communication as a result of the session.

Before the session, the majority of home visitors did not feel confident discussing oral health and had variable levels of knowledge about oral health, supporting previous observations.³ The observed increases in confidence are important as they may result in EHS home visitors more frequently and effectively deploying knowledge gained in oral health sessions. The motivational interviewing training could also be valuable, as MI can be more effective than traditional counseling at reducing rates of caries⁸ and severity of caries⁹ in EHS and other underserved populations, and could also improve the efficacy of other home visitor-caregiver interactions. This brief intervention could be replicated elsewhere at low cost. Limitations of this study include social desirability bias potentially influencing responses and not testing long-

term knowledge retention. The intervention's ability to affect pediatric dental caries outcomes will be assessed in the future.

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