

Alcohol Misuse and Multiple Sexual Partners

Shahrzad Bazargan-Hejazi, PhD* * Charles R. Drew University of Medicine and Science, Department of Psychiatry, Los Angeles, California; Semel Institute, University of California at Los Angeles, Psychiatry and Biobehavioral Sciences, Los Angeles, California
Tommi Gaines, DrPH[†]
Mohsen Bazargan, PhD[‡]
Bobak Seddighzadeh, BS[§] † University of California at San Diego, School of Medicine, Division of Global Public Health, San Diego, California
Alireza Ahmadi, PhD^{||} ‡ Charles R. Drew University of Medicine and Science, Department of Family Medicine, Los Angeles, California
§ Charles R. Drew University of Medicine and Science, Los Angeles, California
|| Kermanshah University of Medical Sciences, Department of Anesthesiology, Critical Care and Pain Management, Kermanshah, Iran; Karolinska Institute, Department of Public Health Sciences, Division of Social Medicine, Stockholm, Sweden

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Introduction: We examine the association between self-reported alcohol misuse and alcohol use within 2 hours of having sex and the number of sexual partners among a sample of African-American and Latino emergency department (ED) patients.

Methods: Cross-sectional data were collected prospectively from a randomized sample of all ED patients during a 5-week period. In face-to-face interviews, subjects were asked to report their alcohol use and number of sexual partners in the past 12 months. Data were analyzed using multiple variable negative binomial regression models, and effect modification was assessed through inclusion of interaction terms.

Results: The 395 study participants reported an average of 1.4 (standard error = 0.11) sexual partners in the past 12 months, 23% reported misusing alcohol, and 28% reported consuming alcohol before sex. There was no statistically significant association between alcohol misuse and the number of sexual partners; however, alcohol before sex was associated with a larger number of sexual partners in the past year. Moreover, among those who misused alcohol, participants who reported alcohol before sex were 3 times more likely to report a higher number of sexual partners (risk ratio = 3.2; confidence interval [CI] = 1.9–5.6). The association between alcohol use before sex and number of sexual partners is dependent upon whether a person has attributes of harmful drinking over the past 12 months. Overall, alcohol use before sex increases the number of sexual partners, but the magnitude of this effect is significantly increased among alcohol misusers.

Conclusion: Alcohol misusers and those who reported having more than 1 sexual partner were more likely to cluster in the same group, ie, those who used alcohol before sex. Efforts to reduce the burden of sexually transmitted diseases, including human immunodeficiency virus, and other consequences of risky sexual behavior in the ED population should be cognizant of the interplay of alcohol and risky sexual behaviors. EDs should strive to institute a system for regular screening, brief intervention, and referral of at-risk patients to reduce negative consequences of alcohol misuse, including those of risky sexual behaviors. [West J Emerg Med. 2012;13(2):151–159.]

INTRODUCTION

Hospital emergency departments (ED) remain a healthcare safety net for much of the inner-city ED population.¹ Therefore, emergency physicians often have to play the role of primary care providers in addition to attending to the immediate care of their patients. As a result, they have a unique opportunity to understand their patients' risky behaviors and facilitate their access to other needed but unmet services.²

Of approximately 100 million annual visits to the ED, nearly 5 million are alcohol related,^{1,3} and ED patients are up to 3 times more likely to report negative consequences of heavy drinking.⁴ A large portion of these patients are trapped in the habitual misuse of alcohol and use the ED as a revolving door to receive care for alcohol-related diseases and consequences. Improving medical screening and prevention strategies for such patients in the ED can improve the outcome of many of these visits. It would also help ED physicians to redirect the care of these patients to subacute centers, potentially saving EDs millions of dollars spent on patients trapped in a cycle of recidivism for alcohol-related negative consequences.⁵ However, this requires clinicians who are vigilant to the screening needs of their patients.⁶

Risky sexual behavior is defined as any behavior that increases the probability of negative consequences associated with sexual contact, including sexually transmitted diseases (STD) and unplanned pregnancy.⁷ Risky sexual behaviors are the primary determinants for the risk of STDs, including human immunodeficiency virus (HIV).⁸ Specifically, sexual activity with multiple sexual partners is a well-documented risk factor for STDs.⁹

Studies from various populations have documented the role of alcohol in the engagement of risky sexual behaviors.¹⁰⁻¹¹ These studies report that individuals who misuse alcohol are more likely to report greater intention to engage in risky sexual behaviors,¹² more likely to report having multiple sexual partners,¹³⁻¹⁴ less likely to use condoms during sex,¹⁵ and more likely to have sex with someone who they have just met (unintended).^{7,16} The underlying assumption of these studies (ie, global association studies) is that drinking alcohol in excessive amounts can increase the likelihood that an individual will engage in unplanned sexual activities or will not use protection when having sex (ie, unsafe sexual practices).¹⁷ Furthermore, the association of alcohol before sex with risky sexual encounters has been reported by earlier studies (ie, situational association and event-level studies).¹⁸⁻¹⁹ Specifically, the relationship between alcohol before sex has been documented among men who have sex with men,^{9,20} bisexual men,²¹⁻²² injection drug users,^{13,23} young gay men, female bar drinkers,²⁴ and abused ethnic minority adolescent women.²⁵

After decades of research, the purported link between alcohol and risky sexual behavior remains intricate and multifaceted. There are also limited data on the relationship between these variables among African-American and Latino

inner-city ED patients. To this end, this paper aims to examine the relative association of alcohol misuse on having sex with more than 1 partner among a sample of African-American and Latino inner-city ED patients, a relationship that has not been well studied in this population. We hypothesize the following: (1) alcohol misuse is directly associated with an increased number of risky sexual activities, measured by a higher number of sexual partners (main-effect hypothesis); (2) there is a stronger direct association between alcohol use within 2 hours of having sex and reported number of sexual partners (situational association hypothesis); and (3) the effect of alcohol before sex on the number of sexual partners is greater among persons who misuse alcohol (interaction-effect hypothesis). We believe results of this study will provide ED clinicians with useful information to improve the delivery of patient care.

METHODS

Study Site and Population

In this prospective study, cross-sectional data were collected from ED patients receiving care in an inner-city large teaching hospital with approximately 50,000 to 60,000 annual visits in South Los Angeles. The area in which the study was conducted is one of the most heavily populated, ethnically, socially, and economically diverse counties in the United States. Of the 1.8 million residents in the area, approximately 36% are African American and 59% Latino. Approximately 28% of the population lives below the federal poverty level, and 36% of adults are uninsured.²⁶ This community also has fewer physicians per capita (91.1) compared with Los Angeles county (302.4).²⁶ A prior study of ED patients revealed that 67% of patients did not have health insurance, and 80% did not have a primary care physician.²

Recruitment, Data Collection, and Study Sample

The recruitment for this study was conducted at the urgent care, emergency room (ER), and trauma bay facilities at the ED by 6 bilingual, trained interviewers. Interviewers were stationed in the triage area of the ED on a 24-hour basis for a 5-week period (March through April 2001). Interviewers used computerized logs in the triage area of the ED, which reflected consecutive patients who arrived and registered in the ED. Every other patient from this list was selected for this study. Patients, both male and female, at least 18 years of age, and from all ethnicities, were eligible to participate in the study. Patients in need of immediate medical attention, as determined by the attending physician, were approached for recruitment following their treatment. Patients who showed signs of cognitive impairment, as assessed by the trained interviewers, spoke a language other than English or Spanish, or who were in police custody, were excluded from participation. We delayed recruitment of intoxicated patients until after they became adequately alert. Consenting patients were interviewed using a closed format 45-minute questionnaire, which was available

both in English and Spanish. Approval for this study was obtained from the university institutional review board committee.

Outcome Measures

Number of sexual partners was the primary outcome variable and was measured by asking participants, "How many sexual partners have you had in the past 12 months?"

Predictor Variables

The study predictor variables included alcohol misuse and alcohol use before sex. Alcohol misuse was constructed by using 4 validated alcohol measures, each with a distinct attribute of harmful drinking. The first measure was the Rapid Alcohol Problems Screen 4 (RAPS4), which is a brief screening tool identifying harmful drinking. The RAPS4 has 4 items each scored yes or no; a positive answer to at least 1 item suggests harmful drinking.²⁷ The reliability and validity of this instrument among African Americans and Latinos is well established.²⁸ The second measure was the Alcohol Use Disorders Identification Test (AUDIT), which measures at-risk drinking. It is a 10-item questionnaire with a range of possible scores from 0 to 40. We used the recommended cutoff of 8 to detect at-risk drinking.²⁹ The AUDIT performs well for both genders and ethnic minority groups.³⁰ The third measure was alcohol abuse, which is assessed by 6 items reflecting the negative physical, social, legal, and psychosocial consequences of drinking.³¹ These dichotomous items operationalize the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition* (DSM-IV) of the American Psychiatric Association criteria for alcohol abuse and have been validated for the minority population.²⁷ A positive response to 1 or more items reflects alcohol abuse.³² Finally, alcohol dependence was measured by 19 items reflecting the DSM-IV criteria for alcohol dependence in the past year.³³ These items assess 7 domains of tolerance, withdrawal, unintended drinking, unsuccessful efforts to control drinking, giving up pleasures or interests to drink, spending a great deal of time in drinking activities, and continued use despite problems. Individuals were diagnosed as alcohol dependent if, in their responses to the 19 items, they endorsed at least 3 of the 7 domains. The aforementioned 4 measures were combined to generate a more comprehensive and robust measure of alcohol misuse within the past 12 months. Participants who scored positive on at least 2 of the alcohol measures were grouped as having a history of alcohol misuse (Cronbach's $\alpha = 0.87$).

Alcohol use before sex was measured by asking the patient, "In the last 12 months, how often did you use alcohol within 2 hours of having sex?" Responses were scored as 1 (all the time) to 5 (never). Respondents who reported all the time, most of the time, and/or some of the time were recoded as yes (or 1); and those who reported rarely and/or never were recoded as no (or 0).

Psychosocial and Demographic Control Variables

For this study, we measured risk-taking/impulsivity and depressive symptoms because evidence suggests that these conditions are related to both alcohol use and risky sexual behaviors.³⁴⁻⁴⁰ We measured risk-taking/impulsivity using the revised version of the Eysenck⁴¹ impulsivity subscale; a 5-item, 4-point scale, ranging from 5 to 20 with a Cronbach's α of 0.80. A composite score of these 5 items was computed with higher values corresponding to higher impulsivity. We classified respondents with a score of 9 or less as less impulsive ($=0$) and those with higher scores as highly impulsive ($=1$).³⁴

Depression symptoms were measured by the Center for Epidemiological Studies Depression Scale (CES-D) that includes a 20-item, 4-point scale, ranging from 4 to 60 with Cronbach's α of 0.80.⁴² We assigned respondents with a score of less than 16 as no symptoms of depression and those with a score of 16 or greater as depressed.⁴³ The time period used in all analyses was the previous 12 months, except for CES-D, which provided an estimate of depressive symptoms for the last 7 days. The decisions for cutoff points for the variables in the study were directed by previous studies, as cited above. Demographic variables included gender, age, education, marital status, and ethnicity. Ethnicity was assessed by asking the respondents to self-identify their own ethnicity from 9 categories, including black, African American, Latino, Mexican, Mexican American, Chicano, or of other Spanish heritage, white, Middle Eastern, and Native American Indian.

Data Analysis

Exploratory analyses were performed to assess the relationship between the alcohol variables and the number of sexual partners and to guide the specification of which psychosocial and demographic variables to include in the final multivariable models. Diagnostic analyses indicated evidence of overdispersion; therefore, negative binomial regression models were used to examine the association between the number of sexual partners in the past 12 months and each alcohol measure. Negative binomial regression provides risk ratios (RR), interpreted as the ratio of means and for presentation. Results from all regression models are reported in terms of the RR rounded to the second decimal place. All regression models simultaneously were adjusted for the same psychosocial measures and demographics. Statistical analyses were performed using the software package Stata version 11⁴⁴ and were based on 2-sided hypotheses and a 5% significance level.

RESULTS

Descriptive Findings

Of 579 eligible patients, 412 completed the study survey, representing a 71% survey completion rate, which approximates rates of previous ER studies.⁴⁵ Participants and nonparticipants were similar with respect to ethnicity, age, and gender. Given the frequency distribution of the race/ethnicity

Table 1. Descriptive statistics and unadjusted bivariate negative binomial regression analyses.

	Mean or proportion (SE)	Bivariate model (RR [SE]; 95% CI)
Number of sexual partners	1.42 (0.11)	
Alcohol measures		
Alcohol misuse (yes)	0.23 (0.02)	1.29 (0.17); 1.00–1.66*
Alcohol prior to sex (yes)	0.28 (0.02)	1.80 (0.21); 1.43–2.27†
Psychosocial variables		
Risk-taking/impulsivity (>9.01)	0.38 (0.02)	1.43 (0.16); 1.15–1.77†
Depression symptoms (CES-D \geq 16)	0.51 (0.03)	1.15 (0.13); 0.92–1.43
Demographics		
Gender (male)	0.62 (0.03)	2.01 (0.24); 1.60–2.53‡
Race (African-American)	0.51 (0.03)	1.51 (0.17); 1.21–1.88†
Education (less than high school)	0.49 (0.03)	0.77 (0.09); 0.62–0.96*
Marital status (separated/divorced/widowed/not married)	0.60 (0.03)	1.23 (0.14); 0.99–1.55
Age	37.95 (0.76)	0.98 (0.00); 0.97–0.99‡

RR, risk ratio; SE, standard error; CI, confidence interval; CES-D, Center for Epidemiological Studies Depression Scale.

* $P < 0.05$.

† $P < 0.01$.

‡ $P < 0.001$

variable, we recoded this variable into 2 groups; African American versus Latino. Thirteen patients who identified their race/ethnicity as other were excluded from the analysis, in addition to 4 who would not answer this question. Therefore, the final sample for this study included 395 African-American and Latino ED patients.

Table 1 displays the overall characteristics of the participants in reference to the study variables (second column). On average, participants reported 1.4 sexual partners (standard error = 0.11) in the past 12 months; 13% had 2 partners, and 15% had 3 or more. Nearly a quarter misused alcohol (23%) or reported drinking alcohol within 2 hours prior to sex (28%). Approximately half exhibited depression symptoms (51%), and over a third were considered highly impulsive (38%). The average age of the participants was 38 years (standard deviation = 14). Participants were equally divided between African Americans (51%) and Latinos (49%), 62% were male, 51% did not graduate from high school, and 60% were living alone.

Bivariate Findings

The second column of Table 1 displays the unadjusted associations between the independent variables and outcome. Both alcohol measures were positively associated with the number of sexual partners. Individuals with a history of alcohol misuse reported 28% more sexual partners (RR = 1.29; 95% confidence interval [CI] = 1.0–1.66), whereas those drinking alcohol before sex reported 88% more sexual partners (RR = 1.8; 95% CI = 1.43–2.27). Further, reporting depressive symptoms in the past 7 days, being highly impulsive, male, African American, or single increased the reporting of more

sexual partners ($P < 0.05$). However, being less educated (less than high school vs completed high school or GED) and of older age decreased the average number of sexual partners.

Multivariate Findings

We excluded nonsignificant demographic variables identified in the unadjusted analysis from the multivariable analysis. To test the first 2 study hypotheses, which were to determine if alcohol misuse and alcohol use before sex were statistically and directly associated with number of sexual partners, we estimated the negative binomial regression models 1 and 2. After inclusion of the psychosocial and demographic variables, alcohol misuse lost the direct association with number of sexual partners ([RR = 1.06; 95% CI = 0.81, 1.40]; model 1) but alcohol use before sex remained significantly and positively associated with number of sexual partners ([RR = 1.4; 95% CI = 1.11, 1.78]; model 2).

Interaction Test

In the third model (Table 2), we added an interaction term to test the hypothesis that alcohol misuse modified the effect of alcohol before sex on the number of sexual partners. Among those who misused alcohol, those reporting alcohol before sex, on average, had 3 times more sexual partners than those not consuming alcohol prior to sex (RR = 3.2; 95% CI = 1.84, 5.57). This effect between alcohol before sex and number of sexual partners was attenuated among individuals without a history of alcohol misuse (RR = 1.33; 95% CI = 0.98, 1.81).

Further, consistent across all 3 models in Table 2, the number of sexual partners significantly varied by gender, race/ethnicity, and age. In other words, males and African

Table 2. Results of multivariable negative binomial regression analyses on number of sexual partners in the past month.

	Risk ratio (standard error); 95% CI		
	Model 1	Model 2	Model 3
Alcohol misuse			
No (ref.)			
Yes	1.06 (0.15); 0.81–1.40		0.46 (0.13); 0.27–0.78 [†]
Alcohol before sex			
No (ref.)			
Yes		1.40 (0.17); 1.11–1.78 [†]	1.33 (0.21); 0.98–1.81
Risk-taking			
Low (ref.)			
High	1.07 (0.14); 0.83–1.37	1.13 (0.13); 0.89–1.42	1.06 (0.13); 0.83–1.36
Depression symptoms			
No (ref.)			
Yes	1.18 (0.14); 0.93–1.48	1.13 (0.13); 0.91–1.41	1.17 (0.14); 0.93–1.47
Gender			
Female (ref.)			
Male	1.82 (0.23); 1.42–2.34 [†]	1.79 (0.22); 1.41–2.27 [†]	1.77 (0.22); 1.38–2.27 [†]
Race			
Latino (ref.)			
African American	1.26 (0.15); 0.99–1.60	1.38 (0.16); 1.10–1.73	1.28 (0.15); 1.02–1.62 [*]
Education			
Less than high school (ref.)			
High school or GED	1.02 (0.13); 0.80–1.30	1.01 (0.12); 0.80–1.27	1.05 (0.13); 0.83–1.33
Age	0.98 (0.00); 0.97–0.99 [†]	0.98 (0.00); 0.97–0.99 [†]	0.98 (0.00); 0.97–0.99 [†]
Alcohol prior to sex			
Alcohol misuse (yes)			3.20 (0.90); 1.84–5.57 [†]
Alcohol misuse (no)			1.33 (0.21); 0.98–1.81

CI, confidence interval; ref., reference; GED, general educational development.

* $P < 0.05$.

[†] $P < 0.01$.

[‡] $P < 0.001$.

Americans reported, on average, more sexual partners, and the average number of sexual partners in the sample decreased with increasing age. Unlike the unadjusted analysis, neither of the psychosocial variables was significant in the 3 multivariable models.

DISCUSSION

The primary objective of this study was to test a series of models to assess the role of alcohol for differences in the number of sexual partners among a sample of ED patients. We were not able to detect a statistically significant direct association between alcohol misuse and report of higher number of sexual partners in our sample in the adjusted multivariable model. This finding is in contrast with findings that support global association between problem drinking and risky sexual behavior.^{46–48} Several proponents of the global link

between alcohol and risky sexual behavior offer alcohol myopia theory⁴⁹ to explain this relationship. They suggest that alcohol reduces individuals' capacity to engage in high-order cognitive functions, and instead individuals become preoccupied with salient clues such as intimacy and immediate pleasure without due consideration of the potential risk involved with risky sexual activity.⁵⁰ They directly relate the level of intoxication with the diminution of the capacity to appropriately process risk. Intoxication, therefore, becomes an important determinant of risky sexual behavior.⁵¹ Lack of global association in our data could be the result of chemical tolerance that individuals build over time with chronic use of alcohol; therefore, they have more control over their behaviors when intoxicated. Alternatively, it could be the result of the limited definition of unsafe sex we used in this study. Additional items besides

number of sexual partners are needed to substantiate our findings.

We also tested the situational association hypothesis, claiming that there will be a statistically significant association between alcohol use before sex and report of higher number of sexual partners in the sample. This hypothesis was confirmed by our data in bivariate as well as multivariable models, supporting findings similar to situational association studies⁵² and some event-level association studies that suggest drinking prior to sexual activity is associated with increased sexual risks. This association is partly explained by alcohol expectancy theory.⁵³ Proponents of this theory⁵⁴ argue that individuals who think that drinking alcohol will cause them to become less nervous and more sexually uninhibited are more likely to use it before a sexual encounter.

Finally, we tested an interaction hypothesis claiming that the effect of alcohol before sex on the number of sexual partners will be greater among those who misuse alcohol. We found that alcohol use before sex did increase the average number of sexual partners and that this association was significantly magnified among those who misused alcohol. Therefore, the context of harmful drinking in the past 12 months affects the relationship between alcohol before sex and the number of sexual partners. This finding can help to better understand the nature of the relationship between alcohol and risky sexual behavior. It seems alcohol misusers and those who report having more than 1 sexual partner in the past 12 months are more likely to cluster in 1 group, those who use alcohol prior to sex. Therefore, this group might benefit from prevention measures to reduce negative consequences of alcohol misuse and the burden of STDs, including HIV, in the ED population.

It is also worth mentioning that, while our study sample was not a priori selected for HIV risk behaviors, 28% of this sample engaged in 1 aspect of HIV-related risk behaviors (ie, having multiple sexual partners). This in combination with the 23% who reported misusing alcohol, 28% who used alcohol before sex, 51% who reported symptoms of depression, and 28% who were highly impulsive calls for the attention of hospital EDs to facilitate or integrate risk prevention efforts into the existing services of the ED, an opportunity that is not available elsewhere for most of these patients.

ED providers are in a unique position to use an ED visit as a window of opportunity and the concept of the teachable moment for contemplating change in their patients.⁵⁵ A 5-year evaluation of an ED-based screening, brief intervention, and referral to a treatment program for unhealthy alcohol and other drug use showed that the project has been successful at integrating into an urban ED.⁵⁶ Also, results of screening and providing brief intervention and referral for counseling or treatment (SBIRT) suggest this technique may be among inexpensive, evidence-based solutions to intervene with risky behaviors and unmet needs of ED patients.^{1,57,58} Delivered by

ED providers and tested in 14 ED settings nationwide, SBIRT offers a brief negotiated interview with direct referral for treatment to at-risk and alcohol-dependent patients. Results of the 3-, 6-, and 12-month follow-up surveys indicated that this technique has the short-term effect of reducing alcohol consumption by ED patients. It further confirmed the earlier finding that ED physicians with appropriate training and institutional support can deliver SBIRT.⁵⁹ Nevertheless, the authors suggested that multicontact interventions or booster programs may be needed to maintain long-term reductions in risky drinking. High participation rates of ED patients in SBIRT-related studies suggest patients are also ready for and accept counseling for alcohol problems.⁶⁰ Yet practice of SBIRT seems to be lagging behind national guidelines that recommend all level 1 and 2 trauma centers implement SBIRT as part of routine trauma care.⁶¹⁻⁶²

Limitations

Bias related to respondent recall and social desirability of responses should be considered. This study utilized standardized measures and intensive training of research assistants to minimize any such bias. In addition, the study instrument included several alcohol-related measures for assessing the subject's alcohol consumption to guard against acquiescence bias (subjects' tendency to express agreement or disagreement toward a statement regardless of its content).⁶³ Reliability of alcohol intake based on self-report is based upon evidence for a close correlation between biological markers and self-report of alcohol intake.⁶⁴ Another significant limitation has to do with the lack of multiple items to measure risky sexual behaviors. Future studies should include a more comprehensive assessment of such risk s (eg, unprotected sex, condom use, etc) to capture the full magnitude of the effect of alcohol-related global association. These studies also should collect information regarding the frequency of sex while intoxicated and the antecedent or temporal behavioral factors that influence such decisions. This will allow for a determination of any existing associations at the sexual event level and also identify risks individuals are willing to incur during sexual encounters.⁴⁹

CONCLUSION

This study examined the association between alcohol misuse, alcohol use before sex, and multiple sex partners among ED patients in a US inner-city hospital. The study population allowed for targeting a disadvantaged, high risk-taking group with over a quarter of the sample reporting multiple sex partners.

While we failed to support the purported global link between alcohol misuse and number of sexual partners, we found patients who used alcohol within 2 hours of having sex were more likely to engage in sex. Furthermore, the interaction effect between alcohol misuse and alcohol use before sex suggests that the effect of the transient acute use of alcohol

before sex on the number of sexual partners is dependent on whether the person misuses alcohol or not.

Future Direction

Those striving to reduce the burden of STDs, including HIV, and other consequences of risky sexual behavior in the inner-city ED population should be cognizant of the interplay of alcohol and risky sexual behaviors. To adequately address these issues, EDs should institute a system for regular screening, brief intervention, and referral of patients at risk for alcohol misuse. Several ED studies have reported the feasibility,⁶⁵ benefits,⁵⁷ and acceptability⁶⁶ of this approach. Further, the American College of Surgeons Committee on Trauma mandated in 2006 that SBIRT be implemented in ED settings,⁶¹ and the US Center for Medicare and Medicaid Services since 2007 has allowed hospital EDs to reimburse for alcohol and drug screening and brief intervention. These are potentials for providing EDs with a regular revenue stream; a built-in incentive that may encourage EDs and ED physicians to facilitate implementation of this critically important public health intervention.¹

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Address for Correspondence: Shahrzad Bazargan-Hejazi, PhD, Charles R. Drew University of Medicine and Science, Department of Psychiatry, 1731 E 120th St, Los Angeles, CA 90059. E-mail: shahrzadbazargan@cdrewu.edu.

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