Published in final edited form as:

Addict Res Theory. 2015 ; 23(5): 421–428. doi:10.3109/16066359.2015.1025062.

Participant report of therapist-delivered active ingredients in a telephone-delivered brief motivational intervention predicts taking steps towards change

Christina S. Lee¹, Richard Longabaugh², Janette Baird³, Val Streszak³, Ted Nirenberg³, and Michael Mello³

¹Department of Applied Psychology, Northeastern University, Boston, MA, USA

²Center for Alcohol and Addiction Studies, Brown University, Providence, RI, USA

Emergency Medicine, Injury Prevention Center, Brown University, Providence, RI, USA

Abstract

Objective—Given the widespread potential for disseminating Motivational Interviewing (MI) through technology, the question of whether MI active ingredients are present when not delivered in person is critical to assure high treatment quality. The Participant Rating Form (PRF) was developed and used to evaluate therapist-delivered active ingredients in phone-delivered MI with hazardous drinking Emergency Department patients.

Method—A factor analysis of all PRFs completed after receiving one call ($n=256$) was conducted. Multiple regression analysis was used to examine whether PRF factors predicted a measure of motivation to change -- taking steps—at the second call ($n=214$).

Results—The majority of participants were male (65%), with a mean age of 32 years and with an average alcohol ASSIST (Alcohol, Smoking, and Substance Involvement Screening Test) score of 20.5 ($SD = 7.1$). Results of the factor analysis for the PRF revealed Relational (working collaboration) and Technical (MI behaviors) factors. After controlling for demographics, alcohol severity, and baseline readiness, the technical factor predicted self-report of increased taking steps towards change while the relational factor did not explain any additional variance.

Conclusions—Our study adds to the growing literature investigating patient perspectives of therapist skill as a source of information to better understand MI active ingredients. The PRF is a feasible instrument for measuring the patient's experience of phone-based MI. Results indicate that MI active ingredients of change (relational and technical components) were present in the telephone intervention as hypothesized. Clinical Trial Registration # 01326169.

Keywords

Motivational intervention; participant perspective; alcohol; active ingredient

INTRODUCTION

Motivational Interviewing (MI) is a “collaborative, goal-oriented style of communication... designed to strengthen personal motivation for...a specific goal” (Miller & Rollnick, 2013, p. 12), with documented efficacy in addiction treatment (Heather, 2005; Hettema, Steele, & Miller, 2005), in other health domains (Lundahl, Kunz, Brownell, Tollefson, & Burke, 2013), with children (Gayes & Steele, 2014), and with adolescents (Cushing, Jensen, Miller & Leffingwell, 2014). While identifying mechanisms underlying the effectiveness of MI has been prioritized (Heather, 2005), the new standard for empirically-supported treatments is to specify what treatment elements carry its effects (Magill & Longabaugh, 2012, p. 878). These important treatment elements, also known as active ingredients, are key features of the treatment (Magill & Longabaugh, 2014; Morgenstern, 2012) that can be measured through “ measurement of enacted behaviors of the therapist” (Magill and Longabaugh, 2012, p. 879). The most consistently identified MI active ingredient has been therapist active shaping of the client’s language during treatment sessions (Morgenstern et al., 2012). Identification of active ingredients requires a full model testing mediational paths (Magill & Longabaugh, 2012), and the research on MI active ingredients is sparse but increasing.

A growing empirical base demonstrates that asking clients about their treatment experience helps to understand how treatment facilitates behavioral change in psychotherapy (Townend & Braithwaite, 2002), and in MI (Montgomery, Sanning, Litvak, & Peters, 2014; Lee et al., 2007; Madson et al., 2013; Orford et al., 2006; Orford, Hodgson, Copello, Wilton, & Slegg, 2009). The focus on client perspectives of treatment is particularly relevant to underlying MI change process, because MI is based on the principle of promoting client autonomy and voice (Marcus, Westra, Anugs, & Kertes, 2011; Madson et al., 2013). Research suggests that clients can identify MI active ingredients (e.g., affirmation, acceptance (Morgenstern et al., 2012)) in MI therapist behaviors (Angus & Kagan, 2009; Marcus, Westra, Angus, & Kertes, 2011; Zuckoff, 2003), and that these active ingredients are associated with change behaviors (Kertes, Westra, Angus, & Marcus, 2011; Lee et al., 2007; Lee et al., 2010). For example, participants interviewed after receiving MI for their generalized anxiety disorder identified therapist empathic attunement and support of their needs as instrumental in helping them to envision and take steps towards change (Angus & Kagan, 2009). Participants have also identified high MI spirit (empathy, collaboration, evocation, support of the client’s goals or autonomy (Miller & Rollnick, 2013) as being instrumental to developing a sense of mastery and hope, (Angus & Kagan, 2009), helping them to articulate their concerns about change openly and to discuss the possibility of making a change (Marcus et al., 2011). Similarly, a qualitative analysis of selected participants from the UKATT study revealed that feeling understood by the counselor was among the elements that induced change (Orford et al., 2006; Orford et al., 2009). In a study that recruited emergency department patients, participants were randomized to receive a motivationally-enhanced intervention (MET) for their hazardous drinking, and then completed ratings of their experience (Lee et al., 2007). ED patients who reported gaining “a new understanding” about how alcohol affected their lives after receiving MET reported reductions in alcohol-related negative consequences 12 months following the treatment.

In the studies mentioned above, participants were asked for their feedback either immediately following the intervention received or shortly afterwards. The ED study asked for participant feedback immediately after receiving MET (Lee et al., 2007). The UKATT study asked participants to report on their attributions of the "...positive changes that had occurred in drinking" (Orford et al., 2006, p. 61) at 3 and 12-months following treatment received. Another study asked African-American participants to rate their treatment after completing three sessions of motivational enhancement therapy (MET) to reduce substance use. African-American participants rated a greater number of treatment components to be more helpful than their White counterparts, even after controlling for demographic variables, treatment assignment, and primary drug type (Montgomery et al., 2014). However, these increased helpfulness ratings were not associated with substance use outcomes. In the current study, participants were asked about their experiences of the therapist delivery of MI immediately following receipt of MI intervention.

Because MI was originally developed as a face-to-face counseling style, exploring whether MI active ingredients are preserved when not delivered in person is particularly important. The potential for MI to be disseminated via technology is supported by preliminary evidence indicating positive response to MI delivered by telephone, in-person, and by video (Miller et al., 2006). A telephone-delivered brief motivational intervention (TBMI) was successfully implemented with emergency department (ED) patients, with decreases in alcohol-related injuries found at 12 months among those who received a TBMI compared to routine medical care (Mello et al., 2013). We refined a participant rating form based on prior addictions research (Lee et al., 2007; Monti et al., 1999; Monti et al., 2007; Woolard et al., 2013), that assessed participant reports of their MI experience. The need to assess whether active ingredients are in fact present in a MI intervention delivered by phone is of clinical significance and important to advance understanding of MI treatment processes when not delivered in person.

Study objectives are to examine participant ratings (PRF) of therapist-delivered motivational intervention and to explore whether MI active ingredients are present. We examined whether participant ratings of the PRF, administered after the first telephone counseling call, reflect the presence of MI active ingredients delivered by therapists during that first call. Further, we investigate whether PRF factors (measured at the first call) predicted patient self-reports of their taking steps towards making a change in drinking, at the second call.

METHODS

Procedure

Injured patients who came to two EDs in a single northeastern US city were screened from July 2010-April 2013. Those who scored an 11 or above on the alcohol portion of the World Health Organization's Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST V3.0) were study eligible. Patients were ineligible from study participation if they were non-English speaking, < 18 years old, prisoners, medically unstable, were being admitted to the hospital or unable to provide consent. After completing informed consent participants completed baseline assessments in the ED, including: demographic questions, measures of alcohol consumption and related negative consequences, other drug use, and

readiness to change, and were then randomized to receive three telephone-based conversations regarding their alcohol use. Individuals had to have completed the first call in order to be eligible to receive Call 2.

Following each call a research assistant (RA) contacted the participant by phone to complete the post call PRF (See Fig. 1). Patients were compensated \$20 for completing each phone call and the associated PRF. All study procedures were approved by Rhode Island Hospital's Institutional Review Board.

Telephone Brief Motivational Intervention

Using the principles of MI the interventionist provided a non-confrontational atmosphere to discuss their alcohol use and related consequences to encourage collaboration on deciding whether the participant chose to make a change to their drinking. During Call 1 the interventionist developed rapport and encouraged patients to discuss what was important to them as well as the pros and cons of drinking. The supportive atmosphere was intended to help evoke the patient's thoughts and feelings about whether they wanted to make a change to their drinking. Once a goal was focused upon, the interventionist worked with the patient on a relevant change plan to help accomplish this change. Following the four underlying processes of MI (Miller & Rollnick, 2013), the Call 1 focus was on building engagement, focusing on a goal, evoking thoughts and feelings about change, addressing ambivalence, and working on a plan for change. The second call was intended to provide a forum for the participant to revisit his/her goals with the therapist, indicate whether one's important values or goals had changed in any way, identify barriers to change and to problem solve. Interventionists worked with those participants who did not identify any goals by the end of the first call, by discussing their thoughts about change to try to focus on an alcohol-related goal. A MI strategy to boost self-efficacy was also included in Call 2.

Protocol training

A total of six therapists were MI trained and supervised by the first author, who is a licensed psychologist and member of the Motivational Interviewing Network of Trainers (MINT). All of the therapists were female, two had a Bachelor's degree and four were enrolled in a Master's degree program, or had received Master's degrees. With the exception of one (nursing student), all had professional backgrounds in social services or psychology. Those who had not been previously MI trained completed a two-day intensive training session on the spirit and principles of MI, practicing active listening and reflective statements, viewed training videotapes, and reviewed the MI intervention protocol. Using role play, interventionists also practiced MI structured strategies, such as the Typical Day and discussing pros and cons of drinking. (The Typical Day is a MI structured strategy designed to enhance working collaboration and reduce the potential for feeling judged (Rollnick, Heather, & Bell, 1992), by encouraging the client to describe his/her alcohol use in the context of their daily routines). The full TBMI treatment protocol can be obtained from the first author.

Four senior members of the research team not involved in training the interventionists evaluated the interventionists' pilot TBMI interventions using global ratings from the

Motivational Interviewing Treatment Integrity coding system (Moyers, Miller, & Hendrickson, 2005). TBMI interventionists had to achieve ratings of 3 or more on all of the global rating scales on two consecutive participants prior to counseling study participants. Ongoing study supervision of counselors included supervisor reviews of recorded interventions and weekly group supervision meetings.

Measures

Demographics: included age, gender, educational level, race, and ethnicity.

Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST, Humeniuk & Ali, 2006) asks 7 questions on past 30-day use and dependent behavior associated with alcohol, tobacco, and illicit drugs. A score of 11-26 indicates harmful or hazardous use of alcohol and the need for a brief intervention (Henry-Edwards, Humeniuk, Ali, Poznyak, Monteiro, 2003); scores > 26 indicate that more intensive treatment is needed.

Readiness to change: Motivation, or readiness to make a change in drinking behavior, was measured by an item used in a prior randomized trial testing motivational intervention in the Emergency Department (Stein et al., 2009). This item, an adaptation of the Beiner and Abrams (1991) Readiness to Change Contemplation Ladder, was validated on an ED treatment –seeking population (Longabaugh et al., 1995) and asked: “How ready are you to change your drinking?” It was asked at baseline. Behavioral anchors were on a 5 point Likert scale, 1 = no thought of change, 2 = think I need to consider changing one day, 3 = think I need to change but not quite ready, 4 = starting to think about how to change, 5 = taking action to change.

Participant Rating Form (PRF) consists of eight items. Five items assessed elements common to MI and most other therapeutic approaches: empathy, collaboration, evocation, acceptance, and developing discrepancy. Three items explicitly focused on alcohol use: decisional balance, giving feedback about how one’s drinking compares to others, and developing a new understanding of how drinking affected one’s life. (See Table 1 for a complete listing of the questions). Response alternatives were: strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree. The Participant Rating Form was based on questions from prior studies (Lee et al., 2007; Woolard et al., 2013) that included patient reports of the motivational interview, including ratings of session quality and of non-specific counseling techniques (Monti et al., 1999; Monti et al., 2007). Additional items were proposed and evaluated by the research team as to how well they captured each MI element. Prior to study implementation the PRF was tested for feasibility of administration and comprehension with pilot study participants.

Proximal Outcome Variable: “Taking Steps”

The dependent variable of interest was the participant’s report of ‘taking steps’ to change their alcohol use, measured at the second call: “Since the last conversation, I have taken steps to change my drinking.” This was asked as a part of the post-session interview conducted by the research assistant. Responses were scored on a Likert Scale (1 = strongly disagree, 5 = strongly agree). Taking steps towards change is considered to be the strongest measure of change talk compared to other categories of speech as it reflects behaviors about

making a change, “specific recovery-related actions a patient did outside of treatment” (Karno, Longabaugh, & Herbeck, 2010, p. 603) or a verbalization of “*action* already being taken to change” (Miller & Johnson, 2008, p. 1178). Put another way, the taking steps item reflects a subtype of change talk that is called commitment language (Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003), that articulates plans to change more strongly and explicitly (CATS : Commitment to Change, Activation to Change, and Taking Steps towards change), and is more strongly predictive of behavioral change than preparatory change talk (DARN: Desire to Change, Ability to change, Reasons to Change, or Need to Change) Moyers et al., 2005; Karno, Longabaugh, & Herbeck, 2010). In contrast, the Change Questionnaire, shortened to three items following a factor analysis to facilitate its use in busy practice settings (Miller & Johnson, 2008), is arguably more reflective of preparatory change talk. The Change Questionnaire included the following items: “I am trying to change”, “It is important for me to change”, and “I could change” my alcohol use.

Overview of Analytic Design

Data were evaluated to determine normality and linearity among the items. An exploratory factor analysis was conducted on the PRF ratings gathered following the first call ($n=256$) to examine latent components. Table 1 reports the means for each PRF item. Principal component analysis was used for extraction followed by Varimax (orthogonal) rotation. To test the predictive validity of the emergent PRF factors, multiple regression analysis was conducted to determine whether these factors, measured at Call 1, explained variance over and above that explained by baseline factors, on predicting reported taking steps to change drinking at the second call. The Factor analysis included all participants who received the first call and who also completed a PRF ($n=256$). The multiple regression included all participants who completed a Call 2 and who also completed a PRF ($n=214$). Data was analyzed using SPSS statistical software (SPSS version 17).

RESULTS

Description of participants

Three-hundred seventy-four participants were randomized to receive a TBMI but $n=23$ participants were considered pilot cases, or part of protocol training, and were not included in the analysis. Of the total sample ($N=374$), a total of 270 ($n=73\%$) completed Call 1 and 220 received both Calls 1 and 2 (59%). Participants who received Calls 1 and 2 did not differ from drop-outs, (participants who did not receive any calls or received only one call), on demographics (gender, marital status, readiness to change, educational status and income) or on ASSIST severity. On average, it took 6 days following the ED visit for participants to complete Call 1 and 18 days between Call 1 and Call 2 completion. The average duration of calls were: Call 1, 29 minutes ($SD=11.12$) and Call 2, 18 minutes ($SD=9.08$). Nearly all (95%) of participants completed a PRF following a call and on average, participants completed the PRF within two days following a call. The average age of the sample was 31.8 years ($SD = 12.03$); 35% were female; 21% were Latino; 70% White, and 22% were African-American. The mean ASSIST was 20.5 ($SD = 7.7$); 19% had less than high school education and 63% had health insurance.

Factor Analysis

Factor analysis was conducted on all Participant Rating Forms completed after the first call ($n=256$). The data set was factorable, indicated by sizable correlations (above .30) on several of the variables (Tabachnick & Fidell, 2001, p. 589). The Kaiser-Meyer-Olkin = .81, indicating sampling adequacy and the Barlett's test of sphericity was significant ($p < .001$). The eight items for the factor analysis yielded two factors with eigenvalues of 1.00 or greater in the initial solution and in the scree test (Costello & Osborne, 2005). As recommended (O'Rourke & Hatcher, 2013), item loadings of .40 or greater were used as the criterion for selection on a factor. When analyzed using maximum likelihood extraction with orthogonal rotation (Varimax), the eight items formed two strong factors. The same solution was found using an oblique rotation; with the same items loading on the factors. With the Varimax rotation, high factor loadings were found, in the excellent range ($> .76$) for Factor 1, Technical (.76-.86), and in the very good ($> .63$) to excellent range for Factor 2, Relational (.69-.81) (Comrey & Lee, 1992). The factor loading solution is presented in Table 2. The two-factor solution explained 65.51% of the cumulative variance.

The two factors were labeled Technical (Factor 1) and the Relational (Factor 2), in keeping with current MI theory (Miller & Rollnick, 2013). Items that loaded highly on the Technical Factor reflected MI-distinctive therapist behavior: e.g., "During my most recent conversation, hearing about how my drinking compares to others helped me to consider a change in drinking." Cronbach's $\alpha = .85$. Items loading on the Relational Factor reflected MI SPIRIT (collaboration, empathy, promoting patient autonomy), such as, "In my most recent conversation, I felt understood by the counselor." Cronbach's $\alpha = .74$. (See Table 2).

Multiple Regression Analysis

To predict participants' ratings of taking steps to change alcohol use at call 2 ($n=214$), we entered age, gender, baseline readiness, and alcohol severity as covariates in the model; this resulted in $R^2 = .17$, $F(4, 191) = 9.78$, $p < .001$, accounting for 17% of the variance. At the second step, entering Factor 1 (Technical), resulted in $R^2 = .32$, $F(1, 190) = 42.89$, $p < .001$, accounting for 32% of the variance in the dependent variable. The significant change in R^2 indicates Factor 1 predicted 15% additional variance in reported taking steps above that contributed by step 1 (see Table 3). At the third step, entering Factor 2 (Relational), did not result in any added variance explained, $R^2 = .32$, $F(1, 189) = .031$, $p = .86$.

DISCUSSION

Although the PRF was developed prior to the theoretical conceptualization of MI as having relational and technical aspects (Miller & Rose, 2009; Morgenstern et al., 2012), our findings report the same two-factor model. Relational elements indicate MI spirit (Morgenstern et al., 2012) and share elements characteristic of other treatment approaches, such as empathic listening (Imel, Wampold, Miller, & Fleming, 2008). MI technical elements are more directive, prescribing techniques and strategies that help increase clients' in-session change talk (Miller & Rose, 2009; Morgenstern et al., 2012). Participants endorsed the presence of therapist-delivered MI purported active ingredients in this study.

Understanding MI active ingredients can clarify how MI works, enhance MI impact, and facilitate training of MI clinicians (Moyers, Martin, Houck, Christopher, & Tonigan, 2009). Our findings advance the literature by demonstrating that active ingredients are present in phone-delivered MI. The fact that evocation loaded on both factors (Tabachnick & Fidell, 2001) is not surprising given its central importance in MI. It may be that evocation, which requires skillful listening and reflections to help articulate motivation, requires both relational skills and technical ability.

Findings demonstrate the feasibility of using patient perceptions of therapist behavior as another source of data to assess whether active ingredients are being delivered (Longabaugh & Magill, 2011) and support the utility of the PRF as an additional measure of active MI ingredients. The PRF adds to methods used to “stabilize” MI identity (i.e., by ensuring that MI is used according to its given definition (Bjork, 2014), such as established MI coding systems (e.g., Motivational Interviewing Skill Coding (Miller, Moyers, Ernst, & Amrhein, 2003).

Our findings contribute to the growing body of research on participant ratings of their MI experience. Another instrument, The Client Experience of Motivational Interviewing (CEMI), which measures the participant’s self-report of their experience of MI (Madson et al., 2013), was not in publication at the time of our study inception. There are notable differences between the two instruments. First, the PRF was designed to investigate potential mechanisms of change as reported by patients themselves, while the CEMI was designed to assess MI fidelity. Therefore, while the CEMI asks questions about MI Spirit and Principles, the PRF includes items on specific counselor behaviors that have been shown to be effective in prior studies of MI, such as giving feedback on alcohol use (Vader, Walters, Prabh, Houck, & Field, 2010; Walters, Vader, Harris, Field, & Jouriles, 2009). The PRF also included items on hypothesized processes related to change, such as developing discrepancy and eliciting change talk. However, the most notable point is that the PRF, designed prior to the recent theoretical conceptualization of MI (Miller & Rose, 2009), nevertheless revealed the same hypothesized active ingredients of MI, Relational and the Technical factors. That participants endorsed the items that yielded these factors supports the idea that hypothesized MI active ingredients, as described by Miller and Rose (2009), were perceived as present by the participants themselves.

With regard to the question of what PRF factors predicted taking steps towards making a change, study findings suggest that the participant’s experience of the MI delivery made a difference in reporting taking steps to change drinking. The Technical factor (measuring the delivery of MI strategies) was found to be more related to taking steps than the Relational factor (measuring MI relational elements such as SPIRIT). These results parallel findings reported by Morgenstern et al. (2012). Using an innovative experimental paradigm comparing MI factors (Relational and Technical) to MI-SPIRIT only (e.g., collaboration, empathy, with technical elements like discussing a change plan proscribed), participants who received the former (MI) had greater change talk and eventual drinking reductions than those who received SPIRIT only, immediately after treatment. In contrast, Borsari et al. (2014), who examined motivational intervention more naturalistically, reported that the relational component predicted reduced post-session alcohol use at six months. Because the

two studies involved different populations, the first being adult (average age = 40 years) problem drinkers (Morgenstern et al., 2012) and the second being college undergraduates who had violated campus alcohol policy (average age = 19 years) (Borsari et al., 2014), study participant composition may have also influenced the relative importance of different active ingredients at different time points. For example, it may be that among college age drinkers, relational factors are more important at longer term follow up, while with older adults, the use of proficient MI strategies predict better outcomes immediately after treatment. Altogether, the pattern of findings across studies demonstrates the importance of relational and technical elements. Investigating relational and technical elements separately would facilitate an understanding of how they work together, which is the ultimate goal, as separating the two is not possible in treatment (Miller & Moyers, 2014). Research on MI active ingredients should specify key relational factors (Miller & Moyers) to better understand how interpersonal skills may influence, or potentiate, the impact of MI technical skills (Magill et al., 2014). The science on investigating MI active ingredients would be strengthened by addressing the fact that MI is delivered in the context of an existing interpersonal relationship, and by finding ways to specify and to measure key dimensions of the relational factor (Miller & Moyers, p. 407).

Limitations include the fact that many ratings were either a 4 or a 5, suggesting a possible ceiling effect. In other words, a majority of participant responses were either “agree” or “strongly agree” on many of the items, possibly in response to a subjective influence, such as wanting to give a socially desirable response (Miller & Johnson, 2008). However, our regression analyses results suggest important variability in participant responses to the therapist that would not be predicted from a social desirability hypothesis. The relational factor did not predict taking steps, whereas the technical factor did. Had the participant ratings simply been a measure of social desirability we would have expected either an opposite result or no difference between the factors in predicting taking steps. Nevertheless, it is important to note that despite the limitations of subjective psychological validation, self-report is often one of the best alternatives in assessing patient response to treatment (Miller & Johnson, 2008).

Our study findings are limited by our use of single items to measure constructs instead of using multiple items, which can increase the stability of measurement of a construct (Lipsey, 1989). The single item used for readiness in our study was used and validated in prior research in the ED (Longabaugh et al., 1995; Stein et al., 2009). Therefore, while the use of a single item remains a limitation, these factors address this limitation somewhat. Secondly, as mentioned earlier, our decision to use the single item, taking steps, instead of multiple items on the Change Questionnaire, was made because we considered taking steps to be a stronger measure of change talk (e.g., behavior taken vs. preparatory change talk) (Amrhein et al., 2003; Karno et al., 2010). Taking steps towards change has been identified as a key factor in the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES, Miller & Tonigan, 1996), and has been found to predict substance abuse treatment outcomes (Karno et al., 2010; Maisto et al., 1999; Miller, Westerberg, Harris, & Tonigan, 1996). Karno et al (2010) identified taking steps as the sole predictor of drinking outcomes in Project MATCH, stating that it could be “considered the highest level of commitment: pro-recovery actions” (p. 606). Therefore, because we proposed taking steps as a stronger

measure of commitment, we believe our findings to be more noteworthy than if we had used multiple items measuring preparatory change talk (see Table 4). A final potential limitation is that of the 374 randomized to receive the TBMI, only 220 (59%) completed both calls 1 and 2. However, the lack of significant differences between the two groups on key demographic variables and on drinking severity, addresses the possibility of selection bias. Nevertheless, further research should address ways to improve treatment engagement, particularly among participants recruited in acute clinical settings like the Emergency Department.

CONCLUSION

Our findings suggest that the therapists enacted active ingredients of change, as endorsed by participant ratings, and that these active ingredients fell into a relational and technical factor structure. Without documentation of such elements and whether they work as hypothesized, there is no empirically-supported justification for the treatment's effects (Magill & Longabaugh, 2012). Although limited, our report contributes to the literature by demonstrating the presence of active ingredients in a telephone-delivered brief intervention. Predictive validity of the rating form was supported by the finding that the technical factor predicted participant reports of taking steps, over and above that which could be accounted for by pre-treatment readiness to change. Future analyses should prospectively examine the discrete and combined effects of MI strategies to enhance outcomes, and potential interactive and synergistic effects between relational and technical elements (Miller & Moyers, 2014). Our findings suggest that the PRF is a feasible instrument for measuring the participant's experience of an MI-based telephone intervention to reduce high risk drinking of injured ED participants.

REFERENCES

- Amrhein PC, Miller WR, Yahne CE, Palmer M, Fulcher L. Client commitment language during motivational interviewing predicts drug use outcomes. *Journal of Consulting and Clinical Psychology*. 2003; 71(5):862–878. [PubMed: 14516235]
- Angus LE, Kagan F. Therapist empathy and client anxiety reduction in motivational interviewing: “She carries with me, the experience”. *Journal of Clinical Psychology*. 2009; 65:1156–1167. [PubMed: 19760742]
- Beiner L, Abrams DB. The contemplation ladder: Validation of a measure of readiness to consider smoking cessation. *Health Psychology*. 1991; 10:360–365. [PubMed: 1935872]
- Bjork A. Stabilizing a fluid intervention: The development of Motivational Interviewing, 1983-2013. *Addiction Research and Theory*. 2014; 22(4):313–324.
- Borsari, B.; Apodaca, TR.; Jackson, KM.; Masteroleo, NR.; Magill, M.; Barnett, NP.; Carey, KB. In-session processes of brief motivational interventions in two trials with mandated college students. *Journal of Consulting and Clinical Psychology*. 2014. Advance online publication. <http://dx.doi.org/10.1037/a0037635>
- Comrey, AL.; Lee, HB. A first course in factor analysis. Erlbaum; Hillsdale, NJ: 1992.
- Costello AB, Osborne JW. Best practices in Exploratory Factor Analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation*. 2005; 10(7):1–9.
- Cushing CC, Jensen CD, Miller MB, Leffingwell TR. Meta-analysis of motivational interviewing for adolescent health behavior: Efficacy beyond substance use. *Journal of Consulting and Clinical Psychology*. 2014; 82(6):1212–1218. [PubMed: 24841861]

- Gayes LA, Steele RG. A meta-analysis of motivational interviewing interventions for pediatric health behavior change. *Journal of Consulting and Clinical Psychology*. 2014; 3:521–35. [PubMed: 24547922]
- Henry-Edwards, S.; Humeniuk, R.; Ali, RL.; Poznyak, V.; Monteiro, M. Draft version 1.1 for field testing. World Health Organization; Geneva: 2003. The Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST): Guidelines for use in Primary Care.
- Heather N. Motivational interviewing: Is it all our clients need? *Addiction Research and Theory*. 2005; 13(1):1–18.
- Hettema J, Steele J, Miller WR. Motivational Interviewing. *Annual Review of Clinical Psychology*. 2005; 1:91–111.
- Humeniuk, R.; Ali, R. Validation of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) and pilot brief intervention: A technical report of phase II findings of the WHO ASSIST Project. World Health Organization; Geneva: 2006.
- Imel ZE, Wampold BE, Miller SD, Fleming RR. Distinctions without a difference: Direct comparisons of psychotherapies for alcohol use disorders. *Journal of Addictive Behaviors*. 2008:533–543.
- Karno MP, Longabaugh R, Herbeck D. What explains the relationship between the therapist structure x patient reactance interaction and drinking outcome? An examination of potential mediators. *Psychology of Addictive Behaviors*. 2010; 24(4):600–607. [PubMed: 21038931]
- Kertes A, Westra HA, Angus L, Marcus M. The impact of motivational interviewing on client experiences of cognitive behavioral therapy for generalized anxiety disorder. *Cognitive and Behavioral Practice*. 2011; 18:55–69.
- Lee CS, Baird J, Longabaugh R, Nirenberg TD, Mello MJ, Woolard R. Change plan as an active ingredient of brief motivational interventions for reducing negative consequences of drinking in hazardous drinking Emergency-Department patients. *Journal of Studies on Alcohol and Drugs*. 2010; 71:726–733. [PubMed: 20731978]
- Lee CS, Longabaugh R, Baird J, Abrantes AA, Borrelli B, Stein LAR, Gogineni A. Do patient intervention ratings predict alcohol-related outcome? *Addictive Behaviors*. 2007; 32(12):3136–3141. [PubMed: 17720325]
- Lipsey, MW. Design Sensitivity: Statistical Power for Experimental Research. Sage Publications; Newbury Park: 1990.
- Longabaugh R, Minugh PA, Nirenberg TD, Clifford PR, Becker B, Woolard R. Injury as a motivator to reduce drinking. *Academic Emergency Medicine*. 1995; 2:817–825. [PubMed: 7584769]
- Longabaugh R, Magill M. Recent advances in behavioral addiction treatments: Focusing on mechanisms of change. *Current Psychiatry Reports*. 2011; 13(5):382–389. [PubMed: 21750958]
- Lundahl BW, Kunz C, Brownell C, Tollefson D, Burke BL. A Meta-Analysis of Motivational Interviewing: Twenty-Five Years of Empirical Studies. *Research on Social Work Practice*. 2013; 20(2):137–160.
- Madson MB, Mohn RS, Zuckoff A, Schumacher J, Kogan J, Hutchison S. Measuring client perceptions of motivational interviewing: factor analysis of the Client Evaluation of Motivational Interviewing Scale. *Journal of Substance Abuse Treatment*. 2013; 44:330–335. [PubMed: 22999814]
- Magill M, Longabaugh R. Efficacy combined with specified ingredients: a new direction for empirically supported addiction treatment. *Addiction*. 2012; 108:874–881. [PubMed: 23072622]
- Magill, M.; Gaume, J.; Apodaca, TR.; Walthers, J.; Mastroleo, NR.; Borsari, B.; Longabaugh, R. The technical hypothesis of motivational interviewing: A meta-analysis of MI's key causal model. *Journal of Consulting and Clinical Psychology*. 2014. Advance online publication. <http://dx.doi.org/10.1037/a0036833>
- Maisto SA, Conigliaro J, McNeil M, Kraemer K, O'Connor M, Kelley ME. Factor structure of the SOCRATES in a sample of primary care patients. *Addictive Behaviors*. 1999; 24:879–892. [PubMed: 10628520]
- Marcus M, Westra H, Angus L, Kertes A. Client experiences of motivational interviewing for generalized anxiety disorder: A qualitative analysis. *Psychotherapy Research*. 2011; 21:447–461. [PubMed: 21644188]

- Mello MJ, Baird J, Nirenberg TD, Lee C, Woolard R, Longabaugh R. DIAL: A randomized trial of a telephone brief intervention for alcohol. *Injury Prevention*. 2013; 19:44–48. [PubMed: 22627778]
- Miller WR, Johnson WR. A natural language screening measure for motivation to change. *Addictive Behaviors*. 2008; 33:1177–1182. [PubMed: 18558466]
- Miller WR, Moyers TB. The forest and the trees: relational and specific factors in addiction treatment. *Addiction*. 2014; 110:401–413. [PubMed: 25066309]
- Miller, WR.; Moyers, TB.; Ernst, D.; Amrhein, P. Manual for the motivational interviewing skill code (MISC). Center on Alcoholism, Substance Use and Addictions, University of New Mexico; Albuquerque: 2003. Unpublished manuscript
- Miller, WR.; Rollnick, S. *Motivational Interviewing: Helping People Change* (Third Edition). The Guilford Press; New York: 2013.
- Miller WR, Rose GS. Toward a theory of motivational interviewing. *The American Psychologist*. 2009; 64:527–537. [PubMed: 19739882]
- Miller WR, Tonigan JS. Assessing drinkers' motivation to change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES). *Psychology of Addictive Behaviors*. 1996; 10(2): 81–89.
- Miller WR, Westerburg VS, Harris RJ, Tonigan JS. What predicts relapse? Prospective testing of antecedent models. *Addiction*. 1996; 91(Suppl):S155–72. [PubMed: 8997790]
- Montgomery L, Sanning B, Litvak N, Peters EN. Preliminary findings on the association between clients' perceived helpfulness of substance abuse treatment and outcomes: Does race matter? *Drug and Alcohol Dependence*. 2014; 139:152–158. [PubMed: 24767892]
- Monti PM, Barnett NP, Colby SM, Gwaltney CJ, Spirito A, Rohsenow DJ, Woolard R. Motivational interviewing versus feedback only in emergency care for young adult problem drinking. *Addiction*. 2007; 102:1234–1243. [PubMed: 17565560]
- Monti PM, Colby SM, Barnett NP, Spirito A, Rohsenow DJ, Myers M, Lewander W. Brief intervention for harm reduction with alcohol positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology*. 1999; 67(6):989–994. [PubMed: 10596521]
- Morgenstern J, Kuerbis A, Amrein PI, Hail L, Lynch K, McKay JR. Motivational Interviewing: A pilot test of active ingredients and mechanisms of change. *Psychology of Addictive Behaviors*. 2012; 26(4):859–869. [PubMed: 22905896]
- Moyers TB, Martin T, Houck JM, Christopher PJ, Tonigan JS. From in-session behaviors to drinking outcomes: A causal chain for motivational interviewing. *Journal of Consulting and Clinical Psychology*. 2009; 77(6):1113–1124. [PubMed: 19968387]
- Moyers TB, Miller WR, Hendrickson SM. What makes Motivational Interviewing work? Therapist interpersonal skills as a predictor of client involvement within Motivational Interviewing sessions. *Journal of Consulting and Clinical Psychology*. 2005; 73(4):590–598. [PubMed: 16173846]
- Orford J, Hodgson R, Copello A, John B, Smith M, Black R, UKATT Research Team. The clients' perspective on change during treatment for an alcohol problem: qualitative analysis of follow-up interviews in the UK Alcohol Treatment Trial. *Addiction*. 2006; 101:60–68. [PubMed: 16393192]
- Orford J, Hodgson R, Copello A, Wilton S, Slegg G. To what factors do clients attribute change? Content analysis of follow-up interviews with clients of the UK Alcohol Treatment Trial. *Journal of Substance Abuse Treatment*. 2009; 36:49–58. [PubMed: 18547778]
- O'Rourke, N.; Hatcher, L. *A Step-by-step approach to using SAS for Factor Analysis and Structural Equation Modeling*, Second Edition. SAS Institute; North Carolina: 2013.
- Rollnick S, Heather N, Bell A. Negotiating behavior change in medical settings: The development of brief motivational interviewing. *Journal of Mental Health*. 1992; 1:25–37.
- Stein LAR, Minugh PA, Longabaugh R, Wirtz P, Baird J, Nirenberg TD, Gogineni A. Readiness to change as a mediator of the effect of a brief motivational intervention on posttreatment alcohol-related consequences of injured Emergency Department hazardous drinkers. *Psychology of Addictive Behaviors*. 2009; 23(2):185–195. [PubMed: 19586135]
- Tabachnick, BG.; Fidell, LS. *Using Multivariate Statistics*. 4th. Allyn and Bacon; Boston: 2001.
- Townend M, Braithwaite T. Mental health research-the value of user involvement. *Journal of Mental Health*. 2002; 11:117–119.

- Vader AM, Walters ST, Prabhu GC, Houck J, Field CA. The language of motivational interviewing and feedback: Counselor language, client language, and client drinking outcomes. *Psychology of Addictive Behaviors*. 2010; 24(2):190–197. [PubMed: 20565145]
- Walters ST, Vader AM, Harris TR, Field CA, Jouriles EN. Dismantling motivational interviewing and feedback for college drinkers: A randomized clinical trial. *Journal of Consulting and Clinical Psychology*. 2009; 77(1):64–73. [PubMed: 19170454]
- Woolard R, Baird J, Longabaugh R, Nirenberg T, Lee CS, Mello MJ, Becker B. Project Reduce: reducing alcohol and marijuana misuse: effects of a brief intervention in the emergency department. *Addictive Behaviors*. 2013; 38(3):1732–9. [PubMed: 23261491]
- Zuckoff A. Motivational interviewing: An empirical-phenomenological study of the interpersonal process and client experience of a counseling style. *Dissertation Abstracts International*. 2003; 63

Length of time (days)

¹Emergency Department visit to Call 1: 5.9 (*SD* = 4.2)
²Call 1 to Participant Rating Form (PRF) 1: 1.8 (*SD* = 2.9)
³Call 1 to Call 2: 17.9 (*SD* = 7.0)
⁴Call 2 to PRF 2: 2.1 (*SD* = 3.7)

Figure 1.
TBMI Intervention Delivery Schedule

Table 1Participant Rating Form *Participant Rating scores (n = 256)*

Item	<i>M</i>	<i>SD</i>	Range
Empathy ^a	4.54	0.72	1-5
Collaboration ^b	4.54	0.72	1-5
Evocation ^c	4.61	0.57	2-5
Acceptance ^d	4.57	0.64	1-5
Develop Discrepancy ^e	3.83	1.05	1-5
Pros and Cons ^f	4.21	0.92	1-5
New Understanding ^g	3.90	1.14	1-5
Feedback on Drinking ^h	3.56	1.18	1-5

Notes: * *p* .05, ** *p* .001, ****p* .0001

^a I felt understood by the counselor

^b We worked well together

^c Encouraged me to express my thoughts and feelings

^d I felt like my thoughts and feelings were paid attention to

^e Helped me to realize the difference between what my life is like now and what I would like it to be

^f Helped me to think about what I like and don't like about my alcohol use

^g I have developed some new understanding of how drinking affects my life

^h Hearing about how my drinking compares to others helped me to consider changing my drinking

Table 2

Factor Analysis of Participant Rating Form items after Call 1 (n=255, n=1 missing) Orthogonally (Varimax) rotated with component loadings

Component	Factor 1 (Technical)	Factor 2 (Relational)
Empathy	.102	.741
Collaboration	.178	.781
Evocation	.357	.692
Acceptance	.170	.806
Develop discrepancy	.756	.256
Pros and cons	.763	.239
New understanding	.838	.151
Feedback on drinking	.859	.129
Eigenvalues	3.84	1.39
Percentage of Total Variance	48.05	17.48
Number of items loaded	4	4

Table 3

Summary of regression analysis predicting taking steps (n=200, n=14 missing)

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	<i>β</i>	<i>B</i>	<i>SE B</i>	<i>β</i>	<i>B</i>	<i>SE B</i>	<i>β</i>
Age	-.004	.008	-.036	-.004	.007	-.034	-.004	.007	-.035
Gender	.389	.191	.134	.238	.175	.082	.238	.175	.082
Baseline readiness	.397	.073	.385***	.303	.067	.294***	.305	.068	.296***
Assist severity	.006	.013	.032	-.008	.012	-.045	-.008	.012	-.043
Technical Factor				.588	.090	.417***	.586	.091	.416***
Relational Factor							.015	.085	.011
<i>R</i> ²			.17			.32			.32
<i>F</i> for change in <i>R</i> ²			9.78***			42.90***			.031

Note: **p* < .05, ***p* < .01,***
p < .001

Table 4

Correlations between the Taking Steps item and the Change Questionnaire items

	Item 1 <i>r</i>	Item 2 <i>r</i>	Item 3 <i>r</i>
Taking Steps	.78***	.70***	.39***

Note. Change Questionnaire (Miller & Johnson, 2008) items are: Item 1, “I am trying to change my alcohol use”; Item 2, “It is important for me to change alcohol use”; and Item 3, “I could change my alcohol use”. Cronbach’s alpha for the three items on the Change Questionnaire = .78.

A regression analysis using the 3-item Change Questionnaire as the dependent variable replicated the findings using taking steps as the dependent measure. After accounting for the baseline covariates (age, gender, alcohol severity and readiness to change alcohol use) the variance explained in change orientation scale score was $R^2 = 0.42$; the technical factor was a significant predictor of the change orientation scale score (with a corresponding increase in $R^2 = 0.47$); the relationship factor was not a significant predictor and there was no change in the variance explained when this predictor was added to the model.

 $p < .001$