



Motivational Interviewing Training Outcomes Among Providers in a Children's Hospital

Elizabeth C. Victor^{1,2} · Ana F. El-Behadli^{1,2} · Wade C. McDonald² · Chelsea D. Pratt^{1,2} · Melissa A. Faith^{2,3}

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Abstract

Motivational interviewing (MI) has proven a well-established psychotherapeutic intervention designed to enhance motivation for behavior change. While the benefits of MI have been established, little research has systematically evaluated dissemination of MI efforts to healthcare providers, especially among pediatric providers. The present pilot study evaluated whether healthcare providers gained valuable knowledge, confidence and desire to utilize MI, and skills in MI techniques and if these outcomes varied based on provider characteristics or duration and intensity of MI training. Twenty pediatric healthcare professionals in a large academic pediatric hospital completed an advanced 20-h MI training and 103 pediatric healthcare professionals completed a basic 4-h MI workshop. The study demonstrated no significant differences in post-workshop MI knowledge, confidence, or desire based on trainee demographics. We also found no significant change from post-basic workshop to post-advanced workshop for advanced MI trainees. However, the advanced training workshop participants evidenced significant growth in utilizing MI skills (via MITI coding) and self-reported confidence in using MI skills. We therefore conclude that while the basic workshop allows participants to gain valuable MI knowledge and confidence and desire to utilize MI, it is through the advanced training that providers have the opportunity to practice these skills, receive feedback, and ultimately gain the expertise necessary to be effective MI providers. Overall, results from this pilot study suggest MI training in pediatric hospitals represents an important area of opportunity for multidisciplinary training, dissemination, and practice.

Keywords Motivational interviewing · Pediatric psychology · Provider training · Provider education · Dissemination

Introduction

Motivational interviewing (MI) is a well-established person-centered, goal-oriented psychotherapeutic intervention designed to enhance motivation for target behavior change (Miller & Rollnick, 2013). MI is effective across a wide variety of pediatric medical contexts, including reducing adolescent risk-taking and improving medical regimen adherence (Gayes & Steele, 2014). Despite benefits even when delivered in short increments in medical settings (Gayes &

Steele, 2014), MI has yet to be systematically disseminated to healthcare professionals.

Although most healthcare professionals feel confident in their knowledge base, fewer than half feel confident motivating patient change (O'may, Gill, McWhirter, Kantartzis, Rees, & Murray, 2016). Further, up to 56% of pediatric residents report wanting additional MI training to enhance clinical skills (Frintner, Liebhart, Lindros, Baker, & Hassink, 2016). In response to growing recognition that MI is a valuable medical care adjunct, researchers have begun investigating MI healthcare provider dissemination. Although originally developed for mental health professional delivery, MI has demonstrated improved patient outcomes when implemented by diverse healthcare service professionals (Lundahl, Kunz, Brownell, Tollefson, and Burke's, 2010). Several studies document improved healthcare provider MI confidence, skills, and knowledge and improved patient health behaviors and ratings of provider empathy following MI training (Cook et al., 2017; Gecht-Silver, Lee, Ehrlich-Jones, Bristow, 2016; Nightingale, Gopalan, Azzam, Douaihy, &

✉ Melissa A. Faith
MFaith1@jhmi.edu

¹ Children's Health, Department of Psychiatry, Children's Medical Center, Dallas, TX, USA

² Department of Psychiatry, University of Texas Southwestern Medical Center, Dallas, TX, USA

³ Johns Hopkins All Children's Hospital, ABPP 880 6th Street South, Suite 440, St Petersburg, FL 33701, USA

Conti, 2016; Sanci et al., 2015). A recent meta-analysis using a study-specific behavioral coding system also demonstrated that MI healthcare professionals have improved patient care behaviors in actual and role-played interactions, despite MI training variability in format and duration (de Roten, Zimmermann, Ortega, & Despland, 2013). Overall, most extant studies included resource-intensive 6–9-h trainings, with a smaller subset evaluating 4-h trainings (Madson, Loignon, & Lane, 2009; Soderlund, Madson, Rubak, & Nilsen, 2011).

MI experts (Miller, Yahne, Moyers, Martinez, & Pirritano, 2004) recommend multi-session MI training to reach adequate MI clinical proficiency. However, most healthcare professional training consists of brief single sessions (Madson et al., 2009). Miller et al. (2004) found that multiple contacts with individual mentoring and support for the trainee over time lead to greater application of MI skills with patients. However, this is not always possible in busy medical settings where time spent in training is also time spent away from billable patient care activities. Given research supporting that even single-session MI training (median duration of 9 h) demonstrates increased knowledge of and confidence in using MI skills (Soderlund et al., 2011), it may be possible that one to two professionals from each institutional clinical area could undergo intensive MI training and then act as MI leaders and coaches to staff who have received only basic MI training. Healthcare professionals are increasingly participating in team-based care (American Association of Colleges of Nursing, 2011); thus, an important research question may be which interdisciplinary team members are most likely to benefit from MI basic and/or intensive MI training. To date, few studies have investigated these questions. Lundahl et al. (2010) meta-analysis found no differences in MI training outcomes related to demographics or professional group; however, de Roten et al. (2013) found that mental health professionals demonstrated better MI training outcomes compared to other professionals. de Roten et al. (2013) findings were replicated on a more recent meta-analysis of RCTs involving MI in medical settings conducted by Lundahl et al. (2013) analyzed moderators of MI outcomes and found that although different provider types (i.e., mental health professionals, physicians, nurses, dietitians, mixed) produced positive outcomes, only mental health providers and mixed teams reached statistical significance. Moderator analyses conducted by Lundahl et al. (2010, 2013) in their meta-analyses of MI suggest the efficacy of MI is robust even when delivered by different types of providers, regardless of amount of MI training. However, type of provider and length of MI training have been the only two provider variables that have been consistently studied as potential MI moderators. Consequently, there is little knowledge regarding the potential moderating effects of other provider characteristics such as demographic

variables (e.g., age, gender) and training-related variables (e.g., MI knowledge).

Additional research is needed to continue identifying strategies for effectively and efficiently disseminating MI in pediatric settings. Given current healthcare climates emphasizing cost effectiveness (Folland, Goodman, & Stano, 2016; Hollingsworth, 2008), evaluating brief, workshop-style trainings is particularly timely. This pilot study evaluated impacts of provider characteristics (i.e., age, gender, specialty, MI knowledge, desire to implement MI, and confidence of implementing MI) on MI knowledge, desire, and confidence following both a basic one-time 4-h workshop and an advanced 2-h ten-session-long advanced MI training for pediatric healthcare providers. We hypothesized all providers who underwent basic MI training would demonstrate improved MI knowledge, confidence, and desire, but that post-training MI knowledge and confidence would be greater for mental health providers compared to other medical professionals. We also hypothesized that the majority of providers who underwent MI advanced training would improve their MI skills such that they reach expert-level MI proficiency, with all providers who underwent advanced training reaching at least basic MI competency (Please see “Method” section for specific details on criteria for meeting proficiency and competency).

Method

Participants

Participants included 123 pediatric healthcare professionals in the basic workshop (Age $M(SD) = 36.75 (8.879)$; 8.1% male; 38.2% medical provider, 45.5% mental health provider, 16.3% medical support staff [e.g., telehealth coaches, resource coaches, research coordinators]), and 20 pediatric healthcare professionals in the advanced workshop (Age $M(SD) = 39.05(9.411)$; 15% male; 15% medical provider, 60% mental health provider, 25% medical support staff).

Measures

Background Questionnaire

This questionnaire was developed for this study to assess demographics, profession, reason for attending, and prior MI training.

MI Knowledge Questionnaire (MIKQ)

Because literature has not converged on a standard MI knowledge assessment, we developed the MIKQ. The MIKQ consists of 19 multiple-choice questions assessing

MI evidence-based and skill knowledge. Because time constraints prevented some participants from completing all items, MIKQ scores were calculated as a percentage of correct responses. Fifty-seven percent of participants completed all pre-test questions ($M = 17.33$, $SD = 3.83$ out of 19 total questions, $median = 19$). Seventy-four percent of participants completed all post-test questions ($M = 17.85$, $SD = 4.44$ out of 19 total questions, $median = 19$). Exploratory factor analysis using Promax rotation yielded a unifactorial solution for the MIKQ. MIKQ internal consistency was $\alpha = .61$ pre-workshop.

Basic Skills Training Perceptions Questionnaire (BSTPQ)

Because measures of MI training satisfaction have not been well validated and time constraints warranted a brief measure of trainee satisfaction, we developed the BSTPQ to assess workshop content satisfaction and instruction satisfaction. Eleven items are rated on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). The arithmetic mean of these 11 responses was used in analyses (internal consistency $\alpha = .98$). The BSTPQ also contains two items assessing pre/post-training confidence motivating patients/families to change (1 = not at all sure, 4 = very sure) and three open-ended questions about workshop strengths/weaknesses.

Motivational Interviewing Treatment Integrity (MITI) 4.2.1

All advanced MI trainees completed a mock-MI session at the end of each training session. Mock-MI sessions were coded to assess MI fidelity per the MITI Coding Manual (MITI version 4.2.1; Moyers, Manuel, & Ernst, 2014; see Appendix S). As stipulated in the MITI Coding Manual (MITI version 4.2.1; Moyers et al., 2014), raters assign a single, categorical behavioral code to clinician utterances (e.g., open question, complex reflection) and assign four global ratings assessing the clinician's overall MI style and fidelity. Consistent with recommendations from Moyers et al. (2014), utterances are parsed and coded within a single pass.

For this study, per stipulations provided in the MITI 4.2.1 manual, session-level behavior code summary indices (e.g., % open questions, % MI-inconsistent behaviors), and global ratings were used to determine whether each mock-MI session met criteria for incompetence, basic competency, or expert-level proficiency (Moyers et al., 2014).

For clarity, throughout “Results” and “Discussion” sections, participant changes in *knowledge* refers to findings from the MIKQ, *confidence and desire to utilize MI* refers to results from the BSTPQ, and *skills* refers to results from the MITI 4.2.1.

Procedure

This pilot study included a naturalistic group comparison. We offered seven 4-h basic MI workshops in a large academic pediatric hospital. Workshops were initially requested by specific physicians and educators but then became a larger hospital-wide initiative. Staff from departments that initially requested training could attend one of the first four workshops. Staff from all hospital departments could attend one of the last three workshops. Advertisement included hospital-wide newsletters, department manager contact, and word-of-mouth. Workshops included ~ 20-min guided MI observation, ~ 55-min micro-skill practice with feedback, ~ 130-min didactic instruction, ~ 15-min break time, and ~ 20-min pre/post-assessment (see Fig. 1). All participants completed the background questionnaire and MIKQ pre-training and the MIKQ and BSTPQ post-training. The MIKQ was scored as a percentage of correct responses out of the number of questions attempted, so that participants' scores were not penalized for lack of available time prior to the workshop. All participants could receive nursing, licensed mental health counselor, psychologist, physician, social work, or physical therapy continuing education credits (a total of 4 credits). Participants who opted to participate in advanced training could receive 9 or 10 credits; 9 credits if they missed one class and 10 if they did not miss any classes. If a participant missed more than one class, he or she could not receive any continuing education credits.

We also offered two advanced trainings (1 per year), each consisting of ten 2-h learning sessions over 3.5 months. Anyone who completed the basic workshop and had department support could attend the advanced training. Advanced trainings were designed to help learners move toward basic competence or expert-level MI proficiency so advanced learners could help guide and remind staff in their respective units to use MI. Advanced training sessions consisted of ~ 5 min of MITI 4.2.1 coding sheet review from the previous learning session, ~ 50 min of didactic teaching, ~ 30 min of practice exercises (e.g., group coding a recorded MI session, class members practicing MI skills with instructor live feedback), ~ 30 min during which classmates paired up and took turns as clinician in a mock-MI session, and ~ 5 min of break time. Between each session, the instructor used the MITI 4.2.1 coding system to provide global MI fidelity scores and behavior counts of clinician behaviors per the audio-recorded mock-MI sessions. The instructor also wrote personalized instructions on each MITI 4.2.1 coding sheet recommending specific skills on which the learner should work for the next recording. Coding sheets were returned to each participant at the beginning of the subsequent learning session. In addition to materials completed during the basic workshop and audio recordings collected during each learning session, advanced training participants also completed

a baseline mock-MI session before advanced training began and completed the MIKQ and BSTPQ at the end of the advanced training. We included all advanced workshop participants in our analyses of basic workshop outcomes.

Results

Basic Workshop

Of basic workshop participants, 32.9% reported they were required by their department to attend the training, 95% sort of or strongly agreed they “learned a lot,” 92.8% reported they sort of or strongly enjoyed the class, and 94.3% reported they sort of or strongly agree that they will use MI in their clinical practice. In open-ended questions about participant experiences, the majority of participants described wanting the workshop to be longer. Participants also requested printed Powerpoint slides instead of the summary of key points provided at the beginning of the workshop (see Fig. 1).

Advanced Training Program

None of the advanced training participants were required to attend the program. Out of the 20 participants who began the advanced training, 1 attrited because of “bad timing” and 4 were missing either pre- or post-knowledge and attitude assessments because of a session absence. In open-ended questions about participant experiences, common participant feedback was to extend the duration of each training session and to include more “off weeks” so participants would have additional time to practice MI skills before the next training session. Throughout the advanced training, ten participants voluntarily met individually with the instructor for additional

live feedback while jointly coding the participant’s previous mock-MI session. Of the ten participants who met with the instructor outside of the regularly scheduled classes, nine participants met with her for approximately 1 h and one participant met with the instructor for 2 h. All ten of the participants who met individually with the instructor suggested requiring future attendees to meet individually with the instructor at least one to two times during the training course.

Knowledge and Skill-Based Training Outcomes

Paired *t* tests revealed MI knowledge ($t(90) = -15.86, p < .001$), confidence ($t(101) = -7.43, p < .001$), and desire ($t(117) = -2.76, p < .01$) increased pre- to post-basic workshop training (see Tables 1, 2; Fig. 2).

Demographic Differences in Training Outcomes

One-way ANOVA revealed no difference in MI knowledge improvement ($F(2,108) = 1.58, p = .21$) or post-workshop MIKQ scores ($F(2,111) = .76, p = .47$) among providers from different specialties (Medical vs. Mental Health vs. Medical Support Staff) in the basic workshop. A linear regression analysis was performed in which age, gender, and specialty were used to predict MI knowledge improvement among the basic workshop participants, while controlling for advanced workshop participants. The overall regression model (see Table 3) was significant ($F(5,75) = 2.381, p = .046$) but age was the only significant determinant within the model ($\beta = -.260, t = -2.307, p = .024$). Repeated measures analyses including only those participants who participated in the advanced training showed an increase in MI knowledge (positive change in MIKQ scores) from pre-basic workshop ($M(SD) = 52.73(11.78)\%$) to post-basic workshop ($M(SD) = 77.00(12.62)$; $p < .001$) and from pre-basic workshop to post-advanced training

Fig. 1 Advanced workshop knowledge scores

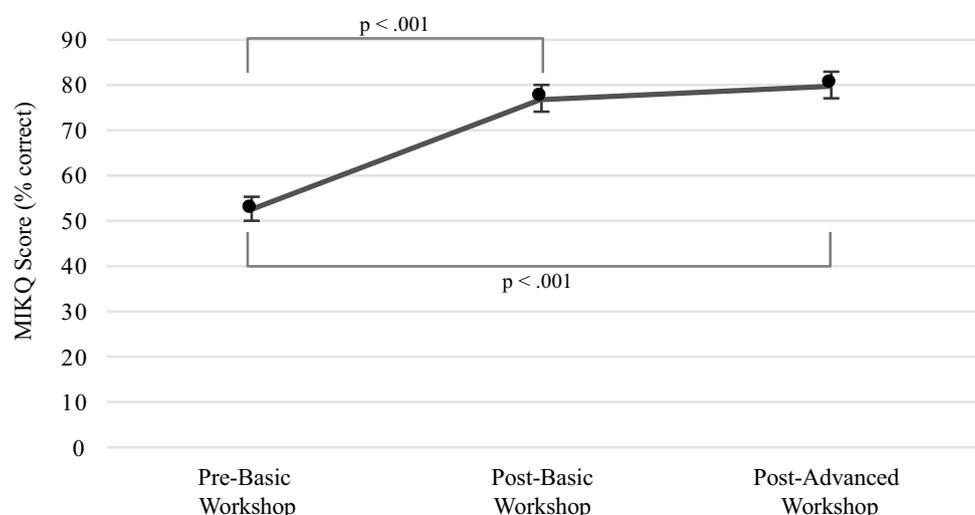


Table 1 Basic workshop outcomes

	Pre-training M(SD)	Post-training M(SD)
Knowledge scores (% correct)**	46.54% (15.59%)	73% (14.04%)
Desire to implement MI*	3.00 (1.36)	3.38 (.64)
Confidence in using MI**	1.72 (1.12)	2.57 (.60)

* $p < .01$

** $p < .001$

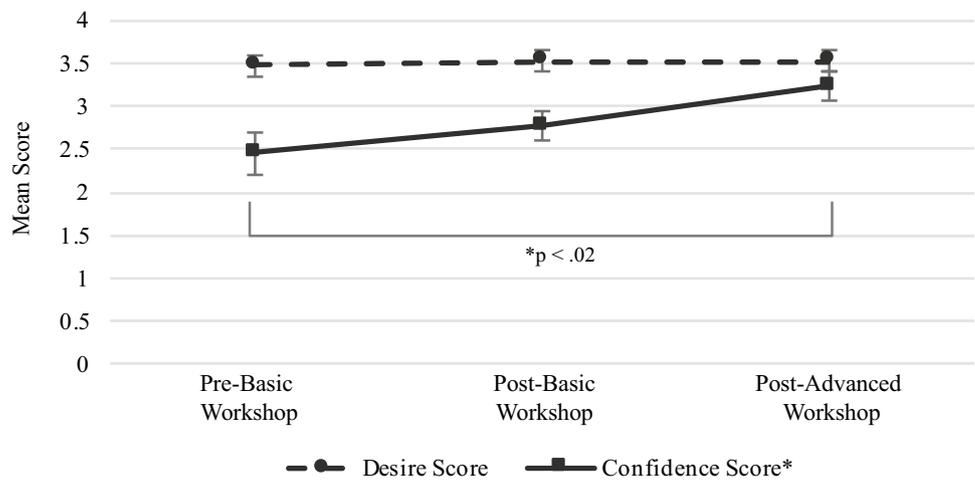
Table 2 Advanced workshop outcomes

	Basic workshop	Advanced workshop	
	Pre-basic M(SD)	Post-basic M(SD)	Post-advanced M(SD)
Knowledge scores (% correct)*	52.73% (11.78%)	77.00% (12.62%)	79.87% (13.85%)
Desire to implement MI	3.47 (.52)	3.53 (.52)	3.53 (.52)
Confidence in using MI**	2.46 (1.13)	2.77 (.73)	3.23 (.73)

*Pre-basic to post-basic and pre-basic to post-advanced $p < .001$

**Pre-basic to post-advanced $p = .02$

Fig. 2 Desire and confidence scores



* = significant finding, $p < .05$

Table 3 Demographic regression model to predict change in pre/post score

Predictor	Unstandardized		Standardized		R^2	ΔR^2	F	p
	B	SE	β	p				
Step 1					.025	.025	2	.161
Advanced workshop participant	- 7.127	5.04	- .157	.161				
Step 2					.137	.112	2.381	.046
Advanced workshop participant	- 4.502	8.886	- .099	.377				
Age	- .502	5.066	- .260	.024				
Gender	10.936	.218	.185	.099				
Medical specialty	5.437	5.599	.141	.335				
Mental health specialty	- .736	5.105	- .021	.886				

Italic values indicate statistical significance $< .05$

($M(SD) = 79.87(13.85)$; $p < .001$), but no significant change from post-basic workshop to post-advanced training, $F(13) = 32.14$, $p < .001$. Repeated measures analyses showed no significant changes over time in desire to use MI (pre-basic $M(SD) = 3.47(.52)$; post-basic $M(SD) = 3.53(.52)$; post-advanced $M(SD) = 3.53(.52)$; $F(13) = .13$, $p = .88$) but did find significant changes in MI confidence from pre-basic ($M(SD) = 2.46(1.13)$) to post-advanced ($M(SD) = 3.23(.73)$) training. The proportion of advanced training participants who met criteria for basic competency and advanced proficiency (as measured by the MITI) steadily increased throughout the training course, with 80% of participants reaching advanced proficiency and 100% of participants reaching at least basic competence by the end of the course (see Fig. 1).

Discussion

MI is an evidence-based, widely used method supporting health behavior change (Burke, Arkowitz, Menchola, 2003). Recent systematic review found single medical professional training sessions lead to increased MI knowledge (Miller & Rollnick, 2013). However, research is needed to determine whether MI can be effectively and efficiently disseminated to interdisciplinary pediatric medical teams and whether shorter workshop-based trainings result in provider MI knowledge change. Moreover, it is important to consider staff differences in MI training receptivity and knowledge gains. Research elucidating predictors of MI trainability may improve MI dissemination efforts, allowing tailored staff training as needed.

This pilot study investigated utilized a naturalistic group comparison to determine whether a single 4-h workshop versus an advanced ten-session workshop could propagate increased MI knowledge across providers with diverse medical backgrounds. Consistent with a 10-year follow-up study (Cook et al., 2017) and meta-analysis (Lundahl et al., 2010), the basic workshop results demonstrated no significant differences in post-workshop MI confidence or desire based on trainee profession. Given O'May's et al. (2016) recent finding that many medical professionals lack confidence motivating patient change, hospital systems and physician education programs may find workshop-style MI trainings helpful in improving provider confidence, as all of the current study trainees reported increased knowledge and confidence following the workshops.

We also found no difference in post-basic workshop knowledge between medical and mental health providers. Interestingly, we found no significant MI knowledge change from post-basic workshop to post-advanced workshop for advanced MI trainees. However, the advanced training workshop evidenced significant growth in trainees' MI skills (via

MITI coding) and self-reported MI confidence. Eighty percent of participants reached advanced MI proficiency by the end of the advanced training. We therefore conclude that while the basic workshop allows participants to gain valuable MI knowledge, it is through the advanced training that providers actually have the opportunity to practice these skills, receive feedback, and ultimately gain the expertise necessary to be effective MI providers.

Our findings suggest 4-h workshop-based training may be equally effective in improving participants' MI knowledge and confidence to deliver MI compared to 20-h advanced training across licensed professional disciplines, but that extensive training is needed to ensure providers' MI proficiency. This finding underscores a cost-effective way to disseminate MI in large pediatric hospital systems, but also underscores the potential value of intensively training a limited number of providers across clinical departments to act as in-department MI advocates and coaches. Future investigation should evaluate whether providers who undergo the advanced training can and do coach and support providers who undergo only basic MI training.

Lessons Learned

In reviewing participants' reported experiences across basic and advanced workshops, both via responses to quantitative measures and verbal or written comments during course evaluations, common themes emerged. The majority of participants were not required by their department to attend the workshops, which could suggest that providers more interested in learning MI skills will also be more likely to attend workshops, gain knowledge, and perhaps apply that knowledge to patient care. Moreover, the majority of participants (> 92%) endorsed learning a lot, enjoying the class, and possessing a strong willingness to use MI in their clinical practice, demonstrating that many healthcare providers are eager to employ evidence-based psychotherapeutic strategies as part of integrative patient care. From both basic and advanced workshop trainees, the majority described a desire to extend training opportunities, either by attending longer and/or more frequent training sessions. In the advanced training, multiple participants voluntarily met individually with the instructor for live feedback and felt strongly meeting individually with the instructor should be a requirement of the training course. Advanced trainees also requested "off weeks" between training sessions to practice their MI skills. This participant feedback is valuable for future MI training programs to consider.

Additional lessons learned from this pilot study included the need for departmental chair support to encourage and support medical care staff to attend workshops. Although we did not collect specific data on departmental support, we observed that departments with leadership supporting the

training initiative had greater representation among basic workshop and advanced training participants. Moreover, support from more senior faculty in departments may also shape the culture of a healthcare system and its desire to improve patient care with innovative training programs like MI workshops. With regard to specific workshop details, it is recommended that class sizes be capped at a reasonably small number to allow trainee participation and class discussion. Setting clear expectations for class attendance is also crucial for trainings that involve many sessions, as many of the skills learned each week build upon previously learned skill sets.

Anecdotally, we found that training hospital personnel in evidence-based psychotherapeutic skills provided added value to the hospital system and helped hospital leadership better understand contributions psychologists can make in healthcare settings. Hospital-wide trainings also allowed the psychology team greater exposure within the hospital system, which may have improved appropriate providers' utilization of and consultation with psychology services.

Limitations and Future Directions

This pilot study had a number of limitations. Foremost, this pilot study was not a randomized controlled trial, but rather a naturalistic group comparison, not allowing us to randomize participants to training conditions to fully compare the results of participants receiving and not receiving MI training in terms of knowledge change or confidence to use MI. An additional consequence of this study design was that a number of participants were unable to complete the entire MIKQ before the workshop began. We attempted to mitigate this issue by scoring the MIKQ as percentage correct out of attempted items. While only 32.9% of basic workshop participants were required to attend the workshop by their clinical department, data were not collected on enrollment requirements for the advanced training group. Given the time commitment and length of training, it is very likely that participants who chose to attend the advanced workshops were especially motivated to improve their MI skills in delivering clinical care. Future controlled studies should also explore how requirements for MI trainings impact interest and perception of the training, as well as knowledge, confidence, and skill in delivering MI clinically post workshops.

Because standard measures of MI knowledge and MI training satisfaction do not yet exist in the literature, our study utilized novel measures of these constructs. Additional study is needed to further validate these measures. Lack of standard measurement also impedes our ability to compare our study findings with other published studies evaluating MI training programs.

Our sample included predominately White female trainees. Although this demographic reflects the largest

professional groups (e.g., nurses) in our hospital, differences might emerge in more diverse samples. Additionally, a single trainer conducted all MI training. Consistent with the pilot nature of this study, the study is limited by a non-standardized knowledge evaluation tool and only same-day follow-up assessments. Because this training was conducted in the employer setting, participants may have falsely represented their MI confidence and desire; however, the large range of confidence and desire scores suggests many participants responded accurately to these items.

Future, larger scale studies should evaluate whether the MI workshops enhance knowledge beyond what could be gained from even briefer web-based or in-person tutorials. Future studies should also investigate whether knowledge improvements persist over time and correlate with improved MI skill performance, frequency of MI use, and patient outcomes. It will be important to investigate the impact of the advanced training sessions in helping to identify in-department MI staff consultants across clinical departments. Future studies should investigate discrepant long-term MI knowledge retention by training intensity and whether having in-department consultants promotes MI use in routine medical care. A limitation of this study is that of the amount of time spent in meeting with the instructor outside of regularly scheduled classes was not systematically tracked. Future research studies should explore whether additional one-on-one time improved MI knowledge and performance over time and determine at what point this extra time is attributing to not only valuable, but statistically significant changes over time. Overall, results from this pilot study suggest MI training in pediatric hospitals represents an important area of opportunity for multidisciplinary training, dissemination, and practice.

Compliance with Ethical Standards

Conflict of interest Elizabeth C. Victor, Ana F. El-Behadli, Wade C. McDonald, Chelsea D. Pratt, and Melissa A. Faith declare no conflicts of interest. No forms of payment were given to anyone to produce the manuscript.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Informed Consent All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Human and Animal Rights This study complied with all ethical standards and human rights as required by the University of Texas Southwestern Medical Center Institutional Review Board.

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