

Motivating mothers to prevent caries

Confirming the beneficial effect of counseling

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Although a number of noninvasive preventive interventions for young children at risk of developing caries have been developed,¹ traditional health education remains the gold standard for delivering the message to encourage parents to subscribe to these preventive interventions. By “traditional health education,” we mean advice-giving sessions conducted by professionals and/or the dissemination of information via pamphlets, posters and media campaigns. Unfortunately, such approaches are not effective.²⁻⁵

In 2004, we compared a brief counseling approach—motivational interviewing (MI)—with traditional health education in a randomized controlled trial composed of the mothers of infants aged 6 to 18 months. One-year data were encouraging and are presented elsewhere.⁶ After one year, children in the MI group had, on average, 0.71 new carious lesions (standard deviation [SD] = 2.8), compared with 1.9 new carious lesions (SD = 4.8) in children in the health education group.

Without an effective approach to influence positively the behavior of mothers, dental services for high-risk children will remain focused on symptomatic treatments, restorative procedures and extractions.

ABSTRACT



Background. The purpose of this study was to compare the effect of a motivational interviewing (MI) counseling visit with traditional health education for mothers of young children at high risk of developing dental caries.

Methods. The authors enrolled 240 infants aged 6 to 18 months and their mothers in the study and randomly assigned them to MI or traditional health education (control) groups. Mothers in the control group received a pamphlet and watched a videotape. Those in the MI group received the pamphlet and watched the videotape, as well as received an MI counseling session and six follow-up telephone calls during the first year. There were no interventions in year 2.

Results. After two years, children in the MI group exhibited significantly less new caries (decayed or filled surfaces) than those in the control group (that is, a protective effect of MI) (odds ratio = 0.35, 95 percent confidence interval = 0.15 to 0.83).

Conclusions. MI is a promising approach that warrants further attention in a variety of dental contexts.

Clinical Implications. The results of this study show that MI has a protective effect with regard to the development of early childhood caries. One reason for this clinical effect is greater compliance with recommended fluoride varnish treatment regimens in families who received MI counseling compared with families who received traditional education.

Key Words. Early childhood caries; motivational interviewing; counseling; behavior.

JADA 2006;137:789-93.

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TABLE

Description of motivational interviewing counseling program.	
CONTACT	GOAL
Initial Visit	Establish rapport and the need for behavioral change; discuss menu options; use strategies that structure/reinforce change
Telephone Calls/Postcard Reminder at Three Months	Cue and reinforce behavioral change and solve any problems
Follow-up Telephone Calls	Promote maintenance and help re-establish behavioral change, if needed
Telephone Calls/Postcard Reminder at Six Months	Cue and reinforce behavioral change

Although our one-year data are valuable, they may not be sufficiently compelling to motivate clinicians to change their long-standing interactions with mothers. The aim of this article is to provide additional evidence of the efficacy of MI with mothers of young children after two years of follow-up.

SUBJECTS AND METHODS

The methods and measures used are described in a previous article.⁶ This project was a joint undertaking of the University of Washington, Seattle, and the University of British Columbia (UBC), Vancouver, in collaboration with the Progressive Intercultural Community Services Society (PICS), a community organization for South Asian immigrants in Surrey, British Columbia. The Behavioural Research Ethics Board of UBC provided approval for the project.

We recruited and enrolled 240 healthy infants aged 6 to 18 months and their mothers from the Punjabi-speaking (South Asian) community in Surrey. Young children of South Asian immigrants are at high risk of developing early childhood caries (ECC).⁷⁻¹⁰ The only exclusion criterion was a history of a serious acute or chronic disease that would interfere with our ability to examine the child or with the ability of the child and parent to participate fully.

Study design and groups. We conducted a randomized clinical trial composed of two groups. We assigned subjects to either an MI counseling or a health education (control) group, after stratifying the children into two age groups (6 to 12

months and older than 12 months) for each sex. We used age stratification to account for individual differences in the number of erupted teeth and the time of exposure to cariogenic foods. We used sex stratification to account for any parenting differences that may have affected caries risk.

Control group. Each mother in the control group received a pamphlet (in Punjabi or English) designed by the staff of the local governmental health unit and also viewed the videotape, "Preventing Tooth Decay for Infants and Toddlers." This 11-minute educational videotape, produced by the Vancouver/Richmond Health Board with the advice of one of us (R.H.), was available in Punjabi or English. The pamphlet and videotape also encouraged mothers to take their children to PICS to have fluoride varnish applied to the children's teeth.

Experimental group. Mothers in the experimental group received the same pamphlet and viewed the same videotape, received one 45-minute counseling session (discussion of the protocol is presented elsewhere⁶) and received two brief follow-up telephone calls within six weeks. To reinforce the behavioral change, mothers in the experimental group received an additional four follow-up telephone calls during the next 20 weeks. Trained laypeople also sent two postcards to the mothers, reminding them about their behavioral change. The table provides an overview of the MI counseling program.

MI protocol. One of us (P.W.) trained three local South Asian women as counselors. They received a detailed 15-page protocol. The author reviewed audiotapes of the interventions periodically to ensure that the MI protocol was being delivered consistently. (The entire protocol, consisting of the counseling session and follow-up procedures, is available from the corresponding author.) Box 1 presents sections of the protocol that focus on establishing rapport and the need for behavioral change. Box 2 presents sections that discuss the menu of options for caries-preventive behavior. Box 3 (page 792) is the list of dietary and nondietary menu items that were identified in focus groups of South Asian women.

Measures. *Caries.* We assessed caries during visual examinations using modified Radike criteria.¹¹ One of three calibrated examiners (R.H. and two local dentists) wiped the teeth with cotton gauze and examined them using front-surface mirrors and a dental light. They used

explorers primarily to remove plaque and periodically to verify cavitation of the enamel. Children were examined in the “knee-to-knee” position. After the examinations, the clinicians made treatment referrals. They did not administer any treatment themselves and any restorative therapy was completed at the discretion of the parents. (We should point out that standard doses of fluoride varnish were applied at separate visits.)

Behavior. Each parent completed two interview schedules that were used in previous studies of high-risk children.¹²⁻¹⁴ We used a modified Evens instrument¹³ to assess parenting practices, as well as dietary and hygiene practices that affect ECC. We administered these instruments to mothers at the two annual assessments. Results of these measures will be presented elsewhere.

RESULTS

As described in our previous report,⁶ baseline comparisons between the two groups—MI and control (traditional health education)—revealed only differences in the age of subjects. We found no differences in sex, diet, hygiene or frequency of dental visits for varnish applications in the first year. Children in the control group were slightly older when we recruited their mothers into the study (12 months versus 11 months, $t_{(238)} = 2.06$, two-tailed, $P < .04$). These age differences remained after two years; children in the control group were slightly older (mean \pm standard deviation [SD] age, 43.1 ± 8.4 months) than their counterparts in the MI group (40.9 ± 7.3 months). The only other group difference after two years was the mean (\pm SD) number of fluoride varnish applications received. Subjects in the control group received 0.3 ± 0.6 applications compared with 4.1 ± 1.0 applications in the MI group. No other dietary, hygiene or demographic variables were significantly different.

Logistic regression analyses confirmed our previous findings. After two years in the trial, 205 (85 percent) of 240 children were available for follow-up dental examinations. The likelihood of new carious lesions (that is, decayed or filled sur-

faces) since the start of the study in the MI group was significantly lower than it was in the control group, confirming the protective effect of MI (odds ratio [OR] = 0.35, 95 percent confidence interval [CI] = 0.15 to 0.83). At year 2, only 35.2 percent of subjects in the MI group had new carious lesions, compared with 52.0 percent of subjects in the control group ($\chi^2 = 5.67$, $P < .02$, two-sided). After controlling for age and number of fluoride varnish visits in year 2, we found that the protective

BOX 1

Establishing rapport and need for behavioral change.

The protocol begins by showing concern and encouraging the mother to talk. It requires the counselor to do the following:

Ask questions about the mother and child's welfare/health:

- “Any other children besides (child's name)?”
- “Tell me about (child's name)”
- “What is it like to be his or her mom (and have other children)?”

Ask about the mother and family's dental health, contact with dentistry and dental expenses:

- Ask about dental wants/desires for the child (choose one):
- “What do you want for your child's teeth for the future?”
- “What are your worst fears concerning your child's teeth?”
- “How would you like things to turn out?”
- “If I (or God) could grant you one wish for your child's teeth (a dental miracle), what would it be?”
- “Tell me more” or “Anything else?”

Paraphrase the mother's dental wants/desires for her child:

- “Let me be sure I understand, you would like your child to ... Please write your wants/desires on paper.”

BOX 2

Presenting the menu of options to mothers.

Counselors initiate a discussion of what other mothers are willing to do.

- “In order to (paraphrase dental health wish), I want to share with you some things we have recently learned.”
- “We have spoken to many Punjabi mothers in small groups about the dental health of their children and the steps they are willing to take. They recommended the steps I will talk to you about. These steps are on a menu I would like to show you.”
- “Let's begin by looking at the items on the list, talk about them briefly and begin to decide which ones may be for you.”

Counselors discuss the menu items, eliciting a commitment for change from the mothers and encouraging them to talk.

- “Now that you have looked at the items on the menu, which one(s) would you try?”
- “Let's talk about the ones you feel most comfortable with.”
- “How do you think each one will work? You are the expert on your family.”
- “What might go wrong? Who can help?”
- “Is this what you want to do?”

BOX 3

Menu of dietary and nondietary options for caries prevention.

- Do not let anyone add anything sugary to your child's bottle.
- Clean your baby's teeth as soon as they appear. Cleaning can be done with a small soft toothbrush or face cloth.
- Use a very small amount (smaller than a pea) of fluoride toothpaste.
- Hold your baby when feeding, then lay the baby down to sleep; if the baby awakens, give him or her water, not milk or juice.
- Limit the time your baby spends sipping and snacking, because the longer he or she takes, the greater the chance of decay.
- Use a cup.
- Offer snacks no more than two to three times a day.
- Bring your child to the dental clinic at least twice a year so the dentist can protect the baby's teeth by painting a safe fluoride medicine on them.

has a positive effect on children's dental health that is greater than that of traditional health education. The results appear to be clinically meaningful and confirm the findings of a recent meta-analysis of MI counseling trials.¹⁵

Because the behavioral recommendations chosen by the mothers varied considerably among subjects in the MI group, we cannot make comparisons of at-home parenting practices (regarding diet and hygiene) between the groups.

Fluoride varnish applications. The counselors recorded the recommendations of mothers in the MI group with regard to dental visits for fluoride varnish applications. The results of comparisons between the MI and control groups

show a higher mean number of fluoride varnish applications in the MI group during the second year of the study. This effect manifested itself even though our protocol did not include follow-up MI visits during year 2. Families in the MI group appeared to value their recommended fluoride varnish visits more than did those who received traditional health education alone, based on the number of visits for varnish application after the counseling follow-up was completed. This finding reflects the goal of MI: to positively influence the preventive behaviors of patients (or their parents).

MI training. The MI counseling approach used in this study can be learned readily by both lay health care workers and professionals. The counselors in our study mastered the MI techniques after 10 hours of training in a workshop setting. MI is appropriate not only for dental personnel, but also for community workers who frequently staff public health and early childhood programs (for example, Head Start and Women, Infants and Children programs). (The corresponding author has developed materials that facilitate training in MI techniques, and they are available from him.) Although we did not collect cost-effectiveness data, it appears that the study had a meaningful effect on the rate of new caries at a reasonable cost. Our other ongoing studies will assess carefully the cost-effectiveness of this technique.

Our protocol did not include in-person MI counseling sessions in year 2. Our telephone follow-up in year 2 was specifically to remind mothers in both the control and MI groups about impending

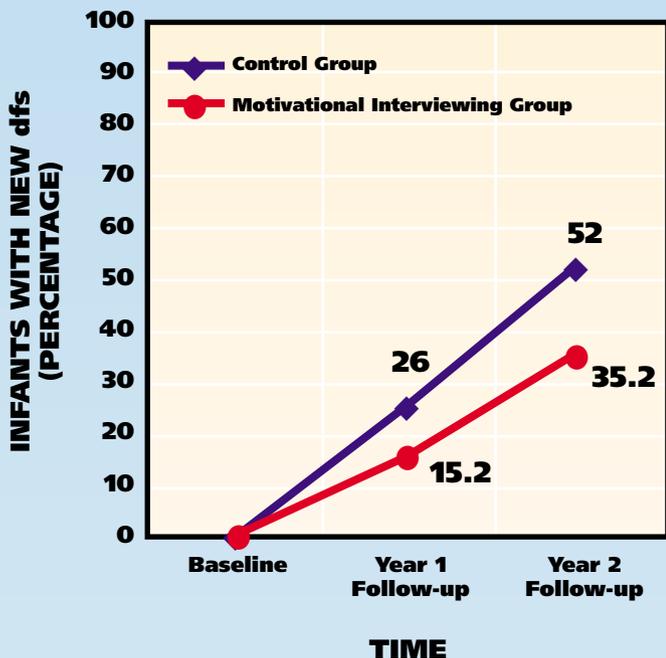


Figure. Differences in caries incidence between the groups during the length of the study. dfs: Decayed or filled surfaces.

effect of MI after two years had not diminished (OR = 37, CI = 0.76 to 1.76). The figure demonstrates this difference between the groups expressed in caries incidence over time.

DISCUSSION

The two-year results of this controlled trial, which is, to our knowledge, the only dental health study using MI counseling, suggest that MI counseling

fluoride varnish appointments, which were available at the local PICS on certain days. We believe that further telephone or in-person follow-up would serve as a booster to reduce the chance of any lapses in parental behavior becoming complete relapses. More intensive follow-up certainly would enhance the effect of the intervention.

CONCLUSION

An MI intervention enhanced the preventive behavior of mothers of young children at high risk of developing caries. This approach also may be used to counsel others at high risk of developing dental diseases. MI has proven to be useful in motivating adolescents who are engaging in high-risk behaviors,^{16,17} and, therefore, it could be used to counsel adolescents who avoid seeking health care or are unwilling to engage in preventive practices.¹⁸ Furthermore, MI can be useful for counseling related to periodontal and gingival disorders, which often develop in patients with poor long-term compliance with regard to preventive recommendations.¹⁹ ■

The study described in this article was supported by National Institute of Dental and Craniofacial Research grant P60-DE13061.

The authors are grateful for the hard work and dedication of Monika Laul Verma, Iti Chandra and all Progressive Intercultural Community Services Society staff and volunteers from Surrey, British Columbia. They also appreciate the cooperation and enthusiasm of the participating families.

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