Published in final edited form as:

Drug Alcohol Depend. 2012 November 1; 126(1-2): 21–26. doi:10.1016/j.drugalcdep.2012.04.009.

Ethnic Differences in the Effect of Drug Use and Drug Dependence on Brief Motivational Interventions Targeting Alcohol Use

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Abstract

Background—We examined the effects of baseline drug use and dependence on alcohol use outcomes following brief motivational intervention for at-risk drinking (BMI-ETOH).

Methods—HLM models were developed to test the interaction of drug use and dependence with BMI-ETOH for alcohol use among Hispanic (n=539), Caucasian (n=667), and Black (n=287) patients admitted to a Level-1 trauma center who screened positive for alcohol misuse.

Results—Analyses of an interaction of drug dependence and BMI-ETOH at baseline showed significant positive effects among Hispanics but not Caucasians or Blacks at six- and 12-months for percent days abstinent (6-month: B=.27, SE=.10, $P=.006$; 12-month: B=.41, SE=.11, $P<.001$), volume per week (6-month: B=-1.91, SE=.77, $P=.01$; 12-month: B=-2.71, SE=.86, $P=.002$), and maximum amount consumed (6-month: B=-1.08, SE=.46, $P=.02$; 12-month: B=-1.62, SE=.52, $P=.002$).

Conclusions—Baseline drug dependence did not negatively impact drinking outcomes. Among Hispanics, those with drug dependence at baseline who received a BMI-ETOH demonstrated consistent improvements across drinking outcomes. While the effects of drug use at baseline on drinking outcomes following BMI-ETOH varied by type of drug used and ethnicity, additional research is required.

Keywords

brief motivational intervention; drug use; drug dependence; race/ethnicity

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Contributors: Craig Field was a co-principal investigator for the parent clinical trial to this study. Dr. Field conceptualized and wrote the largest portions of this manuscript.

Gerald Cochran carried out the statistical analyses and wrote the results section of the manuscript.

Raul Caetano was the principal investigator for the parent clinical trial for this study. Dr. Caetano edited and provided critical feedback for the manuscript.

Conflict of Interest: The authors have no conflicts of interest to declare for this project.

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1. Introduction

A significant amount of research has been conducted to evaluate the impact of brief interventions for alcohol use. While not entirely consistent, many studies have supported the benefits of brief intervention to address heavy drinking. In the trauma care setting, brief alcohol interventions have been shown to reduce alcohol use and its associated consequences, such as drinking and driving (Field et al., 2010; Gentilello et al., 1999; Schermer et al., 2006; Smith et al., 2003; Field and Caetano, 2010b). Similar findings have also been demonstrated in the emergency department and primary care settings (Bazargan-Hejazi et al., 2005; Fleming et al., 1997; 2002; Longabaugh et al., 2001). These interventions have also proven to be cost effective, resulting in a reduction of about \$4 in health care expenditures for every dollar spent (Fleming et al., 2000, 2002; Gentilello et al., 2005). Based on the preponderance of evidence, the World Health Organization, the United States Preventative Services Task Force, and the Committee on Trauma of the American College of Surgeons have endorsed routine alcohol screening and brief interventions (SBI) in primary health care settings and Level-1 Trauma Centers (SAMHSA, 2007; United States Preventive Services Task Force, 2004; ACS, 2006).

Studies evaluating the effectiveness of brief intervention on alcohol use in the emergency department and trauma care setting have not evaluated the potential impact of drug use or drug dependence on drinking outcomes. Like alcohol use, drug use has been found to be over-represented in samples of patients in emergency department settings, with positive toxicology screening rates for illicit drugs as high as 40%. Moreover, these rates have remained relatively consistent in the past two decades (Rivara et al., 1997; Stoduto et al., 1993; Vitale and Mheen, 2006). In one of the few studies of brief alcohol interventions to report drug use, Gentilello et al. (1999) reported that 50% of all trauma patients reported concurrent drug use. To the best of our knowledge no one has reported the frequency or impact of various drugs of abuse or drug dependence or on drinking outcomes following a brief intervention for at risk drinking. Given the high rates of comorbidity between drug and alcohol use and the high prevalence rate of drug use within the emergency department patient population, it is important to establish the impact drug use has on alcohol use outcomes following brief intervention.

We sought to address this knowledge gap by conducting a secondary data analysis of a study that evaluated the benefits of screening and brief motivational intervention for alcohol use (BMI-ETOH) in the trauma care setting. To better understand the potential relationship and influence of drug use on drinking outcomes, we examine the frequency of drug use and drug dependence at baseline and changes in drug use over time. More importantly, we determine the impact of drug use and drug dependence at baseline on drinking outcomes following BMI-ETOH. Based on ongoing efforts to implement screening and brief intervention in a range of healthcare settings to diverse patient populations, this information is critical to the growth and development of a body of evidence to inform clinical practice, professional training and healthcare policy related to screening and brief intervention for substance abuse.

2. Methods

2.1. Recruitment

Patients admitted to an urban Level I trauma center and screened positive for alcohol misuse were recruited into the study between 2003 and 2005. The procedures of the study were approved by the Institutional Review Boards of the University of Texas Health Science Center at Houston and the trauma center where patient recruitment took place. A certificate

of confidentiality from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) was also obtained. Participants were consented into the project following medical stabilization and prior to discharge from the trauma center. The consort chart for this randomized clinical trial was published previously (Field et al., 2010).

2.2. Screening and Enrollment

Given that the primary aim of the parent study was to evaluate ethnic differences in response to BMI-ETOH, study recruitment was limited to self-identifying Caucasian, Hispanic, and Black patients (Roudsari et al., 2009; Field et al., 2010). Patients screened positive based on the following: (1) clinical indication of acute intoxication, alcohol use, or positive BAC; (2) self-reported drinking six-hours before the injury event; (3) self-reported drinking at NIAAA risk levels; i.e., 7 drinks/week women, 14 drinks/week men; more than 4 drinks/day in men; more than 3 drinks/day in women (NIAAA, 2007); or (4) positive on one or more items of the CAGE (Ewing, 1984; Kitchens, 1994). Participants were not screened for the study if they were less than 18 years of age, spoke languages other than English or Spanish, had insufficient contact information, were under arrest or in police custody, were actively suicidal or psychotic, victims of sexual assault, or had a medical condition precluding study involvement. Furthermore, patients who were not oriented to person, place, or time, had a Glasgow Coma Scale ≤ 14 , or were intoxicated were not screened.

2.3. Randomization and Assessment

Study participants were randomized into one of two conditions: treatment as usual (TAU) or brief motivational intervention for alcohol use (BMI-ETOH) using a permuted block design (block size six) to ensure approximately equal distribution of patients according to their race/ethnicity. Following the assessment, participants in the TAU condition were provided handouts related to alcohol and hospital and community services available to them by the assessor administering the questionnaire. Patients randomized to receive a BMI-ETOH met with a study clinician following the assessment. The BMI-ETOH components have been described in previous journal articles regarding brief motivational interventions (Dunn et al., 2005; Field et al., 2005). Treatment fidelity has been reported elsewhere and indicates adherence to the principles of motivational interviewing in the context of brief intervention in the healthcare setting (Field et al., 2010). Participants in both conditions were assessed at baseline, six-, and 12-months for alcohol and drug use. Assessments lasted for approximately 30 to 40 minutes. Participation rates and follow up rates have been reported elsewhere and are consistent with other brief intervention studies conducted in the trauma care setting (Field et al., 2010; Gentilello et al., 1999; Soderstrom et al., 2007). For the present secondary analysis, alcohol use at six and 12 months were examined as outcomes of interest. In addition, drug use and dependence at baseline was examined as potential moderators of drinking outcomes.

2.3.1 Alcohol Use—Quantity and frequency of alcohol consumption was captured at each assessment period using a graduated frequency approach (Greenfield, 2000; Midanik, 1994). Patients reported drinking in standard drinks, i.e., 12 ounces of beer, five ounces of wine, or 1.5 ounces of hard liquor (Dawson, 2003). Maximum number of drinks per drinking day, volume per week, percent days heavy drinking, and percent days abstinent were calculated for the year following recruitment into the study.

2.3.2 Drug Use and Drug Dependence—Drug use and drug dependence at baseline was assessed using The Composite International Diagnostic Interview Short-Form developed by WHO (CIDI-SF; Kessler et al., 1998). Drug use in the CIDI-SF is captured using nine categories of drugs including: sedatives; tranquilizers; amphetamines; analgesics or other prescription pain killers; inhalants; marijuana or hashish; cocaine, crack, or

freebase; LSD or other hallucinogens; or heroin. The CIDI-SF also asks if participants used some “other” type of drug, not included in the nine categories above (Kessler et al., 1998). At baseline, six- and 12- month follow ups, patients were asked if they used drugs “on [their] own.” Based on the CIDI-SF, “on your own” is defined in the preface to the categories of drug use as either: “1) without a doctor's prescription (i.e. illegal drugs or medicine obtained without your own prescription), 2) drugs or medication you may have taken in larger amounts than prescribed, or 3) drugs you may have used for a longer period than prescribed.” The CIDI maps the symptoms elicited during the interview onto DSM-IV diagnostic criteria and, using a computerized algorithm, determines whether the diagnostic criteria are satisfied. The inter-rater reliability of the CIDI has been demonstrated to be excellent, the test-retest reliability good, and the validity has been demonstrated to be good, given the methodological constraints (Andrews and Peters, 1998).

In addition to dependence, drug use was also examined as a potential moderator of drinking outcomes following BMI-ETOH. Specifically, the use of cannabis, cocaine and analgesic/prescription painkillers were separately examined as potential moderators. These drugs were selected for analysis because they were the most frequently abused drugs within the sample. Further, analgesic/prescription painkiller abuse use was examined in this project as a result of the medical setting in which this project was conducted where these drugs are commonly prescribed upon discharge from the hospital. In addition, the misuse of analgesics/prescription painkillers was the second most common substance of abuse at follow up. Lastly, polysubstance abuse (i.e., any combination of more than one substance used) was examined in this study in order to capture the effects of using more than one drug on drinking outcomes following BMI-ETOH.

2.4. Analyses

Analyses for this project were conducted using IBM SPSS 19 (IBM, 2011) and Hierarchical Linear Modeling (HLM) 6.08 (Raudenbush and Bryk, 2009). Consistent with prior analyses from the parent study (Field et al., 2010; Roudsari et al, 2010), analyses for Black, Caucasians and Hispanic participants were conducted separately. First, we examined the frequency of drug use and drug dependence at baseline by ethnicity. Then, a General Estimating Equation (GEE) logistic regression analysis was conducted to detect changes in drug use over time. After which, a series of two-level models with random effects were developed and tested to examine the interaction of receiving BMI-ETOH with drug dependence at baseline and six-and 12-month alcohol use outcomes. A series of two-level models with random effects were also developed and tested to examine the interaction of receiving BMI-ETOH with cannabis use, cocaine use, analgesic/prescription painkiller use, and polysubstance use. Outcomes for these models included alcohol use measures at six and 12 months post-intervention. In each multilevel analysis, the level-one model equation included time as a dummy coded variable and one un-centered dependent variable, which was either maximum amount of drinks per drinking day, volume per week, percent days heavy drinking, or percent days abstinent. The maximum amount consumed and volume per week outcome variables were log transformed. Longitudinal outcomes in multi-level approaches are often modeled in a linear fashion relative to time (Raudenbush et al., 2004). However, in the present analyses, large differences were noted from baseline to six-months, and then smaller differences were noted from six- to 12-months. Therefore, time at the six- and 12-month time periods were modeled as un-centered dummy-coded binary variables, using baseline as the reference category (Field et al., 2010). The level-two equations included BMI-ETOH condition, drug use variables, interaction terms, and covariates. Models were estimated using the maximum likelihood estimation method. For both the GEE regression and multilevel models, gender, age, work status, injury type, prior alcohol

treatment, marital status, education level, and level of injury severity were included as covariates.

3. Results

3.1. Demographics

The sample included a total of 1,493 trauma patients and was 45% Caucasian ($n=668$), 36% Hispanic ($n=537$) and 19% Black, non-Hispanic. Most participants were single ($n=674$, 45.1%), with an average age of 33 years ($SD=11.4$). The majority of participants reported having a high school education ($n=519$, 34.8%) or more than a high school diploma ($n=393$, 26.3%). For the most part, participants reported being employed for wages full- or part-time ($n=1036$, 69.4%) or reported not working at all ($n=315$, 21.1%). The majority of those recruited were insured ($n=959$, 64.2%) and had experienced unintentional injuries ($n=1,176$, 78.8%).

3.2 Drug Use at Baseline and changes in drug use at follow up

At baseline, nearly 47% of participants reported using at least one drug ($n=694$) and 12% of participants reported symptoms congruent with drug dependence ($n=171$). More than 21% of participants reported polysubstance abuse. Use of cannabis only was reported by 17.5% ($n=260$) of participants, and cocaine use only was reported by 5% of participants ($n=75$). Only five (0.3%) individuals reported the use of analgesics or prescription painkillers at baseline. At baseline, Hispanics were significantly less likely to use cannabis. In addition, Caucasians were significantly less likely to use cocaine but significantly more likely to report polysubstance use.

At six months post-intervention, the percent of study participants reporting using at least one drug was 36% ($n=324$), with cannabis ($n=134$, 13%) and analgesics/painkillers ($n=23$, 2.2%) being reported most often. At the 12-month follow up, 35% of participants ($n=268$) reported using at least one drug, and cannabis ($n=121$, 13.9%) and analgesics/painkillers ($n=16$, 1.8%) remained the drugs reported being used most often (see table 1). Time effects for drug use reductions (results not shown) were also examined to determine whether there was an increase in drug use subsequent to BMI-ETOH. Caucasian participants reported increases in the use of analgesics or prescription painkillers at six ($B=2.16$, $SE=0.76$, $p=0.00$) and 12 months ($B=1.69$, $SE=0.81$, $p=0.04$) and decreases in polysubstance use at six ($B=-0.57$, $SE=0.12$, $p=0.00$) and 12 months ($B=-0.79$, $SE=0.15$, $p=0.00$). Hispanics experienced reductions in cannabis use at six ($B=-0.63$, $SE=0.23$, $p=0.01$) and 12 months ($B=-0.68$, $SE=0.27$, $p=0.01$) and cocaine use at six ($B=-1.65$, $SE=0.44$, $p=0.00$) and 12 months ($B=-1.27$, $SE=0.43$, $p=0.00$). Black participants experienced reductions in cocaine use and six ($B=-2.20$, $SE=0.75$, $p=0.00$) and 12 months ($B=-1.34$, $SE=0.53$, $p=0.00$).

3.2. Drug Dependence as a Moderator to Treatment

3.2.1. Maximum Amount Consumed—Significant interactions were noted at the six- and 12-month assessments for the interaction term of BMI-ETOH and drug dependence for Hispanics. Hispanics with drug dependence who received BMI-ETOH consumed less during their heaviest drinking episode at six- ($B=-1.08$, $SE=0.46$, $p=0.02$) and twelve-month follow up ($B=-1.62$, $SE=0.52$, $p=0.00$; see table 2). Significant main effects and interaction effects were not observed ($p>.05$) in the models that tested maximum amount consumed for Caucasian or Black participants.

3.2.2. Average Volume Consumed Per Week—Hispanics with drug dependence who received BMI-ETOH consumed less alcohol per week at six ($B=-1.92$, $SE=0.77$, $p=0.01$) and twelve month follow up ($B=-2.71$, $SE=0.86$, $p=0.00$; see table 3). Significant main

effects and interaction effects were not detected ($p>.05$) in the model that tested average volume per week consumed for Caucasian or Black participants.

3.2.3. Percent Days Abstinent—Hispanics with drug dependence who received BMI-ETOH brief intervention reported a higher percentage days of abstinence at six ($B=0.27$, $SE=0.10$, $p=0.01$) and twelve month follow up ($B=0.41$, $SE=0.11$, $p=0.00$, see table 5). In the equation that measured percent days abstinent as an outcome, significant interaction effects were not observed for Blacks or Caucasians at either follow up.

3.2.4. Percent Days Heavy Drinking—In the equation that measured percent days heavy drinking as an outcome, significant main effects or interaction effects were not observed for Hispanic, Caucasian, or Black participants at either follow up.

3.3. Drug Use as a Moderator to Treatment

A series of multilevel models were estimated to examine the interaction between cannabis use, cocaine use, analgesic or prescription painkiller abuse, and polysubstance abuse at baseline and BMI-ETOH on drinking outcomes. In summary, no significant interactions for drug use and BMI-ETOH were found for Hispanic patients. Results for Caucasians showed a significant negative estimate for the cocaine by BMI-ETOH interaction with maximum drinks outcome at six months ($B=-2.92$, $SE=1.00$, $p=0.00$). There was a significant negative estimate among Caucasians for the cocaine by BMI-ETOH interaction with volume as an outcome at six months ($B=-4.23$, $SE=1.79$, $p=0.02$). A significant negative estimate for the cannabis by BMI-ETOH interaction with the maximum drinks outcome at 12 months was also observed among Caucasians ($B=-0.62$, $SE=0.26$, $p=0.02$). For Black patients, there was a significant negative estimate for the cocaine by BMI-ETOH interaction with PDA as the outcome at six months ($B=-0.36$, $SE=0.18$, $p=0.04$) and a significant positive estimate for the cocaine by BMI-ETOH interaction with PDHD at 12 months ($B=0.67$, $SE=0.31$, $p=0.03$).

4. Discussion

The current study suggests that drinking outcomes following BMI-ETOH among injured patients are not negatively impacted by drug dependence at the time of the injury. Indeed, the evidence from this secondary data analysis suggests that drug dependence may be associated with improved drinking outcomes among Hispanics following BMI-ETOH. It is worth noting that the findings from this secondary analysis mirror the main findings from the parent study. Specifically, in an investigation of drinking outcomes, Hispanics benefited significantly from BMI-ETOH in comparison to treatment as usual (Field and Caetano, 2010a, Field et al., 2010). In addition, patients with alcohol dependence who received BMI-ETOH showed significant improvements in drinking outcomes in comparison to treatment as usual regardless of ethnicity (Field and Caetano, 2010b). Taken together, it appears that, among some injured patients, BMI-ETOH may be more beneficial among those with substance dependence. Overall, the results of this study provide the first insight into the potential impact of drug dependence on drinking outcomes and the potential effects of BMI-ETOH

Inconsistent effects of drug use on drinking outcomes following BMI-ETOH were observed across ethnic groups. No significant interactions with drug use at baseline and BMI-ETOH on drinking outcomes were observed among Hispanics. Among Caucasians cocaine and cannabis use, but not dependence, were associated with significant improvements in some drinking outcomes. Among Blacks, cocaine use at six months was associated with significantly fewer days abstinent and significantly more heavy drinking days. The observed ethnic differences in the impact of drug use at baseline on drinking outcomes following

BMI-ETOH are difficult to interpret. While the sample size for these analyses was relatively small, the potentially detrimental impact of some drugs of abuse on drinking outcomes among Blacks should not be overlooked. It is possible that some ethnic minority or underserved populations would benefit from a more comprehensive intervention to effect drinking outcomes. The potential differential effect of different substances of abuse on drinking outcomes across ethnic groups should be further studied before definitive conclusions can be reached.

Drug use was common in this patient population, with nearly half of all participants reporting drug use at baseline. Ethnic differences were observed in the use of drugs with Hispanics being least likely to use cannabis and Caucasians being more likely to use cocaine or multiple substances of abuse. Finally, with the exception of the misuse of prescription killers, all patients reduced their drug use at follow up. It is worth noting that while we observed reductions in non-prescription drug use, this secondary analysis suggest that, at least among Caucasians, there may be an increase in the misuse of analgesics following injury. In addition, the misuse of analgesics and prescription painkillers was the second most common substance of abuse at follow up. This may be the result of the increased availability of prescription painkillers following traumatic injury. As a result, future studies should consider the potential impact of increased access to analgesics and prescription painkillers following serious injury on the utility of brief motivational interventions targeting alcohol and/or drug use in the emergency department and trauma care setting.

It is important to acknowledge the limitations of this study when considering the potential implications of the current findings. These results may not be generalizable to settings other than the trauma care setting. Specifically, positive outcomes following BMI-ETOH among those with more severe substance abuse problems as indicated by a diagnosis of alcohol or drug dependence may be unique to a medical setting in which an acute, unanticipated and potentially life threatening medical event requiring specialized emergency care creates a teachable moment or window of opportunity that is less likely or less impactful in other medical settings. It may be that injured patients with substance dependence are more likely to be responsive to brief intervention following injury because the acute hospitalization for traumatic injury in combination with preexisting substance use problems and are highly salient and distressing. In contrast, the injury event itself in combination with screening and assessment may effectively reduce drinking among injured patients with less severe substance abuse problems. Future research should investigate the predisposing characteristics of patients who respond to brief intervention and take into account the individual response to the medical events that precipitate opportunistic interventions addressing substance abuse in non-treatment seeking patient populations. Regardless, the generalizability and consistency of the current findings across patient populations and settings require further evaluation prior to reaching any definitive conclusions.

Another limitation of the current study is that it is a secondary data analysis and, while drug use and drug dependence were assessed, the parent study was not designed to test the hypotheses investigated herein. The primary aim of the parent study was to test the effectiveness of a brief motivational intervention targeting at-risk drinking across ethnic groups. Thus, the parent study targeted at-risk drinkers and tested a brief motivational intervention to reduce alcohol use and its related consequences. That is, screening was not conducted to identify patients who use drugs and the brief motivational intervention did not explicitly address drug use, per se. In addition, the primary outcome of interest was not drug use and the assessment of drug dependence and drug use was restricted to the CIDI-SF. The CIDI-SF is intended as a point measure of dependence and is not comprehensive in its determination of drug use. For example, it does not assess frequency of drug use or route of administration. The measurement limitations imposed by the CIDI-SF may, in part, explain

inconsistent effects of specific drugs of abuse across ethnic groups on drinking outcomes following BMI-ETOH. Further study is undoubtedly required before definitive conclusions can be reached about the role of drug use at baseline on drinking outcomes and drug use as an outcome following brief motivational interventions. Nevertheless, the results of this study provide the first insight into the potential impact of drug use on drinking outcomes across different ethnic groups.

Acknowledgments

We kindly thank the National Institute on Alcohol Abuse and Alcoholism for providing the funding to conduct the parent study to this project.

Role of Funding Source: Funding for the parent study to this project was provided by National Institute on Alcohol Abuse and Alcoholism, P.I.: Caetano, R., NIAAA, R01 013824. The NIAAA had no further role in study design; in the collection, analysis and interpretation of data; or in the decision to submit this paper for publication.

References

- American College of Surgeons. Resources for Optimal Care of the Injured Patient: 2006. American College of Surgeons; Chicago, IL: 2006.
- Andrews G, Peters L. The psychometric properties of the Composite International Diagnostic Interview. *Soc Psychiatry Psychiatr Epidemiol*. 1998; 33:80–88. [PubMed: 9503991]
- Bazargan-Hejazi S, Bing E, Bazargan M, Der-Martirosian C, Hardin E, Bernstein J, Bernstein E. Evaluation of a brief intervention in an inner-city emergency department. *Ann Emerg Med*. 2005; 46:67–76. [PubMed: 15988430]
- Dawson DA. Methodological issues in measuring alcohol use. *Alcohol Res Health*. 2003; 2:18–29. [PubMed: 15301397]
- Dunn C, Hungerford DW, Field C, McCann B. The stages of change: when are trauma patients truly ready to change? *J Trauma*. 2005; 59:S27–S32. [PubMed: 16355057]
- Ewing JA. Detecting alcoholism. The CAGE questionnaire. *JAMA*. 1984; 252:1905–1907. [PubMed: 6471323]
- Field C, Caetano R. The role of ethnic matching between patient and provider on the effectiveness of brief alcohol interventions with Hispanics. *Alcohol Clin Exp Res*. 2010a; 34:262–271. [PubMed: 19951297]
- Field C, Caetano R, Harris T, Frankowski R, Roudsari B. Ethnic differences in drinking outcomes following a brief alcohol intervention in the trauma care setting. *Addiction*. 2010; 105:62–73. [PubMed: 19919597]
- Field C, Hungerford D, Dunn C. Brief motivational interventions: an introduction. *J Trauma*. 2005; 59:S21–S26. [PubMed: 16355056]
- Field C, Caetano R. The effectiveness of brief intervention among injured patients with alcohol dependence: who benefits from brief interventions? *Drug Alcohol Depend*. 2010b; 111:13–20. [PubMed: 20493644]
- Fleming M, Mundt MP, French MT, Manwell LB, Stauffacher EA, Barry KL. Brief physician advice for problem drinkers: long-term efficacy and benefit-cost analysis. *Alcohol Clin Exp Res*. 2002; 26:36–43. [PubMed: 11821652]
- Fleming MF, Barry KL, Manwell LB, Johnson K. Brief physician advice for problem alcohol drinkers: a randomized controlled trial in community-based primary care practices. *JAMA*. 1997; 277:1039–1045. [PubMed: 9091691]
- Fleming MF, Mundt MP, French MT, Manwell LB, Stauffacher EA, Barry KL. Benefit cost analysis of brief physician advice with problem drinkers in primary care settings. *Med Care*. 2000; 38:7–18. [PubMed: 10630716]
- Gentilello L, Ebel BE, Wickizer TM, Salkever DS, Rivara FP. Alcohol interventions for trauma patients treated in emergency departments and hospitals: a cost benefit analysis. *Ann Surg*. 2005; 241:541–550. [PubMed: 15798453]

- Gentilello L, Rivara FP, Donovan DM, Jurkovich GJ, Daranciang E, Dunn CW, Villaveces A, Copass M, Ries RR. Alcohol interventions in a trauma center as a means of reducing the risk of injury recurrence. *Ann Surg.* 1999; 230:473. [PubMed: 10522717]
- Greenfield TK. Ways of measuring drinking patterns and the difference they make: experience with graduated frequencies. *J Subst Abuse.* 2000; 12:33–49. [PubMed: 11288473]
- IBM. SPSS (Version 19). IBM; Chicago, IL: p. 2011
- Kessler R, Andrews G, Mroczek D, Ustun B, Wittchen H. The World Health Organization Composite International Diagnostic Interview Short-Form (CIDI-SF). *Int J Methods Psychiatr Res.* 1998; 7:171–185.
- Kitchens JM. Does this patient have an alcohol problem? *JAMA.* 1994; 272:1782–1787. [PubMed: 7966928]
- Longabaugh R, Woolard RE, Nirenberg TD, Minugh AP, Becker B, Clifford PR, Carty K, Sparadeo F, Gogineni A. Evaluating the effects of a brief motivational intervention for injured drinkers in the emergency department. *J Stud Alcohol.* 2001; 62:806–816. [PubMed: 11838918]
- Midanik LT. Comparing usual quantity/frequency and graduated frequency scales to assess yearly alcohol consumption: results from the 1990 US National Alcohol Survey. *Addiction.* 1994; 89:407–412. [PubMed: 8025493]
- National Institute on Alcohol Abuse and Alcoholism. Helping Patients Who Drink Too Much: A Clinician's Guide. National Institute on Alcohol Abuse and Alcoholism; Bethesda, MD: 2007.
- Raudenbush, S.; Bryk, A. Hierarchical Linear and Nonlinear Modeling. Scientific Software International Inc.; Lincoln, IL: 2009.
- Raudenbush, SW.; Bryk, A.; Cheong, Y.; Congdon, R.; Toit, M. HLM 6: Hierarchical linear and nonlinear modeling. Scientific Software International Inc.; Lincolnwood, IL: 2004.
- Rivara FP, Mueller BA, Somes G, Mendoza CT, Rushforth NB, Kellermann AL. Alcohol and illicit drug abuse and the risk of violent death in the home. *JAMA.* 1997; 278:569–575. [PubMed: 9268278]
- Roudsari B, Caetano R, Frankowski R, Field C. Do minority or white patients respond to brief alcohol intervention in trauma centers? A randomized trial. *Ann Emerg Med.* 2009; 54:285–293. [PubMed: 19250705]
- Substance Abuse and Mental Health Services Administration. Alcohol Screening and Brief Intervention (SBI) for Trauma Patients: Committee on Trauma Quick Guide. Rockville, MD: 2007. DHHS publication No. (SMA) 07-4266
- Schermer CR, Moyers TB, Miller WR, Bloomfield LA. Trauma center brief interventions for alcohol disorders decrease subsequent driving under the influence arrests. *J Trauma.* 2006; 60:29–34. [PubMed: 16456433]
- Smith AJ, Hodgson RJ, Bridgeman K, Shepherd JP. A randomized controlled trial of a brief intervention after alcohol-related facial injury. *Addiction.* 2003; 98:43. [PubMed: 12492754]
- Soderstrom CA, Diclemente CC, Dischinger PC, Hebel JR, McDuff DR, Auman KM, Kufera JA. A controlled trial of brief intervention versus brief advice for at-risk drinking trauma center patients. *J Trauma.* 2007; 62:1102–1112. [PubMed: 17495708]
- Stoduto G, Vingilis E, Kapur BM, Sheu WJ, McLellan BA, Liban CB. Alcohol and drug use among motor vehicle collision victims admitted to a regional trauma unit: demographic, injury, and crash characteristics. *Accid Anal Prev.* 1993; 25:411–420. [PubMed: 8357454]
- United States Preventive Services Task Force. Screening and behavioral counseling interventions in primary care to reduce alcohol misuse recommendation statement. *Ann Intern Med.* 2004; 140:555–557.
- Vitale S, Mheen D. Illicit drug use and injuries: a review of emergency room studies. *Drug Alcohol Depend.* 2006; 82:1–9. [PubMed: 16183213]

Table 1
Proportions of Participants Using Specified Substances and Differences by Race/Ethnicity

Drug	Time period	Total use [*]		Hispanic		Blacks		Whites		χ^2	(df)	p
		n	%	n	%	n	%	n	%			
Any drug use	Base	694	46.5	212	39.5	147	51.2	335	50.1	16.79	(2)	0.00
	6 months	335	36.7	73	35.3	67	33.8	195	38.5	1.56	(2)	0.46
	12 months	275	35.7	57	34.5	55	32.4	163	37.5	1.52	(2)	0.47
Cannabis only	Base	260	17.5	68	12.7	60	21.1	132	19.8	13.48	(2)	0.00
	6 months	134	13.0	23	7.2	33	16.6	78	15.3	14.17	(2)	0.00
	12 months	121	13.9	18	6.8	26	15.2	77	17.7	16.41	(2)	0.00
Cocaine only	Base	75	5.0	41	7.7	24	8.4	10	1.5	31.82	(2)	0.00
	6 months	13	1.3	5	1.6	2	1.0	6	1.2	0.37	(2)	0.83
	12 months	10	1.1	6	2.3	4	2.3	0	0.0	10.17	(2)	0.01
Analgesics or other Rx painkillers only	Base	5	0.3	2	0.4	1	0.3	2	0.3	0.05	(2)	0.98
	6 months	23	2.2	5	1.6	5	2.5	13	2.5	0.96	(2)	0.62
	12 months	16	1.8	6	2.3	3	1.8	7	1.6	0.42	(2)	0.81
Polysubstance	Base	320	21.5	90	16.8	53	18.6	177	26.6	18.51	(2)	0.00
	6 months	147	16.2	36	17.9	24	12.1	87	17.2	3.2	(2)	0.20
	12 months	111	14.4	25	15.2	21	12.4	65	14.9	0.77	(2)	0.68
Drug dependence ^{**}	Base	171	11.5	87	9.7	32	11.1	52	13.0	3.30	(2)	0.19

^{*} χ^2 tests do not include differences between total use and individual races/ethnicities

^{**} Drug dependence was only measured at baseline

Table 2

Maximum amount consumed

Race/Ethnicity	Time	Effects	Coefficient	SE	T-ratio	df	p
Hispanics	6 months	BMI	-0.30	0.14	-2.17	1064	0.03
		Drug dependence	0.46	0.31	1.47	1064	0.14
		BMI $\times$ drug dependence	-1.08	0.46	-2.33	1064	0.02
	12 months	BMI	-0.34	0.15	-2.30	1064	0.02
		Drug dependence	0.93	0.33	2.84	1064	0.01
		BMI $\times$ drug dependence	-1.62	0.52	-3.11	1064	0.00
Caucasian	6 months	BMI	0.05	0.10	0.50	1562	0.62
		Drug dependence	0.01	0.21	0.07	1562	0.95
		BMI $\times$ drug dependence	-0.17	0.30	-0.57	1562	0.57
	12 months	BMI	-0.02	0.11	-0.16	1562	0.87
		Drug dependence	-0.05	0.23	-0.22	1562	0.83
		BMI $\times$ drug dependence	-0.16	0.32	-0.50	1562	0.62
Blacks	6 months	BMI	0.00	0.17	-0.02	607	0.98
		Drug dependence	0.10	0.45	0.22	607	0.82
		BMI $\times$ drug dependence	0.46	0.60	0.77	607	0.44
	12 months	BMI	-0.05	0.18	-0.28	607	0.78
		Drug dependence	-0.13	0.47	-0.28	607	0.78
		BMI $\times$ drug dependence	0.44	0.67	0.65	607	0.52

Table 3

Average volume per week

Race/Ethnicity	Time	Effects	Coefficient	SE	T-ratio	df	p
Hispanics	6 months	BMI	-0.27	0.23	-1.18	1064	0.24
		Drug dependence	0.36	0.52	0.70	1064	0.48
		BMI $\times$ drug dependence	-1.92	0.77	-2.50	1064	0.01
	12 months	BMI	-0.41	0.24	-1.70	1064	0.09
		Drug dependence	1.18	0.54	2.18	1064	0.03
		BMI $\times$ drug dependence	-2.71	0.86	-3.14	1064	0.00
Caucasian	6 months	BMI	0.09	0.18	0.49	1562	0.62
		Drug dependence	-0.16	0.37	-0.44	1562	0.66
		BMI $\times$ drug dependence	0.17	0.53	0.32	1562	0.75
	12 months	BMI	0.04	0.19	0.22	1562	0.83
		Drug dependence	0.03	0.40	0.08	1562	0.94
		BMI $\times$ drug dependence	0.05	0.57	0.09	1562	0.93
Blacks	6 months	BMI	0.01	0.30	0.04	607	0.97
		Drug dependence	-0.44	0.78	-0.56	607	0.58
		BMI $\times$ drug dependence	1.01	1.04	0.97	607	0.33
	12 months	BMI	0.11	0.32	0.36	607	0.72
		Drug dependence	-0.68	0.83	-0.81	607	0.42
		BMI $\times$ drug dependence	0.79	1.19	0.66	607	0.51

Table 4

Percent days abstinent

Race/Ethnicity	Time	Effects	Coefficient	SE	T-ratio	df	p
Hispanics	6 months	BMI	-0.01	0.03	-0.52	1064	0.61
		Drug dependence	0.00	0.07	0.00	1064	1.00
	12 months	BMI × drug dependence	0.27	0.10	2.80	1064	0.01
		BMI	-0.02	0.03	-0.71	1064	0.48
		Drug dependence	-0.07	0.07	-0.99	1064	0.32
		BMI × drug dependence	0.41	0.11	3.76	1064	0.00
Caucasian	6 months	BMI	0.01	0.03	0.41	1562	0.69
		Drug dependence	0.12	0.06	2.11	1562	0.04
	12 months	BMI × drug dependence	-0.13	0.08	-1.56	1562	0.12
		BMI	0.01	0.03	0.28	1562	0.78
		Drug dependence	0.10	0.06	1.63	1562	0.10
		BMI × drug dependence	-0.08	0.09	-0.88	1562	0.38
Blacks	6 months	BMI	0.02	0.05	0.44	607	0.66
		Drug dependence	0.29	0.12	2.32	607	0.02
	12 months	BMI × drug dependence	-0.23	0.16	-1.42	607	0.16
		BMI	0.00	0.05	0.07	607	0.95
		Drug dependence	0.17	0.13	1.30	607	0.19
		BMI × drug dependence	0.01	0.19	0.08	607	0.94