

# UCLA

## UCLA Previously Published Works

### Title

Health-related material needs and substance use among emergency department patients.

### Permalink

<https://escholarship.org/uc/item/3gd5q67g>

### Journal

Substance Abuse, 41(2)

### Authors

Gerber, Evan

Gelberg, Lillian

Rotrosen, John

et al.

### Publication Date

2020

### DOI

10.1080/08897077.2019.1635960

Peer reviewed



Published in final edited form as:

*Subst Abus.* 2020 ; 41(2): 196–202. doi:10.1080/08897077.2019.1635960.

## Health-Related Material Needs and Substance Use Among Emergency Department Patients

Evan Gerber<sup>1</sup>, Lillian Gelberg, MD, MSPH<sup>2,3,4</sup>, John Rotrosen, MD<sup>5</sup>, Donna Castelblanco, MBE<sup>6</sup>, Tod Mijanovich, PhD<sup>7</sup>, Kelly M. Doran, MD, MHS<sup>6,8</sup>

<sup>1</sup>NYU School of Medicine, New York, New York, USA.

<sup>2</sup>Department of Family Medicine, David Geffen School of Medicine at UCLA, Los Angeles, California, USA.

<sup>3</sup>Department of Health Policy and Management, UCLA Fielding School of Public Health, Los Angeles, California, USA.

<sup>4</sup>Office of Healthcare Transformation and Innovation, VA Greater Los Angeles, Healthcare System, Los Angeles, California, USA.

<sup>5</sup>Department of Psychiatry, NYU School of Medicine, New York, New York, USA.

<sup>6</sup>Department of Emergency Medicine, NYU School of Medicine, New York, New York, USA.

<sup>7</sup>Department of Applied Statistics, Social Science, and Humanities, NYU Steinhardt School of Culture, Education, and Human Development, New York, New York, USA.

<sup>8</sup>Department of Population Health, NYU School of Medicine, New York, New York, USA.

### Abstract

**Background:** Emergency department (ED) visits related to substance use are common. ED patients also have high levels of health-related material needs (HRMNs) such as homelessness and food insecurity. However, little research has examined the intersection between ED patient HRMNs and substance use.

**Methods:** We surveyed a random sample of public hospital ED patients. Surveys included validated single-item screeners for unhealthy alcohol and any drug use, and questions on self-reported past year material needs. We compared individual HRMNs and cumulative number of HRMNs by substance use screening status using bivariate and multivariable analyses.

**Results:** 2,312 surveys were completed. Nearly one-third of patients (32.3% [n=747]) screened positive for unhealthy alcohol use, and 21.8% (n=503) screened positive for drug use. Prevalence of HRMNs for all patients — including food insecurity (50.8%), inability to meet essential expenses (40.8%), cost barriers to medical care (24.6%), employment issues (23.8%), and

---

Correspondence should be addressed to Kelly M. Doran, MD, MHS, 462 1<sup>st</sup> Avenue Room A-345, New York, NY 10016. kelly.doran@nyumc.org. Phone: 212-263-5850. Fax: 646-501-4106.

#### AUTHOR CONTRIBUTIONS

KMD, LG, JR, and EG conceived of the study. DC and KMD led data collection for the study. KMD conducted the analysis for the study, with assistance from TM. EG assisted with the literature review. EG and KMD drafted the article. All authors provided critical feedback. All authors reviewed and approve of the final version.

homelessness (21.4%) was high — and was significantly higher for patients with unhealthy alcohol use or drug use. In multivariable analyses, homelessness was independently associated with unhealthy alcohol use (aOR 1.61 [95% CI: 1.24-2.09]) and drug use (aOR 2.30 [95% CI: 1.74-3.05]). There was a significant stepwise increase in the odds of patient unhealthy alcohol or drug use as number of HRMNs increased.

**Conclusions:** ED patients with unhealthy alcohol or drug use have higher prevalence of HRMNs than those without. Our findings suggest that HRMNs may act additively and that homelessness is particularly salient. Patients' comorbid HRMNs may affect the success of ED-based substance use interventions.

### Keywords

substance use; drug use; alcohol; homelessness; social determinants; food insecurity; emergency care

---

## INTRODUCTION

Each year, there are nearly 2.5 million ED visits related to drugs and 8.3 million ED visits related to alcohol.<sup>1,2</sup> There has been strong interest in implementing ED-based programs to address substance use, such as screening, brief intervention, and referral to treatment (SBIRT).<sup>3,4</sup> Developing effective ED interventions for substance use requires a clear understanding of the unique characteristics of ED patients. The ED has been described as both a healthcare and social safety net, and there is an increasing recognition that ED patients face high burdens of social needs.<sup>5,6</sup> Social determinants of health (SDOH) are “conditions in the environments in which people are born, live, learn, work, play, worship, and age” that affect health.<sup>7</sup> Health-related material needs (HRMNs) is a term that describes SDOH such as food insecurity and homelessness that specifically represent concrete material resource needs.<sup>6</sup> Prior studies have found that ED patients have high levels of HRMNs<sup>5,8,9</sup> and that certain HRMNs are associated with substance use.<sup>10-17</sup>

Overall, however, few prior studies have examined the association of substance use and HRMNs among ED patients specifically. Most research has been done on homelessness, which is strongly associated with both substance use and ED use.<sup>18-23</sup> Studies have found higher rates of positive substance use screening and ED visits specifically related to substance use among homeless compared to non-homeless patients.<sup>22,24-26</sup> One study found an independent association of homelessness with substance use outcomes, including substance use severity and overdose history, among ED patients.<sup>22</sup> There has been little prior research looking at other HRMNs and substance use among ED patients. A multi-center study found that ED patients who were food insecure were more likely to report drug and alcohol use than patients who were food secure.<sup>27</sup> One single-center study found that ED patients who were identified as high-risk for alcohol or drug dependence had low rates of full-time employment.<sup>23</sup> Another single-center study found cumulative number of adverse economic stressors was independently associated with drug use but not alcohol use among ED patients.<sup>9</sup> Overall, prior studies were limited by conducting descriptive or bivariate analyses only, using convenience samples, examining a limited number of HRMNs, or using non-validated measures of substance use. In the current study we build on the prior research

by examining the association of five different HRMNs with unhealthy alcohol and drug use in a large, random sample of ED patients.

## METHODS

We surveyed a random sample of ED patients at an urban, public hospital from November 2016–September 2017. Research assistant (RA) shifts were scheduled at all hours each day of the week to approximately mirror ED patient arrivals. RAs followed a random sampling scheme to approach patients. Patients were eligible if they were ≥ 18 years old, medically and psychiatrically stable, not in prison/police custody, and spoke English or Spanish. RAs were instructed to return to patients who were too intoxicated to provide informed consent after they were more sober.

Bilingual (English/Spanish-speaking) RAs conducted surveys using iPads and secure REDCap electronic data capture tools. Questions were read out loud to participants. RAs used multiple strategies to maximize privacy in the ED setting. Surveys took 20 to 40 minutes to complete. Participants provided written informed consent and received a \$15 incentive.

Participants were screened for unhealthy alcohol use and any drug use in the past year using validated single-item screening questions.<sup>28,29</sup> Unhealthy alcohol use was defined as self-report of ≥ 1 episode of binge drinking (≥ 5 drinks in a day for men and ≥ 4 for women) in the past year and any drug use was defined as use of any drug (including marijuana and prescription medication for non-prescribed reasons) ≥ 1 time in past year.<sup>28,29</sup> We chose these definitions as conservative measures of substance use and because they match the screening used by the study hospital ED's SBIRT program. Supplemental analyses were performed using definitions of past-year drug use excluding cannabis and drug use with a DAST-10 score of ≥ 3 (moderate or greater drug use severity), as well as for individual drug classes.

Participants were asked about 5 HRMNs. A question on ability to meet essential expenses was taken from the National Survey of Income and Program Participation.<sup>30</sup> Food insecurity was defined as an affirmative response to at least one of 4 questions from the USDA U.S. Food Security Survey, including worry about running out of food, that food would not last, eating less than they should, or not eating balanced meals due to money.<sup>31</sup> Cost barriers to medical care were assessed by asking if participants were unable to see a doctor or take medication as prescribed due to cost.<sup>9</sup> Participants were asked if they had any issues or needed help with employment (getting a job or problems with their existing job).<sup>32</sup> Participants were also asked whether they had experienced broadly defined homelessness including staying on the street, in a shelter, or doubled up with friends or family because they lacked another place to stay. All HRMNs questions used a past 12 month timeframe, as did all substance use variables.

To ensure data quality, RAs completed two days of didactic training and multiple directly observed shifts prior to being allowed to collect data independently. Ongoing close supervision included weekly data monitoring and biweekly direct supervision in the ED. The

study was approved by the NYU School of Medicine Institutional Review Board. All participants provided written informed consent.

## Analysis

Some patients participated in the survey more than once. In these cases, only the first instance was retained for analysis. We analyzed the associations between patient characteristics (including the presence or absence of each HRMN, and the total number of HRMNs), and self-reported unhealthy alcohol use or any drug use. For bivariate analysis we used: chi-squared tests of independence between categorical patient characteristics and unhealthy alcohol use or any drug use; t-tests to test differences between mean levels of continuous patient characteristics for respondents who reported vs. did not report unhealthy alcohol or drug use; and logistic regressions of unhealthy alcohol or drug use on the presence or absence of each individual HRMN, and on the total number of HRMNs. Multivariable analysis was conducted using logistic regression to assess the independent association of HRMNs with unhealthy alcohol and drug use. Separate multivariable analyses were performed for the two dependent variables, unhealthy alcohol use and any drug use. The amount of missing data including refusals was small (<2% for all variables) so complete case deletion was used for missing data in multivariable analyses. We included all five HRMNs together in fully adjusted multivariable models to examine the independent contribution of each, and each HRMN was analyzed separately in partially adjusted models. Separate multivariable analyses were conducted to assess the effect of number of patient-reported HRMNs from 0 to 5. In all partially and fully adjusted multivariable analyses we controlled for potential confounders including age, gender, race/ethnicity, education, insurance status, physical health, and mental illness. Correlations among variables were checked prior to entering in multivariable models; Spearman's rank correlation coefficients were all less than 0.4. Depression and anxiety were excluded from adjusted multivariable models as Spearman's rank correlation coefficient was greater than 0.4. We also tested for multicollinearity among variables used in the final fully adjusted models — including all five HRMNs — using variance inflation factors; no values were above 1.36. Fully adjusted model c-statistics were 0.743–0.806, indicating very good to excellent fit. Analysis was conducted using SAS 9.2 (Cary, NC).

## RESULTS

RAs approached 6,097 patients. Approximately half (52%) were ineligible (n=2,816) or refused to complete eligibility screening questions (n=357). Reasons for ineligibility included being medically unfit (n=858), too intoxicated to participate (n=496), unable to speak English/Spanish (n=480), or in prison/police custody (n=361). Of 2,924 eligible patients, 2,396 participated (81.9%). Duplicate records for patients who participated more than once (n=84) were removed, leaving a final analytic sample of n=2,312.

The mean age was 46.2 years and 44% of participants were female. About half (55.3%) were Hispanic/Latino, 23.1% non-Hispanic black, 12.2% non-Hispanic white, and 9.4% other. Participants reported high rates of fair or poor overall health, depression, and anxiety (Table 1).

Rates of HRMNs were high among participants overall and were significantly higher among participants with unhealthy alcohol and drug use for all HRMNs (Table 2). Food insecurity was the most commonly experienced HRMN (50.8% overall, 56.2% among those with unhealthy alcohol use, 63.3% among those with any drug use), followed by inability to meet essential expenses (40.8%, 45.8%, 52.8%, respectively). Unhealthy alcohol and particularly drug use were associated with screening positive for a higher number of HRMNs. Supplemental analyses (Supplemental Tables 1 and 2) likewise found strong bivariate associations of HRMNs with DAST-10 score and individual classes of drug use (including cocaine, opioids, and cannabis).

In models adjusting for non-HRMN potential confounders (partially adjusted models), food insecurity and homelessness were significantly associated with unhealthy alcohol use, and each HRMN was significantly associated with drug use (Table 3). In fully adjusted analyses including all HRMNs together, only homelessness (including living doubled up) remained independently associated with unhealthy alcohol use (aOR 1.61) and drug use (aOR 2.30), though food insecurity approached significance for drug use (Table 3). We also observed a significant stepwise increase in the odds of both unhealthy alcohol use and drug use as number of HRMNs increased. Supplemental analyses (Supplemental Table 3) using other measures of drug use found similar results, with additional significant associations for food insecurity with DAST-10 score  $\geq 3$  and opioid use in fully adjusted models.

## DISCUSSION

We found that HRMNs were closely related to unhealthy alcohol and drug use in a random sample of urban ED patients. Our findings are largely consistent with prior literature conducted both among ED patients and other populations, but our study uniquely addresses some of the limitations of prior research on this topic. We utilized a random sample, used previously validated measures of substance use, and examined multiple types of HRMNs as well as cumulative number of HRMNs.

We observed a dose-response type relationship between number of HRMNs and substance use. This dose-response type relationship was similarly observed in a prior study among ED patients by Bisgaier, et al.<sup>9</sup> In that study, however, the relationship was observed only for drug use and not for their measures of alcohol use.<sup>9</sup> Our findings are largely consistent with theirs, in that HRMNs appeared to be even more strongly associated with drug use than with unhealthy alcohol use. Other studies among individuals seeking or enrolled in substance use treatment programs have found that those with drug use were more likely to be economically disadvantaged, report lack of stable housing, and have problems with employment than those with alcohol use.<sup>33-36</sup> Our findings were likely influenced, however, by the measure we used for alcohol use, which represents a relatively low bar of unhealthy use rather than more severe alcohol dependence.

In our fully adjusted multivariable models including all five HRMNs together, broadly-defined homelessness stood out as significantly and independently associated with unhealthy alcohol and drug use. This finding is not surprising given that prior studies have found people experiencing homelessness have higher rates of substance use, greater severity of

drug and alcohol use, and worse substance use related outcomes.<sup>12,16,22,37,38</sup> Our results add to the growing body of literature suggesting the importance of addressing housing status among people with unhealthy alcohol or drug use.<sup>17,22,37-40</sup> Notably, once controlling for all HRMNs we found a lack of independent association between HRMNs other than homelessness and unhealthy alcohol and drug use, though in partially adjusted models both homelessness and food insecurity were associated with unhealthy alcohol use and all HRMNs with drug use. Other ED studies have found that patients who were food insecure were more likely to report substance use than those who were not and that those at high-risk for alcohol or drug dependence had low rates of full time employment, but these studies did not include multivariable analyses.<sup>23,27</sup> Although we found homelessness had the strongest independent association, we still found a dose-response relationship between number of HRMNs and unhealthy alcohol and drug use, suggesting that other HRMNs should not be neglected when developing substance use interventions in the ED.

Little direct attention has been paid to HRMNs in ED-based substance use interventions. Prior studies conducted among ED patients have demonstrated moderate effectiveness of SBIRT for alcohol use but mixed results with respect to drug use.<sup>41-49</sup> For example, three randomized controlled trials found no effect of SBIRT for ED patients with drug use, while other ED SBIRT studies have shown reduced drug use days and increased marijuana abstinence.<sup>45-49</sup> Our study findings, other prior research, and results from prior ED SBIRT trials suggest that assessing and addressing HRMNs may be an important missing piece in ED-based interventions for substance use and that it may be important to simultaneously address multiple HRMNs in this population.

### Limitations

We conducted a cross-sectional study and thus cannot suggest causality for the relationships described. Our study was conducted at a single public hospital in New York City that serves patients with high levels of HRMNs, which may limit its generalizability to other settings. Additionally, our sample size may have limited our ability to detect significant associations for some variables and our ability to conduct mediation analyses. Finally, a relatively large number of patients were excluded due to being medically unfit; therefore, our results may best be interpreted to apply to ED patients who are medically stable / not critically ill.

### Conclusion

In this study of ED patients, we found a dose-response relationship between number of HRMNs (including inability to meet expenses, food insecurity, cost barriers to medical care, unemployment, and homelessness) and unhealthy alcohol and drug use. We also found a strong independent association between homelessness and unhealthy alcohol and drug use. Future research should examine the role of assessing and addressing patient HRMNs as part of substance use interventions in the ED.

### Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## ACKNOWLEDGEMENTS

The authors would like to thank all of the ED-CARES Research Assistants, and the study Research Stakeholder and Expert Advisory Panel.

### FUNDING

Research reported in this publication was supported by the National Institute on Drug Abuse of the National Institutes of Health (K23DA039179, PI Doran), the United Hospital Fund (PI Doran), and the Doris Duke Charitable Foundation—NYULMC (PI Doran). The funders had no role in the conduct of the research or the writing of the manuscript. The content is solely the responsibility of the authors and does not represent the official views of any funder.

## REFERENCES

1. Substance Abuse & Mental Health Services Administration. The DAWN Report: Highlights of the 2011 Drug Abuse Warning Network (DAWN) Findings on Drug-Related Emergency Department Visits. <https://www.samhsa.gov/data/sites/default/files/DAWN127/DAWN127/sr127-DAWN-highlights.htm>. Published 2 22, 2013 Accessed June 23, 2018.
2. McDonald AJ, Wang N, Camargo CA. US emergency department visits for alcohol-related diseases and injuries between 1992 and 2000. *Arch Intern Med*. 2004;164(5):531–537. [PubMed: 15006830]
3. Bernstein SL, D’Onofrio G. A promising approach for emergency departments to care for patients with substance use and behavioral disorders. *Health Aff (Millwood)*. 2013;32(12):2122–2128. [PubMed: 24301395]
4. Bernstein SL, Haukoos JS. Public Health, Prevention, and Emergency Medicine: A Critical Juxtaposition. *Acad Emerg Med*. 2008;15(2):190–193. [PubMed: 18275450]
5. Gordon JA. The hospital emergency department as a social welfare institution. *Ann Emerg Med*. 1999;33(3):321–325. [PubMed: 10036347]
6. Malecha PW, Williams JH, Kunzler NM, Goldfrank LR, Alter HJ, Doran KM. Material needs of emergency department patients: a systematic review. *Acad Emerg Med*. 2018;25(3):330–359. [PubMed: 29266523]
7. HealthyPeople 2020: Social Determinants of Health. Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>. Accessed June 24, 2018.
8. Doran KM, Kunzler NM, Mijanovich T, et al. Homelessness and other social determinants of health among emergency department patients. *J Soc Distress Homeless*. 2016;25(2):71–77.
9. Bisgaier J, Rhodes KV. Cumulative adverse financial circumstances: associations with patient health status and behaviors. *Health Soc Work*. 2011;36(2):129–137. [PubMed: 21661302]
10. Galea S, Vlahov D. Social determinants and the health of drug users: socioeconomic status, homelessness, and incarceration. *Public Health Rep*. 2002;117(Suppl 1):S135. [PubMed: 12435837]
11. Probst C, Roerecke M, Behrendt S, Rehm J. Socioeconomic differences in alcohol-attributable mortality compared with all-cause mortality: a systematic review and meta-analysis. *Int J Epidemiol*. 2014;43(4):1314–1327. [PubMed: 24618188]
12. Collins SE. Associations Between Socioeconomic Factors and Alcohol Outcomes. *Alcohol Res*. 2016;38(1):83–94. [PubMed: 27159815]
13. McLellan AT, Lewis DC, O’Brien CP, Kleber HD. Drug dependence, a chronic medical illness: implications for treatment, insurance, and outcomes evaluation. *JAMA*. 2000;284(13):1689–1695. [PubMed: 11015800]
14. Baer TE, Scherer EA, Fleegler EW, Hassan A. Food Insecurity and the Burden of Health-Related Social Problems in an Urban Youth Population. *J Adolesc Health*. 2015;57(6):601–607. [PubMed: 26592328]
15. McLaughlin KA, Green JG, Alegría M, et al. Food Insecurity and Mental Disorders in a National Sample of U.S. Adolescents. *J Am Acad Child Adolesc Psychiatry*. 2012;51(12):1293–1303. [PubMed: 23200286]



16. Fazel S, Khosla V, Doll H, Geddes J. The prevalence of mental disorders among the homeless in western countries: systematic review and meta-regression analysis. *PLoS Med*. 2008;5(12):e225. [PubMed: 19053169]
17. O'Toole TP, Gibbon JL, Hanusa BH, Freyder PJ, Conde AM, Fine MJ. Self-reported changes in drug and alcohol use after becoming homeless. *Am J Public Health*. 2004;94(5):830–835. [PubMed: 15117708]
18. Capp R, Rosenthal MS, Desai MM, et al. Characteristics of Medicaid enrollees with frequent ED use. *Am J Emerg Med*. 2013;31(9):1333–1337. [PubMed: 23850143]
19. Stergiopoulos V, Gozdzik A, Nisenbaum R, et al. Racial-Ethnic Differences in Health Service Use in a Large Sample of Homeless Adults With Mental Illness From Five Canadian Cities. *Psychiatr Serv*. 2016;67(9):1004–1011. [PubMed: 27133726]
20. Chambers C, Chiu S, Katic M, et al. High utilizers of emergency health services in a population-based cohort of homeless adults. *Am J Public Health*. 2013;103 Suppl 2:S302–310. [PubMed: 24148033]
21. Krupski A, Graves MC, Bumgardner K, Roy-Byrne P. Comparison of Homeless and Non-Homeless Problem Drug Users Recruited from Primary Care Safety-Net Clinics. *J Subst Abuse Treat*. 2015;58:84–89. [PubMed: 26153073]
22. Doran KM, Rahai N, McCormack RP, et al. Substance use and homelessness among emergency department patients. *Drug Alcohol Depend*. 2018;188:328–333. [PubMed: 29852450]
23. Hankin A, Daugherty M, Bethea A, Haley L. The Emergency Department as a prevention site: a demographic analysis of substance use among ED patients. *Drug Alcohol Depend*. 2013;130(1–3):230–233. [PubMed: 23253936]
24. Pearson DA, Bruggman AR, Haukoos JS. Out-of-hospital and emergency department utilization by adult homeless patients. *Ann Emerg Med*. 2007;50(6):646–652. [PubMed: 17950488]
25. Ayangbayi T, Okunade A, Karakus M, Nianogo T. Characteristics of Hospital Emergency Room Visits for Mental and Substance Use Disorders. *Psychiatr Serv*. 2017;68(4):408–410. [PubMed: 27974000]
26. Tsai J, Doran KM, Rosenheck RA. When health insurance is not a factor: national comparison of homeless and nonhomeless US veterans who use Veterans Affairs Emergency Departments. *Am J Public Health*. 2013;103 Suppl 2:S225–231. [PubMed: 24148061]
27. Sullivan AF, Clark S, Pallin DJ, Camargo CA Jr. Food security, health, and medication expenditures of emergency department patients. *J Emerg Med*. 2010;38(4):524–528. [PubMed: 19272731]
28. Smith PC, Schmidt SM, Allensworth-Davies D, Saitz R. Primary care validation of a single-question alcohol screening test. *J Gen Intern Med*. 2009;24(7):783–788. [PubMed: 19247718]
29. Smith PC, Schmidt SM, Allensworth-Davies D, Saitz R. A single-question screening test for drug use in primary care. *Arch Intern Med*. 2010;170(13):1155–1160. [PubMed: 20625025]
30. U.S. Census Bureau. Survey of Income and Program Participation. <https://www.census.gov/programs-surveys/sipp/about.html>. Accessed April 23, 2014, 2014.
31. USDA Food Security Survey. Available at <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/survey-tools/#household>. Accessed 16 Jan 2017.
32. Aidala AA, McAllister W, Yomogida M. Frequent Users Service Enhancement “Fuse” Initiative: New York City Fuse II Evaluation Report. Columbia University; 2014.
33. Lubman DI, Garfield JB, Manning V, et al. Characteristics of individuals presenting to treatment for primary alcohol problems versus other drug problems in the Australian patient pathways study. *BMC Psychiatry*. 2016;16(1):250. [PubMed: 27435013]
34. National Drug Treatment Monitoring System (NDTMS). Report: Adult substance misuse statistics from the NDTMS, April 2016 to March 2017. Published 2017.
35. Stenius K, Witbrodt J, Engdahl B, Weisner C. For the marginalized or for the integrated? A comparative study of addiction treatment systems in Sweden and the United States. *Contemp Drug Probl*. 2010;37(3):417–448.
36. Manning V, Gomez B, Guo S, Low YD, Koh PK, Wong KE. An exploration of quality of life and its predictors in patients with addictive disorders: Gambling, alcohol and drugs. *Int J Ment Health Addict*. 2012;10(4):551–562.

37. Eyrich-Garg KM, Cacciola JS, Carise D, Lynch KG, McLellan AT. Individual characteristics of the literally homeless, marginally housed, and impoverished in a US substance abuse treatment-seeking sample. *Soc Psychiatry Psychiatr Epidemiol*. 2008;43(10):831–842. [PubMed: 18504513]
38. Linton SL, Celentano DD, Kirk GD, Mehta SH. The longitudinal association between homelessness, injection drug use, and injection-related risk behavior among persons with a history of injection drug use in Baltimore, MD. *Drug Alcohol Depend*. 2013;132(3):457–465. [PubMed: 23578590]
39. Neale J Homelessness amongst drug users: A double jeopardy explored. *Int J Drug Policy*. 2001;12(4):353–369.
40. Bachhuber MA, Roberts CB, Metraux S, Montgomery AE. Screening for homelessness among individuals initiating medication-assisted treatment for opioid use disorder in the Veterans Health Administration. *J Opioid Manag*. 2015;11(6):459–462. [PubMed: 26728642]
41. Schmidt CS, Schulte B, Seo HN, et al. Meta-analysis on the effectiveness of alcohol screening with brief interventions for patients in emergency care settings. *Addiction*. 2016;111(5):783–794. [PubMed: 26637990]
42. Havard A, Shakeshaft A, Sanson-Fisher R. Systematic review and meta-analyses of strategies targeting alcohol problems in emergency departments: interventions reduce alcohol-related injuries. *Addiction*. 2008;103(3):368–376. [PubMed: 18190671]
43. Nilsen P, Baird J, Mello MJ, et al. A systematic review of emergency care brief alcohol interventions for injury patients. *J Subst Abuse Treat*. 2008;35(2):184–201. [PubMed: 18083321]
44. D’Onofrio G, Degutis LC. Preventive care in the emergency department: screening and brief intervention for alcohol problems in the emergency department: a systematic review. *Acad Emerg Med*. 2002;9(6):627–638. [PubMed: 12045080]
45. Guan W, Liu T, Baird JR, Merchant RC. Evaluation of a brief intervention to reduce the negative consequences of drug misuse among adult emergency department patients. *Drug Alcohol Depend*. 2015;157:44–53. [PubMed: 26482090]
46. Bogenschutz MP, Donovan DM, Mandler RN, et al. Brief intervention for patients with problematic drug use presenting in emergency departments: a randomized clinical trial. *JAMA Intern Med*. 2014;174(11):1736–1745. [PubMed: 25179753]
47. Woodruff SI, Clapp JD, Eisenberg K, et al. Randomized clinical trial of the effects of screening and brief intervention for illicit drug use: the life shift/shift gears study. *Addict Sci Clin Pract*. 2014;9(1):8. [PubMed: 24886786]
48. Bernstein E, Edwards E, Dorfman D, Heeren T, Bliss C, Bernstein J. Screening and brief intervention to reduce marijuana use among youth and young adults in a pediatric emergency department. *Acad Emerg Med*. 2009;16(11):1174–1185. [PubMed: 20053238]
49. Blow FC, Walton MA, Bohnert AS, et al. A randomized controlled trial of brief interventions to reduce drug use among adults in a low-income urban emergency department: the HealthiER You study. *Addiction*. 2017;112(8):1395–1405. [PubMed: 28127808]

**Table 1.**

## Participant characteristics

	<b>n (%)</b>
	<b>n=2312</b>
<b>Basic Characteristics</b>	
Age, mean (SD)	46.2 (16.1)
Female	1006 (43.8)
Race/ethnicity	
Hispanic/Latino	1270 (55.3)
Non-Hispanic Black	531 (23.1)
Non-Hispanic White	280 (12.2)
Other	217 (9.4)
Insurance	
Uninsured	621 (26.9)
Medicaid and/or Medicare	1202 (52.1)
Private / Other	485 (21.0)
Employment	
Working full-time	1053 (45.6)
Unemployed	544 (23.5)
Unable to work	454 (19.7)
Retired	260 (11.3)
Education	
Less than high school diploma	839 (36.3)
High school graduate/GED	600 (26.0)
Some college or higher	870 (37.7)
Overall health fair or poor	1041 (45.2)
Depression (PHQ-2)	534 (23.2)
Anxiety (GAD-2)	706 (31.0)
Mental illness diagnosis (lifetime) <sup>a</sup>	879 (38.3)
<b>Substance Use Screening Status</b>	
Neither unhealthy alcohol nor drug use	1377 (59.8)
Unhealthy alcohol use only <sup>b</sup>	425 (18.4)
Any drug use only <sup>c</sup>	181 (7.9)
Both unhealthy alcohol use and drug use	321 (13.9)
<b>Drug Use</b>	
DAST-10 score 3	276 (12.1)
Types of drugs used in past 12 months	
Cannabis	492 (21.5)
Heroin	128 (5.6)
Prescription opioids	126 (5.5)
Cocaine or crack cocaine	212 (9.3)

	n (%)
	n=2312
Synthetic cannabinoids	31 (1.4)
Sedatives, sleeping pills, or benzodiazepines	125 (5.5)
Hallucinogens and other synthetics	60 (2.6)
Prescription stimulants	57 (2.5)
Methamphetamine	30 (1.3)
<b>Health-Related Material Needs</b>	
Inability to meet essential expenses	936 (40.8)
Food insecurity	1159 (50.8)
Cost barriers to medical care	561 (24.6)
Homeless/doubled up	492 (21.4)
Employment issues	545 (23.8)
Number of HRMNs <sup>d</sup>	
0	684 (30.2)
1	503 (22.2)
2	453 (20.0)
3	326 (14.4)
4	216 (9.5)
5	81 (3.6)

Percentages among those who answered each question. Refusals/missing less than 2% for all questions.

<sup>a</sup>Self-report of diagnosis given by a health care professional of at least one of 8 different mental health problems (depression, anxiety, panic attacks, schizophrenia, bipolar disorder, PTSD, borderline personality, or other mental health disorder).

<sup>b</sup>Unhealthy alcohol use via single-item screener (response = 1 time in past year).<sup>28</sup>

<sup>c</sup>Any drug use via single-item screener (response = 1 time in past year).<sup>29</sup>

<sup>d</sup>Health-related material needs.

**Table 2.**

Participant characteristics by substance use screening status

	Unhealthy alcohol use <sup>a</sup> (-) n (%)	n=1558	Unhealthy alcohol use <sup>a</sup> (+) n (%)	n=747	P-value	Any drug use <sup>b</sup> (-) n (%)	n=1805	Any drug use <sup>b</sup> (+) n (%)	n=503	P-value
<b>Basic Characteristics</b>										
Age, mean (SD)	48.9 (16.4)		40.6 (14.0)		<.01	47.8 (16.1)		40.5 (14.7)		<.01
Female	806 (51.9)		200 (27.0)		<.01	908 (50.4)		97 (19.5)		<.01
Race/ethnicity					<.01					<.01
Hispanic/Latino	906 (58.6)		362 (48.5)			1074 (59.9)		196 (39.0)		
Non-Hispanic Black	345 (22.3)		185 (24.8)			370 (20.6)		161 (32.0)		
Non-Hispanic White	141 (9.1)		139 (18.6)			183 (10.2)		96 (19.1)		
Other	155 (10.0)		61 (8.2)			167 (9.3)		50 (9.9)		
Insurance					<.01					<.01
Uninsured	430 (27.7)		189 (25.3)			523 (29.0)		98 (19.5)		
Medicaid and/or Medicare	828 (53.3)		369 (49.4)			909 (50.4)		290 (57.8)		
Private / Other	296 (19.0)		189 (25.3)			370 (20.5)		114 (22.7)		
Employment					<.01					<.01
Working full-time	674 (43.3)		377 (50.5)			846 (46.9)		205 (40.8)		
Unemployed	338 (21.7)		204 (27.3)			383 (21.2)		159 (31.7)		
Unable to work	320 (20.6)		132 (17.7)			337 (18.7)		117 (23.3)		
Retired	225 (14.5)		34 (4.6)			239 (13.2)		21 (4.2)		
Education					<.01					<.01
Less than high school diploma	623 (40.0)		215 (28.8)			696 (38.6)		143 (28.5)		
High school graduate/GED	383 (24.6)		215 (28.8)			448 (24.8)		150 (29.9)		
Some college or higher	550 (35.4)		316 (42.4)			660 (36.6)		208 (41.5)		
Overall health fair or poor	752 (48.6)		286 (38.3)		<.01	839 (46.7)		201 (40.0)		<.01
Depression (PHQ-2)	321 (20.7)		210 (28.3)		<.01	366 (20.4)		167 (33.5)		<.01
Anxiety (GAD-2)	422 (27.4)		279 (38.1)		<.01	480 (26.9)		223 (45.5)		<.01
Mental illness diagnosis (lifetime)	523 (33.8)		352 (47.4)		<.01	591 (32.9)		287 (57.5)		<.01
<b>Health-Related Material Needs</b>										
Inability to meet essential expenses	590 (38.2)		340 (45.8)		<.01	670 (37.4)		263 (52.8)		<.01

	Unhealthy alcohol use <sup>a</sup> (-) n (%)	Unhealthy alcohol use <sup>a</sup> (+) n (%)	p-value	Any drug use <sup>b</sup> (-) n (%)	Any drug use <sup>b</sup> (+) n (%)	p-value
	n=1558	n=747		n=1805	n=503	
Food insecurity	738 (48.1)	416 (56.2)	<.01	841 (47.3)	316 (63.3)	<.01
Cost barriers to medical care	355 (23.1)	204 (27.7)	0.02	403 (22.6)	157 (31.7)	<.01
Homeless/doubled up	264 (17.1)	224 (30.1)	<.01	282 (15.7)	209 (41.8)	<.01
Employment issues	318 (20.7)	222 (29.9)	<.01	368 (20.6)	175 (35.2)	<.01
Number of HRMNs <sup>c</sup>			<.01			<.01
0	487 (32.0)	196 (26.8)		585 (33.1)	98 (19.9)	
1	369 (24.2)	133 (18.2)		433 (24.5)	69 (14.0)	
2	317 (20.8)	136 (18.6)		345 (19.5)	108 (21.9)	
3	198 (13.0)	127 (17.4)		232 (13.1)	93 (18.9)	
4	117 (7.7)	97 (13.3)		136 (7.7)	80 (16.2)	
5	36 (2.4)	43 (5.9)		35 (2.0)	45 (9.1)	

Percentages among those who answered each question. Refusals/missing less than 2% for all questions.

<sup>a</sup>Unhealthy alcohol use via single-item screener (response = 1 time in past year).<sup>28</sup>

<sup>b</sup>Any drug use via single-item screener (response = 1 time in past year).<sup>29</sup>

<sup>c</sup>Health-related material needs.

**Table 3.** Association of ED patient health-related material needs (HRMNs) and unhealthy alcohol and drug use

	Unhealthy alcohol use <sup>a</sup>			Any drug use <sup>b</sup>		
	Unadjusted OR (95% CI)	Partially Adjusted OR (95% CI)	Fully Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Partially Adjusted OR (95% CI)	Fully Adjusted OR (95% CI)
Inability to meet essential expenses	<b>1.37 (1.15–1.63)</b>	1.17 (0.96–1.43)	1.02 (0.82–1.27)	<b>1.87 (1.53–2.29)</b>	<b>1.49 (1.18–1.87)</b>	1.11 (0.85–1.43)
Food insecurity	<b>1.39 (1.16–1.65)</b>	<b>1.31 (1.07–1.60)</b>	1.16 (0.93–1.46)	<b>1.92 (1.57–2.36)</b>	<b>1.73 (1.36–2.20)</b>	1.29 (0.98–1.69)
Cost barriers to medical care	<b>1.27 (1.04–1.56)</b>	1.15 (0.91–1.43)	1.01 (0.79–1.29)	<b>1.58 (1.27–1.97)</b>	<b>1.38 (1.07–1.79)</b>	1.05 (0.80–1.39)
Homeless/doubled up	<b>2.09 (1.71–2.57)</b>	<b>1.71 (1.34–2.19)</b>	<b>1.61 (1.24–2.09)</b>	<b>3.85 (3.10–4.79)</b>	<b>2.67 (2.05–3.47)</b>	<b>2.30 (1.74–3.05)</b>
Employment issues	<b>1.64 (1.34–2.00)</b>	1.18 (0.94–1.49)	1.03 (0.81–1.32)	<b>2.10 (1.69–2.61)</b>	<b>1.55 (1.20–2.00)</b>	1.17 (0.89–1.54)
Number of HRMNs <sup>c</sup> (ref=0)						
1	0.90 (0.69–1.16)	N/A	0.94 (0.71–1.24)	0.95 (0.68–1.33)	N/A	1.01 (0.70–1.45)
2	1.07 (0.82–1.38)	N/A	1.07 (0.80–1.43)	<b>1.87 (1.38–2.53)</b>	N/A	<b>1.88 (1.32–2.67)</b>
3	<b>1.59 (1.21–2.10)</b>	N/A	<b>1.37 (1.00–1.87)</b>	<b>2.39 (1.73–3.30)</b>	N/A	<b>1.94 (1.34–2.81)</b>
4	<b>2.06 (1.50–2.83)</b>	N/A	<b>1.60 (1.11–2.29)</b>	<b>3.51 (2.45–4.98)</b>	N/A	<b>2.42 (1.61–3.62)</b>
5	<b>2.97 (1.85–4.76)</b>	N/A	<b>1.82 (1.08–3.07)</b>	<b>7.67 (4.70–12.54)</b>	N/A	<b>4.47 (2.57–7.77)</b>

Unadjusted models are bivariate. Partially adjusted models adjust for age, gender, race/ethnicity, education, insurance status, physical health, and mental illness but include only one HRMN (each HRMN included in separate models). Fully adjusted models include all of the previously listed potential confounders and additionally include all five HRMNs together in the same model.

<sup>a</sup>Unhealthy alcohol use via single-item screener (response = 1 time in past year).<sup>28</sup>

<sup>b</sup>Any drug use via single-item screener (response = 1 time in past year).<sup>29</sup>

<sup>c</sup>Health-related material needs.