Feasibility of a Smoking Cessation Intervention for Teens in the Emergency Department: Reach, Implementation Fidelity, and Acceptability

By Kimberly Horn, EdD, Geri Dino, PhD, Candice Hamilton, MPH, N. Noerachmanto, MA, MSc, MAPS, and Jianjun Zhang, MS

**Background** Traditional efficacy research alone is insufficient to move interventions from research to practice. Motivational interviewing has been adapted for brief encounters in a variety of health care settings for numerous problem behaviors among adolescents and adults. Some experts suggest that motivational interviewing can support a population health approach to reach large numbers of teen smokers without the resource demands of multisession interventions.

**Objectives** To determine the reach, implementation fidelity, and acceptability of a brief motivational tobacco intervention for teens who had treatment in a hospital emergency department.

**Methods** Among 74 teens 14 to 19 years old, 40 received a brief motivational tobacco intervention and 34 received brief advice/care as usual at baseline. Follow-up data were collected from the interventional group at 1, 3, and 6 months and from the control group at 6 months. For the interventional group, data also were collected from the teens' parents, the health care personnel who provided the intervention, and emergency department personnel.

**Results** Findings indicated low levels of reach, high levels of implementation fidelity, and high levels of acceptability for teen patients, their parents, and emergency department personnel. Data suggest that practitioners can operationalize motivational interventions as planned in a clinical setting and that patients and others with an interest in the outcomes may find the interventions acceptable. However, issues of reach may hinder use of the intervention among teens in clinical settings.

**Conclusions** Further investigation is needed on mechanisms to reduce barriers to participation, especially barriers related to patient acuity. (American Journal of Critical Care. 2008;17:205-216)
Motivational interviewing is a common technique used to facilitate clinic-based brief smoking intervention, an emergent strategy for teen smokers. Brief intervention with motivational interviewing facilitates (1) patient-centered negotiation in which a provider responds sensitively to a patient’s feelings about quitting smoking, especially motivational ambivalence; (2) consideration of the patient’s values and preferences; and (3) shared decision making between the patient and the provider.

Since its development, motivational interviewing has been adapted for brief encounters in a variety of health care settings for numerous problem behaviors among adolescents and adults. For instance, recent studies indicated that brief, tailored interventions with motivational interviewing are at least as effective as other treatment methods for mild-to-moderate alcohol problems and are clearly superior to no treatment. Some research suggests that these motivational techniques also may be useful for smoking cessation among teenagers. Because motivational interviewing occurs in a single “on the spot” intervention (usually <30 minutes), many experts suggest that it supports a population health approach to reach large numbers of teen smokers without the resource demands of multisession interventions. Moreover, and particularly important for teens, motivational interviewing may be acceptable to teens “because of its brief duration, nonconfrontational and empathic therapist style.”

Together, these factors suggest that clinic-based brief interventions with motivational interviewing may be a feasible method to promote smoking cessation or reduction among teens. Yet few investigators have examined the overall feasibility of using clinic-based motivational strategies to change behaviors among teens, particularly in the settings for which these methods are most recommended (ie, hospital clinics and emergency departments). The lack of feasibility assessment has critical implications, because interventions for which implementation is unfeasible are not likely to be widely adopted, even if the interventions are effective.

A better understanding of the feasibility of a clinic-based teen smoking cessation with motivational interviewing requires that researchers go beyond conventional evaluations that focus solely on efficacy. Glasgow et al argue for broader evaluation strategies and eloquently point out that the “efficacy-based research paradigm that dominates our current notions of science is limiting and not always the appropriate standard to apply.”

Feasibility can be assessed by answering questions such as the following: How much does it cost? What are the time requirements? Does it require staff training? Do we have access to the target population? How much space will we need? Do we have the necessary equipment? Can we access program materials? Does the program require any additional services (eg, transportation)? Moreover, feasibility must address critical factors of patient reach, patient and practitioner acceptability, and ease of implementation (see following list for definitions).

As part of a larger evaluation study, we examined the feasibility of implementing a brief motivational tobacco intervention (MTI) for teens who had treatment in the emergency department at Ruby Memorial Hospital, Morgantown, West Virginia. We assessed feasibility on the basis of 3 factors: Reach: Did the program sufficiently access and recruit targeted teens for the intervention?
2. Implementation fidelity: Was the intervention delivered as planned?

3. Acceptability: Did patients, staff, and parents perceive the intervention as meaningful and acceptable?

We hypothesized that the MTI would reach at least 75% of age-eligible smokers who came to the emergency department for care, be implemented as described, and be acceptable to patients, patients’ parents, providers, and other emergency department staff.

Methods

Participants

Data were collected from teen participants, parents of participants, MTI providers, and emergency department personnel. Teen participants were patients 14 to 19 years old who came to the emergency department for care for any reason during a 2-year period (2002-2004). Teens were eligible for the intervention if they reported smoking on 1 or more days in the preceding 30 days, volunteered to participate, spoke English, provided parental consent (if <18 years old), and provided written assent or consent. Consent and assent forms approved by the institutional review board were used. Teens were ineligible if they arrived in police custody; had severe communication deficits such as an inability to speak English or severe impairments in hearing, vision, or speech; were deemed mentally incompetent by the emergency department staff; had immediately life- or limb-threatening conditions or could not be contacted because of the course of treatment; or were verbally or physically combative toward staff.

Data were collected from teens at baseline (immediately before implementation of the MTI) and 1, 3, and 6 months later. Parents of the participants were interviewed and completed a questionnaire at baseline. MTI providers recorded essential fidelity information (ie, the extent to which the MTI was delivered as planned) immediately after each interview with a teen participant. Emergency department staff completed a questionnaire approximately 6 months after the onset of the study. Nonphysician staff were interviewed because they were the ones most likely to interact with the participants in the MTI program and its providers.

Procedure

A blinded, randomized 2-group design was used. Teens were divided into 2 different groups: one group received the MTI; the other received brief advice/care as usual (BA). The MTI consisted of (1) screening; (2) a 15- to 30-minute face-to-face motivational interview tailored to the patient: readiness assessment, reflection on smoking behaviors, and a general health inventory; (3) a stage-matched, self-help workbook with audio (called the Power Guide); (4) a handwritten personal postcard within 3 days of the visit to the emergency department; and (5) 3 follow-up “booster” telephone calls at 1, 3, and 6 months after the visit to the emergency department.

BA consisted of (1) screening; (2) 2 minutes or less of generic advice to quit smoking; (3) referral to 1-800 Health Line, a general information source; and (3) a follow-up phone call 6 months after the visit to the emergency department.

Trained providers were located in the emergency department during the busiest periods (noon-midnight) for intake of patients. Providers had relevant backgrounds in social work, psychology, and public health education and received approximately 75 hours of on-site training in motivational interviewing, the study protocol, and all relevant study forms. Training also included role-playing, hands-on practice, and direct observation by us in the emergency department.

A highly prescribed, blinded randomization procedure was used. Specifically, all required study forms were collated into folders for the MTI and BA intervention groups, then combined in a single stack in random order as generated by the SAS random number function (SAS Institute Inc, Cary, North Carolina). Each randomized manila folder contained either the MTI or the BA forms and instruments required for implementation with a teen patient. The stack had equal numbers of MTI and BA folders of equal weight and size. Each provider took a folder from the stack (located in a secure location in the emergency department) before approaching a patient. The provider had no knowledge of the contents of the folder and did not know the patient’s group assignment until the folder was opened. For additional details, see Horn et al and Hungerford et al.

Data Collection

Reach. Reach was determined by using the following variables: total number of age-eligible patients during all shifts; total number of age-eligible patients available during the MTI shift coverage; total number of age-eligible patients approached who were current smokers; and total number of age-eligible smokers who assented and consented, withdrew, and complied through follow-up. Several sources were used to assess reach, including the emergency department-based injury surveillance system (EDBISS). EDBISS, the hospital’s central database, provided data on the

On average, teens smoked half a pack of cigarettes per day.
The smoking rate in the target population was 30.7%, which was lower than anticipated.
Reach

On the basis of 1997 EDBISS data, we initially expected that 2446 age-eligible teen patients would be present in the emergency department during a 12-month period (totaling 4892 in years 2 and 3 of the trial). On the basis of data from the 1998 Youth Risk Behavior Survey, Centers for Disease Control and Prevention, we planned for a 41.9% smoking rate or 1024 teen smokers in each year (2048 total). During the study period, 6749 age-appropriate patients (14- to 18-year-olds in 2003; 14- to 19-year-olds in 2004) came to the emergency department for treatment, a number higher than our original projection of 4892 teens (see Figure).
Approximately 2699 age-eligible teens were present during shift coverage. Critically important, the Health Insurance Portability and Accountability Act went into effect during the study. These new regulations made it impossible to track reasons for nonapproach of all age-eligible patients. Therefore, only estimates of the total eligible youth were available from EDBISS.

Among 2699 age-appropriate teens available during shift coverage, providers approached or reached 896 (33.2%). If overall reach is calculated on the basis of 6749, the total number of possible age-appropriate youth within and beyond our shift coverage, the reach is 13.3%. Precisely 59 teens were outside the age requirements, had already been approached in a previous visit, or had no guardian with them; thus, the overall smoking rate was calculated on the basis of 841 teens. Among those teens, 579 reported that they were not smokers. We classified the remaining 258 teens as smokers, for a smoking rate of 30.7% in the targeted patients.

Of note, the smoking rate in the target population (West Virginia teen smokers in the emergency department) was lower than we anticipated (30.7% vs 41.9%; between 1998 and 2004, the teen smoking rate in West Virginia decreased from 41.9% to 24%). If the 30.7% smoking rate in the targeted patients is applied to the total 6749 age-eligible teens and the 2699 approached during our shift coverage, the number of eligible teen smokers was approximately 2071 overall and 828 during shift coverage. As a bottom-line estimate, we reached approximately 6.2% (128 of 2071) of the total smokers in our population overall and 15.5% (128 of 828) during the shift periods covered by our providers.

A total of 128 of the 896 teens approached (14%) were eligible to participate in the study. Among the 52 who chose not to participate, the most frequently cited reason for refusal was acuity or severity of condition (54%); approximately one-third of patients offered no reason for refusal (33%). Precisely 76 of 128 teens (59.4%) consented to be in the study. One participant was discharged before finishing the assessment, bringing the sample to 75. Among those 75 patients, 1 patient withdrew after the MTI assessment; the reported reason was acuity.

At 1, 3, and 6 months, 1 of 40 (28%), 17 of 40 (42%), and 28 of 74 (38%) teen participants were available, respectively. An attrition analysis was conducted to detect any baseline differences between teens who provided 6-month follow-up data and those who did not. A 2 (present/absent) x 2 (MTI/BA) multivariate analysis of variance of number of cigarettes smoked on weekdays and weekends, nicotine dependence, age, and previous attempts to quit smoking revealed no significant differences between teens who did or did not (present/absent) provide data at 6-month follow-up. The quit outcomes are discussed extensively elsewhere.16 In summary, among the 74 participants, 2 quit smoking, 1 teen in each treatment group at 6-month follow up. Cessation rates were not significant. However, a medium effect size (Cohen’s $h = .38$) was found for reduction in smoking and a large effect for percent reduction (Cohen’s $h = .69$).

### Implementation Fidelity

Fidelity was assessed by determining if the MTI was delivered as planned in the emergency department. As recommended by Miller and Mount,17

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### Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total</th>
<th>Motivational tobacco intervention</th>
<th>Brief advice/care as usual</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of days youth smoked in the past 30 days, mean, SD</td>
<td>25.40 (.76 (n = 75)</td>
<td>26.98 (.728 (n = 41)</td>
<td>23.50 (.105 (n = 34)</td>
<td>.09$^b$</td>
</tr>
<tr>
<td>Number of cigarettes smoked every day, mean, SD</td>
<td>9.91 (.798 (n = 56)</td>
<td>10.23 (.726 (n = 31)</td>
<td>9.52 (.894 (n = 25)</td>
<td>.75$^b$</td>
</tr>
<tr>
<td>Number of cigarettes smoked on weekdays, mean, SD</td>
<td>8.50 (.668 (n = 75)</td>
<td>9.34 (.648 (n = 41)</td>
<td>7.45 (.688 (n = 34)</td>
<td>.23$^b$</td>
</tr>
<tr>
<td>Number of cigarettes smoked on weekends, mean, SD</td>
<td>12.68 (.818 (n = 74)</td>
<td>14.59 (.835 (n = 41)</td>
<td>10.38 (.746 (n = 33)</td>
<td>.03$^b$</td>
</tr>
<tr>
<td>Ever tried to quit or cut back smoking, %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>75 (n = 56)</td>
<td>71 (n = 29)</td>
<td>79 (n = 27)</td>
<td>.40$^c$</td>
</tr>
<tr>
<td>No</td>
<td>25 (n = 19)</td>
<td>29 (n = 12)</td>
<td>21 (n = 7)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100 (n = 75)</td>
<td>100 (n = 41)</td>
<td>100 (n = 34)</td>
<td></td>
</tr>
<tr>
<td>Number of times tried to quit or cut back, mean, SD</td>
<td>1.98 (.04 (n = 56)</td>
<td>2.24 (.118 (n = 29)</td>
<td>1.70 (.078 (n = 27)</td>
<td>.05$^b$</td>
</tr>
</tbody>
</table>

$^a$ Values for n are number of teens.
$^b$ 2-tailed t test.
$^c$ $\chi^2 = 0.74.$
analysis for intervention assessment and fidelity was based on 1-time data collection from providers after each MTI intervention with a patient. Descriptive frequency analysis was applied. As intended, MTI patients received a higher dosage of provider contact/intervention in the emergency department than did the BA patients (20.45 minutes vs 2.03 minutes; Table 2). When all patient contact from baseline to follow-up was factored in, MTI patients received a mean of 30.6 minutes of contact compared with 11.86 minutes for BA patients.

As indicated by state-of-the-art recommendations, providers were required to discuss various topics related to smoking and its consequences with the patients, tailoring topics to the needs of each patient. The gold standard for measuring adherence to a motivational interviewing protocol is direct observation by trained third-party observers and by videotaping. Because our intervention was administered in the emergency department, which is a crowded and often unpredictable environment, videotaping was not feasible or ethical. Instead, immediately after each interaction with a teen participant, providers used the MTI provider intervention assessment form to self-rate the delivery of the intervention. The results suggest that the required components of MTI were administered as required (Table 3).

The most discussed topics were physical consequences of smoking (75% of patients), reasons for cutting back (70% of patients), and how patients worked on their confidence for quitting (55% of patients). In support of the providers’ responses, patients’ responses revealed that MTI patients had higher awareness about the importance of smoking cessation at follow-up (mean, 6.18 at baseline and 7.81 at 6-month follow-up; \( P = .04 \)). Providers also assessed the MTI patients’ stages of change in smoking behavior during the course of the intervention. At the end of the intervention, providers perceived that 38% (15 patients) planned to quit smoking in the next 6 months, whereas 32% (13 patients) did not. Goal setting is an important feature of motivational interviewing; providers perceived that 7 patients (18%) had set a goal to “stop smoking.”

Providers were required to give each MTI patient the Power Guide workbook before the patient left the emergency department. The workbooks were given to teens as planned. Of the 16 patients in the MTI group who participated in the 6-month follow-up, 56% (9 patients) reported using the workbook (Table 4) and 78% (7 patients) reported that it helped them change their smoking behavior. Half of the patients who reported quitting or reduced smoking used the workbook. However, no significant
relationships were detected between workbook usage and changes in smoking behavior.

Teens had favorable responses to the MTI project; 100% believed it to be somewhat or very helpful and 82% reported new knowledge as a result of the project (Table 5).

The 10 members of the emergency department staff who returned the staff survey were aware of the intervention and agreed or strongly agreed that the emergency department is a good place to intervene with teen smokers (Table 6). Of the 10 respondents, 9 reported that they were adequately informed about the project.

A total of 13 parents/guardians completed the parent questionnaire at baseline, expressing their opinions about the acceptability of the motivational tobacco intervention; 10 of these (77%) reported current smoking (Table 7). However, parents were overwhelmingly supportive of both MTI and youth participants’ desire to stop smoking. A total of 12 parents (92%) believed that the emergency department was an appropriate place for a teen smoking intervention. In addition, 6 parent smokers (46%)...
the eligible smokers would consent to participate in the study; our actual consent rate was 59%. The lower-than-predicted consent rate has several possible explanations. First, the initial study projections were based on the assumption of a 41.9% smoking rate among teens in West Virginia, which was the rate at the time of study preparation. The teen smoking rate dropped significantly between 1999 and 2004, from 42% to 24%.18 The smoking rate among our age-appropriate study sample in the emergency department was about 30.7%, so fewer teen smokers were available than anticipated.

Second, we experienced higher-than-expected patient acuity. General patient acuity is defined as “the number of patients requiring emergency department resuscitation efforts and/or admission to the hospital.”19 Most of the teens were approached during our shift coverage.

Discussion

Reach

The teens in the study appropriately represented the target population. Teens were daily smokers, averaging about one half-pack of cigarettes (10) per day. Most teens had made at least one previous attempt to quit smoking. Although more age-eligible teens than projected sought care in the emergency department during the study period, the study reach was significantly lower than expected. Estimates suggest that we reached only 6.2% of the age-eligible smokers, 15.5% during our shift coverage. On the basis of previous studies on smoking cessation in teens, we predicted that about 75% of the eligible smokers would consent to participate in the study; our actual consent rate was 59%. The lower-than-predicted consent rate has several possible explanations. First, the initial study projections were based on the assumption of a 41.9% smoking rate among teens in West Virginia, which was the rate at the time of study preparation. The teen smoking rate dropped significantly between 1999 and 2004, from 42% to 24%.18 The smoking rate among our age-appropriate study sample in the emergency department was about 30.7%, so fewer teen smokers were available than anticipated.

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Table 6

Acceptability of the motivational tobacco intervention (MTI) by emergency department personnel

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Unsure</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was acquainted with the MTI providers who delivered the MTI in the emergency department</td>
<td>70</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Overall, my interactions with the MTI providers were positive</td>
<td>60</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Overall, the MTI providers “fit” into the flow of routine procedures in the emergency department</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The MTI service should continue in the emergency department</td>
<td>60</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Patients who received MTI spent more time in the emergency department than those who did not receive MTI</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>80</td>
<td>0</td>
</tr>
<tr>
<td>MTI goes beyond the service or treatment patients would ordinarily receive in the emergency department</td>
<td>0</td>
<td>70</td>
<td>20</td>
<td>0</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 7

Acceptability of the motivational tobacco intervention by parents/guardians

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Don’t care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you want your teen to stop smoking?</td>
<td>92</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Do you believe your teen can stop smoking?</td>
<td>92</td>
<td>0</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>How supportive will you be if your teen decides to try to quit smoking?</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>How supportive will other people in his or her household be?</td>
<td>67</td>
<td>33</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Do you think the emergency department is as good as any place to give teens information about quitting smoking?</td>
<td>92</td>
<td>0</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>If you smoke, would you be interested in receiving information for yourself about quitting smoking?</td>
<td>46</td>
<td>23</td>
<td>8</td>
<td>23</td>
</tr>
</tbody>
</table>
daylight hours, which are the busiest emergency department shifts and when high acuity is most likely. More important, certain types of illnesses, such as pains and infections, are highly correlated with patients’ acuity. Among our teen patients, pain was the most common reason for their visit to the emergency department. Finally, two-thirds (1803 of 2699; 66.8%) of the age-appropriate youth in the emergency department during our shift coverage were not approached by the providers. Again, the primary reasons were related to patients’ acuity.

Fidelity

Exploring fidelity allowed us to determine if the intervention was delivered as planned. On the basis of the theoretical components prescribed by the motivational interviewing framework, data suggested that providers administered motivational strategies as trained. Consistent with state-of-the-art recommendations, the providers used several methods to facilitate change in smoking behavior. Results from the provider assessments suggest that providers administered the required MTI components. Providers covered a variety of topics; the most common were confidence, physical consequences of smoking, and reasons for quitting. However, despite providers’ perceptions that patients moved along the stages of change from contemplation to preparation, actual patient data indicated that patients remained in the contemplation stage throughout the study. A majority of patients in the MTI group reported that they used the Power Guide workbook. Of note, MTI patients showed significant increases in recognizing the importance of quitting. During the intervention, as perceived by the MTI providers, 17 of 40 teens (42%) set a goal to stop or cut back on smoking. This finding suggests that the discussion of relevant MTI topics achieved its intended goal in almost half of the patients.

Acceptability

All teen patients who provided follow-up data agreed that the MTI approach was a helpful one for smoking cessation. Most (82%) reported learning new information, and all agreed or strongly agreed that the emergency department is a good place to address smoking cessation in teens. At 1-month follow up, 6 of 11 MTI teens said that if they had not received a smoking intervention in the emergency department, they would not have received it at all. Emergency department staff also supported the project. One concern before the study began was that the intervention would disrupt day-to-day operations in the emergency department. On the emergency department staff survey, 100% of respondents agreed or strongly agreed that MTI fit in well with the day-to-day emergency department flow; 100% also agreed that the MTI should continue as a routine service.

Similar support was indicated by the teens’ parents. Most parents (92%) stated that they wanted their teens to stop smoking, and 92% believed that the emergency department was as good a place as any to deliver cessation services. In addition, among the 77% of parents who also smoked, almost half were amenable to receiving information to aid their own cessation efforts.

Limitations

Several limitations should be noted. First, 96% of the study participants were white. In addition, most were from West Virginia, which is largely a rural state. Thus, caution is warranted when applying these results to nonwhite or nonrural populations. Second, our refusal rate was high. Among 128 age-eligible teens, 52 chose not to participate. Refusals were mainly due to acuity issues. As such, our sample reflects emergency department patients with minor medical conditions; such patients may be the most appropriate subpopulation for this type of cessation service. Last, our follow-up percentage was lower than anticipated. At 1, 3, and 6 months, 11 of 40 (28%), 17 of 40 (42%), and 28 of 74 (38%) teen participants, respectively, were available for follow-up, a situation that may introduce biases in favor of compliant teens. However, of note, attrition analyses showed no differences between the characteristics of teens available at baseline and those available at the critical comparison 6-month follow-up.

Conclusion

Motivational interviewing is promoted as a population-based option for addressing teen smoking cessation in clinical settings. Although encouraging results with motivational interviewing have been reported, most researchers have focused solely on efficacy outcomes, leaving feasibility questions unanswered. Although efficacy studies are critical, we cannot conclude that an efficacious intervention also will be suitable, acceptable, and delivered as intended in the intended settings. As a
result, traditional efficacy research alone is insufficient to move interventions from research to practice.\textsuperscript{14}

In this feasibility study, we explored the reach, implementation fidelity, and acceptability of a brief MTI for teens who came to the emergency department for treatment. Our findings indicate low levels of reach, high levels of implementation fidelity, and high levels of acceptability for teen patients, their parents, and emergency department personnel. Overall, our findings suggest that motivational interventions can be operationalized as planned in a clinical setting and may be acceptable to patients and others who have an interest in the outcomes. However, despite high fidelity and acceptability, the MTI did not achieve the desired results in terms of reach and efficacy.\textsuperscript{16} Although compared with teens in the BA group, twice as many teens in the MTI group reduced smoking, the MTI teens did not quit smoking. Significant reduction rates, however, suggest the value of MTI for reducing the harm associated with smoking.

Our positive findings of implementation fidelity and acceptability must be considered in the context of treatment efficacy and reach, including the challenges of recruiting young smokers in clinical settings such as the emergency department. Sometimes interventions may be effective under controlled conditions but not feasible or acceptable in real-world clinical conditions. Other times, as in this study, interventions may be mostly feasible and acceptable but not effective in terms of complete cessation. Our findings underscore the importance of examining all facets of intervention programming. Crucial feasibility issues of reach, recruitment, and retention require in-depth investigation, especially in clinical settings where patients’ acuity must be considered.

Our findings provide several important lessons for researchers and practitioners. First, like Glasgow et al.\textsuperscript{13,14} we recommend that researchers who examine smoking cessation in teens take a comprehensive approach, exploring a range of intervention factors, including both efficacy and feasibility. This type of approach will increase understanding about the suitability of an intervention for widespread use in specific clinical settings. Different settings may pose different or unique challenges. As we found, the emergency department presents unique challenges because of the acuity of the patients. It may be necessary to administer these types of interventions among certain subgroups of teen patients with less severe signs and symptoms or conditions. Many emergency departments across the United States now have mechanisms to “fast track” nonacute patients.

Second, in contrast to other types of clinical settings, emergency departments provide time-limited patient-provider relationships. Because no established relationships exist, motivational interventions may require a tailored approach to establish trust and reach teens in emergency department settings and to retain the teens for follow-up contact.\textsuperscript{23}

Finally, despite a carefully executed intervention protocol, we did not affect large numbers of teens. Protocol fidelity does not necessarily dictate high reach and high impact. Nonetheless, those who participated had positive views of the program. The study findings underscore the importance of understanding the potential barriers to the reach of the intervention before it is implemented. Before implementation, researchers and practitioners should carefully and strategically plan to address barriers to reach and recruitment that may be unique to or characteristic of a particular clinical setting.

Although the overall results of the MTI were negative in terms of quit rates, it is premature to suggest that emergency department–based motivational interventions are not effective for teen smokers. Specifically, the reduction in smoking in our efficacy study\textsuperscript{15} indicates that motivational interviewing may have some value as an approach to reduce the harm of smoking. Still, our findings may raise concerns about the appropriateness of using the emergency department for smoking interventions with teens. In previous research\textsuperscript{24,25} with adults in the same emergency department, this setting was effective for delivering a motivational intervention for alcohol problems. Unfortunately, in this study with teens, our methods did not allow us to determine whether low reach was due to the setting or to the interaction between the setting and the targeted population.

We also were unable to determine if the challenges faced in our study were typical of emergency department settings, arose from the particular teen population cared for in this rural emergency department, or were the function of programming in the context of research. Before the emergency department is discounted as a setting for smoking cessation in teens, additional studies should address the feasibility of an emergency department–based teen smoking intervention in multiple clinic-based settings, and under research and nonresearch conditions.\textsuperscript{26}

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Despite high fidelity and acceptability, this motivational tobacco intervention did not achieve expected levels of reach to subjects or efficacy.
REFERENCES


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Evidence-Based Review and Discussion Points
Kimberly Horn, Geri Dino, Candice Hamilton, N. Noerachmanto and Jianjun Zhang

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