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Culturally Adapted Motivational Interviewing for Latino Heavy Drinkers: Results from a Randomized Clinical Trial

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Abstract

A randomized clinical trial of culturally adapted (CAMI) and un-adapted motivational interviewing (MI) to reduce drinking and related problems among heavy drinking Latinos randomized and assessed 58 participants at baseline, at 2 (86% retention) and 6 months (84% retention). Significant declines across both were found in heavy drinking days/month and drinking consequences ($p < .001$), with greater reductions for drinking consequences for CAMI at 2 months ($p = .009$) and continuing reductions in CAMI at 6 months. Findings provide preliminary support for the value of culturally adaptation to enhance the efficacy of motivational interviewing with Latino heavy drinkers.

Keywords

alcohol; Latinos; motivational interviewing; cultural adaptation; randomized clinical trial

A disproportionate burden of illness and negative social consequences related to alcohol consumption are reported among Latinos compared to other racial/ethnic groups (Caetano, Clark, & Tam, 1998; Caetano, Raimisetty-Mikler, & Rodriguez, 2008; Campos-Outcalt, Bay, Dellapenna, & Cota, 2002; Grant et al., 2004; Mulia, Ye, Greenfield, & Zemore, 2009). Latinos who consume alcohol are significantly more likely than non-Latinos to report workplace, legal, and health problems regardless of drinking level (Mulia et al., 2009).

Latino men are more likely than non-Latino men to develop alcohol dependence (Caetano & Clark, 1998). Once alcohol dependence occurs, Latinos experience higher rates of recurrent or persistent dependence than non-Latino Whites (Chartier & Caetano, 2010). Latinos experience higher rates of cirrhosis mortality (Singh & Hoyert, 2000; Stinson, Grant, & Dufour, 2001), injuries (Campos-Outcalt et al., 2002), and motor vehicle crash-related fatalities than non-Latinos, even after controlling for place of residence and income (Baker, Braver, Chen, Pantula, & Massie, 1998; Voas, Fisher, & Tippetts, 2002). Although alcohol interventions can prevent the progression of alcohol use to hazardous or harmful drinking and the development of alcohol use disorders, there is higher unmet need for mental health treatment generally and substance abuse treatment specifically among Latinos compared to non-Latino whites (Wells, Klap, Koike & Sherbourne, 2001; Zemore, Mulia, Ye, Borges, & Greenfield, 2009).

Latinos have low participation rates in substance abuse treatment (Carroll et al., 2009; O'Connell, Boat, & Warner, 2009; Smedley, Stith, & Nelson, 2002). A pooled analysis of the U.S. National Alcohol Surveys (1995–2005) reported that Latinos were significantly less likely than non-Latino Whites to have attended a specialty alcohol and drug treatment program (Shmidt, Greenfield, & Mulia, 2006) and Latinos with more severe alcohol problems were less likely to use any treatment services compared with non-Latino Whites with a similar level of alcohol problems (Shmidt et al., 2006). These differences remained even after controlling for health insurance. In addition to low rates of participation and retention in alcohol treatment, there is evidence that Latinos tend to benefit less from treatment compared to non-Latino Whites (Blumenthal, Jacobson, & Robinson, 2007). Collectively, low rates of treatment participation and retention, relatively poorer treatment response, and the differential burden of health and social problems related to alcohol use, justify the need for cultural adaptation of evidenced-based treatment (Borrelli, 2010). In fact, cultural adaptation is recommended to improve addiction treatment participation and response (Szapocznik, Lopez, Prado, Schwartz, & Pantin, 2006). Cultural adaptations to evidence-based treatment can take various forms: changes in the approach to service delivery, changes the nature of the therapeutic relationship, or changes in the treatment content itself to accommodate the cultural beliefs and attitudes of the target population regarding a specific health behavior (Whaley & Davis, 2007). However, research advances on this topic are challenged by a limited empirical base and few existing models of adaptation (Burrow-Sanchez and Wrona, 2012).

Limited Empirical Base

An important empirical question is whether un-adapted treatments are detrimental to minority patients (Miranda, 2005; Tonigan, 2003), which may make it hard for patients to find the offered treatment credible, or may discourage future change attempts (Borrelli, 2010). Attempts to address this question have not been conclusive. First, most findings were based on post-hoc secondary analyses and thus were not prospectively powered nor designed to examine the effect of ethnicity on treatment outcomes (Lowman & LeFauve, 2003; Tonigan, 2003). Therefore, findings that reported a lack of differences across racial/ethnic groups, as found in the secondary analysis reported for Project MATCH (Madras et al., 2009; Tonigan, 2003) may be due to the lack of randomized clinical trials prospectively powered to detect racial/ethnic differences in outcomes (Lowman & LeFauve, 2003; Tonigan, 2003). Second, lack of treatment fidelity has also prevented conclusions regarding treatment effects. For example, one study (Madras et al., 2009) did not standardize the intervention across sites. Third, the samples in the aforementioned studies recruited treatment-seeking participants, which limits generalizability of findings to non-treatment-seeking samples.

Motivational Interviewing (MI) is a directive, client-based counseling approach originally developed for individuals with substance abuse problems. The efficacy of MI is well-documented for alcohol. Although a greater effect size was reported for minority compared to non-minority samples (Hettema, Steele, & Miller, 2005), the conclusion is limited because of the small number of studies (8/82 studies reviewed) that actually reported the racial/ethnic sample composition. Also, these eight studies reported no more than 15% racial/ethnic minorities and included only clinical subpopulations, such as substance dependent individuals or pregnant women.

Taken together, the question of whether MI needs to be culturally adapted, and whether doing so enhances its effects on diverse population, remains open to investigation. This question is of growing importance given the growing diversity of the U.S. population and the proliferation of MI in different countries. For example, MI trainers have asked questions about delivering MI techniques and understanding patient responses to MI when working in different countries (www.motivationalinterviewing.org). This suggests there may be cultural variability in the delivery and response to MI, as well as questions about how to deliver MI in different cultural contexts. These questions need further examination.

Preliminary evidence suggests that cultural adaptation might enhance treatment (MI) effectiveness. A randomized clinical trial comparing the effects of a motivationally-enhanced brief intervention (BMI) across ethnic groups revealed reductions in drinking outcomes only for Latinos who received BMI from a Spanish-speaking Latino/a provider (Field & Caetano, 2010) compared to African-American and White participants. Based on this finding, the authors speculated that culturally adapting treatment might further augment the benefits of translating treatments (Carroll et al., 2009; Field & Caetano, 2010).

Conceptual Model of Cultural Adaptation

Although studies of cultural adaptation in addictions treatment are often called for, few conceptual models exist (Borrelli, 2010; Hall, 2001). Traditionally, MI focuses on the clinical interaction and considers social contextual factors, such as experiences of discrimination, as treatment mediators or moderators (Miller & Rose, 2010), not primary influences (Stanton, 2010). These experiences, which can also include the language barrier, or overall context of migratory experience, are central to lives of many Latinos. In this trial, we hypothesized that such social contextual factors should be at the forefront of the adapted intervention. Thus, our key adaptation theme was to expand the focus of the MI from the individual and his/her drinking contexts, to the individual's broader cultural and social context, and how that might affect their drinking behavior. Tailoring behavioral interventions to address these multiple sources of risk, including poverty, discrimination, and acculturation stress, has been recommended as a way to enhance their relevance and efficacy (Gallardo & Curry, 2009; N. Mulia, Ye, Zmore, & Greenfield, 2008; Zmore, Karriker-Jaffe, Keithly, & Mulia, 2010). At this time, few alcohol treatments have been developed or tested that address the multiple sources of stress and/or disadvantage, including the effects of poverty and discrimination that confront Hispanics living in under-resourced urban settings (Zmore, Karriker-Jaffe, Keithly, & Mulia, 2011). Acknowledging these important aspects of the social context is hypothesized to enhance the patient's feeling of being understood, which may improve therapeutic alliance by building rapport. In fact, Miller commented that the MI approach, which elicits and values the participant's perspectives as a collaborator with the therapist, may be appealing to minority clients because it presents a "...welcome contrast to how others have treated the person" (p. 298) (Miller, 2010). Adapting the MI to optimize collaboration with the participant may well augment its effects.

We present results of a NIH-funded training award to the first author, which focused on developing and implementing a culturally adapted version of motivational interviewing for heavy drinking Latinos following the Stage I model of treatment development (Rounsaville, Carroll, & Onken, 2001). In Stage I, qualitative work (Lee et al., 2006), manual development of the cultural adaptation (Lee et al., unpublished) and piloting an open series of patients using the new adaptation (Lee et al., 2011) was accomplished. These efforts culminated in Stage II, the preliminary small-scale randomized trial to test the effects of the CAMI against MI. The results of this trial are reported in this paper and a larger scale study is now underway (R01AA021135, Lee, PI). We hypothesized that both culturally adapted MI (CAMI) and un-adapted MI would improve drinking outcomes but that greater reductions in drinking and negative consequences related to alcohol consumption would be observed among participants who received the CAMI.

Methods

Participant Characteristics

Study eligible participants met inclusion criteria for hazardous drinking (≥ 5/4 drinks/occasion for men/women or ≥ 14/7 drinks/week for men/women), were between the ages of 18–54, of Hispanic nationality, and proficient in English, as indicated by the ability to understand a description of the study in English without the use of an interpreter and ability to repeat the components of informed consent. Because a study goal was to investigate the effects of culturally adapting treatment separately from translation, oral English proficiency was assessed using the following procedure. The research assistant read the informed consent aloud and the participant asked whether they understood the four basic elements of informed consent (confidentiality, voluntariness, risks and benefits), and were asked to explain them. Potential volunteers were excluded if there the individual was cognitively impaired, had evidence of psychotic symptoms, was pregnant, or unable to speak English. All study procedures received approval from the Institutional Review Board at Brown University.

Recruitment Procedures

Community-based recruitment methods included advertising on Spanish-radio talk show, presenting the study at local churches and in English as a Second Language classes using “word-of-mouth” techniques, in Providence, RI. Our bilingual research team approached potential participants in community settings and described the study. Interested individuals were either screened on-site for study eligibility, or subsequently contacted the research team to be screened.

Consent procedures—A trained research assistant orally reviewed the informed consent form and explained rights of participation before consent was obtained in writing. Participants were then randomized to receive either the standard or the culturally adapted MI.

Assessment procedures—A research assistant administered the breath analysis test to confirm they were not under the influence of alcohol during the session. The research assistant then verbally administered baseline assessments (one hour). Following the assessments, the interventionists completed a MI session. The research assistant then met with the participant to ask them questions about their study experience and to schedule follow-up appointments. Participants were informed that the interventionist would not be aware of their responses to the questions about the study experience. Research assistants unaware of treatment assignments completed face-to-face interviews with participants on study outcomes at the two follow-ups scheduled at 2 and 6 months. Individuals were

reimbursed for the time and effort involved in participating at baseline (\$70), two-month (\$45) and six-month (\$45) follow ups, in the form of merchandise certificates to local stores. Child care and transportation to the study site were also provided to participants if needed.

Measures

Demographics and acculturation—Age, gender, nativity, and socioeconomic status were assessed. Place of birth was categorized as U.S. born (including U.S. territories) or foreign-born. Acculturation was measured by the Short Acculturation Scale for Hispanics (SASH) (Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987), a 12-item scale with higher scores suggesting greater acculturation. The scale assesses English or Spanish-speaking preference for linguistic as well as behavioral dimensions and has demonstrated good reliability (Cronbach's $\alpha = .92$) and criterion validity (Marin et al., 1987).

Graduated Frequency Scale—The Graduated Frequency Scale was used to assess the past-month frequency of drinking/heavy drinking by asking, "During the past 30 days, on about how many days did you drink alcohol?" and frequency of heavy drinking days, by asking, "During the past 30 days, how many times did you drink 4 drinks (if a woman, 5 drinks if a man) when you were drinking?"

Drinkers Inventory of Consequences (DrInC)—The DrInC (Miller, Tonigan, & Longabaugh, 1995) is a 50-item self-report questionnaire that characterizes the severity of alcohol problems in five subscales: physical (e.g., "I have had a hangover or felt bad after drinking."), intrapersonal (e.g., "I have felt bad about myself because of my drinking."), social responsibility (e.g., "I have failed to do what is expected of me because of my drinking."), interpersonal (e.g., "My family or friends have worried or complained about my drinking."), and impulse control (e.g., "I have driven a motor vehicle after having three or more drinks"). The DrInC total score and its subscale scores were used.

Intervention Procedures

Interventionist training and supervision—Having multiple clinicians per condition reduces the impact of possible therapist effects in determining treatment efficacy (Crits-Christoph & Mintz, 1991). All seven of the therapists were trained by the first author to deliver both MI and CAMI. Interventionists were all graduate or post-graduate clinical psychology students. MI training took up to 16 hours and focused on MI Spirit and Principles, MI techniques, recognizing/eliciting change talk, and role plays. The CAMI training, also conducted by the first author, took 16 hours and included: description of the social contextual model of cultural adaptation, review of how each MI component was adapted, culturally relevant content, process issues in delivering the CAMI, and role plays. To determine that therapists were trained to criterion to deliver both the MI and the CAMI, the first author reviewed audiotapes of each therapist conducting sessions.

Treatment fidelity monitoring procedures—Therapist adherence to each treatment protocol was achieved by reviewing session audiotapes during ongoing supervision and by using checklists of required MI intervention components. There was a checklist for both conditions (MI and CAMI).

MI condition: Participants randomized to the control condition received a manualized single session brief MI that lasted approximately 1.5 hours. The MI included structured strategies tailored to the participant's readiness to change (Rollnick, Heather, & Bell, 1992) such as: the Typical Day exercise, personal feedback reports (e.g., normative feedback about drinking based on participant assessment results), pros and cons of drinking, and completion

of a change plan. The MI was designed to follow MI principles of invoking participant autonomy and of emphasizing collaboration with the interventionist.

CAMI condition: Participants randomized to the adapted intervention condition received a manualized single session brief MI that also lasted approximately 1.5 hours but was culturally adapted. The elements of cultural adaptation were based on social contextual themes relevant to heavy drinking in Latinos established in earlier qualitative research, which are described in detail elsewhere (Lee et al., 2006).

The CAMI followed the same MI sequence of structured strategies with parallel MI components (e.g., typical day, pros and cons and change plan). The main theme of cultural adaptation was to address the social context of drinking and acculturation stressors that influenced drinking behavior (Lee et al., 2006). In addition, following the Whaley and Davis (2007) categorization of adaptations, *Changes to Service Delivery* involved providing child care and transportation when needed, and accommodating work schedules by conducting sessions after work hours and on the weekends. *Changes to the Nature of the Therapeutic Relationship* involved building rapport and collaboration by training CAMI interventionists to elicit and to discuss participant ideas about cultural and social influences on their drinking and cultural motivations to change. For example, the Motivational Interviewing Typical Day strategy was adapted by training interventionists to acknowledge changes in the social context that were stressful and related to drinking behavior among Latinos (Lee et al., 2006). CAMI interventionists learned to identify and to discuss the effects of low-status employment, or social isolation, on drinking behavior, and also to elicit what mattered to the participant, an important way to understand cultural priorities (Kleinman, 1995). The Motivational Interviewing technique of pros and cons of drinking was culturally adapted to acknowledge the importance of family and the changes in family structure following U.S. arrival. CAMI interventionists were trained to broaden inquiry and discussion from oneself to important others. Cultural values and priorities were identified as potential reasons for making a change in drinking behavior, and the discrepancy between these cultural values and their current drinking behavior, was presented to enhance intrinsic motivation to change. Last, *Changes to Content* involved using a manualized form of the culturally adapted MI (Lee, unpublished). The manual gave suggested questions to build rapport by asking about the participant's social and cultural context. Treatment content of the CAMI components was culturally adapted incorporating material that acknowledged cultural experiences and norms regarding drinking behavior. For example, because motor vehicle crashes and related fatalities are noted to be higher among Latinos compared with non-Latinos (Caetano et al., 2008c), information on the risks of drunk driving for child passengers in Latino families was presented. Latino and non-Latino norms for drinking based on national survey data were also presented (Chan, Neighbors, Gilson, Larimer, & Marlatt, 2007).

Results

Data Analysis

Generalized Linear Modeling (GLM) 2×3 (treatment by time) repeated measures were conducted to test the effect of treatment on each of the drinking outcomes of interest (drinking days/month, heavy drinking days/month and drinking consequences). The within-subjects factor was time (baseline, 2- and 6-month follow up), and the between-subjects factor was treatment assignment.

Project staff screened 145 potential participants during the recruitment phase. Of the 145 screened applicants, 62% (n=91) qualified for the study and 67% (n=61) completed the baseline and intervention session. Three were subsequently omitted from the analysis because they were incorrectly screened and later determined to have been ineligible for

study inclusion. Therefore, the final sample for follow up and analysis was 58, which exceeded the originally proposed sample size ($n=40$) and was achieved within the originally proposed window of time. Randomization resulted in $n=26$ in CAMI and $n=28$ in non-adapted MI. Follow-up assessment completion was 86% at 2-month follow-up, and 84% at six-month follow-up, with no significant difference in retention rates between conditions.

Participant Characteristics

Approximately 56% were male, 54% were single and 25% were married, the average age was 35 years old ($SD = 12.35$), and educational attainment averaged 12 years. Most (93%) were employed but working at lower wage jobs, such as domestic care, janitor, and teacher aid. Nearly half (49%) of the participants reported an annual income of less than \$20,000/year. Consistent with demographics for the Northeast United States, over half (55%) of the Latino participants were from the Caribbean (Puerto Rico, 28%; Dominican Republic, 26%), and 44% were from: Columbia, Mexico, Guatemala, Venezuela, Peru, Ecuador, or Brazil. According to the SASH, participants were moderately to highly acculturated (Mean [M] = 3.12, $SD = .78$, range = 1.33–5.00). Roughly half (54%) were U.S. born. Weekly drinking rates among men were $M = 44$ drinks/week, $SD = 42.57$, and for women were $M = 18$ drinks/week, $SD = 15.56$, and 86% of participants met AUDIT criteria for possible alcohol use disorder. No significant differences were found between groups on baseline variables (see Table 1) or on treatment evaluations, with participants in both conditions reporting high treatment satisfaction using a scale on which 0 = not at all satisfied and 4 = very satisfied (MI $M = 3.64$, $SD = .62$; CAMI $M = 3.57$, $SD = .63$) and high treatment engagement (MI $M = 3.64$, $SD = .56$; CAMI $M = 3.82$, $SD = .39$).

Treatment Effects

Results comparing the two active treatments revealed significant declines for both groups from baseline to follow-up on drinking days/month $F(1, 45) = 34.23$, $p < .000$, heavy drinking days/month ($F(1, 45) = 20.70$, $p < .001$), DrInC (total, $F(1, 44) = 34.93$, $p < .001$; and DrInC subscales: Impulse Control $F(1, 44) = 39.26$, $p < .001$; Interpersonal $F(1, 44) = 23.39$, $p < .001$; Intrapersonal $F(1, 44) = 17.43$, $p < .001$; Physical $F(1, 44) = 29.31$, $p < .001$; Social Responsibility $F(1, 44) = 11.87$, $p < .001$).

A significant time by treatment interaction on the DrInC Impulse scale was found. Items on this subscale assess serious legal and physical harms related to alcohol use. Examples include: “My drinking has caused me to use other drugs more”, “I have smoked tobacco more when I am drinking”, “I have been arrested for driving under the influence of alcohol”, “I have had trouble with the law (other than driving) because of my drinking”, “I have gotten into a physical fight while drinking”, “When drinking, I have done impulsive things that I regretted later”.

Greater reductions over time for CAMI were observed ($F(1, 44) = 7.48$, $p = .009$, $\eta^2 = .14$, $f = .40$, large effect) than for MI at 2-months, with continuing reductions in CAMI at six months compared to MI. Second, a trend for a treatment by time interaction was found for number of heavy drinking days/month, ($F(1, 44) = 3.18$, $p = .08$, $\eta^2 = .10$, $f = .33$, medium effect). For both findings, medium to large effect sizes were found. Cohen’s recommended conversion of η^2 to the f statistic, recommended for ANOVAs, was used to estimate these effect sizes (Cohen, 1988).

Discussion

While both groups (CAMI and MI) improved after intervention, findings support the advantage of the CAMI in that those who received the CAMI tended to show greater

reductions in negative consequences related to impulsive drinking and in heavy drinking days compared to those who received the MI. As addictions research moves towards dissemination of empirically based treatments, evaluating their external validity with diverse populations is a priority (Miranda et al., 2005; Whaley & Davis, 2007). Cultural adaptations research examines the external validity of treatments and are a critical step towards integrating cultural competence and evidenced-based practice (Whaley & Davis, 2007), the gold standard for mental health care (Whaley & Davis, 2007). The most rigorous test of adaptation directly tests the culturally adapted treatment to a non-adapted treatment (Martinez & Eddy, 2005). However, such research designs are not common (Miranda, 2005). This gap is unfortunate, because studies that compare placebo to the adapted treatment make it difficult to determine whether adaptation makes a difference (Griner & Smith, 2006; Huey & Polo, 2008). Our study, which compared a culturally adapted version of MI to an un-adapted MI, provides such data. Another notable feature of the study is that it compares two active treatments.

The first hypothesis, that both MI and CAMI would improve after intervention, was supported. Participants in both conditions reported fewer days heavy drinking, and fewer alcohol-related consequences. Participants in both CAMI and MI reported equally high levels of satisfaction and treatment engagement. This finding suggests that the underlying spirit of MI, with its emphasis on collaboration and on non-judgmental counselor attitude, was delivered as intended and is effective for Latinos (Lee et al., 2011).

The second hypothesis received support: greater reductions in alcohol-related negative consequences were observed among participants who received the CAMI as opposed to MI, with reductions continuing out to 6 months. These alcohol consequences were associated with (poor) impulse control, including: driving under the influence of alcohol (DUI), less drug use and smoking while drinking alcohol, fewer violent altercations, and a decline in risk taking or impulsive behavior when drinking. The decline in drinking and driving for CAMI participants is noteworthy as one of the adapted components focused on giving information about the increased risks for motor vehicle crashes and alcohol involvement for Latino families and for Latino children who are passengers in such crashes. However, we could not assess effects on risk of motor vehicle crashes separately from other items in the DrInC subscale. Future studies should assess each adapted component and whether it influences outcome (Martinez & Eddy, 2005).

A trend towards significance for heavy drinking days was also observed for CAMI participants relative to MI participants, with the CAMI tending to report fewer heavy drinking days, with a medium statistical effect size. Heavy drinking is considered an indicator of drinking that is associated with harmful consequences (Russell, Light, & Gruenewald, 2004), such as increased risk for drunk driving, work problems, and alcohol dependence (Midanik, Tam, Greenfield, & Caetano, 1996).

Anecdotally, participants viewed the study as something that helped the community. Some reported asking their friends/family to cut down on drinking after they participated. Surprisingly, some returned their gift cards, saying they already benefited from the study. More than half the sample were men, suggesting that our male research assistant may have enhanced our recruiting efforts by increasing the comfort level of male volunteers. Thus, we found a positive response from the community towards an alcohol intervention. In general, participants responded well to the three types of cultural adaptations implemented in this study (Whaley & Davis, 2007).

Researchers are becoming more aware of the need to identify and to test the effects of language translation versus adaptation in clinical trials. Although language translation is

viewed as a type of cultural adaptation (falling under the category of Changes to Service Delivery (Whaley & Davis, 2007), it is not a comprehensive cultural adaptation. First, changes to treatment content are minimal (Bernal, Bonilla, & Bellido, 1995; Lee et al., 2011) and second, the underlying cultural meanings behind language are sometimes not communicated (Cortes, Drainoni, Henault, & Paasche-Orlow, 2010; Cortes et al., 2007; American Psychological Association, 2003; Whaley & Davis, 2007; Burrow-Sanchez et al., 2005). The APA (2003) views linguistic competence as: "...necessary but not sufficient condition for cultural competence" (Whaley & Davis, 2007, p. 571). Community experts agree, expressing the opinion that being able to speak Spanish was not indicative of, nor equal to, cultural competency: "It's a little disappointing that we say that [cultural competency] is a need for [treatment] providers and then the best they can do is say, "Well, we'll try to hire someone who speaks Spanish," as if that is cultural adaptation" (Burrow-Sanchez, Martinez, Hops, & Wrona, 2011, p. 216).

Our study took a stepped approach to understanding the empirical issue of translation vs. adaptation, by first isolating the effects of cultural adaptation on Latinos. After completing the preliminary study, to meet the gold standard for treatment, a larger randomized clinical trial will (R01AA021135, Lee, PI) deliver a culturally adapted version of treatment available in the language of the participant's choice. Study goals of the larger trial are to explore the unique and potentially synergistic effects of translation and cultural adaptation on alcohol treatment outcomes and to replicate and to extend the results reported here.

Study limitations should be noted. Participants were recruited for the study from a single urban area, and mirrors the Hispanic national group representation in the Northeast, which is more heavily from the Caribbean (Puerto Rico, Dominican Republic), than other parts of the U.S.. However, our study contributes to the growing need for alcohol research focused on Hispanic nationalities, such as Puerto Ricans, who have a higher prevalence of alcohol misuse and related problems relative to other Latin groups (Alegria et al., 2008; Caetano, 1988; Caetano, Raimisetty-Mikler, & Rodriguez, 2008a, 2008b; Caetano, Ramisetty-Mikler, & Rodriguez, 2009; Dawson, 1998; Guarnaccia et al., 2007). Further, most of the participants in this study reported low levels of income and educational achievement and may not be generalizable to Latinos of higher income and educational levels.

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Table 1

Demographics of Total Sample and by Condition Means and Standard Deviations

Variable	Total Sample	MI (n=28)	CAMI(n=26)	p
Sex	56% male	52% male	48% male	n.s.
Age	34.91 (12.35)	33.5(12.30)	36.4(12.47)	n.s.
Marital	54% single	57% single	43% single	n.s.
Accult level ¹	3.12(.78)	3.2(.63)	3.02(.92)	n.s.
Readiness	4.86(3.40)	4.57(3.46)	5.19(3.77)	n.s.
DrInC ²	1.84(.12)	1.83(.11)	1.86(.13)	n.s.
Audit	15.54(7.93)	15.03(6.9)	16.06(8.97)	n.s.

¹ According to Marin, a score of 3.12 indicates a moderate level of acculturation

² The Drinkers Inventory of Consequences was log transformed

Table 2

Means and Standard Deviations of Outcome variables baseline and at 2 and 6 months follow-up

Variable	Total Sample	MI	CAMI
DrInC_score (log transformed)			
Baseline	1.80 (.13)	1.80 (.11)	1.80 (.14)
2 months	1.65 (1.76)	1.73 (.09)	1.78 (.14)
6 months	1.65(2.07)	1.73 (.072)	1.74 (.11)
Drinc_Impulse			
Baseline	19.72 (6.28)	18.33 (5.4)	21.11 (6.87)
2 months	15.47 (4.11)	14.54 (3.93)	16.22 (4.18)
6 months	14.85 (3.69)	14.68 (3.69)	15.00 (3.76)