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Trends and Mental Health Correlates of Nonmedical Opioid Use Among Criminal Justice-Involved African American Men

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Abstract

Background—The Centers for Disease Control and Prevention has deemed nonmedical opioid use (NMOU) an epidemic. Population-based survey data indicate high rates of NMOU among Caucasians, however, these estimates exclude incarcerated samples and may underestimate use among criminal justice-involved African Americans. Despite opioid-associated risks of co-occurring mental illness and mortality, to our knowledge, this is the first study to examine NMOU and mental health among a sample of African American men receiving corrections-based substance use disorder (SUD) treatment in jail, prison, or the community.

Method—We conducted a cross-sectional study examining trends and mental health correlates of NMOU during the year prior to each participant's incarceration, across five cohorts of African American men ($N = 4,021$) enrolled in corrections-based SUD treatment between the years, 2010 and 2014. A series of chi-square, ANOVAs, correlations, and logistic regression models were conducted.

Results—Over 20% of our sample reported NMOU during the year prior to incarceration. On average, participants were 36-years-old, earned 13 years of education, and were generally unemployed, prior to incarceration. We found a statistically significant positive linear trend between NMOU prior to incarceration and cohort year. The final stepwise multivariate regression model was significant and revealed, older age was associated with lower odds of NMOU. More years of education and frequent mental health symptoms were associated with significantly increased odds of NMOU.

Discussion—Our findings are unique in that extant literature has primarily described NMOU as a 'White suburban' problem. Culturally-adapted behavioral interventions and medication assisted therapies are discussed.

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Keywords

Nonmedical opioid use; African Americans; criminal justice; mental health

1.0 Introduction

The Centers for Disease Control and Prevention has deemed nonmedical prescription drug use an epidemic in the United States (CDC, 2017a). Nonmedical opioid use (NMOU), operationally defined as ingesting medications not prescribed to the user or using opioids for non-medicinal purposes (Hughes et al., 2016), is especially high with an estimated 12.5 million Americans reporting consumption of prescription opioids or heroin, in the past year (Substance Abuse and Mental Health Services [SAMHSA], 2017). Rates of nonmedical prescription opioid use among African Americans and Caucasians are similar, 3.9% vs. 4.5%, respectively (SAMHSA, 2017). Further, African Americans are disproportionately over-represented among the incarcerated (Carson & Anderson, 2016), historically have higher rates of substance use (SAMHSA, 2016), greater risk of co-occurring mental illness (SAMHSA, 2017) compared to national averages, and are likely to return to urban communities with high accessibility to prescription opioids and heroin, through illegal drug trade sources (Draus et al., 2012; Drug Enforcement Agency [DEA], 2013). Despite the potential for accidental overdose and mortality (CDC, 2017a; O'Donnell et al., 2017), studies have rarely examined NMOU at the intersection of race and criminal justice status, and have primarily focused on community-based Caucasians (Cicero et al., 2014; Marsh et al., 2018). Collectively, these findings suggest criminal justice-involved African Americans have significant risk factors for NMOU that are not well-captured in extant literature. This study addresses a significant research gap by examining trends and mental health correlates of NMOU among criminal justice-involved African American men, using the availability-proneness theory of opioid addiction (Smart, 1980) as a guiding framework. Specifically, we investigated statistical trends in NMOU in the year prior to incarceration and the relationship between mental health symptoms and NMOU prior to incarceration. Findings from this study may be used to inform culturally-sensitive prevention efforts and interventions for this subgroup.

1.1 Availability-Proneness Theory of Addiction

The availability-proneness theory posits opioid use occurs within a psychosocial context and has implications for criminal justice involvement (Smart, 1980). The first component is availability, which is defined by the social context in which NMOU is accessible (Smart, 1980). The second component is proneness, operationalized as individual or psychosocial risk factors that increase likelihood of psychological symptoms and consequential opioid use and criminal behavior (Smart, 1980). The availability-proneness theory (Smart, 1980) suggests African Americans with greater psychosocial risk factors may be more likely to experience psychological distress, subsequent opioid use, and criminal justice-involvement. Though extant research using the theory is limited, a structural equation model indicated the availability and proneness constructs, indirectly and directly, significantly predicted nonmedical prescription opioid use among other marginalized groups (Rigg & DeCamp, 2014). Collectively, these findings suggest the availability-proneness theory of addiction is a

suitable paradigm for examining NMOU among criminal justice-involved African American men, and will be used as a premise for the current study.

1.1.1 Availability and trends in NMOU—The first component of the availability-proneness theory focuses on the convenience of obtaining opioids (Smart, 1980). Recent literature suggests prescription opioids (DEA, 2013) and heroin (Draus et al., 2012) are particularly easy to acquire in African American communities. Similarly, population-based surveys have revealed a steady increase in NMOU among Americans age 12 and older since 2010 (Center for Behavioral Health Statistics and Quality [CBHSQ], 2015; SAMHSA, 2017). However, the National Survey on Drug Use and Health reports (CBHSQ, 2015; SAMHSA, 2017) rely on community-based samples and do not include incarcerated individuals. Given African American males' significant likelihood of being involved in the criminal justice system (Carson & Anderson, 2016), and limited opportunity to participate in population-based surveys, it is likely that national statistics underestimate NMOU among this subgroup, which have historically been disproportionately impacted by substance use and related psychosocial risk factors (e.g. socioeconomic disadvantage and mental health concerns) (Executive Office of the President of the United States, 2016; SAMHSA, 2017).

1.1.2 Proneness to use: sociodemographic correlates of NMOU—Aggregate population data suggest a proneness to engage in NMOU is embedded in a sociodemographic context related to age, education, and employment status, though these findings are mixed. Specifically, national estimates have revealed among African Americans, those under age 25 have the highest rates of nonmedical prescription opioid use (SAMHSA, 2017). National findings have been replicated by cross-sectional studies and have found younger age, college attendance, and unemployment are significantly associated with higher rates of NMOU among convenience samples of African Americans (Agnich et al., 2013). Conversely, others have found older age (Broz & Ouellet, 2010; Liebschutz et al., 2010), having less than a high school education (Broz & Ouellet, 2010), lack of employment (Green et al., 2010), and criminal justice-involvement (Broz & Oullet, 2010; Liebschutz et al., 2010) are significantly related to higher rates of NMOU among community-based samples of African Americans. Notably, African American men attending college versus those with criminal justice histories are exposed to different psychosocial contexts, which may account for the mixed findings. The inconsistent results also suggest studies using exclusive samples of African Americans are needed to adequately capture the risk of NMOU at the nexus of sociodemographics and criminal justice status. Yet, the dearth of literature examining NMOU among criminal justice-involved African Americans offers minimal data for resolving these discrepancies. Consequently, the psychosocial context in which NMOU among criminal justice-involved African Americans remains unclear.

1.2 Mental health and NMOU

Examining historical data offers some direction in clarifying current gaps in the literature. The psychosocial context in which substance use exists has been linked to mental illness among criminal justice-involved African Americans (Calcaterra et al., 2014; Western et al., 2015). More specific to NMOU, cross-sectional studies (Davis et al., 2017), meta-analyses (Fischer et al., 2012), secondary analyses of population-based surveys (Ashrafioun et al.,

2017), and longitudinal analysis (Martins et al., 2012) have revealed individuals who engage in NMOU are significantly more likely to have mental health problems. Others have posited NMOU is motivated by the desire to attenuate psychological distress (Martins et al., 2009; Martins et al., 2012). Though extant research illustrates a convincing relationship between mental health concerns and NMOU among community-based individuals, little is known about how this association potentially manifests among criminal justice-involved African Americans. Given the associated increased risk of suicide (Ashrafioun et al., 2017), accidental overdose (O'Donnell et al., 2017; Yarborough et al., 2016), future research with this subgroup is vital to promoting public health.

The current study is novel because it quantitatively examines NMOU and mental health among a large, exclusive sample of African American men in the criminal justice system. African American men returning to the community from prison may be particularly at risk given their increased likelihood of: a) accessibility of prescription opioids and heroin in their respective communities (DEA, 2013; Draus et al., 2012); b) socioeconomic disenfranchisement (e.g. convicted felon, Black race, low income) (Wildeman & Wang, 2017), associated psychological distress (Martins et al., 2012; Spaulding et al., 2009); and c) possible proneness to use opioids to cope (Rigg & DeCamp, 2014; Smart, 1980). The present study aims to: 1) examine trends in NMOU; and 2) identify sociodemographic and mental health correlates of NMOU among African American men in corrections-based drug treatment. We hypothesized there would be a significant positive linear trend in NMOU by cohort year. We also hypothesized sociodemographic and mental health factors would significantly correlate with NMOU among a sample of African American men in corrections-based substance use disorder (SUD) treatment.

2.0 Method

Secondary data for this study was analyzed across five cohorts of treatment-seeking adults participating in the Criminal Justice Kentucky Treatment Outcome Study between 2010 and 2014 (CJKTOS; see Staton-Tindall et al., 2009; Staton-Tindall et al., 2011, for additional detail). The parent study investigated substance use-related outcomes among participants enrolled in corrections-based SUD treatment in prison, jail, or in the community. Participants who enrolled in SUD treatment between 2010 and 2014, were asked to complete an intake assessment upon treatment entry. Data were derived from intake assessments completed across the five cohorts. All data were obtained using a secured web-based program at treatment entry. The study was approved by the Medical Institutional Review Board and the Department of Corrections.

2.1 Study participants

Between 2010 and 2014, 22,336 individuals entered and completed a treatment intake assessment in a Kentucky corrections or community corrections-based treatment facility. Participants who self-identified as male and African American were selected for the current study (N = 4,021). The sample size varied across annual cohorts, from 2010 (n = 323), 2011 (n = 952), 2012 (n = 1,109), 2013 (n = 1,132), to 2014 (n = 505). All participants were under

correctional supervision (i.e. in prison or jail, parole, or probation) at the time of data collection.

2.2 Dependent variable

The primary (binary) outcome was whether the participant had engaged in NMOU during the prior year. Participants were asked, “In the 12 months prior to this incarceration have you used… [opioids] not prescribed for you?” Similarly, participants were asked, “In the 12 months prior to this incarceration have you used heroin?” Respondents were prompted to respond “yes” or “no” for each substance. An affirmative response to either question resulted in a code of “1” or “yes”, whereas denial was coded, “0” for “no,” to create the dependent variable, NMOU during the year prior to incarceration. These items were derived from the Addiction Severity Index, Fifth Edition (ASI-5; McClellan et al., 1992).

2.3 Trends in NMOU

To examine trends in NMOU by cohort, the year in which the participant completed the baseline interview was used as the primary independent variable. Specifically, baseline data collected from years 2010, 2011, 2012, 2013, and 2014 were used to examine time (year) related trends in nonmedical opioid use. Date of intake interview was transformed into year and dummy-coded resulting in cohort year, whereas *2010* = 0, *2011* = 1, *2012* = 2, *2013* = 3, and *2014* = 4.

2.4 Covariates

Cohort year, age, years of education, and employment status prior to incarceration, were entered as control variables in the regression analysis examining correlates of NMOU in the year prior to incarceration. Cohort year was dummy-coded as aforementioned and 2010 was used as the reference category. Participants were asked how old they were to assess age and how many years of education they earned, with 12 years of education being a high school diploma or its equivalent. Employment was dummy coded to assess differences across status, from 0 = *unemployed*, 1 = *full-time*, 2 = *part-tim*e, and 3 = *occasional/seasonal*, to 1 = *unemployed* (reference category), 2 = *full-time*, and 3 = *part-time or seasonal* work.

2.5 Independent variable

Mental health symptoms were the primary independent variable and assessed using the 15-item Stress Related Health Consequences Scale (Logan & Walker, 2010). Sample items include, “In the 7 days prior to this incarceration, how often did you experience… [feeling stressed out]; [experienced anxiety]; or [used prescription drugs to reduce stress, anxiety, worry, or fear]?” The responses were rated on a 6-point Likert scale and ranged from 0 = *none of the time*, to 5 = *all of the time*. Higher scores indicated more frequent occurrence of mental health symptoms. The scale statistics revealed good reliability (M = 20.59, SD = 16.08, α = 0.89).

2.6 Statistical analyses

A series of descriptive, bivariate, and multivariate analyses were conducted. Chi-square tests and one-way ANOVAs were conducted to examine cohort differences. Point-biserial

coefficients were used to examine the association between categorical and continuous variables. Phi-coefficients were used to determine the relationships between categorical variables. To examine trends, a fitted logistic regression model was run to analyze cohort year (independent variable) stratified time trends with NMOU during the year prior to incarceration, as the dependent variable. To examine psychosocial correlates of NMOU, a stepwise logistic regression analysis was conducted with covariates entered in step one and mental health symptom frequency added in step two. Missing data were accounted for using list-wise deletion for final $N = 4{,}021$. All analyses were conducted using STATA 12 (StataCorp., 2011).

3.0 Results

3.1 Descriptives

Descriptive statistics for sociodemographic variables are outlined in Table 1. On average, participants were 36-years-old, and had 13.25 years of education. Most of the sample was unemployed prior to incarceration (41.7%). Participants reported a mean of 20.59 mental health symptoms (range: 0.00 – 75.00), with higher scores indicating more frequent psychological distress.

3.1.1 Cohort differences: descriptives—Chi-square analyses did not reveal significant cohort differences in NMOU. The one-way ANOVA revealed, on average, each successive cohort was younger, $F(4, 4016) = 10.43$, $p < .001$. There were no significant cohort differences related to years of education or employment status prior to incarceration.

3.2 Trends in NMOU

Across cohorts, 20.5% ($N = 823$) of participants reported NMOU during the year prior to incarceration (see Figure 1 for use by year). The fitted logistic regression model revealed a significant trend in NMOU by cohort year, *(Log Likelihood* = −2035. 29, $p = .02$). The quadratic and cubic models were not significant. The final model revealed a positive linear relationship between cohort year and NMOU ($OR = 1.08$, 95% C.I. 1.00, 1.15, $p = .02$). Specifically, every one-year increase in cohort was associated with 8% increased odds of NMOU prior toincarceration.

3.3 Correlates of NMOU

To examine bivariate associations, correlation coefficients for NMOU during the year prior to incarceration, are displayed in Table 2. The results indicated several of the hypothesized associations were significant. NMOU was negatively correlated with age ($r = -.10$, $p < .001$), and positively correlated with years of education ($r = .05$, $p < .01$) and mental health symptoms ($r = .20$, $p < .001$). Cohort year and employment status were not significantly correlated with NMOU at the bivariate level; but included in the multivariate analysis as dummy-coded variables to compare differences.

3.4 Multivariate regression analyses

The stepwise logistic regression model (Table 3) was significant (*Log Likelihood* = 3832.13, $p < .001$) and correctly classified 79.6% of cases of NMOU during the year prior to

incarceration. In step one, African American men in the 2011, 2012, 2013, or 2014 cohorts did not have significant odds of nonmedical opioid use, compared to participants in the 2010 cohort. For every one-year increase in age, participants had 3% lower odds of NMOU (*OR* = 0.97, 95% C.I: 0.96, 0.98, $p < .001$). For every one-year increase in education, participants were 6% more likely to report NMOU (*OR* = 1.06, 95% C.I: 1.01, 1.10, $p < .05$). Part-time and full-time employment, compared to unemployment, were not significantly associated with NMOU. In step two, the association between age (*OR* = 0.96, 95% C.I: 0.95, 0.97, $p < .001$), education (*OR* = 1.05, 95% C.I: 1.01, 1.10, $p < .01$), and NMOU remained significant. For every one-year increase in age, men were 3% less likely to report NMOU. Every one-year increase in education was associated with 5% increased likelihood of NMOU. Finally, for every one-unit increase in mental health symptom frequency, participants were 3% more likely to report NMOU, compared to participants with less frequent psychological concerns (*OR* = 1.03, 95% C.I: 1.02, 1.03, $p < .001$). That is, individuals who reported having mental health symptoms more often, were significantly more likely to report NMOU, compared to individuals who experienced related concerns, less frequently.

4.0 Discussion

To our knowledge, the current study is the first known investigation of NMOU among criminal justice-involved African American males. The availability-proneness theory of addiction (Smart, 1980) was used as the guiding framework to discuss sociodemographic and mental health correlates associated with NMOU. Rates of NMOU were 20.5% among our sample. Our estimates are higher than national rates among community based-samples illustrating 4.4% of Americans age 12 or older reported NMOU in 2016 (SAMHSA, 2017). Results of this study have implications for addressing the current opioid epidemic (CDC, 2017a) and developing culturally-relevant treatment interventions.

Our first hypothesis was confirmed. Specifically, significant positive linear trends were observed in NMOU across five cohorts of African American men in corrections-based SUD treatment. This result is unique in that extant research has found NMOU is most prevalent among community-based Caucasian samples (Cicero et al., 2014). This finding also suggests African American men involved in the criminal justice system may encounter unique sociodemographic and psychosocial risk factors, which are not being captured in extant literature, conceptualizing NMOU as a ‘White problem’ in suburban (Cicero et al., 2014) and rural areas (Love et al., 2016). Consistent with the availability-proneness theory (Smart, 1980), these psychosocial risk factors may include: re-entry stress (Baron et al., 2013; Lee et al., 2017), mental illness (Broz & Oullet, 2010), homelessness (Nyamathi et al., 2014), and poverty (Bright, 2012). In the absence of adequate resources, these psychosocial stressors may persist and increase their proneness to engage in substance use, criminal behavior (Mahaffey et al., 2017), and consequently, involved in the criminal justice system; resulting in a potentially cyclical pattern of substance use (Baillargeon et al., 2009).

In fact, part of our second hypothesis tested the relationship between psychological distress and NMOU and revealed a higher number of mental health symptoms was associated with significant increased likelihood of NMOU. African American males’ psychosocial risk combined with the high accessibility of opioids in urban communities (Draus et al., 2012) is

concerning and has implications for increased risk of accidental overdose (CDC, 2017a), suicidality (Ashrafioun et al., 2017), contraction of HIV, Hepatitis C (CDC, 2017b; Spaulding et al., 2009), and significant public health costs (Birnbaum et al., 2011).

The second hypothesis related to education was also confirmed and found, men with more years of education, had increased odds of NMOU. This finding is commensurate with a previous study that indicated high school aged African Americans had significantly greater odds of NMOU, compared to older cohorts (Miech et al., 2013). The association between years of education and NMOU may be further explained or mediated by greater access to opioids among same age peers and social norms that reinforce NMOU (Agnich et al., 2013; Peters et al., 2007). Collectively these findings suggest age and years of education may be helpful descriptives to capture the social and cultural context, in which NMOU exists among criminal justice-involved African American males. These findings also have implications for assessing the chronicity of NMOU and need for treatment (Trenz et al., 2012).

The findings revealed African American men involved in the criminal justice system have high rates of NMOU and culturally specific treatment considerations are warranted. Previous studies have noted the utility of Faith-Based Health Promotion interventions in assessing chronic health conditions among underserved (Tagai et al., 2017), African American congregations (Hankerson et al., 2015). Churches collaborating with community health organizations could host health education/prevention seminars, and serve as ‘drop points’ for old prescriptions. Support from the church to utilize treatment may also counteract perceived or internalized stigma, commonly reported by African American men, related to both opioid use (Olsen & Sharfstein, 2014) and healthcare utilization (Pingel & Bauermeister, 2018).

Once in treatment, providers are encouraged to address perceived culturally specific values and barriers to maintaining sobriety. This may include incorporating religion and spirituality, family therapy, case management, collaboration with probation and parole, and vocational training. Cognitive behavioral therapy (Kumari et al., 2016; Moore et al., 2016) and contingency management (Ling et al., 2013) have previously shown effectiveness with community-based samples and may have potential – if culturally adapted to address the specific substance use and mental health needs of criminal justice-involved African American men. Finally, while medication-based interventions have shown some efficacy (Carroll & Weiss, 2017) and effectiveness (Damian et al., 2017), compared to Whites, African Americans are disproportionately underrepresented in pharmacotherapy studies (Hansen et al., 2016; Mitchell et al., 2016). More research is needed to assess the acute and long-term effectiveness of buprenorphine, methadone, and potential barriers in accessing related treatments among African American men re-entering the community from prison.

4.1 Limitations

Our study addresses a significant gap in the current literature but has some limitations. First, the current study targeted African American males involved in corrections-based SUD treatment and the findings may not generalize to community-based samples of different races or genders. Second, the study was a cross-sectional secondary data analysis. Consequently, predictability could not be assessed, nor some correlates, for example, length of incarceration, and whether participants were repeat offenders across cohorts. Third,

participants were queried about NMOU in the year prior to incarceration and subject to memory recall bias. Finally, NMOU in the year prior to incarceration was self-reported and not substantiated by drug testing.

4.2 Conclusion

Our findings lend support to explaining rising trends in NMOU among criminal justice-involved African American men that extends current literature specific to race and criminal justice status. Studies examining the effectiveness of culturally-adapted preventions and interventions and medication assisted therapies are warranted. Interventions that simultaneously attend to re-entry barriers and mental health may be most effective. Successful implementation of related interventions could have public health implications in a of related interventions could have public health implications in addressing the high mortality (CDC, 2017a), and growing health costs (Kisron et al., 2017) associated with nonmedical opioid use.

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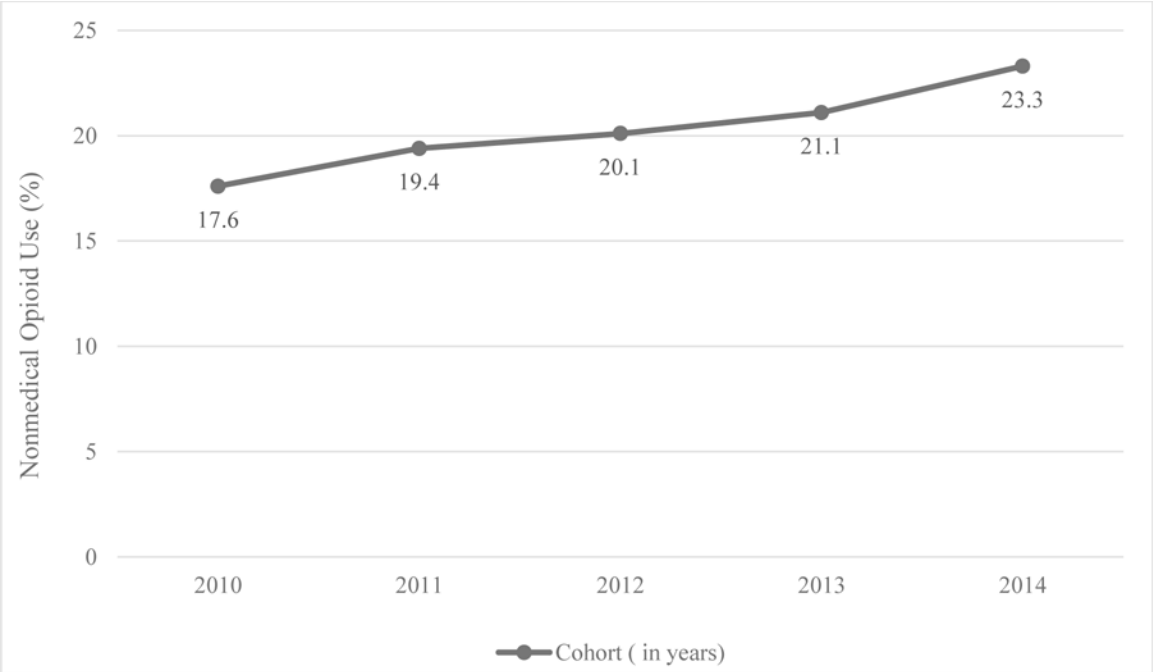

Figure 1.0.
Trends in Nonmedical Opioid Use among African American Men in Corrections-Based SUD Treatment (*N* = 4,021)

Table 1.0

Descriptive Characteristics. African American Men in Corrections-Based SUD Treatment (*N* = 4,021)

				***N* (%)**	
Dependent Variables					
Nonmedical Opioid Use				823 (20.5)	
Independent Variables				N (%)	
Cohorts					
2010				323 (8.0)	
2011				952 (23.7)	
2012				1,109 (27.6)	
2013				1,132 (28.2)	
2014				505 (12.6)	
Socio-Demographics	M	SD	Range	N (%)	Cronbach α
Age (years)	36.00	9.74	14.96-74.46		
Education (years)	13.27	1.88	2.00-20.00		
Employment					
Unemployed				1678 (41.7)	
Full-time				1569 (39.0)	
Part-time or seasonal				564 (14.0)	
Mental Health Symptom Scale	20.59	16.08	0.00-75.00		0.89

Table 2.0

Zero-Order Correlates of NMOU among African American Men in Corrections-Based SUD Treatment (*N = 4,021*)

Variables	1	2	3	4	5	6
1) Nonmedical Opioid Use[a]	–					
2) Cohort[a]	.03	–				
3) Age[a]	−.10**	−.12**	-			
4) Education[a]	.05**	.01	.06**	–		
5) Employment[a]	.03	.00	.07**	.06**	–	
6) Mental Health Symptoms	.20**	−.02	.06**	.01	−.02	–

[a]Note. = Phi coefficient reported;

* = p < .05;

** p ≤ .01 (two-tailed test);

*** p ≥ .001

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Table 3.0

Summary of Logistic Regression Measuring Correlates of Nonmedical Opioid Use *(N = 4,021)*

	Model 1		Model 2	
	OR (SE)	***95% CI***	***OR (SE)***	***95% CI***
2011[a]	1.03 (0.08)	[0.87, 1.22]	1.02 (0.08)	[0.86, 1.21]
2012 [a]	1.03 (0.05)	[0.92, 1.15]	1.03 (0.06)	[0.92, 1.15]
2013 [a]	1.03 (0.04)	[0.95, 1.12]	1.04 (0.04)	[0.95, 1.13]
2014 [a]	1.05 (0.03)	[0.97, 1.12]	1.04 (0.04)	[0.97, 1.12]
Age	0.97 (0.00) ***	[0.96, 0.98]	0.96 (0.00) ***	[0.95, 0.97]
Education	1.06 (0.02) *	[1.01, 1.10]	1.06 (0.02) **	[1.01, 1.10]
Part-time Employment[b]	1.03 (0.05)	[0.93, 1.14]	1.01 (0.05)	[0.91, 1.13]
Full-time Employment[b]	0.90 (0.09)	[0.76, 1.08]	0.92 (0.09)	[0.77, 1.11]
Mental Health Symptoms[c]			1.03 (0.00) ***	[1.02, 1.03]
Model χ^2		54.12 ***		243.67 ***
Nagelkerle R^2		0.02		0.09

[a] = compared to reference category, 2010 cohort;

[b] = compared to unemployment status;

[c] = Likert scale (0 = none to 5 = all the time);

* $p \leq .05$;

** $p \leq .01$;

*** $p \leq .001$