

Health Services Use Among Jailed Women with Alcohol Use Disorders

Christine Timko, PhD

Jennifer E. Johnson, PhD

Megan Kurth, MPH

Yael Chatav Schonbrun, PhD

Bradley J. Anderson, PhD

Michael D. Stein, MD

Abstract

Correctional facilities now house unprecedented numbers of women with complex treatment needs. This investigation applied the Behavioral Model for Vulnerable Populations to study 168 jailed women with alcohol use disorders. It described the sample's predisposing (age, race, victimization), enabling (health insurance), and need (self-reported medical, substance use, and mental health problems) factors and examined associations of these factors with pre-incarceration services utilization. Most participants had clinically significant levels of depression and PTSD symptoms, most took psychiatric medications, and most had been victimized. Participants reported considerable health services utilization. Younger, Black, and uninsured women utilized fewer medical and mental health services. Drug use was associated with less use of medical services, but more use of alcohol and drug services. High rates of health services use support the need for integrated, ongoing care for substance-using women before, during, and after incarceration.

Address correspondence to Christine Timko, PhD, Center for Innovation to Implementation, VA Palo Alto Health Care System and Stanford University School of Medicine, 795 Willow Road, Menlo Park, CA 94025, USA. E-mail: ctimko@stanford.edu; Christine.Timko@va.gov.

Jennifer E. Johnson, PhD, Division of Public Health, College of Human Medicine, Michigan State University, Flint, MI, USA.

Megan Kurth, MPH, Behavioral Medicine and Addictions Research, Butler Hospital, Providence, RI, USA.

Bradley J. Anderson, PhD, Behavioral Medicine and Addictions Research, Butler Hospital, Providence, RI, USA.

Michael D. Stein, MD, Behavioral Medicine and Addictions Research, Butler Hospital, Providence, RI, USA.

Yael Chatav Schonbrun, PhD, Department of Psychiatry and Human Behavior, Alpert Medical School, Brown University, Providence, RI, USA.

Michael D. Stein, MD, Department of Health Law, Policy, & Management, Boston University School of Public Health, Boston, MA, USA.

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Introduction

Women represent the fastest growing offender segment of the US criminal justice system.¹ The number of women incarcerated in prisons increased by more than 700% from 1980 to 2014, more than twice the rate of men for this same time period.² More than 1.6 million women in the US are arrested and held in jail detention each year.³ Consequently, correctional facilities now house an unprecedented number of women with complex substance use, mental health, and medical treatment needs.

The health care needs of incarcerated women are greater than those of incarcerated men and of women in the general population (e.g., prevalence rates were higher among women prison inmates than women in the general population for mood disorder [19 vs. 7%], alcohol use disorder [48 vs. 6%], drug use disorder [46 vs. 10%], and antisocial personality disorder [21 vs. 2%]).⁴⁻⁵ Upon admission to short-term correctional facilities, compared to men, women manifest more symptoms of substance-related disorders (9 vs. 18% for alcohol dependence; 22 vs. 35% for drug dependence; 12 vs. 21% for non-dependent use of alcohol and drugs), anxiety (38 vs. 48%), and other mental health disorders.⁶ Nationally in the USA, more women in jail had drug use disorders than did men in jail (72 vs. 62%).⁷ Similarly, among jail and prison inmates, women are more likely to report having chronic medical conditions and infectious diseases.⁸ Alcohol use disorder in particular among jailed women is not only common, with about half having this disorder, but is also associated with the high risk and co-occurrence of other health problems and consequent need for medical, mental health, and addiction treatment services.⁹ Alcohol is implicated in the incarceration of more than half of all inmates in the USA, and similarly, in the UK, 70% of inmates surveyed said they had been drinking when they committed their offense.⁹ Although incarcerated women commonly report frequent alcohol and drug use, and mental health and medical problems, research is limited concerning their health services utilization prior to incarceration.

Generally, women in the criminal justice system report difficulty accessing health services, and many incarcerated women lack health care prior to imprisonment,^{4,10} exacerbating health problems.¹¹ Prior to incarceration in a medium-security correctional center, one-third of women had not seen a medical care provider in the last year when they needed to because of the cost, and two-thirds had obtained health care at an emergency room.¹² Similarly, women with a recent arrest reported difficulty with health care payments, finding a health clinic, and obtaining transportation to clinics.¹³ Women with a recent incarceration identified barriers to care that fell into two main categories: lack of resources (means to pay for services), and systematic obstacles within treatment programs (e.g., requiring group attendance to obtain medications).¹⁰

The Behavioral Model for Vulnerable Populations¹⁴ was designed to include domains relevant to understanding the health and healthcare seeking of populations such as incarcerated women. It has been applied in cross-sectional studies to homeless women, for whom drug problems were associated with hospitalizations,¹⁵ and female sex workers, for whom having a regular source of health care was related to health care utilization.¹⁶ Applying this model of health services utilization to incarcerated and other at-risk women is helpful in identifying the challenges they have faced in obtaining needed services and in providing insights into improving their health status. The model's determinants of health behaviors, including use of health services, are predisposing (e.g., demographics, victimization), enabling (e.g., having insurance), and need (e.g., self-reported medical, substance use, and mental health problems) factors.

Prior research has documented that the predisposing factors of age, race, and victimization are associated with the extent to which health services are utilized,¹⁷⁻¹⁸ and this holds among justice-involved women. A study of older incarcerated women found them to have multiple chronic health conditions, frequent histories of victimization, and high rates of mental health issues, which indicated a need for more health services utilization.¹⁹ Studies have also documented racial and ethnic disparities in health care access at the patient, provider, and health care system levels,²⁰ with

African-American women in particular receiving less care and experiencing consequences of access disparities.²¹ Braithwaite et al.⁴ found poorer health among Black female inmates than other female inmates and concluded that being a Black, female, and poor criminal offender confers serious health risks, due in part to lower rates of services usage. Victimization, another factor predisposing individuals' greater use of health care in the Behavioral Model, is common in the life experience of incarcerated women. Among women newly admitted to a medium-security correctional center, 50% had been physically abused.¹² Taken together, these studies suggest that women who are older, Black, and have been physically harmed or threatened use more health services prior to being jailed.

Having health insurance, which is a personal resource and therefore an enabling factor in the Behavioral Model for Vulnerable Populations, has been associated with greater access to and use of health care services.²² Although data on the insurance status of people moving into and out of the criminal justice system are limited, some studies suggest that the population has lower rates of being insured than the general population.²³ For example, about 90% of people who entered San Francisco county jails had no health insurance.²⁴ Subsequently, a study of recently-incarcerated women found that the majority (74%) had health insurance,¹⁰ a rate still below that of the general population.²⁵ Health insurance may be an important correlate of service use for incarcerated women.

Substance use, mental health, and medical problems are also likely correlates of higher utilization of health services. It is clear that incarcerated women report high rates of substance use and mental health problems, as well as chronic medical conditions, which are identified as health needs in the Behavioral Model. The majority of women in prison reported lifetime depression (62%) and anxiety (53%) symptoms; and, 53% reported having ever received mental health treatment, and 80% reported ever receiving substance use treatment.²⁶ Recurring medical conditions such as reproductive health problems (78%), respiratory problems (57%) and sexually transmitted diseases (53%) were also quite common among the prison population.²⁶ In addition, there were positive correlations between having a lifetime history of mental health problems and mental health treatment utilization; having a history of medical problems and number of hospital stays; and a history of mental health or medical problems and lifetime number of emergency room visits.²⁶ Of women in nine county jails in four US regions, 53% had a current substance use disorder, and 32% had serious mental illness.²⁷ Of women with co-occurring substance use disorder and serious mental illness (20% of the sample), 29% had received treatment for both mental illness and substance use, and one third had not received any health care in the past year.²⁷ Despite knowledge gained by studies on the breadth and severity of health problems among incarcerated women, there is still a need to examine associations of problems with health services utilization, which steered the present study.

Present study

Much of what is known about the health problems and health services utilization of incarcerated women has come from studies of prisons rather than of jails. Jails, which constitute about 50% of US correctional facilities, differ from prisons in a number of ways that may be related to inmates' health status and behaviors.²⁸ Jails are usually municipal and county facilities that hold those with shorter sentences, generally a year or less, and often only days or weeks. They serve many more people in a year (approximately 11 million versus approximately 2 million in prisons), receive individuals awaiting trial, conviction, or sentencing, and readmit probation or parole violators.²⁹

The present study used baseline data from a randomized controlled trial that is evaluating the effectiveness of a method to enhance the linkage of female pretrial detainees with alcohol use disorders who are leaving jail to resources in the community.³⁰ It examines associations of

predisposing, enabling, and need factors to utilization of medical, mental health, alcohol, and drug treatment services, as well as of 12-step mutual-help groups for alcohol use.

Because women's concerns before entering jail are relevant as they are released and re-enter their community often only a few days later, knowledge of predictors of health care utilization prior to incarceration provides guidance in planning interventions to decrease risk for poor health access and outcomes. That is, findings from this study are informative for health care practices and policies in terms of whether access to targeted services should be expanded for this vulnerable population due to high needs for particular kinds of care, and whether disparities based on factors such as age, race, ethnicity, and lack of health insurance need to be eliminated. In keeping with the Behavioral Model, hypotheses were that women with the predisposing factors of older age, white race, and a history of victimization, the enabling factor of having health insurance, and the need factors of poorer physical and mental health, more severe alcohol use, and illicit drug use would be associated with more use of health care services.

Methods

Participants

Participants were 168 women in the participating jail who met eligibility criteria for the randomized controlled trial: (1) 18 years of age or older; (2) unsentenced or sentenced to jail time of less than 60 days, (3) lived within 20 miles of the research offices and planned to remain in the area for the next six months, (4) met DSM-5 criteria for alcohol use disorder in the last 90 days (according to the Structured Clinical Interview for DSM-5 [SCID-5]),³¹ (5) did not expect to attend residential alcohol or drug treatment upon release, (6) spoke English well enough to understand study measures when read aloud, and (7) could provide the name of at least two verifiable locator persons who would know where they could be found.

Procedure

In the jail, research assistants approached women who were unsentenced or sentenced to less than 60 days, and asked them if they were interested in being screened for a research study. All women approached were told that their choice of participating or not would have no impact on their time in jail or sentencing process; that the study had a Certificate of Confidentiality to ensure that all responses would be kept confidential; and that, except when danger to self or other was identified, no information provided during the study would be shared with Department of Corrections staff, court or parole officers, or anyone else involved in the correctional setting. Interested women were screened for the additional eligibility criteria, and when they were eligible, informed consent and the baseline interview were administered to them the same day. Of 482 women screened from 2013 to 2017, 188 (39%) met eligibility criteria, and of these, 168 (89%) provided informed consent and completed the baseline assessment.

Measures

Predictors Predictors included the *predisposing* factors of participants' background characteristics: age, Hispanic ethnicity (no or yes), and race (White, Black, or Other). Predisposing factors also included Victimization, which was the count of "yes" answers to 10 items taken from the Conflict Tactics Scale (CTS).³² Items described victimization experiences during a disagreement with someone in the past 3 months, e.g., pushed, grabbed, or shoved you.

The *enabling* factor of health insurance status was assessed with an item asking about presence or absence of various kind of insurance at the time of incarceration (no or yes, e.g., private, Medicaid, Medicare).

Predictors representing *need* factors included medical, substance use, and mental health measures. The 12-item Short Form Survey (SF-12) creates two summary scores that assess role functioning related to physical health and to emotional health.³³ Higher scores indicate better physical and emotional health. Alcohol use severity was indicated by the number of symptoms, out of 11, endorsed on the SCID 5's alcohol use disorder module. Drug Use was coded as no or yes to any use of heroin, cocaine, methamphetamine, non-prescribed opioids or painkillers, or sedatives or benzodiazepines in the past 90 days. (Cannabis was not included in this measure for this analysis because only one woman had not used cannabis on at least 1 day in the past 90 days.) Depressive symptoms were assessed with the Center for Epidemiologic Studies Depression Scale (CES-D-10);³⁴ 10 items were summed with regard to the past week (0=rarely, 3=most days). PTSD symptoms were assessed with the PTSD Checklist (PCL);³⁵ 17 items were summed with regard to the last month (1 = not at all, 5 = extremely).

Outcomes Health services utilization outcomes were assessed based on the Treatment Services Review.³⁶ Medical Services use was the sum of 6 items asking whether the participant had (yes or no) treatment services such as any emergency medical visits, hospitalizations for medical problems, or scheduled outpatient medical visits in the past 90 days. Mental Health Services use was the sum of 4 items asking whether the participant had (yes or no) treatment services such as any hospitalization for psychiatric problems, or any outpatient appointment for mental health (not addiction) problems with a counselor, psychologist, or psychiatrist, in the past 90 days. Alcohol Services was the sum of 4 items asking whether the participant had (yes or no) treatment services such as having been in a residential alcohol treatment program or having seen an outpatient counselor for an alcohol problem in the past 90 days. Drug Services was the sum of 5 items asking whether the participant had (yes or no) treatment services such as having been in a residential drug treatment program or having seen an outpatient counselor for a drug problem in the past 90 days. Use of 12-step groups for alcohol use was assessed by any attendance at such meetings (yes or no) in the past year. This study included the use of 12-step groups because they provide an informal mental health service for many women with alcohol use disorder re-entering the community after incarceration,³⁷ and because mutual-help groups are cited as particularly helpful to achieving recovery. Specifically, women described the vital role of substance-related groups in enabling them to meet other women with similar backgrounds and help each other as peers toward the common goal of good health.³⁷

Analytical methods

Descriptive statistics are presented first to summarize the background characteristics of participants. Five multivariate regression analyses were conducted, with number of medical services, number of mental health services, number of alcohol-related services, number of drug-related services, and 12-step attendance for alcohol use (yes or no) as dependent variables in separate analyses. Each analysis included all predictors. Multivariate linear regressions were used to evaluate associations of predictors (i.e., age, race, ethnicity, age, victimization, physical and emotional health, alcohol use severity, drug use, and PTSD and depressive symptom severity) with continuous measures of treatment services utilization (i.e., numbers of medical services, mental health services, alcohol-related services, and drug-related services). Multivariate logistic regression was used to estimate the adjusted association of these factors with the fifth dependent variable: past-year attendance at 12-step groups for alcohol use. Prior to analysis, all continuous variables

were standardized to zero mean and unit variance. For the linear regression models, the coefficients reported for continuous correlates were fully standardized, and the coefficients reported for categorical correlates were y-standardized. For the logistic regression model, the coefficients presented give the expected change in the odds of 12-step group attendance for a one standard deviation increase in the evaluated correlate. Confidence interval estimates and tests of significance were based on the robust Huber-White variance estimates.³⁸

Results

Participant characteristics

Participants averaged 35.9 (SD=10.1) years of age; 10.7% were of Hispanic ethnicity, and 68.5% were White (Table 1). On average, participants reported having undergone 3.6 (SD=3.1) victimizing experiences in the past 90 days, most commonly having been insulted or sworn at (79%), pushed, grabbed, or shoved (51%), and threatened with being hit or having something thrown at them (51%). Most (89%) participants had health insurance. SF-12 summary scores yielded a mean of 46.6 (SD=11.4) for Physical Health, and 31.0 (SD=10.9) for Emotional Health. On average, participants met 7.5 (SD=2.4) alcohol use disorder criteria, and 53% reported use of at least one illicit drug (excluding marijuana) in the past 90 days, most commonly cocaine (41%), sedatives or benzodiazepines (39%), and non-prescribed opiates in the form of painkiller pills

Table 1
Background characteristics (*n* = 168)

Predisposing factors	<i>n</i> (%)	Mean (SD)	Median	Range
Age		35.9 (10.2)	34	17–68
Hispanic Ethnicity	18 (10.7)			
Race				
White	115 (68.5)			
Black	23 (13.7)			
Other	30 (17.9)			
Victimization		3.56 (3.1)	3	0–10
Enabling factor				
Has health insurance	149 (88.7)			
Need factors				
Physical health		46.6 (11.4)	49	22–70
Emotional health		31.0 (10.9)	31	10–61
Alcohol use Severity		7.5 (2.4)	8	3–11
Drug use	89 (53.0)			
Depression severity		18.2 (6.5)	19	2–30
PTSD severity		50.6 (19.7)	53	17–85
Use of				
Medical services		2.0 (3.1)	2.0	0–3
Mental health services		1.2 (1.0)	1.0	0–3
Alcohol services		1.4 (1.3)	1.0	0–4
Drug services		1.7 (1.7)	1.5	0–5
Attended AA	76 (45.2)			

(27%). The mean score on the CES-D-10 was 18.2 (SD=6.48), and the mean score on the PTSD Checklist was 50.6 (SD=19.7).

Regarding medical services, in the past 90 days, 62% had experienced at least one emergency medical visit, 22% at least one medical hospitalization, and 47% reported at least one outpatient medical visit (not tabled). Regarding mental health care, in the past 90 days, 18% had at least one psychiatric hospitalization, 42% had at least one mental health outpatient visit, and 55% had taken medications for mental health problems (not tabled). Additional descriptive statistics for services utilization measures are reported in Table 1.

Regarding alcohol services, in the past 90 days, 8% had been in a detoxification program at least once, and 5% had been in a residential alcohol treatment program at least once, whereas 17% had seen an outpatient counselor for alcohol problems at least once (not tabled). Regarding drug services, 4% had been in a drug detoxification program, and 5% had been in a residential drug treatment program, whereas 22% had seen an outpatient counselor for a drug problem in the past 90 days. Less than one-half (45.2%) had attended a 12-step meeting for alcohol use in the past year.

Predictors of treatment services utilization

As hypothesized, more use of medical services was significantly associated with older age ($\beta = 0.27$, 95% CI 0.14; 0.41, $p < .01$) and having health insurance ($\beta = 0.95$, 95% CI 0.54; 1.35, $p < .01$) (Table 2). Also as hypothesized, compared to white women, black women had significantly lower utilization of medical services ($\beta = -0.47$, 95% CI -0.89 ; -0.06 , $p < .05$), as did women with better physical health ($\beta = -0.16$, 95% CI -0.30 ; -0.02 ; $p < .05$). However, contrary to hypotheses, compared to women who did not use drugs, women who did use drugs had significantly lower use of medical services ($\beta = -0.54$, 95% CI -0.83 ; -0.26 , $p < .01$). As hypothesized, more use of mental health services was also associated with older age ($\beta = 0.20$, 95% CI 0.03; 0.36, $p < .05$), having health insurance ($\beta = 0.59$, 95% CI 0.14; 1.04, $p < .05$), being white rather than black ($\beta = -0.60$, 95% CI -1.10 ; -0.20 , $p < .01$), and having more severe symptoms of PTSD ($\beta = 0.22$, 95% CI 0.03; 0.42, $p < .05$).

As expected, more use of alcohol services was associated with older age ($\beta = 0.22$, 95% CI 0.07; 0.38, $p < .01$), having health insurance ($\beta = 0.70$, 95% CI 0.36; 1.03, $p < .01$), a more severe alcohol use disorder ($B = 0.20$, 95% CI 0.06; 0.33, $p < .01$), and using drugs ($\beta = 0.32$, 95% CI 0.01; 0.62, $p < .05$) (Table 2). Also as expected, more use of drug services was associated with using drugs ($\beta = 0.82$, 95% CI 0.52; 1.12, $p < .01$).

Adjusting for other covariates in the multivariate logistic regression model, the likelihood of having attended a 12-step group meeting for alcohol use was positively and significantly associated with age (OR = 1.98, 95% CI 1.36; 2.89, $p < .01$) and Hispanic ethnicity (OR = 0.07, 95% CI 0.01; 0.54, $p < .01$) (Table 2). Participants who reported drug use also had a significantly higher likelihood of attending 12-step group meetings for alcohol use (OR = 2.04, 95% CI 1.01; 4.13, $p < .05$).

Discussion

The jailed women with alcohol use disorders in this cohort reported considerable health services utilization. In just the 3 months prior to incarceration, almost two thirds had at least one emergency medical visit, about one-fifth had at least one medical and/or psychiatric hospitalization, and about one-fifth had seen an outpatient counselor for alcohol and/or drug problems. Using the Behavioral Model for Vulnerable Populations,¹⁴ this study found that predisposing factors (age, race, and ethnicity), the enabling factor of having health insurance, and need factors (poorer physical health, drug use, and greater alcohol and PTSD severity) significantly influenced treatment and mutual-

Table 2Adjusted associations of predisposing, enabling, and need factors with services and AA use ($n = 168$)

	Medical	Mental Health	Alcohol	Drug	Alcohol groups
	β^a (95% CI)	β^a (95% CI)	β^a (95% CI)	β^a (95% CI)	OR ^b (95% CI)
Age	0.27** (0.14; 0.41)	0.20* (0.03; 0.36)	0.22** (0.07; 0.38)	0.10 (-0.04; 0.25)	1.98** (1.36; 2.89)
Hispanic	0.11 (-0.28; 0.51)	0.22 (-0.27; 0.71)	-0.28 (-0.69; 0.13)	-0.40	0.07** (-0.84; 0.05) (0.01; 0.54)
Race					
Black	-0.47* (-0.89; -0.06)	-0.60** (-1.10; -0.20)	-0.16 (-0.60; 0.28)	-0.32 (-0.69; 0.06)	0.45 (0.15; 1.41)
Other	0.02 (-0.39; 0.43)	-0.10 (-0.53; 0.33)	-0.13 (-0.47; 0.21)	0.12 (-0.26; 0.50)	1.94 (0.67; 5.59)
White [REF]	[0.00]	[0.00]	[0.00]	[0.00]	[1.00]
Victimization	0.06 (-0.08; 0.21)	0.03 (-0.30; 0.19)	-0.05 (-0.20; 0.11)	-0.10 (-0.26; 0.07)	1.20 (0.81; 1.78)
Has health insurance	0.95** (0.54; 1.35)	0.59* (0.14; 1.04)	0.70** (0.36; 1.03)	0.05 (-0.38; 0.48)	3.00 (0.94; 9.59)
Physical health	-0.16* (-0.30; -0.02)	0.02 (-0.14; 0.18)	0.01 (-0.14; 0.17)	-0.08 (-0.23; 0.08)	1.16 (0.78; 1.73)
Emotional health	-0.01 (-0.17; 0.16)	0.07 (-0.01; 0.23)	-0.06 (-0.23; 0.11)	-0.11 (-0.27; 0.06)	0.90 (0.60; 1.36)
Alcohol severity	-0.01 (-0.15; 0.14)	0.04 (-0.10; 0.18)	0.20** (0.06; 0.33)	0.00 (-0.14; 0.14)	1.25 (0.89; 1.77)
Drug use	-0.54** (-0.83; -0.26)	-0.21 (-0.53; 0.10)	0.32* (0.01; 0.62)	0.82** (0.52; 1.12)	2.04* (1.01; 4.13)
Depression severity	0.14 (-0.05; 0.32)	0.05 (-0.14; 0.25)	0.13 (-0.93; 0.35)	-0.10 (-0.31; 0.10)	1.08 (0.68; 1.72)
PTSD severity	-0.09 (-0.25; 0.08)	0.22* (0.03; 0.42)	-0.05 (-0.20; 0.11)	0.13 (-0.07; 0.33)	1.02 (0.65; 1.60)

^aCoefficients are fully standardized for continuous covariates, and y-standardized for categorical covariates. Standard errors and tests of significance were based on robust variance estimators. ^bEffects on the expected odds were estimated by logistic regression with robust standard errors. All continuous covariates were standardized prior to estimation and give the expected factor change in the odds for a 1 standard deviation increase in the covariate. * $p < .05$; ** $p < .01$

help group utilization. This sample was similar to earlier studies of jailed women with alcohol problems in that they commonly experienced symptoms of severe depression and PTSD, and victimization.³⁹

In support of hypotheses, the study found that in contrast to younger black women without health insurance, older, white, and insured women utilized more medical and mental health care services. Moreover, older age was associated with more use of alcohol treatments and 12-step groups, and having health insurance was associated with more use of alcohol treatments. Consistently, in the general population, as adults age, they have a higher prevalence of physical health problems and medical conditions, which are exacerbated by alcohol consumption and necessitate the use of more outpatient and hospital-based services.⁴⁰⁻⁴² General US population studies have also found, as this study did for jailed women, that utilization of alcohol treatment services is lower among black than among white adults.⁴³ As they get older, prisoners have higher rates of major illnesses and psychological difficulties, and thus more treatment service needs, than younger prisoners and older persons in the community.⁴⁴ Like Colbert et al.¹⁰ who noted that incarcerated women view having health insurance as a critical need, this study found that the

majority of the sample was insured. Higher current rates of health insurance in the adult incarcerated population are explained by expanded access to Medicaid coverage since the Affordable Care Act (ACA). The ACA's Medicaid expansion and Marketplaces provided opportunities to increase coverage among adults involved in the criminal justice system.²³

Older age was positively associated with past-year 12-step alcohol meeting attendance. Other researchers have noted that the medical problems of middle-aged and older adults with alcohol use disorders constitute a main reason that they are referred by health care providers to the 12-step group of Alcoholics Anonymous (AA).⁴⁵ Indeed, one-half of older AA group members entered AA because of medical problems caused or made worse by alcohol, compared to almost none of young AA group members.⁴⁵ When older adults participate in AA, they have improved alcohol-related outcomes up to 10 and 20 years later,⁴⁶ although this has not been studied in incarcerated women specifically. Regarding the finding that participation in 12-step groups for alcohol use was more likely by Hispanic than non-Hispanic women, other studies of non-incarcerated populations have shown that when Hispanic adults participate in AA they show positive benefits from attendance.⁴⁷

This study additionally found, consistent with hypotheses, that more severe alcohol use was related to more use of alcohol treatment services, and that drug use was related to more use of both alcohol and drug treatment services.⁴⁸ Unexpected was the finding that drug use was associated with less use of medical services, despite recommendations that persons with relatively high drug use severity should receive not only specialty substance use and mental health care, but also ongoing medical care that addresses the consequences of drug use.⁴⁹ This finding is also unexpected in light of interviews with jailed women that revealed high rates of hepatitis C (HCV) and of HCV and HIV risk behaviors among those using drugs.⁵⁰⁻⁵¹ A lower overall quality of medical care has been found among patients with illicit drug use,⁵² which may discourage use of medical services, especially by those already receiving specialty substance use care. Suboptimal health care for persons using drugs may be explained by health professionals' negative attitudes toward these patients, as shown by a systematic review and surveys assessing stigma in this context.⁵³⁻⁵⁴

This study found that women using drugs in addition to alcohol were more likely to attend 12-step meetings for alcohol use. In this regard, a common concern across institutional and community treatment programs and providers is whether those who report using drugs should be given recommendations to attend AA meetings; AA meetings are more available than other 12-step groups that ostensibly may be a better fit with people's drug-related experiences. A study addressing this concern found AA referral for drug patients to have empirical support: drug patients who attended AA did as well as drug patients attending other mutual-help groups on outcomes of AA participation and abstinence from alcohol and drugs.⁵⁵ Thus, providers in the medical, mental health, and addiction treatment settings in which women with criminal justice involvement are seen should consider referring those using drugs to AA.

As found in previous studies,²⁷ this sample of women in jail had relatively severe substance use and mental health problems. Specifically, 77.3% of participants had severe alcohol use disorders, in that they had 6 or more symptoms.³² In addition, virtually the entire sample had used cannabis at least once in the previous 3 months, and 41% had used at least one other illicit substance. Regarding mental health symptoms, for this study's depression measure, the CES-D-10, cutoff scores of both 8 and 10 have been suggested for identifying potential depression in non-clinical samples,⁵⁶ but a cutoff score of 15 has been recommended for acutely symptomatic psychiatric samples.³⁵ In this sample, the percentage screening positive for depression was high using any of these cutoff scores (91%, 86%, and 70%, at 8, 10, and 15, respectively). On this study's measure of PTSD, the PCL, a cutoff score of 35 is recommended to diagnose PTSD for general population samples, 44 for specialized medical or primary care clinic patients, and 50 for specialty mental health clinic patients.⁵⁷ In this sample, the percentage screening positive for PTSD using scores of 35, 44, and 50 was 77%, 56%, and 54%, respectively, again indicating a high rate of this mental health disorder. Together with the high percentage taking psychiatric medications (55%), these

findings underscore the likelihood of co-occurring mental health disorders among jailed women with alcohol use disorders.

With regard to PTSD, this study found that having more severe symptoms was related to more use of mental health services. It is particularly important to treat PTSD among women involved in the criminal justice system because PTSD is associated with poor substance use outcomes and with re-victimization.⁵⁸⁻⁵⁹ Accordingly, studies provide evidence of the effectiveness of integrating trauma-informed treatment into women's addiction treatment, and support the importance of a continuing care model, in which treatment is available both during and after incarceration, for women offenders exposed to traumatic events.⁶⁰⁻⁶¹ Integrated and ongoing care in turn increases women's self-efficacy to develop healthier emotional and behavioral responses to adverse events and/or risky situations that they are likely to encounter in the community.⁶¹

This study also identified groups of justice-involved women with alcohol use disorders who may be in particular need of outreach to ensure they receive medical and mental health services, namely, black women, women without health insurance, and women who are using drugs such as cocaine, sedatives, benzodiazepines, and non-prescribed opiates in addition to alcohol. Regarding better outreach to black women, studies have identified mistrust of health care providers as a main barrier to African-American women's treatment-seeking, due to historical events (the Tuskegee Syphilis Study) promoting concern about being used for medical experimentation, experiences and expectations of racism and discrimination, dissatisfaction with prior care, and concerns about both privacy and stigma related to obtaining help for mental health problems.⁶²⁻⁶⁴ This study suggests that more active and targeted outreach of services to black women for medical and mental health care, in both the health care and criminal justice systems, may be critical to achieve better health outcomes.

A limitation of this study is that the sample was accrued in only one jail. However, this participating jail, located in the northeastern US, was similar to jails nationally in that it covered a geographic area similar in size, the majority of inmates were charged with misdemeanor offenses, and the median length of stay was less than 1 week.³⁰ Another limitation was that the measures, although previously well-validated, did not all refer to the same time frame. Finally, health service use measures were self-reported, and were not confirmed by claims data.

Implications for Behavioral Health

In this study, the Behavioral Model for Vulnerable Populations was demonstrated to be useful for predicting use of services among jailed women with alcohol use disorders. The findings provide important suggestions for improvement in the health of jailed women through understanding predisposing, enabling, and need factors that facilitate or inhibit use of health care. They suggest the need for structural-level interventions to connect women more efficiently and equitably to health services to increase the consistency and dependability of access and care. These incarcerated women may represent other at-risk populations that likely experience similar difficulties with regard to obtaining health care. This study provides information to inform practice and policy on how to better serve those in need to benefit women's recovery and public health.

In this study, women without medical insurance were less likely to receive medical, mental health, and alcohol-related services, and women with concurrent drug use were less likely to receive medical care. Thus, efforts are needed to ensure that at-risk women are enrolled in health insurance programs for which they are eligible, including Medicaid at entry to and exit from jail. In addition, substance use disorder treatment programs could actively screen clients for medical problems and refer them to medical services when indicated. To ensure outreach to all marginalized groups, training of health care providers in how to communicate well (e.g., be direct and empathetic), convey respect, and adopt a non-judgmental and non-stigmatizing stance will help build partnerships with patients to increase patients' trust and facilitate their receipt of needed

health care.⁶⁵ It may be useful to enhance provider skills that encourage patients to talk more about their health conditions, express opinions about their symptoms, and ask questions, and then offer clear answers.⁶⁵ It may be especially important to direct these communication improvement efforts to health care providers practicing in settings where continuity with patients is limited because the settings are often used by uninsured individuals.

Even though incarceration may be short-lived by many women in jail, extending access to the same types of pre-incarceration alcohol and drug treatments and 12-step meetings, as well as needed medical services, during the jail stay could be a step in the continuity of care that supports healthy reentry into the community. For example, 12-step volunteers correspond with inmates, and bring 12-step meetings to jails and prisons, and could help released inmates connect to 12-step meetings in the community. Future research should focus on designing and implementing effective practices to ensure continuity of medical, mental health, and addiction treatment services for substance-using women while they are involved in the criminal justice system, as they likely to have continuing health care needs as they return to the community.

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Compliance with Ethical Standards

Ethical Approval All procedures were reviewed and approved by the Institutional Review Board of Butler Hospital.

Conflict of Interest The authors declare that they have no conflicts of interest.

References

1. Swavola E, Riley K, Subramanian R. *Overlooked: Women and Jails in an Era of Reform*, New York: Vera Institute of Justice, 2016.
2. Carson EA. *Prisoners in 2014*. Washington DC: Bureau of Justice Statistics, 2015.
3. Minton TD, Zeng Z. *Jail Inmates in 2015*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, 2016.
4. Braithwaite RL, Treadwell HM., Arriola KJ. Health Disparities and Incarcerated Women: A Population Ignored. *American Journal of Public Health* 2005;95:1679–1681.
5. Moloney KP, van den Bergh BJ, Moller LF. Women in Prison: The Central Issues of Gender Characteristics and Trauma History. *Public Health*. 2009;123(6):426–430.
6. Lafortune D. Prevalence and Screening of Mental Disorders in Short-term Correctional Facilities. *International Journal of Law Psychiatry*. 2010;33(2):94–100.
7. Bronson J, Stroop J. *Drug Use, Dependence, and Abuse among State Prisoners and Jail Inmates, 2007–2009*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, 2017.
8. Maruschak LM, Berzofsky M, Unangst J. *Medical Problems of State and Federal Prisoners and Jail Inmates, 2011–12*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, 2016.
9. Travis J, Western B, Redburn S. *The Growth of Incarceration in the United States: Exploring Causes and Consequences*. Washington DC: The National Academies Press, 2014.

10. Colbert AM, Skula LK, Zoucha R, et al. Health Care Needs of Women Immediately Post-Incarceration: A Mixed Methods Study. *Public Health Nursing*. 2013;30(5):409–19.
11. Sarteschi CM, Vaughn MG. Double Jeopardy: A Review of Women Offenders' Mental Health and Substance Abuse Characteristics. *Victims and Offenders*. 2010;5(2):161–182.
12. Conklin, TJ, Lincoln T., Tuthill RW. Self-reported Health and Prior Health Behaviors of Newly Admitted Correctional Inmates. *American Journal of Public Health*. 2000;90:1939–1941.
13. Laroche F, Castro C, Goldenson J, et al. Contraceptive Use and Barriers to Access among Newly Arrested Women. *Journal of Correctional Health Care*. 2012;18(2):111–119.
14. Gelberg L, Andersen RM, Leake BS. The Behavioral Model for Vulnerable Populations: Application to Medical Care Use and Outcomes for Homeless People. *Health Services Research*. 2000;34(6):1273–1302.
15. Stein JA, Andersen R, Gelberg L. Applying the Gelberg-Andersen Behavioral Model for Vulnerable Populations to Health Services Utilization in Homeless Women. *Journal of Health Psychology*. 2007;12:791–804.
16. Varga LM, Surratt HL. Predicting Health Care Utilization in Marginalized Populations: Black, Female, Street-based Sex Workers. *Women's Health Issues*. 2014;24:e335–e343.
17. An S, Choi YJ. A Review and Assessment of Intimate Partner Violence Interventions and Trainings for Service Providers and Frontline Staff. *Violence and Victims*. 2017;32(3):379–404.
18. Freedman VA, Spillman BC. Disability and Care Needs among Older Americans. *The Milbank Quarterly*. 2014;92(3):509–541.
19. Aday R, Farney L. Maligned Neglect: Assessing Older Women's Health Care Experiences in Prison. *Journal of Bioethical Inquiry*. 2014;11(3):359–372.
20. Wheeler SM, Bryant AS. Racial and Ethnic Disparities in Health and Health Care. *Obstetrics and Gynecology Clinics*. 2017;44(1):1–11.
21. Brown Speights JS, Nowakowski ACH, De Leon J, et al. Engaging African American Women in Research: An Approach to Eliminate Health Disparities in the African American Community. *Family Practice*. 2017;34(3):322–329.
22. Sommers BD, Gawande AA, Baicker K. Health Insurance Coverage and Health: What the Recent Evidence Tells Us. *The New England Journal of Medicine*. 2017;377:586–593.
23. Gates A, Artiga S, Rudowitz R. Health Coverage and Care for the Adult Criminal Justice-Involved Population. Menlo Park: The Henry J. Kaiser Family Foundation, 2014.
24. Wang EA, White MC, Jamison R, et al. Discharge Planning and Continuity of Health Care: Findings from the San Francisco County Jail. *American Journal of Public Health*. 2008;98(12):2182–2184.
25. Gallup News Healthcare. U.S. Uninsured Rate Rises to 11.7%. Gallup. Available online at <http://news.gallup.com/poll/213665/uninsured-rate-rises.aspx>. Accessed on July 10, 2017.
26. Staton M, Leukefeld C, Webster JM. Substance Use, Health, and Mental Health: Problems and Service Utilization among Incarcerated Women. *International Journal of Offender Therapy and Comparative Criminology*. 2003;47(2):224–239.
27. Notwotny KM, Belknap J, Lynch S, et al. Risk Profile and Treatment Needs of Women in Jail with Co-occurring Serious Mental Illness and Substance Use Disorders. *Women & Health*. 2014;54(8):781–795.
28. Newman B. Jail and Prison Inmates' Healthcare Issues Vary by Type of Facility. Bellevue: Ultra Risk Advisors, 2013.
29. Harrison PM, Beck AJ. Prisoners in 2005. Washington DC: Bureau of Justice Statistics, 2006.
30. Johnson JE, Schonbrun YC, Anderson B, et al. Study Protocol: Community Links to Establish Alcohol Recovery (CLEAR) for Women Leaving Jail. *Contemporary Clinical Trials*. 2017;55:39–46.
31. First M, Williams JBW, Karg RS, Spitzer RL. Structured Clinical Interview for DSM-5. Arlington: American Psychiatric Association, 2015.
32. Straus MA, Hamby SL, Boney-McCoy S, et al. The Revised Conflict Tactics Scales (CTS2). *Journal of Family Issues*. 1996;17:283–316.
33. Ware J, Kosinski M, Keller SD. A 12-item Short-form Health Survey: Construction of Scales and Preliminary Tests of Reliability and Validity. *Medical Care*. 1996;34(3):22–233.
34. Björgvinsson T, Kertz SJ, Bigda-Peyton JS, et al. Psychometric Properties of the CES-D-10 in a Psychiatric Sample. *Assessment*. 2013;20:429–436.
35. Harrington T, Newman E. The Psychometric Utility of Two Self-report Measures of PTSD among Women Substance Users. *Addictive Behaviors*. 2007;32:2788–2798.
36. McLellan AT, Alterman AI, Cacciola J, et al. A New Measure of Substance Abuse Treatment. *The Journal of Nervous and Mental Disease*. 1992;180(2):101–110.
37. Flores JA, Pillico LH. A Meta-synthesis of Women's Postincarceration Experiences. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*. 2011;40(4):486–496.
38. Muthén BO, Muthén LK, Asparouhov T. Regression and Mediation Analysis Using Mplus. Los Angeles: Muthén & Muthén, 2017.
39. Stein MD, Anderson BJ, Caviness, CM, et al. Relationship of Alcohol Use and Sexual Risk Taking among Hazardously Drinking Incarcerated Women: An Event-level Analysis. *Journal of Studies on Alcohol and Drugs*. 2009;70(4):508–515.
40. Cherry DK, Woodwell DA, Rechtsteiner EA. National Ambulatory Medical Care Survey: 2005 Summary. *Advance Data*. 2007;387:1–39.
41. Kessler RC, Birmbaum HG, Shahly V, et al. Age Differences in the Prevalence and Comorbidity of DSM-IV Major Depressive Episodes: Results from the WHO World Mental Health Survey Initiative. *Depression and Anxiety*. 2010;27:351–364.
42. Mukamal KJ, Chung H, Jenny NS, et al. Alcohol Use and Risk of Ischemic Stroke among Older Adults: The Cardiovascular Health Study. *Stroke*. 2005;36:1830–1034.
43. Zemore SE, Murphy RD, Mulia N, et al. A Moderating Role for Gender in Racial/Ethnic Disparities in Alcohol Services Utilization: Results from the 2000 to 2010 National Alcohol Surveys. *Alcoholism: Clinical and Experimental Research*. 2014;38(3):2286–2296.
44. Fazel S, Baillargeon J. The Health of Prisoners. *The Lancet*. 2011;377:956–965.
45. Cumella EJ, Scott CB. In the Experience of AA, a Member's Age Matters. *Addiction Professional*. 2014;31:1–3.
46. Moos RH, Schutte KK, Brennan PL, et al. Late-life and Life History Predictors of Older Adults of High-risk Alcohol Consumption and Drinking Problems. *Drug and Alcohol Dependence*. 2010;108(1–2):13–20.

47. Tonigan JS, Miller WR, Juarez P, et al. Utilization of AA by Hispanic and non-Hispanic White Clients Receiving Outpatient Alcohol Treatment. *Journal of Studies on Alcohol*. 2002;63(2):215–218.
48. Cucciare MA, Coleman E, Timko C. A Conceptual Model to Facilitate Transitions from Primary Care to Specialty Substance Use Disorder Care. *Primary Care Health Research & Development*. 2015;16(5):492–505.
49. Krupski A, West II, Graves MC, et al. Clinical Needs of Patients with Problem Drug Use. *Journal of the American Board of Family Medicine*. 2015;28(5):605–616.
50. Pateet B, Staton M, Miller-Roenigk B, et al. Rural Incarcerated Women: HIV/HCV Knowledge and Correlates of Risky Behavior. *Health Education & Behavior*. 2018.
51. Staton-Tindall M, Webster JM, Oser CB, et al. Drug Use, Hepatitis C, and Service Availability: Perspectives of Incarcerated Rural Women. *Social Work in Public Health*. 2015;30:385–396.
52. Kortuis PT, Fiellin DA, McGinnis KA, et al. Unhealthy Alcohol and Illicit Drug Use are Associated with Decreased Quality of HIV Care. *Journal of Acquired Immune Deficiency Syndromes*. 2012;61(2):171–178.
53. van Boekel LC, Brouwers EP, van Weeghel J, et al. Stigma among Health Professionals towards Patients with Substance Use Disorders and its Consequences for Healthcare Delivery: Systematic Review. *Drug and Alcohol Dependence*. 2013;131(1–2):23–35.
54. van Boekel LC, Brouwers EP, van Weeghel J, et al. Comparing Stigmatizing Attitudes towards People with Substance Use Disorders between the General Public, GPs, Mental Health and Addiction Specialists and Clients. *International Journal of Social Psychiatry*. 2015;61(6):539–49.
55. Kelly JF, Greene ME, Bergman BG. Do Drug-dependent Patients Attending Alcoholics Anonymous Rather than Narcotics Anonymous Do As Well? A Prospective, Lagged, Matching Analysis. *Alcohol and Alcoholism*. 2014;49(6):645–653.
56. Andresen EM, Malmgren JA, Carter WB, et al. Screening for Depression in Well Older Adults. *American Journal of Preventive Medicine*. 1994;10(2):77–84.
57. National Center for PTSD. Using the PTSD Checklist. Boston: Department of Veterans Affairs, National Center for PTSD, Behavioral Sciences Division, 2012.
58. Cusack KJ, Herring AH, Steadman HJ. PTSD as a Mediator between Lifetime Sexual Abuse and Substance Use among Jail Diversion Participants. *Psychiatric Services*. 2013;64(8):776–781.
59. Risser HJ, Hetzel-Riggen MD, Thomsen CJ, et al. PTSD as a Mediator of Sexual Revictimization: The Role of Reexperiencing, Avoidance, and Arousal Symptoms. *Journal of Traumatic Stress*. 2006;19(5):687–698.
60. Grella C, Rodriguez L. Motivation for Treatment among Women Offenders in Prison-based Treatment and Longitudinal Outcomes among Those Who Participate in Community Aftercare. *Journal of Psychoactive Drugs*. 2011;43(sup1):58–67.
61. Saxena P, Grella CE, & Messina NP. Continuing Care and Trauma in Women Offenders' Substance Use, Psychiatric Status, and Self-efficacy Outcomes. *Women & Criminal Justice*. 2015;26(2):99–121.
62. Jacobs EA, Rolle I, Ferrans CE, et al. Understanding African Americans' views of the trustworthiness of physicians. *Journal of General Internal Medicine*. 2006;21(6): 642–647.
63. Jacobs EA, Mendenhall E, Mclearney AS, et al. An Exploratory Study of How Trust in Health Care Institutions Varies across African American, Hispanic and White Populations. *Communication and Medicine*. 2011;8(1):89–98.
64. Cuffee YL, Hargraves JL, Rosal M, et al. Reported Racial Discrimination, Trust in Physicians, and Medication Adherence among Inner-city African Americans with Hypertension. *American Journal of Public Health*. 2013;103(11):e55–e62.
65. Halbert C, Armstrong K, Gandy OH, et al. Racial Differences in Trust and in Health Care Providers. *Archives of Internal Medicine*. 2006;166(8):896–901.