JOURNAL CLUB

Randomized Trial of Teaching Brief Motivational Interviewing to Pediatric Trainees to Promote Healthy Behaviors in Families

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Hypothesis: That pediatric resident trainees would demonstrate increased counseling skill following training in brief motivational interviewing (MI).

Design: Randomized controlled trial.

Setting: University of Washington Pediatric Residency.

Participants: Pediatric residents (N = 18), including residents in postgraduate years 1, 2, 3, and 4.

Interventions: Collaborative Management in Pediatrics, a 9-hour behavior change curriculum based on brief MI plus written feedback on communication skills (based on a 3-month Objective Standardized Clinical Evaluation [OSCE]).

Main Outcome Measure: The percentage of MI-consistent behavior (%MICO), a summary score for MI skill, was assessed via OSCEs in which standardized patients portray parents of children with asthma in 3 clinical scenarios (stations). The OSCEs were conducted at baseline and 3 and 7 months. Blinded coders rated videotaped OSCEs using a validated tool to tally communication behaviors. Training effects were assessed using linear regression controlling for baseline %MICO. Global ratings of counseling style served as secondary outcome measures.

Results: Trained residents demonstrated a trend toward increased skill (%MICO score) at 3 months compared with control residents. At 7 months, %MICO scores increased 16% to 20% (P < .02) across all OSCE stations after the combined intervention of Collaborative Management in Pediatrics training plus written feedback. The effect of training on global ratings supported the main findings.

Conclusions: Pediatric trainees' skills in behavior change counseling improved following the combination of training in brief MI plus personalized feedback.

Trial Registration: clinicaltrials.gov Identifier: NCT00510341


THERE IS GROWING ACKNOWLEDGMENT that support for behavior change is necessary to optimize a variety of health outcomes such as promoting medication adherence, tobacco avoidance, and healthy eating.1,2 Pediatric competency requirements now recognize pediatricians' roles in supporting healthy behaviors.3 Furthermore, pediatricians rate behavior change counseling as one of the most clinically important research areas.4 This raises questions about how to effectively train pediatricians to counsel families about behavior change and to what extent physicians can acquire these skills.5-10

Motivational interviewing (MI) has emerged as an approach to assisting primary care patients with behavior change.8 A directive, patient-centered counseling style, MI helps people explore and resolve their ambivalence about changing behavior.11 Two central goals of MI are (1) to create and amplify, from the patient's perspective, a discrepancy between present behavior and broader goals and values and (2) to evoke from patients statements indicating their reasons for, desire to, or intent to change (change talk). The MI counselor builds trust and directs the patient toward increasing readiness for change.12 Techniques of MI include listening reflectively, examining both sides of patients' ambivalence, and reducing resistance by not promoting change prematurely.13 This approach differs from the traditional medical paradigm in which the

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Adaptations of MI (eg, brief MI) are effective for promoting behavior change in adults with diabetes, hypertension, risky alcohol use, and other conditions. However, research in this area is lacking in 2 respects. First, few pediatric adaptations have been rigorously evaluated. In addition, few studies in any health care setting describe the training, evaluation, and supervision of clinicians and most lack objective evaluation of providers’ MI skills. Although validated skill assessment methods using standardized patients (SPs) are often used in MI training evaluations in addiction research, few have adapted these tools for medical providers.

We adapted a brief MI curriculum for the pediatric setting, conducted pilot training with volunteer pediatric residents and fellows, and developed a skill assessment methodology using SPs. In the present study, we sought to determine the effect of training on MI skills of pediatric trainees, as measured using a standardized coding system applied to videotaped visits with SPs. We designed a randomized controlled trial, hypothesizing that trainees’ MI skill would increase with training, compared with a control group, and that subsequent tailored, written feedback would augment the effect of the training workshop.

**METHODS**

**DESIGN**

We conducted a small randomized trial of training in brief MI in which residents were randomized to behavior change training (Collaborative Management in Pediatrics [CMP]) or a waitlist control group. We assessed change in trainees’ skills at baseline and at 3 and 7 months using Objective Standardized Clinical Evaluations (OSCEs) with SPs. The 3-month CMP time point was chosen instead of immediately after training owing to scheduling constraints. The 7-month time point allowed OSCEs to be completed within the academic year.

**PARTICIPANTS**

We recruited pediatric residents and chief residents at the University of Washington Pediatric Residency between July and September 2006. Inclusion criteria were (1) having a continuity clinic at 1 of 3 large sites representing 75% of residents, (2) being on elective rotation at least once between August and October (to coincide with workshop dates), and (3) not having participated in previous CMP pilot workshops. We excluded residents who were on vacation or post-call on workshop dates. Study staff located participants to the intervention or control arms using a random number generator. We also recruited families of children with asthma (aged 2 to 12 years) scheduled for well child care with participating residents, requesting their permission to audio-tape the visit for resident skill assessment.

Intervention residents participated in a 9-hour workshop using CMP, the brief MI curriculum developed by our team, and received written performance-based feedback on their 3-month OSCE. This study was approved by the University of Washington and Seattle Children’s institutional review boards. We obtained informed consent from trainees and from the 10 parents whose visits were audio-taped, and assent from their children.

Trainees received a $20 gift certificate after each OSCE. Parents received a $20 gift certificate after each visit.

**INTERVENTION**

We used the CMP curriculum (http://depts.washington.edu/lozanop/) to train residents in techniques to promote health behavior change in families. We adapted CMP with permission from Kaiser Permanente’s Brief Negotiation program, a behavior change counseling approach that incorporates the therapeutic stance and counseling skills of MI. The CMP focuses on pediatric health behaviors, drawing examples from asthma (eg, medication adherence, tobacco use), obesity (diet and physical activity), and other areas of behavior change relevant to child health. Because the evidence in support of brief MI in medical settings has come largely from adult studies, we designated the parent (not child) as the main target of CMP and focused on families with children aged 2 to 12 years.

Two MI trainers (P.L. and C.R.) delivered the curriculum to two 4.5-hour workshops consisting of interactive presentations, demonstrations, videotapes, and skill practice. The first workshop focused on skills (eg, asking open-ended questions, reflective listening, assessing readiness to change, and making summary statements). Residents practiced the steps of a CMP encounter (Figure 1) and received feedback in the second workshop.

Intervention arm participants also received performance-based feedback on their 3-month OSCE (described below). A trainer reviewed OSCE tapes and provided written feedback in the form of a letter noting CMP skills and tools used particularly skillfully and those warranting further practice. The OSCE videotapes were used both as outcomes assessment and intervention component (Figure 2).

**OBJECTIVE STRUCTURED CLINICAL EXAMINATIONS**

We developed a set of OSCEs to assess trainee skill. Each consisted of 3 clinical scenarios (stations) in which SPs portrayed parents of children with asthma in a 12-minute segment of a visit. All SPs were experienced in simulating patients in health care education settings. The SPs received training regarding CMP and rehearsed OSCE stations.

We chose asthma because it is common and management involves multiple behaviors. The OSCE stations depicted parents of children with moderate, persistent asthma who had problems starting or adhering to controller medications and avoiding environmental triggers. To assess skills used in working with parents of varying motivation for behavior change, we designed each 12-minute station to represent 1 of the 3 levels of readiness to change (not ready, unsure, and ready), based loosely on Prochaska and DiClemente’s Stages of Change model. For example, one station depicts a mother who is eager to try increasing medication adherence (ready), whereas another depicts a mother who is defensive about her smoking and unwilling to talk about cessation (not ready). Trainees were given a written summary of the history and physical examination results and were instructed to begin the simulation at the point in a clinic visit at which they were beginning to discuss the plan with the parent. All OSCEs were videotaped.

Three research assistants independently reviewed randomly assigned OSCE recordings (while blinded to time point, study arm, and resident identifiers) using the Motivational Interviewing Treatment Integrity scale (MITI). Coders received 60 hours of training including review of videotaped MI sessions produced by Miller and colleagues. A member of the Motivational Interviewing Network of Trainers with experience in measuring MI skillfulness in varied settings (B.H.) led coder training. Coders attended weekly meetings to promote consistent application of scoring decisions and monitor reviewer drift.
Collaborative Management in Pediatrics

Set the Stage
- Ask permission to discuss topic
  "Is it OK if we spend a few minutes talking about her asthma?"
- Explore thoughts and feelings
  "Tell me more about your concerns about his weight."
- Listen
  "It sounds like reducing her exposure to smoke has been a real challenge for your family."

Provide Information and Feedback
- Present facts
  "Children with weight difficulties often benefit from being more active. What are your thoughts on that?"
- Express concern about possible health consequences
  "I’m concerned that not taking her asthma medication every day is making her cough worse. What do you think?"
- Elicit patient response
  "On a scale of 0-10, how ready are you to have her start a controller med?"
- Listen
  "A five? I’m curious why you chose a five and not, say, a three?"

Assess Readiness to Change
- Use ruler
  "What do you like about smoking?...What don’t you like about smoking?"
- Acknowledge patient’s position
  "It sounds like you’re not ready to think about starting this new medication right now."
- Explore number choice
  "A five? I’m curious why you chose a five and not, say, a three?"
- Summarize
  "What’s your next step?"

Explore Ambivalence/Elicit Change Talk
- Strengthen commitment
  "Why do you feel ready now?"
  "What’s your next step?"
- Facilitate action planning
  "What do you like about eating healthier?...What do you like about smoking?...What are some reasons you can think of for building more physical activity into her routine?"
  "Where does this leave you now? Is there anything you’d like to do between now and our next visit?"
- Ask about the next step
  "What do you like about smoking?...What don’t you like about smoking?"
  "What would need to be different for you to start her on a controller?"
  "I’m here to help and I’m confident you can make a change in his eating habits when you’re ready."

Close the Conversation
- Express confidence
  "What’s your next step?"
- Acknowledge patient’s willingness to discuss change
  "Why is eating healthier important to you?"
- Confirm next steps, including follow-up visit
  "What’s your next step?"

MITI 2.0 SCALE

The MITI 2.0 is an established instrument for measuring MI fidelity, previously used to code SP encounters in medical settings. Seven practitioner communication behaviors are tallied continuously; among these were (1) open questions (questions that promote patient narrative by allowing a range of responses); (2) reflections (statements that convey understanding of patient perspective by repeating or paraphrasing parent statements or those that introduce new meaning or emphasis); and (3) MI-adherent behaviors (eg, asking permission to discuss a topic, affirming/supporting the parent, emphasizing parent control). In addition, the MITI 2.0 includes 2 global ratings (reviewers’ gestalt judgments) of residents’ counseling styles regarding empathy/understanding and MI spirit (a composite of the resident’s collaboration with the SP, attempts to evoke the SP’s perspective, and support for SP autonomy), rated on a Likert scale (scores, 1-7).

OUTCOME MEASURES

Guided by others using the MITI to capture practitioners’ MI skillfulness, we computed the percentage of MI-consistent behavior (%MICO) summary score. We defined %MICO as the proportion of all resident communication behaviors coded as open questions, reflections, or MI-adherent behaviors. These behaviors are more likely than others to be followed by patient change talk and are associated with behavior change. We computed %MICO scores for each OSCE recording and computed group means by station. Secondary measures were global ratings of MI spirit and empathy.

SCORING RELIABILITY

Interrater reliability was computed for MITI elements in a random 40% of encounters reviewed by all raters. Pooled intraclass correlation coefficients were computed using a 2-way mixed model, reflecting collective rater agreement. Compared with published psychometric standards and prior MI studies, our data had adequate scoring reliability across all counted behaviors and global ratings (intraclass correlation coefficients, 0.57-0.93). Reliability was excellent for open and closed questions; good for giving information, MI-nonadherent behavior, and simple reflections; and fair for complex reflections, MI-adherent behavior, empathy, and MI spirit. In addition to sound measurement across the individual constructs, our computed primary outcome measure, %MICO score, also demonstrated high interrater reliability (intraclass correlation coefficient, 0.88).

SCORING RELIABILITY

We used a traditional scale reliability approach to assess the consistency of MITI elements across OSCE stations (not ready, unsure, and ready). For each MITI element, a 3-item scale was formed consisting of the element as assessed in the 3 stations. Cronbach α values computed for these scales were generally low, suggesting variability in resident behavior across OSCE stations. Accordingly, randomized controlled trial analyses were conducted separately by station.

STATISTICAL ANALYSIS AND POWER

Effects of training and feedback on resident skill (%MICO score, empathy, and MI spirit) were assessed using linear regression, controlling for baseline values, stratified by OSCE station. Sample
size was limited by the number of residents available to participate. All eligible residents were approached.

A convenience subsample of 8 participants from both arms provided a total of 10 audiotapes of patient visits after training to assess the ecological validity of OSCE-derived skill assessments. Spearman correlations assessed the strength of the association between %MICO in this set of tapes and %MICO at the 7-month OSCE for the same residents. Statistical analyses were run using Stata 9.0 (Stata Corp, College Station, Texas).

### RESULTS

Of the 84 residents, 29 met inclusion criteria (Figure 3), of whom 11 refused (reasons included lack of interest or time). Eighteen residents provided consent and were randomized to training plus feedback or wait list control. Two had incomplete data. The eventual sample (n=16) was predominantly female (75%), representative of the residency program. Participants consisted of 7 residents in postgraduate year 1, 5 in year 2, 3 in year 3, and 1 chief resident (postgraduate year 4). All reported some exposure to MI during medical school, typically a single lecture. Intervention arm residents attended the CMP workshop and received personalized written feedback based on 3-month OSCEs. Intervention and control groups were balanced with respect to postgraduate year.

Resident use of MI-consistent behaviors (%MICO score) at 3 time points is shown in Table 1. Prior to training, the two arms were similar, with close to a third of utterances consistent with MI (Table 1). Among control residents, the effect of time on %MICO score varied across stations, from a slight increase (ready) to a slight decrease (unsure). Among residents trained in CMP, the %MICO score in the ready and not ready stations rose at 3 months and stayed higher than baseline at 7 months. In the unsure station, the %MICO score fell slightly at 3 months then rose to slightly above baseline at 7 months.

Linear regression results, controlling for %MICO score at baseline, are shown in Table 2. At 3 months there was a significant effect of training on the %MICO score in the ready station (+18%; P=.009). Increases in the other 2 stations were not statistically significant. Training plus feedback was associated with significant increases in all 3 stations at 7 months: not ready (+18%; P=.02), unsure (+20%; P=.001), and ready (+16%; P=.01) relative to untrained controls. Sample size did not permit subanalyses.

At baseline, the mean (SD) ratings of residents’ MI spirit were 3.6 (1.6) in the ready station; 2.9 (1.4), unsure; and 2.4 (1.1), not ready (range, 1-7). At both 3 and 7 months, MI spirit ratings of resident counseling style in all stations rose more from baseline in trained residents compared with controls. In linear regression models controlling for baseline ratings, the effect at 3 months was statistically significant in the not ready (+1.8; P=.02) and ready (+3.5; P<.001) stations only. At 7 months, this difference between arms was statistically significant in the unsure (+1.6; P=.02) and ready (+1.8; P=.001) stations only. The effect of training on empathy ratings was less pronounced.

We compared the %MICO scores in audio taped clinic visits with %MICO score in the OSCEs in a convenience sample of 8 residents from the 2 arms to assess the OSCEs’ ecological validity. Spearman correlation coefficients were 0.49 for the not ready station, 0.94 for unsure, and 0.70 for ready, suggesting that the OSCEs provided a reasonable approximation of actual clinical practice.
This study provides support for the effect of training in brief MI on the communication style that pediatric trainees exhibit with standardized patients. We found an increase in resident use of MI-consistent behaviors (eg, open-ended questions, reflections, affirmations, and supportive statements) following CMP training when compared with an untrained, randomly assigned control group. Global rating of counseling style (MI spirit) also rose more among residents who received training.

The effect of CMP training on %MICO is more pronounced at 7 months than at 3 months in the residents, increasing by 16% to 20% from a baseline of 25% to 37%. Others have found that, following the posttraining skill increase, skills decline without additional doses of training. The greater increase in %MICO score at 7 months in our study may be owing, in part, to the written feedback based on 3-month OSCEs (Table 2). It is also possible that trained residents had clinical experiences that reinforced their use of brief MI apart from formal feedback.

Our study adds to the growing literature on training health professionals in brief MI. Ours is one of a few studies to use validated tools to assess performance-based outcomes, either based on videotaped encounters or written responses, making comparisons difficult. Our main outcome measure (%MICO) is computed from the validated MITI 2.0 instrument, represents a broad behavioral index of key MITI elements, and is consistent with training objectives. Prior research suggests that similarly conceived indices correlate with other MI fidelity measures, are responsive to training, and predict health behavior change.

Trials documenting MI’s efficacy in health care rely largely on interventionists with prior MI experience or who receive extensive training and supervision. In contrast, most health care clinicians using brief MI receive modest training and minimal performance feedback. As interest in MI grows, standards for training, skill assessment, and proficiency benchmarking will be critical for maintaining treatment fidelity and safeguarding internal validity. The wide variability in %MICO scores found for our trainees (SD range, 6-17; Table 1) supports the importance of skill assessment in rigorous evaluation of brief MI curricula.

The study has several limitations. The small sample size, single institution, and 38% refusal rate limit generalizability to the larger population of pediatric residents. Were this training to be made mandatory, it is not clear that the same effect would be achieved. However, there were no outliers in the distributions of our main outcome (%MICO), and secondary outcomes echoed the main findings. Because we did not assess skills immediately after training, any changes in the 3 months after training would have gone undetected. We did not assess long-term training effects beyond 7 months; yet, this time frame exceeds that of many published training trials. Possible barriers to dissemination to other residency programs include time commitment (a 9-hour workshop may be infeasible) and the dearth of faculty with MI skills. Finally, lack of patient outcomes limits our ability to extrapolate from behavior change counseling to actual patient and/or family behavior change. However, clinician proficiency in MI is associated with behavioral outcomes such as medication adherence, smoking cessation, and reduced problem drinking. Caveats notwithstanding, trial findings advance our understanding of how training plus feedback can enhance pediatric residents’ skills in delivering empirically supported counseling.

The therapeutic stance and skills taught of MI—eliciting patient/family perspective, affirming patient autonomy, and supporting self-efficacy—are relevant to ongoing national quality improvement efforts that put provider communication style and patient-centered care in the forefront of health care innovation and medical education. The Institute of Medicine has advocated for patient-centered care, defined as providing care that is respectful of and responsive to individual patient preferences, needs, and values, as a key to improving health care quality. The Accreditation Council for Graduate Medical Education’s Pediatric Residency Review Committee recognizes the need for formal training in communication with patients and families, requiring that residents demonstrate “interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.” Motivational interviewing–based approaches may confer benefits beyond the realm of behavior change counseling by enhancing the patient-centeredness of other facets of the health care encounter.

Training pediatrics residents in brief MI produces measurable improvements in counseling skill that persist for at least 7 months. Replication of our findings in a larger multicenter sample with a broader variety of skill indicators is needed. Future trials should address optimal length/format of training, integration of MI into residency training, sustainability of skills, integration of behavior change counseling into the health care encounter, and the effect of adoption of MI skills by pediatricians on patient outcomes.

Accepted for Publication: December 10, 2009.

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Financial Disclosure: None reported.

 Funding/Support: This study was supported by grant R21 HL080067 from the National Institutes of Health; the Group Health Community Foundation; and Seattle Children’s Hospital.


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