
Article

Brief Intervention in the Emergency Department Among Mexican-Origin Young Adults at the US–Mexico Border: Outcomes of a Randomized Controlled Clinical Trial Using Promotores[†]

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[†]Presented at the International Network on Brief Interventions for Alcohol and Other Drugs, Warsaw, Poland, 18–19 September 2014.

Received 1 December 2014; Revised 9 June 2015; Accepted 30 June 2015

Abstract

Aims: A randomized controlled trial of brief intervention (BI), for drinking and related problems, using peer health promotion advocates (*promotores*), was conducted among at-risk and alcohol-dependent Mexican-origin young adult emergency department (ED) patients, aged 18–30.

Methods: Six hundred and ninety-eight patients were randomized to: screened only ($n = 78$), assessed ($n = 310$) and intervention ($n = 310$). Primary outcomes were at-risk drinking and Rapid Alcohol Problems Screen (RAPS4) scores. Secondary outcomes were drinking days per week, drinks per drinking day, maximum drinks in a day and negative consequences of drinking.

Results: At 3- and 12-month follow-up the intervention condition showed significantly lower values or trends on all outcome variables compared to the assessed condition, with the exception of the RAPS4 score; e.g. at-risk drinking days dropped from 2.9 to 1.7 at 3 months for the assessed condition and from 3.2 to 1.2 for the intervention condition. Using random effects modeling controlling for demographics and baseline values, the intervention condition showed significantly greater improvement in all consumption measures at 12 months, but not in the RAPS4 or negative consequences of drinking. Improvements in outcomes were significantly more evident for non-injured patients, those reporting drinking prior to the event, and those lower on risk taking disposition.

Conclusions: At 12-month follow-up this study demonstrated significantly improved drinking outcomes for Mexican-origin young adults in the ED who received a BI delivered by *promotores* compared to those who did not.

Trial Register: ClinicalTrials.gov.

Clinical Trial Registration Number: NCT02056535.

INTRODUCTION

Mexican-origin Hispanics are the largest minority group in the USA, constituting over half of those living in the 24 US counties bordering Mexico, among whom a high proportion are under 35 (United States Census Bureau, 2012). Young adults in the USA have the highest rates of alcohol consumption and alcohol-related problems, compared to other age groups, and those residing at the US–Mexico border may be especially vulnerable to at-risk drinking and related problems, due to alcohol advertising, and in Mexico, poor enforcement of drinking age (18) and greater availability of alcohol at low cost. While volume of consumption among Mexican-Americans living at the Texas–Mexico border is no greater than that for those living off the border, rates of alcohol use disorders (AUDs) are high (Wallisch and Spence, 2006), with 30% reporting one or more episodes of binge drinking (5 or more drinks on an occasion) during the previous month, and 23% reporting symptoms of alcohol dependence among those aged 18–25 (Wallisch, 1998; Wallisch and Spence, 2006), with El Paso, site of the present study, reporting the second highest rates in Texas (Lawrence, 1998). Despite elevated rates of at-risk drinking and AUD among Mexican-origin young adults living along the border, no studies have been reported on brief intervention (BI) in the emergency department (ED) for drinking and related problems in this age and ethnic group, although the ED is the main point of access for medical care for many of these individuals (de Cosío and Boadella, 1999).

Outcome studies of BI among ED patients have reported mixed results (Longabaugh *et al.*, 2001; Rodríguez-Martos Dauer *et al.*, 2003; Field and Caetano, 2010; D’Onofrio *et al.*, 2013). In view of negative findings in several studies in ED settings, recommendations for future research have suggested the possible key role of specific types of ‘messengers’ delivering the intervention (Bernstein and Bernstein, 2008). One such ‘messenger’ is the trained Health Promotion Advocate (HPA) who is increasingly becoming an integral part of routine ED service (Bernstein *et al.*, 2009). ‘Promotores’, who are community-based Mexican-origin peer HPAs, recruited based on their bilingual/bicultural skills, ethnic identification with the target population, communication skills and familiarity with local referral resources, have been used successfully in health promotion activities in Hispanic community settings (Warrick *et al.*, 1992; Ramos and Ferreira-Pinto, 2006; Ramos *et al.*, 2006) but there are no reports of their use to deliver BI for drinking and related problems. *Protomores* might be expected to be particularly effective in delivering BI to Mexican-origin young adults in the ED, given their long-established success in other health promotion and prevention activities in the Mexican-origin community.

The present study examines the efficacy of BI applied to Mexican-origin young adults in the ED at the US–Mexico border in El Paso, TX, using ‘promotores’ conversant in Spanish and English, and represents the first such randomized controlled clinical trial of BI using *promotores*. While existing ED staff have been shown to be effective providers of BI (D’Onofrio *et al.*, 2013) they have limited time and competing priorities that present barriers to implementation of BI.

Reported here are findings from a 3- and 12-month follow-up assessment of drinking and related problems for those receiving only an assessment at baseline compared to those also receiving an intervention. We hypothesized that those in the intervention condition would report significantly greater reductions in primary outcomes of at-risk drinking and symptoms of alcohol dependence, and secondary outcomes of drinking days per week, drinks per drinking day, maximum drinks in a day, and negative consequences of drinking, compared to the assessed condition at 12-month follow-up.

Since ED admission for an injury has been thought to be a time when patients might be more inclined to change their drinking

behavior (Conigrave *et al.*, 1991; Monti *et al.*, 1999), especially if they had been drinking prior to the injury event, and those more disposed to risk taking may be less inclined to behavioral change due to perceived lack of vulnerability (Donovan *et al.*, 1988), we hypothesize in subgroup analysis that admission to the ED with an injury and self-reported drinking prior to the injury or illness event would positively predict efficacy of the intervention, while risk taking/impulsivity and sensation seeking dispositions would negatively predict efficacy.

METHODS

Patient screening, eligibility, recruitment and randomization

A cadre of interviewers were trained by the authors and supervised by survey research staff from Texas Tech University Health Sciences Center (TTUHSC) in El Paso to carry out patient screening, recruitment, assessment and randomization procedures.

Screening and eligibility

Patients aged 18–30 presenting to the ED at TTUHSC between 10:00 am and 10:00 pm 7 days a week, who self-identified as Mexican-origin and lived in El Paso County, were eligible for screening. Screening was based on questions about the usual quantity and frequency (Q-F) of drinking as a measure of at-risk drinking and the Rapid Alcohol Problems Screen (RAPS4) (Cherpitel, 2000) as a measure of alcohol dependence. Patients met eligibility criteria for the study if they were positive for at-risk drinking (reporting 15 or more drinks per week for males/8 or more for females, or 5 or more drinks in a day for males/4 or more for females, all over the past 28 days), or met criteria for Diagnostic and Statistical Manual 4th revision (DSM-IV) alcohol dependence (American Psychiatric Association, 1994) (positive on any one of the RAPS4 items during the last year: feeling of guilt or remorse after drinking, being told by a friend or family member about things said or did while drinking that could not be remembered, failed to do what was normally expected because of drinking, sometimes taking a drink in the morning when first get up). Eligibility criteria also included: (a) willingness to be randomized into one of three conditions: (i) screened only with 12-month assessment, (ii) screened plus baseline assessment with 3- and 12-month follow-up assessments, (iii) screened plus baseline assessment and receive the intervention with 3- and 12-month follow-up assessments; and (b) willingness to provide contact information for at least two individuals who would always know their whereabouts. Exclusion criteria included admitted to the hospital for inpatient treatment, currently in alcohol treatment, or planning to leave the El Paso metropolitan area.

Recruitment, randomization and attrition

Eligible patients were provided an informed consent to participate, and once signed were randomized using a two-stage process. In the first stage patients who screened positive were randomized to whether or not they would receive a baseline assessment by the study interviewer who drew an envelope indicating if the assessment was to be given. Those who did not receive an assessment were assigned to the screened-only condition. The envelope of those receiving an assessment contained a second envelope, which was opened by the interviewer following assessment, to determine whether the patient was assigned to the intervention condition. Due to slower recruitment than anticipated, a decision was made after completing 12 months to discontinue the screened-only condition, so that all patients received

the assessment and were then randomized to the intervention condition in order to assure adequate numbers for analysis in the assessment and intervention conditions.

Patient recruitment continued over a 17-month period (November 2010–April 2012), and resulted in 3176 screened individuals. Figure 1 shows the CONSORT Diagram (Schulz *et al.*, 2010) flow chart. Of those screened, 26% ($n = 824$) screened positive and of these, 85% ($n = 698$) were recruited into the study: 78 were randomized to the screened condition and 310 to each of the assessment and intervention conditions. Follow-up rates at 12 months were 72% for the screened condition ($n = 56$), 78% for the assessment condition ($n = 243$) and 75% for the intervention condition ($n = 231$). Patients in the screened-only condition received a list of Alcoholics Anonymous (AA) groups and specialized services for alcohol treatment and counseling.

Baseline assessment

Patients randomized to the assessment and intervention conditions were asked questions regarding the reason for the ED visit, self-reported drinking within 6 h prior to the event bringing them to the ED, Q-F of usual drinking, negative consequences of drinking, and risk taking/impulsivity and sensation seeking disposition. Baseline assessment included the following standardized instruments.

The *Timeline Followback* (Sobell and Sobell, 1992) was used to assess Q-F of drinking over the last 28 days, including number of drinking days, number of drinks per drinking day and the maximum number of drinks per day.

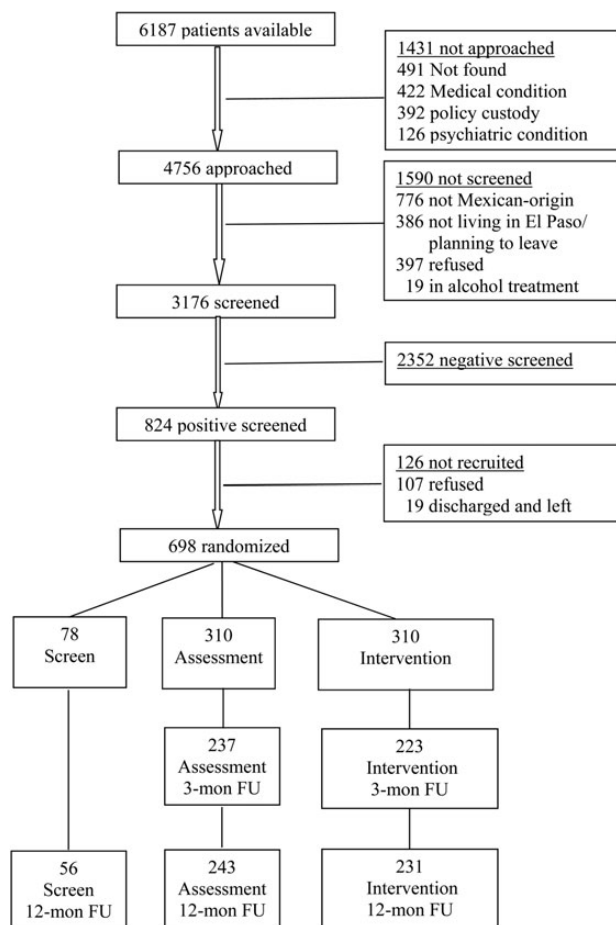


Fig. 1. Screening, recruitment and follow-up rates.

The *Short Inventory of Problems* (SIPs + 6) (Miller *et al.*, 1995), a brief version of the Drinking Inventory of Consequences, was used to assess negative consequences related to drinking over the last 3 months and includes 15 consequence items related to physical, social responsibility, intrapersonal, impulse control and interpersonal domains, with six additional questions from the original instrument on injury and drink driving.

Risk taking/impulsivity was assessed from five items adapted from Eysenck and Eysenck (1977) and Jackson (1974), and *sensation seeking* from four items on novelty and thrill seeking adapted from Zuckerman (1979). Each item for both dispositions was measured on a 4-point scale, summed across items for each disposition, separately, and then combined as a single measure (Cherpitel, 1993).

Instruments were translated into Spanish, verified by back-translation (Breslin, 1986) or expert attestation. Patients could choose whether they preferred to be interviewed in English (75%) or in Spanish (10%); 15% were conducted in both languages.

Patients randomized to the screening plus assessment condition received a list of AA groups and specialized services for alcohol treatment and counseling.

Intervention

Patients randomized to the intervention condition received a brief motivational intervention by *promotores* who had been trained in BI using the Brief Negotiation Interviewing (BNI) protocol (Bernstein *et al.*, 1997) which integrates the following elements with readiness to change (Prochaska and DiClemente, 1992): (a) establishing a relationship of empathy and trust with the patient and gaining permission to discuss drinking (engagement and permission), (b) providing the patient with feedback about their drinking based on safe drinking guidelines (feedback, information and norms), (c) asking the patient to discuss the pros and cons of their drinking (decisional balance), (d) assessing the patient's readiness to change their drinking behavior (readiness to change), (e) providing the patient with options regarding changing drinking behavior (menu of options) and (f) negotiating with the patient their goal for reducing drinking and strategies for achieving this (prescription for change, in which the *promotore* and the patient sign a plan of action for change in the patient's drinking). The intervention was designed to take about 20 min to complete and was generally provided in a private area near the waiting room while the patient was waiting for treatment, or in the treatment area. A list of AA groups, general resources, and specialized services for alcohol treatment and counseling was provided to the patient.

Training of *promotores*

A unique feature of this study was the use of community-based Mexican-origin peer HPAs, called *promotores*, to deliver the intervention. Training in BI was provided on-site by the project team, utilizing protocols established in training at all sites (Bernstein *et al.*, 2007) in the Academic Emergency Medicine Collaborative SBIRT (Screening, Brief Intervention and Referral to Treatment) study (Academic ED SBIRT Research Collaborative, 2007). Four *promotores* received a 3-day training which included practice interventions with patients in the ED, in the presence of study staff, and two booster training sessions.

Monitoring fidelity to treatment and controlling potential threats to validity

As a measure of integrity, interventions were initially observed by supervisory staff with a patient's consent and immediate feedback provided to the *promotore* to assure high quality of the intervention.

Additionally, with a patient's consent, interventions were taped and any deviation from the intervention protocol was discussed with the *promotore*. Brief exit interviews were conducted by interviewers regarding whether the *promotore* had talked with the patient about their drinking, patient satisfaction with the intervention and whether a contract agreement was reached.

Three- and twelve-month follow-up assessment

Those in the assessment and intervention conditions were assessed at 3 months and all three groups were assessed at 12 months via telephone by an interviewer blinded to group status, using the RAPS4, Timeline Followback and SIPS + 6. Patients were also asked whether they obtained treatment for their drinking in the last 3 months.

Data analysis

Chi-square and *T*-tests were used for bivariate comparisons. A random effects model was used to examine the intervention effect, which allows for unbalanced data due to loss to follow-up, issues related to missing data and potential bias, and accounts for correlation in errors resulting from repeated measures on the same individuals over time. The change in primary and secondary outcomes between the intervention and assessment conditions were compared, controlling for age, gender, country of birth (USA or Mexico), and baseline values for the total sample and, separately, by injury status, drinking prior to the event, and risk taking/impulsivity and sensation seeking.

Distributions of the continuous primary and secondary outcome measures demonstrated evidence of non-normality, indicated by large skewedness and kurtosis estimates, and were log-transformed. The specific model estimated was: $y_{i,t} = \alpha_i + \beta_1 \cdot G_i + \beta_2 \cdot t_3 + \beta_3 \cdot t_{12} + \beta_4 \cdot G_i \cdot t_3 + \beta_5 \cdot G_i \cdot t_{12} + \epsilon_{i,t}$ where t_3 and t_{12} are indicator variables representing observations collected at 3- and 12-month interviews, and $G_i = 0,1$ if the i th case was assigned to the assessed and intervention conditions, respectively. The β_2 coefficient represents change in drinking from baseline to the 3-month interview when G equals 0 (i.e. for

the assessed condition); β_3 represents the corresponding difference between baseline and the 12-month interview. The β_1 estimate represents the difference in drinking variables between the assessed and intervention conditions at baseline. Last, β_4 and β_5 estimate the corresponding intervention effect at 3 and 12 months, which can be seen as the post-pre difference (i.e. 3-month or 12-month minus baseline) in outcomes for the intervention condition minus the analogous difference for the assessed condition (i.e. a difference in differences).

RESULTS

No significant differences were found in baseline variables between the assessed and intervention conditions, except for age, where the difference, while statistically significant due to the small age range (18–30), was minimal, suggesting randomization was achieved across conditions at baseline (Table 1).

Table 2 shows drinking outcomes at 3 and 12 months for the assessed compared to the intervention condition. At both follow-ups the intervention condition showed significantly or marginally significantly lower values on all outcome variables compared to the assessed condition, with the exception of the RAPS4 score.

Using random effects modeling, differences in improvement in outcomes between the intervention and assessed conditions are examined at 3- and 12-month follow-up (Table 3). For each drinking outcome, the table shows the coefficient estimates of the difference between assessed and intervention conditions at baseline (the group effect at baseline), the differences between baseline and 3 or 12 months for the assessed group (the time effect), and changes in drinking from baseline to 3 or 12 months for the intervention group vs the assessed group (the intervention effect as measured by interaction). Negative time effects were seen for almost all drinking variables at both 3 and 12 months, indicating decline in drinking from baseline. For estimates of intervention effects, at 3 months the intervention condition showed greater improvement than the assessed condition only in maximum drinks on an occasion, while at 12 months the intervention condition, compared to

Table 1. Baseline comparison between the assessment and intervention groups

	Screen only ^a	Assess	Intervene	<i>P</i> ^b
<i>N</i>	78	310	310	
Gender male, %	52.6	54.4	58.3	0.330
Age, mean (SD) ^b	24.0 (3.4)	24.3 (3.5)	23.6 (3.5)	0.009
Born in the USA, %	N.A.	81.9	77.3	0.156
Injured, %	N.A.	38.3	33.9	0.250
Drinking before event, %	N.A.	13.9	17.7	0.192
Risk taking scale, mean (SD)	N.A.	13.7 (7.5)	13.3 (7.4)	0.551
Primary outcomes				
Days of 5+/4+ men/women last 28-day, mean (SD)	N.A.	2.92 (4.15)	3.16 (4.56)	0.704
Any RAPS4 positive last 3 months, %	32.1	37.7	40.0	0.564
Secondary outcomes				
No. of drinking days per week last 28-day, mean (SD)	1.77 (1.60)	1.06 (1.21)	1.12 (1.24)	0.394
Drinks per drinking day last 28-day, mean (SD)	5.86 (3.50)	6.15 (4.83)	5.99 (4.58)	0.914
Maximum drinks last 28-day, mean (SD)	8.13 (3.76)	8.53 (7.61)	8.49 (7.16)	0.695
SIPs + 6 count last 3 months, mean (SD)	N.A.	3.49 (4.01)	3.51 (4.25)	0.758

SD, standard deviation.

^aScreen only group individuals were only asked the screening questions, thus not available (N.A.) for the assessment questions. In addition, other than the RASP4%, the three drinking outcomes shown for the screen only groups are from the screen items too, rather than from the time line follow-back questions used for Assess and Intervention groups, thus their estimates are not directly comparable. For example, the number of drinking days per week for the screen only group was based on the question: on average, how many days a week do you drink alcohol.

^b*P*-values are based on tests between the Assess and the Intervention groups only, with *t*-tests for continuous measures and Chi-square tests for categorical measures; all continuous drinking outcomes were log-transformed due to their skewed distribution.

Table 2. Drinking outcomes at 3- and 12-month follow-up, for assessment and intervention groups, separately

N	3-month			12-month			
	Assessed	Intervention	P-value ^a	Assessed	Intervention	P-value ^a	
	237	223		243	231		
Primary outcomes							
	Days of 5+/4+ men/women last 28-day, mean (SD)	1.66 (3.32)	1.17 (2.12)	0.087	2.43 (4.19)	1.46 (2.95)	0.001
	Any RAPS4 positive last 3 months, %	23.6	19.7	0.311	14.4	14.3	0.971
Secondary outcomes							
	No. of drinking days per week last 28-day, mean (SD)	0.72 (1.06)	0.56 (0.92)	0.066	1.13 (1.31)	0.82 (1.21)	0.003
	Drinks per drinking day last 28-day, mean (SD)	3.90 (4.51)	3.10 (3.88)	0.065	3.08 (3.02)	2.65 (3.13)	0.040
	Maximum drinks last 28-day, mean (SD)	5.08 (5.91)	3.90 (4.87)	0.044	4.75 (5.20)	4.06 (5.50)	0.035
	SIPs + 6 count last 3 months, mean (SD)	1.55 (2.95)	0.91 (2.02)	0.011	1.35 (2.46)	1.10 (2.46)	0.047

^aAll continuous measures (all variables except for RASP4 positive) were log-transformed for *t*-test; Chi-square test was used for RAPS4 positive.

Table 3. Random effect model coefficients for change in drinking between baseline and 3- and 12-month follow-up for the total sample (*N* = 620 at baseline)^a

	Intercept ^b (assess at baseline)	Group effect at baseline (intervention vs assess)	Time effect (3-month vs baseline)	Time effect (12-month vs baseline)	Interaction (3-month × intervention)	Interaction (12-month × intervention)	
Primary outcomes							
	Days of 5+/4+ men/women last 28-day	0.69 (0.11)	0.03 (0.06)	-0.43 (0.06)***	-0.26 (0.06)***	-0.12 (0.08)	-0.27 (0.08)**
	Any RAPS4 positive last 3 months	-1.15 (0.42)	0.14 (0.23)	-0.95 (0.23)***	-1.74 (0.27)***	-0.36 (0.34)	-0.12 (0.37)
Secondary outcomes							
	No. of drinking days per week last 28-day	0.40 (0.06)	0.03 (0.04)	-0.19 (0.03)***	-0.01 (0.03)	-0.09 (0.05) [†]	-0.17 (0.05)***
	Drinks per drinking day last 28-day	1.36 (0.11)	0.001 (0.07)	-0.55 (0.06)***	-0.63 (0.06)***	-0.17 (0.09) [†]	-0.18 (0.09)*
	Maximum drinks last 28-day	1.56 (0.12)	0.02 (0.07)	-0.64 (0.07)***	-0.65 (0.07)***	-0.22 (0.10)*	-0.24 (0.10)*
	SIPs + 6 count last 3 months	1.02 (0.11)	-0.03 (0.06)	-0.58 (0.06)***	-0.60 (0.06)***	-0.12 (0.08)	-0.11 (0.08)

^aAll drinking outcome variable were log-transformed, except for any RAPS4 positive.

^bSignificant tests not shown for intercepts.

[†]*P* < 0.10, **P* < 0.05, ****P* < 0.001.

the assessed condition, showed greater improvement in all outcome variables with the exception of the RAPS4 and SIPs + 6 score.

Subgroup analysis was performed to investigate potential differential intervention effects by ED admission injury status (injured vs not-injured, Table 4), by drinking within 6 h prior to the injury or medical event (Table 5), and by patients' risk taking/impulsivity and sensation seeking disposition (Table 6). Improvement in outcomes was more evident, especially at 12 months, for non-injured patients, those who reported drinking prior to the event that precipitated the ED visit, and those lower on risk taking disposition. For example, while greater improvement at 12 months for the intervention condition compared to the assessed condition was observed in 5+/4+ days and number of drinking days for both injured and non-injured patients, significant additional reduction was also seen in drinks per drinking day and maximum drinks for the non-injured patients (the last column of Table 4), proving stronger evidence of the intervention effect for this subgroup compared to the injured patients. When the intervention effects were estimated separately for those who reported drinking before the event and those who did not (Table 5), four out of six 12-month outcomes were significant (*P* < 0.05) among those who reported drinking, while only one 12-month outcome was significant for those who did not report drinking. This 12-month intervention effect for those who reported drinking is even more evident considering its sample size is much smaller (*n* = 98) than for those who did not report

drinking (*n* = 521), and thus having less power in significant testing. Lastly, the intervention effect appeared to be more evident for those lower on risk taking disposition compared to those higher, with a larger number of significant intervention effects observed for both 3- and 12-month outcomes (Table 6).

The assessed condition was also compared to the screened-only condition to examine potential biases related to assessment reactivity (not shown). No difference was found between the two conditions at baseline, while at 12-month follow-up the direction of differences in the observed effects varied across outcome measures, and, except for RAPS4, none of the comparisons were significant.

DISCUSSION

In this BI study of young adult Mexican-origin ED patients residing in the Texas–Mexico border city of El Paso, 25% of those screened met criteria for at-risk or dependent drinking, which was similar to the proportion screening positive in other BI studies (Longabaugh *et al.*, 2001; Academic ED SBIRT Research Collaborative, 2007; Daeppen *et al.*, 2007; Cherpitel *et al.*, 2010). Both the assessment and intervention conditions showed decreases in all primary and secondary outcomes from baseline to the 12-month follow-up, with the intervention condition showing significantly or marginally significantly lower values on outcome variables except the RAPS4 score. Controlling

Table 4. Random effect model coefficients for change in drinking between baseline and 3- and 12-month follow-up, by injury status^a

	Intercept ^b (assess at baseline)	Group effect at baseline (intervention vs assess)	Time effect (3-month vs baseline)	Time effect (12-month vs baseline)	Interaction (3-month × intervention)	Interaction (12-month × intervention)
Injured patients (N = 223 at baseline)						
Primary outcomes						
Days of 5+/4+ men/women last 28-day	0.98 (0.19)	0.03 (0.11)	-0.49 (0.10)***	-0.18 (0.10) [†]	-0.09 (0.14)	-0.27 (0.14)*
Any RAPS4 positive last 3 months	-0.56 (0.66)	0.24 (0.38)	-1.33 (0.39)***	-1.95 (0.45)***	0.14 (0.55)	-0.01 (0.61)
Secondary outcomes						
No. of drinking days per week last 28-day	0.49 (0.10)	0.06 (0.06)	-0.21 (0.06)***	0.05 (0.06)	-0.09 (0.09)	-0.18 (0.09)*
Drinks per drinking day last 28-day	1.59 (0.18)	-0.05 (0.11)	-0.65 (0.10)***	-0.63 (0.10)***	0.03 (0.14)	-0.06 (0.14)
Maximum drinks last 28-day	1.84 (0.21)	-0.03 (0.13)	-0.75 (0.11)***	-0.67 (0.11)***	-0.02 (0.16)	-0.07 (0.16)
SIPs + 6 count last 3 months	1.20 (0.18)	0.00 (0.11)	-0.72 (0.09)***	-0.57 (0.10)***	-0.07 (0.14)	-0.14 (0.14)
Non-injured patients (N = 395 at baseline)						
Primary outcomes						
Days of 5+/4+ men/women last 28-day	0.52 (0.13)	0.05 (0.08)	-0.38 (0.07)***	-0.30 (0.07)***	-0.14 (0.10)	-0.28 (0.10)**
Any RAPS4 positive last 3 months	-1.51 (0.55)	0.14 (0.30)	-0.71 (0.30)*	-1.55 (0.33)***	-0.70 (0.43)	-0.27 (0.46)
Secondary outcomes						
No. of drinking days per week last 28-day	0.35 (0.08)	0.02 (0.05)	-0.17 (0.04)***	-0.04 (0.04)	-0.10 (0.06) [†]	-0.17 (0.06)**
Drinks per drinking day last 28-day	1.18 (0.13)	0.06 (0.08)	-0.48 (0.08)***	-0.62 (0.08)***	-0.29 (0.11)*	-0.26 (0.11)*
Maximum drinks last 28-day	1.34 (0.15)	0.08 (0.09)	-0.56 (0.09)***	-0.62 (0.09)***	-0.35 (0.13)**	-0.35 (0.13)**
SIPs + 6 count last 3 months	0.93 (0.14)	-0.04 (0.08)	-0.50 (0.07)***	-0.62 (0.07)***	-0.15 (0.10)	-0.10 (0.10)

^aAll drinking outcome variable were log-transformed, except for any RAPS4 positive.

^bSignificant tests not shown for intercepts.

[†]P < 0.10, *P < 0.05, **P < 0.01, ***P < 0.001.

Table 5. Random effect model coefficients for change in drinking between baseline and 3- and 12-month follow-up, by drinking prior to the event^a

	Intercept ^b (assess at baseline)	Group effect at baseline (intervention vs assess)	Time effect (3-month vs baseline)	Time effect (12-month vs baseline)	Interaction (3-month × intervention)	Interaction (12-month × intervention)
Drinking before event (<i>N</i> = 98 at baseline)						
Primary outcomes						
Days of 5+/4+ men/women last 28-day	0.92 (0.29)	0.27 (0.17)	-0.53 (0.18)**	-0.29 (0.18)	-0.28 (0.25)	-0.78 (0.24)**
Any RAPS4 positive last 3 months	-0.54 (1.05)	0.18 (0.59)	-1.56 (0.67)*	-2.72 (0.78)***	0.27 (0.86)	-0.03 (0.94)
Secondary outcomes						
No. of drinking days per week last 28-day	0.55 (0.17)	0.18 (0.11) [†]	-0.26 (0.11)*	0.00 (0.11)	-0.16 (0.15)	-0.48 (0.15)***
Drinks per drinking day last 28-day	1.56 (0.25)	0.10 (0.16)	-0.54 (0.17)**	-0.63 (0.16)***	-0.10 (0.23)	-0.44 (0.22)*
Maximum drinks last 28-day	1.83 (0.29)	0.15 (0.18)	-0.72 (0.19)***	-0.72 (0.18)***	-0.16 (0.25)	-0.59 (0.24)*
SIPs + 6 count last 3 months	1.41 (0.30)	0.19 (0.17)	-0.85 (0.17)***	-0.82 (0.17)***	-0.21 (0.23)	-0.40 (0.22) [†]
No drinking before event (<i>N</i> = 521 at baseline)						
Primary outcomes						
Days of 5+/4+ men/women last 28-day	0.67 (0.11)	-0.04 (0.07)	-0.41 (0.06)***	-0.26 (0.06)***	-0.07 (0.09)	-0.16 (0.08) [†]
Any RAPS4 positive last 3 months	-1.18 (0.46)	0.07 (0.26)	-0.89 (0.26)***	-1.60 (0.29)***	-0.44 (0.37)	-0.09 (0.40)
Secondary outcomes						
No. of drinking days per week last 28-day	0.39 (0.06)	-0.01 (0.04)	-0.18 (0.03)***	-0.01 (0.03)	-0.07 (0.05)	-0.10 (0.05)*
Drinks per drinking day last 28-day	1.34 (0.12)	-0.03 (0.07)	-0.55 (0.07)***	-0.63 (0.07)***	-0.17 (0.10) [†]	-0.13 (0.10)
Maximum drinks last 28-day	1.53 (0.13)	-0.02 (0.08)	-0.63 (0.08)***	-0.64 (0.08)***	-0.22 (0.11)*	-0.16 (0.11)
SIPs + 6 count last 3 months	0.95 (0.11)	-0.10 (0.07)	-0.54 (0.06)***	-0.57 (0.06)***	-0.08 (0.09)	-0.03 (0.08)

^aAll drinking outcome variable were log-transformed, except for any RAPS4 positive.

^bSignificant tests not shown for intercepts.

[†]*P* < 0.10, **P* < 0.05, ***P* < 0.01, ****P* < 0.001.

Table 6. Random effect model coefficients for change in drinking between baseline and 3- and 12-month follow-up, by dispositional variables^a

	Intercept ^b (assess at baseline)	Group effect at baseline (intervention vs assess)	Time effect (3-month vs baseline)	Time effect (12-month vs baseline)	Interaction (3-month × intervention)	Interaction (12-month × intervention)
Higher risk taking ^c (N = 205 at baseline)						
Primary outcomes						
Days of 5+/4+ men/women last 28-day	0.80 (0.20)	0.13 (0.12)	-0.46 (0.11)**	-0.33 (0.11)**	-0.23 (0.16)	-0.35 (0.16)*
Any RAPS4 positive last 3 months	-1.09 (0.64)	0.44 (0.39)	-1.04 (0.37)**	-1.65 (0.41)**	-0.36 (0.54)	-0.53 (0.58)
Secondary outcomes						
No. of drinking days per week last 28-day	0.43 (0.12)	0.12 (0.07)	-0.18 (0.07)**	-0.03 (0.07)	-0.15 (0.10)	-0.22 (0.10)*
Drinks per drinking day last 28-day	1.53 (0.19)	-0.06 (0.12)	-0.64 (0.11)**	-0.80 (0.11)**	-0.03 (0.16)	-0.05 (0.16)
Maximum drinks last 28-day	1.79 (0.22)	-0.01 (0.14)	-0.76 (0.13)**	-0.83 (0.13)**	-0.12 (0.18)	-0.16 (0.18)
SIPs + 6 count last 3 months	1.46 (0.20)	0.09 (0.12)	-0.75 (0.10)**	-0.88 (0.10)**	-0.25 (0.15)	-0.22 (0.15)
Lower risk taking (N = 414 at baseline)						
Primary outcomes						
Days of 5+/4+ men/women last 28-day	0.59 (0.12)	-0.01 (0.07)	-0.42 (0.07)**	-0.23 (0.06)**	-0.05 (0.09)	-0.24 (0.09)*
Any RAPS4 positive last 3 months	-1.34 (0.55)	0.01 (0.29)	-0.97 (0.31)**	-1.82 (0.35)**	-0.32 (0.44)	0.14 (0.48)
Secondary outcomes						
No. of drinking days per week last 28-day	0.35 (0.07)	0.00 (0.04)	-0.20 (0.04)**	0.00 (0.04)	-0.06 (0.05)	-0.15 (0.05)**
Drinks per drinking day last 28-day	1.23 (0.13)	0.03 (0.08)	-0.52 (0.08)**	-0.55 (0.07)**	-0.22 (0.11)*	-0.25 (0.11)*
Maximum drinks last 28-day	1.38 (0.15)	0.04 (0.09)	-0.60 (0.08)**	-0.56 (0.08)**	-0.25 (0.12)*	-0.28 (0.12)*
SIPs + 6 count last 3 months	0.74 (0.12)	-0.06 (0.07)	-0.50 (0.07)**	-0.46 (0.06)**	-0.05 (0.09)	-0.06 (0.09)

^aAll drinking outcome variable were log-transformed, except for any RAPS4 positive.

^bSignificant tests not shown for intercepts.

^cIncludes impulsivity and sensation seeking.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

for gender, age, nativity and baseline drinking values, the intervention condition showed greater improvement than the assessed condition only in maximum drinks on an occasion at 3 months, while at 12 months the intervention condition showed greater improvement in all consumption variables, but not in problem variables (RAPS4 measuring dependence and SIPs + 6 measuring negative consequences of drinking). Unlike those studies which have found positive results for BI in the short-term deteriorating on longer-term follow-up (Nilsen *et al.*, 2008), findings here suggest long-term effects of the intervention, also reported elsewhere (Monti *et al.*, 1999; Longabaugh *et al.*, 2001; Cherpitel *et al.*, 2010).

In *subgroup analysis*, improvement in outcomes was significantly more evident for non-injured patients, those who reported drinking prior to the event that precipitated the ED visit and those lower on risk taking disposition. We hypothesized that injured patients would demonstrate greater improvement in outcomes over non-injured patients due to the injury event being viewed as a 'teachable moment', at which time patients may be more receptive to an intervention (Conigrave *et al.*, 1991; Monti *et al.*, 1999), but findings here did not support this. Drinking prior to the injury or medical event was found to be a significant moderator of effectiveness of the intervention, as hypothesized and found elsewhere (Barnett *et al.*, 2010), presumably due to the increased salience of alcohol's role in the event as a motivator to change drinking behavior. Likewise we hypothesized that those low on risk taking/impulsivity and sensation seeking would also show improved outcomes compared to those higher on these dispositions who may be least susceptible to behavioral change due to perceived lack of vulnerability and differences in information processing (Donovan *et al.*, 1988), and findings here support this hypothesis.

Improved outcomes from baseline to 12 months for both the assessed and intervention condition may be due, in part, to regression to the mean, operant where those recruited based on a given level of criteria may be at a peak for the criteria at the time of recruitment. Likewise, assessment reactivity, where the impact of assessment may be nearly as strong as the impact of the intervention in changing drinking behavior, has been thought to account for improved outcomes for the assessment condition, but little evidence of this was apparent in this study. Comparison between the screened and assessed condition at the 12-month follow-up found the direction of differences in the effects observed varied across outcome measures, and except for RAPS4, none of the comparisons were significant.

Additionally, patients expecting a follow-up contact may have reduced their drinking under both conditions, or may claim to have reduced consumption to meet perceived expectation of the interviewers. This *social desirability* bias may be especially relevant for this population of Mexican-origin patients among whom there is a strong cultural emphasis on harmony in interpersonal relationships and respect and obedience for authority figures (Marín, 1996; Marín and Marín, 1997).

The present study employed peer educator HPAs, licensed as community health workers, who were able to spend more time with the patient and conduct the intervention in a private area, addressing some of the observed shortcomings of BI in the ED setting (Daepfen *et al.*, 2007), and may account for the long-term effects of BI found here. While the use of *promotores* has reached widespread success as a low-cost, culturally appropriate prevention model in clinical settings among ethnic populations (Warrick *et al.*, 1992; Williams, 2001; Ramos and Ferreira-Pinto, 2006; Ramos *et al.*, 2006), they have not previously been used to deliver BI for drinking and related problems. It was hypothesized, and substantiated by our findings, that *promotores* would be particularly effective in delivering BI to Mexican-origin

young adults, given their long-established success in other health promotion and prevention activities in the Mexican-origin community. Additionally, *ethnic matching* between patient and interventionist has been found to be an important factor in efficaciousness of BI (Marín, 1989; Marín *et al.*, 1995; Casas *et al.*, 2002; Comas-Días, 2006; Vasquez, 2007; Field and Caetano, 2010), especially among those less acculturated who may be more distrustful and less comfortable discussing their alcohol use with a stranger (Field and Caetano, 2010).

Limitations

Findings here may be influenced by the low severity of drinking of those recruited into this study. Patients reported drinking on average about 1 day a week, but consuming six drinks per drinking day and over eight drinks on a maximum drinking occasion, reflecting a pattern of heavy episodic drinking characteristic of a fiesta drinking culture typical in this Mexican-origin population. BI directed toward patients in the mild range of drinking severity is less likely to show improvement in drinking outcomes (Bernstein and Bernstein, 2008), and findings based on this drinking style may not be generalizable to other cultures or populations with more frequent heavy drinking patterns.

Also potentially effecting study findings is attrition at follow-up. While no significant differences were observed between those followed and those not followed in the assessed condition, those not followed in the intervention condition were heavier drinkers at baseline. One possible explanation for this is that those with a more serious drinking problem who undergo an intervention may find it more difficult to change their drinking behavior than those with a less severe problem, and therefore less inclined to participate at follow-up, due to the strong cultural emphasis on respect and obedience for authority figures in this ethnic group (Marín, 1996; Marín and Marín, 1997).

Lastly, findings here pertain only to one ED in El Paso, TX, and may not be generalizable to other border settings either in Texas, or in the three other states that border Mexico, or to other more rural border areas.

Despite these limitations, main findings related to both primary and secondary outcomes were similar to those from other BI studies, and intervention may have added benefits above assessment for specific subgroups of patients in the ED, an area that warrants additional study in the ED setting. Data also suggest the efficacy of *promotores* in delivering BI in this population of young adult Mexican-origin patients in the ED.

FUNDING

This work was supported by a grant from the U.S. National Institute on Alcohol Abuse and Alcoholism (R01 AA018119).

CONFLICT OF INTEREST STATEMENT

None declared.

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