

The smoking behaviors of incarcerated smokers

Pamela Valera¹, Andrea Reid¹, Nicholas Acuna¹
and Daniel Mackey²

Health Psychology Open
January-June 2019: 1–11
© The Author(s) 2019
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2055102918819930
journals.sagepub.com/home/hpo



Abstract

To determine smoking behaviors, quit attempts, and cessation preferences among incarcerated smokers, a cross-sectional survey was given to a sample of inmates from three state prison facilities in the United States. A majority of Black smokers (62%) identified as smokers, and 38% identified as ex-smokers, as compared to 46.4 percent of smokers (and 53.6% of ex-smokers) in the non-Black group. There were significant differences in the number of cigarettes smoked per day with non-Black smokers smoking one pack ($M=20.44$, standard deviation = 15.86) than Black smokers ($M=14.49$, standard deviation = 13.43; $t=-2.50$, $p=0.014$). Smoking cessation interventions are needed to reduce smoking during incarceration.

Keywords

Black men, health, incarceration, prisons, tobacco

Introduction

The United States (US) is the world's leader in incarcerating adults, with around 1.5 million currently incarcerated in state and federal prisons (Carson, 2018). Racial and ethnic minorities are disproportionately affected by incarceration, with Black men incarcerated in higher numbers than non-Hispanic Whites and Hispanics/Latinos (Carson, 2018; Kaeble and Cowhig, 2018). Current statistics show that Black men are six times more likely to be incarcerated than non-Hispanic White men, while Hispanics/Latinos are 2.3 times more likely than non-Hispanic White men to be incarcerated (Carson, 2018). These racial disparities affect the younger population of incarcerated males, as well. In 2016, Black males aged 18–19 years were 11.8 times more likely to be imprisoned than non-Hispanic White males of the same age (Kaeble and Cowhig, 2018). Policies enacted during the 1970s on the “war on drugs” played a huge part in contributing toward these racial inequalities (Bronson et al., 2017; Western and Pettit, 2010). In addition to multiple burdens incarcerated men of all races and ethnic groups face, they also face higher rates of cigarette smoking.

Cigarette smoking in US prisons is a public health problem (Cropsey and Kristeller, 2003, 2005; Kennedy et al., 2016). Smoking prevalence is about four times higher in criminal justice populations than in the general population

(Cropsey et al., 2008; Cropsey and Kristeller, 2003, 2005). Between 50 and 83 percent of incarcerated individuals are cigarette smokers, versus 15 percent of cigarette smokers in the US adult population (Cropsey et al., 2008; Cropsey and Kristeller, 2005). These disparities do not discriminate based on age; for instance, 70 percent of adolescents involved in the juvenile system reported cigarette smoking, and about half consider themselves daily smokers (Cropsey et al., 2007).

The culture within the correctional environment contributes to this prevalence of tobacco smoke (Cropsey et al., 2010). In the US, tobacco is an integral part of prison culture that serves several functions, such as managing stress and forming an avenue for social interaction (Kennedy et al., 2016). In state prisons that have not banned the use of tobacco, tobacco use has become embedded into the prison system for lack of more useful alternatives that might serve these purposes. Characteristics frequently

¹Rutgers School of Public Health, The State University of New Jersey, NJ, USA

²Lake Erie College of Osteopathic Medicine (LECOM), PA, USA

Corresponding author:

Pamela Valera, Rutgers, School of Public Health, The State University of New Jersey, Newark, NJ 08854, USA.

Email: pv181@sph.rutgers.edu



found in individuals involved with the criminal justice system, such as histories of substance abuse, mental illness, poverty, and low educational attainment (Davis et al., 2017; Wakeman and Rich, 2015), may also increase their risk for using tobacco, as these characteristics are all also associated with an increased prevalence of smoking (Krejci et al., 2003; Novotny et al., 1988; Turan, 2015). The high percentages of incarcerated individuals smoking becomes an even greater public health issue when it is considered that tobacco use disproportionately affects another vulnerable population: Black inmates.

It is well established that Black men use more tobacco than non-Hispanic White men. The prevalence of cigarette smoking in the US is 20.9 percent among Black male smokers compared to 17.3 percent of White male smokers (American Lung Association, n.d). Furthermore, because of the drastically higher number of Black men who are incarcerated, the number of Black male smokers in prison is also higher than the number of smokers who are not Black. In addition to smoking in greater numbers, Black male smokers may have more difficult time quitting smoking than other racial and ethnic groups. Studies investigating the factors impacting smoking cessation efforts among Black men have indicated that high rates of poverty, low education, substance abuse, and mental illness may contribute to their poor smoking cessation outcomes (Blankenship et al., 2005; U.S. Department of Health and Human Services (HHS), 1998; Trinidad et al., 2011). Black male inmates also suffer disproportionately from the health effects of smoking. Furthermore, it is well established that cigarette smoking contributes to cancer-related disparities and respiratory diseases, including unnecessary deaths (Danaei et al., 2009). Smoking not only causes cancer and heart disease but also complicates other health conditions such as diabetes (HHS, 2010). These health conditions are exacerbated in the inmate population. A cross-sectional study conducted in 2009 observed that after adjusting for a range of sociodemographic factors, inmates had higher odds of developing chronic medical conditions related to smoking compared to the general population (Binswanger et al., 2009). Using the Inmates in State and Federal Correctional Facilities (SISFCF) survey, this study observed an increase in hypertension, asthma, and cervical cancer for smokers (Binswanger et al., 2009).

These side effects of tobacco use are heightened in the Black inmate population. Epidemiological studies suggest that cigarette smoking is a serious problem for many Black individuals because of the harmful effects of cigarette smoking (American Cancer Society (ACS), 2008). Black individuals tend to have similar or worse health outcomes from smoking compared to non-Hispanic White smokers (Fagan et al., 2007). For example, Blacks die in greater numbers from smoking-related diseases than non-Hispanic Whites, and tobacco use is a major contributor to the three leading causes of death for Blacks: heart disease,

cancer, and stroke (Centers for Disease Control and Prevention (CDC), 2018). The risk of developing diabetes, which is the fourth leading cause of death for Black individuals, increases by 30–40 percent when Black individuals smoke cigarettes (CDC, 2018).

Even though smoking cessation is a very effective way of reducing the negative health effects of smoking, behavioral studies on smoking cessation strategies have been limited in correctional settings. Some studies have suggested that gender and race affect individual responses to smoking cessation treatments (Eissenberg et al., 1999; Perkins et al., 1999) and that racial minorities are less likely to respond well to smoking cessation treatment (HHS, 1998).

Given the high rates of smoking in the US correctional population and the racial disparities found in the prison systems, relapse to smoking is common among Black men after re-entering society (Valera et al., 2014, 2016). Despite this, there exist large gaps of information regarding appropriate evidence-based treatments for tobacco cessation in prison facilities focusing on the smoking behaviors, intentions to quit, and motivations to quit among Black and non-Black male inmates. In a study conducted by Cropsey et al. (2010), with Black and non-Hispanic White smokers, more than half of smokers reported that they would be interested in receiving help to quit smoking if free help were available. Of this group, almost one quarter reported previous use of nicotine replacement therapy, and 10.2 percent reported the use of other medications for previous attempts at smoking cessation (Cropsey et al., 2010). The majority of smokers wanting to quit, 60 percent, were most interested in trying some form of pharmacotherapy, with about 20 percent preferring some other type of psychotherapy and 20 percent not knowing what type of intervention they would prefer (Cropsey et al., 2010). In this study, Cropsey et al. (2010) found some differences across racial lines with respect to smoking characteristics. Although her study showed that non-Hispanic Whites smoked more cigarettes per day (cpd) than Blacks (17.3 cpd vs 10.5 cpd), the study also highlighted the disparity in treatment between Black and non-Hispanic White smokers. Non-Hispanic Whites were more likely to have received mental health and substance abuse treatment and tried medication to help them quit smoking compared to Black smokers. Importantly, Black smokers expressed more interest than non-Hispanic White smokers in quitting, suggesting their higher desire to quit smoking than non-Hispanic White smokers (Cropsey et al., 2010). Furthermore, Black smokers were more interested in behavioral therapies for smoking cessation as compared to pharmacotherapies. These data on smoking behaviors, intentions to quit, and motivations for quitting suggest that Blacks have the interest and desire to quit smoking, but lack the means to do so since very little is known about smoking and cessation behaviors among incarcerated Black male smokers.

To address this concern, this study examined the smoking behaviors and smoking characteristics of incarcerated Black male smokers versus non-Black male smokers (those who self-identify as non-Hispanic Whites or Hispanic/Latino) enrolled in a cancer education program (described below) in three state correctional facilities in the Northeast. Since little is known about tobacco and cigarette smoking in a state prison environment, this study was designed to provide baseline information on the smoking behaviors of Black incarcerated men enrolled in a cancer education program.

Methods

The Cancer Risk in Incarcerated Men's Study (CRIIMS), a longitudinal pilot study conducted from 2015 to 2017, was approved by institutional review boards (IRBs) of two states' Department of Corrections, the first author's home institution, and the HHS Office for Human Research Protections.

CRIIMS had two phases. In Phase I, 356 inmates were recruited, consented, and screened for study participation; of those, 89 men did not meet criteria, leaving a total of 267 participants from three state prisons who completed a cross-sectional survey that assessed knowledge, attitudes, and beliefs related to tobacco, substance use, treatment, physical health, psychosocial factors, and other lifestyle behaviors contributing to the risk of cancer. In Phase II, 169 men were invited to participate in testing the feasibility of an 8-week cancer education program tailored to address cancer health disparities for incarcerated smokers.

Flyers about the study were posted by prison guards and counselors on bulletin boards and at each prison cell blocks or housing units. Prison officials also included a memo about the study on the inmates' TV broadcast system (a televised listing of current events available at the three participating state facilities). Interested participants were asked to contact the prison liaison, who then generated a call-out list of these names. After the call-out list of volunteer inmates was generated, the research team, comprised the first author, a graduate student in public health, and two peer specialists with criminal justice backgrounds, were invited to meet with potential participants to discuss the study.

Interested inmates at each of the participating prison facilities were briefed on the aims and objectives of the study. Potential participants were asked to complete a screening form to determine eligibility. The brief screening form determined whether the participant was a smoker, ex-smoker, or non-smoker. Only current smokers and ex-smokers were eligible to participate in the study. In addition, participants had to meet the following eligibility criteria: (1) self-identify as male; (2) be at least 18 years of age; (3) self-report smoking tobacco or cigarettes during

incarceration; (4) self-identify as Black, Latino, or White; and (5) be fluent in English or Spanish. In addition, a potential participant was excluded if he (1) had a serious language or cognitive impairment that would prevent comprehension of the study procedures assessed during the informed consent process and/or (2) was currently suicidal or psychotic.

Eligible participants completed informed consent procedures. Inmates who completed the cross-sectional questionnaire CRIMM were invited to participate in a prison-based cancer education program known as *Cancer 101, prison version* to improve cancer knowledge regarding cancer prevention and control in correctional settings. This study reported data on characteristics and smoking behavior of incarcerated men enrolled in the cancer education program.

Measures

Only those who provided written informed consent and met eligibility criteria were selected for the paper-based, cross-sectional survey known as CRIIM. The survey contained several standardized measures and informed by the author's previous research (Valera et al., 2014). It was designed to describe participants' demographic characteristics, including incarceration experience, prison conditions and treatment, tobacco and cancer health, psychosocial factors, health behaviors, and physical and mental health outcomes. For this study, the variables of (1) smoking behaviors, (2) cessation patterns, and (3) motivations to quit were included in the data analysis. To reduce any form of coercion, no compensation was provided.

Demographic characteristics. Race and ethnicity, smoking status, levels of education, and employment status were investigated.

Smoking patterns. Smoking behaviors were assessed by asking participants questions concerning their smoking status (i.e. *current smoker, ex-smoker, non-smoker*); tobacco use; change in smoking behavior since incarceration ("Has your smoking behavior changed since being incarcerated?"); the number of cigarettes used and frequency of use (this was an open response option); other tobacco products used (i.e. *pipes, cigars, chew/snuff*); and sources of money for cigarettes ("How do you obtain money to buy cigarettes?"), and participants could check all that applied: "1 = family/friends," "2 = working a job," "3 = barter/trade," and "4 = other." Participants were also asked, "How much money do you spend per week on cigarettes?" This was an open response, which allowed them to enter the amount they spent per week on cigarettes. Participants were also asked whether a roommate smoked around them and the types of cigarettes smoked: "roll loose tobacco," "non-filter," "non-menthol," "regular," and "menthol."

Table 1. Frequencies and percentages for the demographic variables.

Variables	Blacks (N = 100)		Non-Blacks (N = 69)	
	n	%	n	%
Smoking status				
Current smoker	62	62	32	46.4
Ex-smoker	38	38	37	53.6
Level of education prior to incarceration				
Less than high school	34	34	25	10.1
High school or GED	37	37	31	17.4
Some college/vocational	23	23	11	20.3
College or more	5	5	2	37.7
Current employment status				
Student	6	6	6	8.7
Employed	49	49	33	47.8
Unemployed but looking for work	29	29	17	24.6
Disability	3	3	2	2.9
Other	10	10	3	8.7

Cessation behaviors and medical problems. Participants were asked the following open-response question, “How many times have you tried to quit smoking in the past (for 24 hours or more)?” This item had a 5-point Likert-type scale where each response was assigned a value from: “1 = less than a month,” “2 = 1–2 months,” “3 = 3–4 months,” “4 = 6 months–1 year,” and “5 = 1 year or more.” Another quitting behavior question was, “How long have you stopped smoking in the past?” This item had a 5-point Likert-type scale and each response was assigned a value from “1 = less than a month,” “2 = 1–2 months,” “3 = 3–4 months,” “4 = 6 months–1 year,” and “5 = 1 year or more.” Each participant was also asked the type of products used to quit smoking (“Have you tried any of the following to help you quit (check all that apply)?”). Responses options included 1 = nicotine patch or other nicotine replacement (e.g. gum, inhaler), 2 = therapy (e.g. group or individual), 3 = self-help materials (e.g. books, pamphlets), 4 = hypnosis, 5 = medication, and 6 = none. The final question included in the quitting questionnaire was “How difficult was it to quit on your last attempt?” A 5-point Likert-type scale was used where the following values were assigned: “1 = very easy,” “2 = easy,” “3 = neutral/undecided,” “4 = difficult,” and “5 = very difficult.”

Other questions related to whether the participant was aware of a family member who had medical problems related to smoking were asked (“Does anyone in your family have medical problems due to smoking—cancer, heart disease?”). Response items were “0 = no,” “1 = yes,” and “2 = don’t know.” Another question focused on whether the participant was aware if family members had died due to smoking (“Has anyone in your family died from a smoking-related disease—cancer, heart disease?”). Response items were “0 = no,” “1 = yes,” and “2 = don’t know.” Medical

problems related to smoking were also a question that was asked to the participant (“Do you have medical problems related to smoking or worsened by your smoking?”). Response items were “0 = no,” “1 = yes,” and “2 = don’t know.”

Motivation to quit. The following questions were asked to participants to gauge their interest, confidence, and motivation to quitting using tobacco products: “How interested in quitting smoking are you right now,” “how confident are you that you can quit,” and “how motivated are you to quit smoking.” Participants were also asked, “How much support from family and friends do you think you would get for quitting smoking?” These questions were based on a 5-point Likert-type scale where the following values were assigned: “1 = not at all,” “2 = a little,” “3 = moderately,” “4 = quite a bit,” and “5 = very much.”

Statistical analysis

Items were viewed as single choice unless otherwise indicated where participants were able to choose multiple responses and those were viewed individually as yes or no. Using SPSS, a two-tailed *t*-test was done in order to calculate *p* values. Likert-type scales were used for several of the quitting items from 1 to 5 and are shown as a continuous variable.

Results

Study participants

Table 1 describes the demographic characteristics of the sample. Approximately, 62 percent of Black men were

Table 2. Frequencies and percentages for smoking variable between Blacks and non-Blacks.

Variables	Blacks (N= 100)		Non-Blacks (N= 69)	
	n	%	n	%
Behavior changed since incarceration				
Yes, started smoking	9	9	7	10.1
Yes, smoke more	18	18	12	17.4
Yes, smoke less	27	27	14	20.3
Yes, quit smoking	31	31	26	37.7
No	15	15	10	14.5
Smoked 100 cigarettes or more in lifetime				
No	8	8	2	2.9
Yes	86	86	63	91.3
No response	6	6	4	5.8
Other tobacco products used ^a				
Pipe	6	6	9	13
Cigar	20	20	18	26.1
Chew/snuff	5	5	19	27.5
None	55	55	33	47.8
Thoughts of quitting smoking				
Yes, in general	41	41	34	49.3
Yes, within the next 30 days	19	19	11	15.9
Yes, within the next 6 months	12	12	3	4.3
No thinking of quitting	4	4	5	7.2
No response	24	24	16	23.2
Sources of money for cigarettes ^a				
Family	22	22	19	27.5
Work	64	64	39	56.5
Barter	7	7	4	5.8
Get from friends	14	14	8	11.6
Other	16	16	7	10.1
Type of cigarettes smoked ^a				
Roll loose tobacco	21	21	13	18.8
Non-filter	4	4	3	4.3
Non-menthol or regular	5	5	5	7.2
Menthol	51	51	33	47.8
Roommate smoke around you				
No	31	31	25	36.2
Yes	67	67	41	59.4
No response	2	2	3	4.3
Medical professional talk to you about quitting				
No	40	40	31	44.9
Yes	48	48	29	42
No response	12	12	9	13

^aParticipants were able to check off multiple responses. Each item viewed as “yes” or “no.”

smokers, and 34 percent did not graduate from high school, and close to 30 percent of them were unemployed, but looking for work.

Smoking patterns and characteristics

In Table 2, the smoking patterns of the Black and non-Black study participants are presented. Of the 169 incarcerated

men who met study criteria, approximately 100 men identified as Black and 69 men identified as a race and/or ethnicity other than Black (non-Black); 62% of Black participants (vs 46% of non-Black participants) reported current smoking status, and 38% of Blacks (vs 53.6% of non-Blacks) were former smokers. Approximately 27 percent of the men in the Black smoking group indicated that they smoked more since getting incarcerated (“Yes, started to smoke” or

Table 3. Cessation Behaviors and Medical Problems.

Variables	Blacks (N = 100)		Non-Blacks (N = 69)	
	n	%	n	%
Last time tried to quit				
Less than a month	19	19.0	12	17.4
One to two months	7	7.0	8	11.6
Three to four months	6	6.0	9	13.0
Six months to a year	13	13.0	11	15.9
One year or more	38	38.0	24	34.8
No response	17	17.0	5	7.2
Length of time quit smoking in the past				
None	11	11.0	4	5.8
Less than a month	13	13.0	6	8.7
One to two months	10	10.0	9	13.0
Three to four months	12	12.0	10	14.5
Six months to a year	11	11.0	8	11.6
One year or more	36	36.0	28	40.6
No response	7	7.0	8	11.6
Products to help with quitting*				
Individual Therapy	11	11.0	4	5.8
Reading Materials	1	1.0	1	1.4
Group Therapy	11	6.0	10	14.5
Nicotine Patch	6	6.0	0	0
Medications	6	6.0	2	2.9
None	68	68.0	50	72.5
Family member has medical problem due to smoking				
No	49	19.0	35	50.7
Yes	27	27.0	24	34.8
Don't know	23	23.0	10	14.5
No response	1	1.0	0	0
Family member died due to smoking-related disease				
No	51	51.0	39	56.5
Yes	29	29.0	23	33.3
Don't know	20	20.0	7	10.1
Have medical problem related to smoking				
No	73	73.0	48	69.6
Yes	8	8.0	6	8.7
Don't know	19	19.0	15	21.7

*Participants were able to check off multiple responses. Each item viewed as "yes" or "no."

"Yes, smoke more"), whereas a virtually identical percentage of men in the non-Black smoking group (27.5%) reported smoking more since incarceration. A strong majority of the current and former smokers in both racial groups (Black: 86%; non-Black: 91.3%) reported that they had smoked 100 cigarettes or more during their lifetime. Both groups also expressed a strong interest in quitting smoking, with slightly more Black smokers (72%) and 69.5 percent of non-Black smokers indicating they had thoughts of quitting smoking "in general," "within the next 30 days," or "within the next six months." Only 4 percent of the Black participants and 7.2 percent of non-Black participants indicated they were "not thinking of quitting."

Both Black and non-Black participants indicated that they used tobacco products other than cigarettes, although

cigarette smoking was, by far, the most frequent tobacco product used in both groups, with 64 percent of Blacks and 47.8 percent of non-Blacks only using the tobacco from cigarettes. Interestingly, non-Black smokers reported using chew/snuff in higher numbers (27.5%) than Black smokers (5.0%).

The cessation behaviors and medical problems related to smoking for both Black and non-Black groups are summarized in Table 3. Many smokers in both the Black and non-Black groups who had tried to quit smoking indicated that it had been 1 year or more since they last tried to quit (38% for Blacks; 34.8% for non-Blacks). Smokers who had tried to quit smoking in the past had fair retention rates, with 36% of Black smokers indicating that they had stopped smoking for "one year or more," and 40.6% of non-Black

smokers indicating that they had stopped smoking for “one year or more.” However, the majority of smokers in both groups (Blacks: 57%; non-Blacks: 53.6%) were only able to quit smoking for less than 1 year or not at all.

A few participants indicated using several products to help them quit smoking. However, the majority of Black (68%) and non-Black (72.5%) study participants reported not using any smoking cessation treatment to help them quit tobacco smoking. In addition, the men were asked about the health effects of smoking on themselves and their family members. More than a quarter of participants in both the Black (27%) and non-Black (34.8%) groups indicated that a family member had a medical problem due to smoking, and more than a quarter of participants in both groups also reported having a family member die due to a smoking-related disease (Black: 29%; non-Black: 33.3%). It was surprising that a good percentage of both Black and non-Black participants indicated that they “did not know” whether cigarette smoking had adverse health effects (including death) on themselves or their family members, suggesting a possible lack of information flow about the health effects of cigarette smoking to these incarcerated participants. Furthermore, 23 percent of Black smokers and 14.5 percent of non-Black smokers “did not know” whether a family member had medical problems due to smoking, and 20 percent of Black participants and 10.1 percent of non-Black participants indicated not knowing whether a family member had died due to a smoking-related disease. Approximately, 19 percent of Black smokers and 21.7 percent of non-Black smokers did not know whether they had medical problems related to smoking.

Participants answered more detailed questions about their tobacco use, including where they obtained funds to purchase cigarettes, the type of cigarettes smoked, whether their roommates smoked around them, and whether a medical professional had talked to the participant about quitting, as seen in Table 3.

Both groups reported using money from work as their main source of income for buying cigarettes, with funds also provided from family (Black: 22%; non-Black: 27.5%) being the second primary source of income for buying cigarettes. Bartering, getting money from friends, and other sources of income were also indicated.

Menthol was used by the majority of Black (51%) and non-Black (47.8%) smokers and the type of cigarettes they smoked. Blacks (21%) and non-Blacks (18.8%) also reported using roll loose tobacco; they reported using non-filter and non-menthol/regular cigarettes in lower numbers.

Both participant groups also reported high numbers of roommates who smoked around them; 67 percent of Black men indicated that their roommates smoked around them, and 59.4 percent of non-Black men indicated that their roommates smoked around them.

Almost half of the Black smokers and 42 percent of non-Black smokers had a prison medical provider speak with them about quitting smoking, indicating a dire need for more proactive treatment approaches for inmates.

We further investigated whether there were differences between the two groups’ averages on smoking variables, which included the following items: smoking habits, quitting behaviors, social influence (friends and family who smoke), money spent on cigarettes, and any support for quitting, including smoking cessation treatment and support from family and friends. As shown in Table 4, there were significant differences in the most smoked cigarettes regularly per day, with non-Black smokers smoking the highest at one pack ($M=20.44$, standard deviation (SD)=15.86) than Black smokers ($M=14.49$, $SD=13.43$; $t=-2.50$, $p=0.014$). In addition, we found that non-Black smokers had more friends who smoke ($M=58.59$, $SD=32.81$) than Black smokers ($M=41.37$, $SD=34.08$; $t=-3.18$, $p=0.002$). These results suggest that Black participants were less likely to have been heavy smokers than non-Black smokers and that friend’s smoking is particularly high for both groups, but especially for non-Black smokers. However, there was no statistical difference between Black and non-Black smokers in regard to the cigarettes smoked per day, the total years of smoking, number of quit attempts, interest in quitting, money spent per week on cigarettes, confidence in quitting, motivation to quit, and support of quitting.

Discussion

Tobacco smoke continues to be the leading cause of morbidity and mortality in the US (Danaei et al., 2009; Trinidad et al., 2011). A study conducted by Mehta and Preston (2012) suggests that the relative risk of death continues to increase over time for current and former smokers. Consistent with current research on smoking in incarcerated populations (Ceelen et al., 2012; Spaulding et al., 2018), our study found that smoking prevalence was high in the correctional institutions studied, with many beginning to smoke or continuing to smoke in prison, likely due to not only the characteristics of institutionalization (e.g. increased stress, boredom, use of cigarettes as “currency”) itself, but also due to the characteristics of the population studied (i.e. histories of substance abuse, mental illness, poverty, and low educational attainment; Cropsey et al., 2003, 2008; Krejci et al., 2003; Novotny et al., 1988). The findings from this study build upon a sparse, but growing body of literature describing the characteristics of incarcerated smokers and their interest in and preferences for smoking cessation treatment, with a specific focus on the distinction between characteristics in Black versus non-Black smokers.

Table 4. Descriptive statistics and independent t-test results for the smoking variables.

Variables	Black smokers (N=100)			Non-Black smokers (N=69)			t	p value
	Range	M	SD	Range	M	SD		
Cigarettes smoked per day	0 to 100	10.73	11.92	0 to 60	12.63	11.57	-0.91	0.365
Most smoked regularly per day	0 to 100	14.49	13.43	3 to 100	20.44	15.86	-2.5	0.014*
Total years smoking	1 to 54	21.29	13.84	1 to 47	17.27	12	1.89	0.060
Number of quit attempts	0 to 20	3.92	4.18	0 to 50	6.43	11.17	-1.67	0.060
Difficulty of quitting during last attempt ^a	1 to 5	3.39	1.3	1 to 5	3.02	1.4	1.69	0.099
Percentage of family members who smoke	0 to 100	25.13	31.03	0 to 100	32.15	34.45	-1.35	0.181
Percentage of friends who smoke	0 to 100	41.37	34.08	0 to 100	58.59	32.81	-3.18	0.002*
Money spent per week on cigarettes	0 to 100	20.22	24.66	0 to 150	22.41	27.25	-0.51	0.613
Interest in quitting ^a	1 to 5	4.26	1.24	1 to 5	4.39	1.2	-0.62	0.537
Confidence in quitting ^a	1 to 5	3.89	1.34	1 to 5	4.29	1.2	-1.77	0.080
Motivation to quit ^a	1 to 5	4.02	1.32	1 to 5	4.04	1.32	-0.05	0.961
Support for quitting ^a								
Family and friends	1 to 5	4.52	1.23	1 to 5	4.33	1.27	0.91	0.367
Individual therapy	1 to 5	3.92	1.64	1 to 5	3.67	1.79	0.87	0.388
Reading materials	1 to 5	3.18	1.93	1 to 5	2.97	1.78	0.67	0.505
Group therapy	1 to 5	3.64	1.83	1 to 5	3.3	1.67	1.15	0.251
Nicotine patch	1 to 5	4.15	1.91	1 to 5	3.73	2.02	1.27	0.206
Medication	1 to 5	3.91	2.13	1 to 5	3.74	2.11	0.48	0.634

^aParticipants used a Likert-type scale from 1 = not at all to 5 = very much.
*p < 0.05.

Almost one-third of Black (27%) and non-Black (27.5%) smokers reported starting smoking or smoking more cigarettes during incarceration. Furthermore, similar numbers reported primarily using work wages to buy their cigarettes instead of accessing them through other means. At present, the average wages earned during incarceration remain extremely low, with most inmates making, on average, 14 cents per hour (Sawyer, 2017); despite this, money from these wages was reported as the primary source of income for buying cigarettes, demonstrating the addictive and mind-altering nature of cigarettes. These findings are concerning, considering that the long-term effects of cigarette smoking upon release are unknown. It is well established that smoking is a contributor toward heart disease, diabetes, cancer, and respiratory disease, and Blacks especially are disproportionately affected by the health effects of cigarette smoking (CDC, 2018). Blacks are more likely to die from smoking-related diseases than non-Hispanic Whites, and tobacco use is a major contributor to the three leading causes of death among Black smokers—heart disease, cancer, and stroke (CDC, 2018). It is well established that there is a lack of resources available in prison and upon release to the community, for smoking cessation assistance. Our study is essential in working to study the preferences of these smoking inmates—studying why Black inmates begin to smoke and continue smoking—to better tailor cessation programs to assist them with life-saving quit endeavors.

These results showed that Black and non-Black smokers used tobacco products other than cigarettes and preferred smoking menthol cigarettes over other types of cigarettes. Almost one-third (31%) of Black smokers and 52.2 percent of non-Black smokers reported using pipes, cigars, and chew/snuff. This is concerning, because the use of other tobacco products are also addictive and negatively affect user health. For example, chew/snuff has the same amount of nicotine as regular cigarettes, and users are exposed to at least 30 different chemicals, including dangerous tobacco-specific nitrosamines (TSNAs) that cause cancer; chewing and dipping have been linked to an increased risk of oral cancers and precancers (ACS, 2015). Our study suggest the need to include these types of tobacco products in cessation intervention programs, with instructions on how to specifically quit using them.

Tailoring cessation programs to include how to quit smoking menthol cigarettes is also important. In our study, both Blacks and non-Blacks smoked menthol cigarettes in concerning high numbers. Menthol cigarettes are more addictive and dangerous to user health than other types of cigarettes. Menthol's dangers are two-fold, in that it works to reinforce smoking behavior and mitigate motivations to quit smoking (Ahijevych and Garrett, 2010). Menthol is an additive to cigarettes that produces a cooling and anesthetic (i.e. pain killing) effect that decreases the cough reflex and soothes the "dry throat" feeling that comes with smoking

cigarettes. Consequently, smokers who inhale cigarettes with menthol may inhale more deeply and hold the smoke in their lungs for a longer period, increasing their exposure to the dangerous, cancer-causing chemicals in cigarette smoke.

Our findings, suggest that the majority of incarcerated Black smokers (51.0%) preferred menthol cigarettes, mirror averages in the general US population regarding Black smokers' preference for menthol cigarettes. About 80 percent of Black smokers in the US prefer menthol cigarettes over other types of cigarettes (National Jewish Health, 2015). Numbers for non-Hispanic White Americans are concerning, but not as high as Black smokers, with 30 percent of White smokers preferring menthol cigarettes (National Jewish Health, 2015). Tailoring cessation programs with specific lessons on how to quit smoking menthol cigarettes—such as gradually substituting menthol cigarettes for regular cigarettes over the course of the cessation program—may strengthen quit programs, especially for Black inmates.

A strong majority of smokers in both groups (Black and non-Black) expressed a desire to quit smoking. This desire to quit smoking was confirmed by responses from 36 percent of Black participants and 40.6 percent of non-Black participants who indicated that, in the past, they had been able to quit smoking for “one year or more.” These results hold consistent with previous studies showing that Blacks have strong motivations and readiness to quit, even more so than Whites, and are more likely to believe they will be able to quit successfully and make quit attempts (Burgess et al., 2014). These results are very promising in that they indicate that there is a strong *want* to quit among incarcerated smokers, especially among Black incarcerated smokers; these vulnerable individuals simply lack the *means*.

Aids to quit smoking were conspicuously absent from our participants' quit attempts. Study participants indicated that when they tried to quit smoking, majority of Black participants and non-Black participants did not use any products to help them quit smoking. Furthermore, less than half of participants in both racial groups (Blacks: 48%; non-Blacks: 42%) had a medical professional speak with them about quitting. This is concerning, considering that there is a dearth of information and effective smoking cessation aids available, including individual therapy, reading materials, group therapy, the nicotine replacement patch, and medications, that are not being taken advantage of by incarcerated individuals, likely because of lack of access or information. Correctional facilities have the means through which to provide information about cessation aids, provide the aids themselves, and tailor treatment programs to their incarcerated population. Unfortunately, at present, instead of implementing life-saving tobacco cessation programs in its facilities, the more common response by prisons has

been to introduce bans on smoking, which may have some effect at stopping inmates from smoking but cannot fully prevent smoking inside the prison, cannot force smokers to quit upon release, and most importantly, cannot prevent the diseases caused by tobacco use inside or outside of the prison walls. Indeed, in studies that examined smoking rates after release, studies showed that in the absence of an intervention other than a prison smoking ban, smoking rapidly reverted to baseline levels after release (Spaulding et al., 2018).

The influence of participants' friends and peers while incarcerated seemed to negatively influence their smoking habits. Almost one quarter (21%) of Black smokers and 17.4 percent of non-Black smokers reported getting cigarettes from their friends or bartering for them with their peers. Furthermore, a strong majority of participants reported that their roommate smoked around them—67 percent for Blacks and 59.4 percent for non-Blacks. This is troubling, considering that peers exert great influence over one another in prison and can both positively and negatively affect smoking habits. Implementing prison-wide cessation programs with tailored information for individuals who want to quit may help vulnerable individuals find alternative ways to handle complicated bartering situations and deal with roommates who smoke around individuals trying to quit. These results are also concerning in that secondhand smoke is not only hazardous to the recipient's health, but it also acts as a barrier to cessation and retention for individuals trying to quit.

Furthermore, with respect to peer influence, correctional facilities might consider looking at the offenders themselves to be used as agents of change in assisting them in implementing successful smoking cessation interventions. Offenders themselves are highly capable of having a powerful and positive influence on fellow offenders, and when offenders act as agents of change, they may change their own opinions and beliefs regarding offending behavior, consistent with their new positions as role-models (Deville et al., 2005). Future studies could explore the use of correctional facility staff and medical and social work professionals, employing prison-based, peer-led programs for smoking cessation.

Implications for smoking cessation strategies

Tailored smoking cessation interventions are effective and needed in reducing smoking during incarceration (Spaulding et al., 2018). These tailored interventions are especially needed for Black inmates, considering that multiple studies have shown that Blacks are less likely to achieve smoking cessation than Whites. This may be the case because racial ethnic minorities are less likely to participate in evidence-based smoking cessation treatment (HHS, 1998), and racial/ethnic differences have been found

in the efficacy of pharmacotherapies, with Blacks seeming wary about the use and efficacy of pharmacotherapies. More specifically, Blacks seem less likely to be screened for nicotine use; receive advice regarding smoking cessation; and be prescribed nicotine replacement treatment (NRT) than Whites (Burgess et al., 2014).

Limitations

This study has several limitations. First, the sample size was small, with data collected from approximately 169 participants. Recruiting more participants for this study would strengthen the data related to smoking characteristics and cessation preferences and behaviors.

Furthermore, this study only worked with men who were current smokers in prison incarcerated in three male prison facilities at two state's Department of Corrections. It did not include women; men incarcerated in maximum security prisons; men incarcerated in federal prisons; or men who resumed or began smoking upon release. Broadening the scope of the study to include women, those incarcerated in federal prison and those who are currently under community corrections supervision would help to diversify and strengthen the data about smoking characteristics and cessation preferences in this vulnerable inmate population. In addition, our data are based on self-report and did not include biochemical assessments of smoking (i.e. CO monitoring) that would have produced better estimates of smoking habits than our self-report data. There is also a need to better understand the impact of social/peer influence on incarcerated smokers, specifically, whether friends,' roommates,' and peers' smoking habits affect quit attempts and successes of Black and non-Black smokers.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the National Institutes of Health/National Cancer Institute to Dr. Pamela Valera (K22CA197066).

References

- Ahijevych K and Garrett BE (2010) The role of menthol in cigarettes as a reinforcer of smoking behavior. *Nicotine & Tobacco Research* 12: S110–S116.
- American Cancer Society (ACS) (2008) *Cancer Facts & Figures for African Americans 2007–2008*. Atlanta, GA: ACS. Available at: <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/cancer-facts-and-figures-for-african-americans/cancer-facts-and-figures-for-african-americans-2007-2008.pdf>
- American Cancer Society (ACS) (2015) *Health Risks of Smokeless Tobacco*. Atlanta, GA: ACS. Available at: <https://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer/smokeless-tobacco.html>
- American Lung Association (n.d). *Tobacco use in racial and ethnic populations*. Available at: <https://www.lung.org/stop-smoking/smoking-facts/tobacco-use-racial-and-ethnic.html>
- Binswanger IA, Krueger PM and Steiner JF (2009) Prevalence of chronic medical conditions among jail and prison inmates in the USA compared with the general population. *Journal of Epidemiology and Community Health* 63: 912–919.
- Blankenship KM, Smoyer AB, Bray SJ, et al. (2005) Black-White disparities in HIV/AIDS: The role of drug policy and the corrections system. *Journal of Health Care for the Poor and Underserved* 16: 140–156.
- Bronson J, Stroop J, Zimmer S, et al. (2017) Drug use, dependence, and abuse among state prisoners and jail inmates, 2007–2009. In: Bronson J (ed.) *U.S. Department of Justice Office of Justice Programs Bureau of Justice Statistics*. Washington, DC: U.S. Department of Justice, pp. 1–27.
- Burgess DJ, Van Ryn M, Noorbaloochi S, et al. (2014) Smoking cessation among African American and White smokers in the Veterans Affairs health care system. *American Journal of Public Health* 104: S580–S587.
- Carson EA (2018) Prisoners in 2016. In: Carson EA (ed.) *U.S. Department of Justice Office of Justice Programs Bureau of Justice Statistics*. Washington DC: U.S. Department of Justice. Available at: <https://www.bjs.gov/content/pub/pdf/p16.pdf>
- Ceelen M, Dorn T, Buster M, et al. (2012) Health-care issues and health-care use among detainees in police custody. *Journal of Forensic and Legal Medicine* 19: 324–331.
- Centers for Disease Control and Prevention (CDC) (2018) *African Americans and Tobacco Use*. Atlanta, GA: CDC. Available at: <https://www.cdc.gov/tobacco/disparities/african-americans/index.htm>
- Cropsey KL and Kristeller JL (2003) Motivational factors related to quitting smoking among prisoners during a smoking ban. *Addictive Behaviors* 28: 1081–1093.
- Cropsey KL and Kristeller JL (2005) The effects of a prison smoking ban on smoking behavior and withdrawal symptoms. *Addictive Behaviors* 30: 589–594.
- Cropsey K, Eldridge G, Weaver M, et al. (2008) Smoking cessation intervention for female prisoners: Addressing an urgent public health need. *American Journal of Public Health* 98: 1894–1901.
- Cropsey KL, Jones-Whaley S, Jackson DO, et al. (2010) Smoking characteristics of community corrections clients. *Nicotine & Tobacco Research* 12: 53–58.
- Cropsey KL, Linker JA and Waite DE (2007) An analysis of racial and sex differences for smoking among adolescents in a juvenile correctional center. *Drug and Alcohol Dependence* 92: 156–163.
- Danaei G, Ding EL, Mozaffarian D, et al. (2009) The preventable causes of death in the United States: Comparative risk assessment of dietary, lifestyle, and metabolic risk factors (mortality effects of risk factors in the US). *PLOS Medicine* 6: 1–23.
- Davis MA, Lin LA, Liu H, et al. (2017) Prescription opioid use among adults with mental health disorders in the United States. *Journal of the American Board of Family Medicine* 30: 407–417.

- Devilly GJ, Sorbello L, Eccleston L, et al. (2005) Prison-based peer-education schemes. *Aggression and Violent Behavior* 10: 219–240.
- Eissenberg T, Adams C, Riggins III EC, et al. (1999) Smokers' sex and the effects of tobacco cigarettes: Subject-rated and physiological measures. *Nicotine & Tobacco Research* 1(4): 317–324.
- Fagan P, Moolchan ET, Lawrence D, et al. (2007) Identifying health disparities across the tobacco continuum. *Addiction* 102: 5–29.
- Kaeble D and Cowhig M (2018) Correctional populations in the United States, 2016. In: Watkins TD (ed.) *U.S. Department of Justice Office of Justice Programs Bureau of Justice Statistics*. Washington, DC: U.S. Department of Justice. Available at: <https://www.bjs.gov/content/pub/pdf/cpus16.pdf>
- Kennedy SM, Sharapova SR, Beasley DD, et al. (2016) Cigarette smoking among inmates by race/ethnicity: Impact of excluding African American young adult men from national prevalence estimates. *Nicotine & Tobacco Research* 18: S73–S78.
- Krejci J, Steinberg ML and Ziedonis D (2003) Smoking status and substance abuse severity in a residential treatment sample. *Drug and Alcohol Dependence* 72: 249–254.
- Mehta N and Preston S (2012) Continued increases in the relative risk of death from smoking. *American Journal of Public Health* 102: 2181–2186.
- National Jewish Health (2015) Menthol cigarettes. Available at: <https://www.nationaljewish.org/health-insights/smoking-and-tobacco-use/tobacco/menthol-cigarettes>
- Novotny TE, Warner KE, Kendrick JS, et al. (1988) Smoking by Blacks and Whites: Socioeconomic and demographic differences. *American Journal of Public Health* 78: 1187–1189.
- Perkins KA, Donny E and Caggiula AR (1999) Sex differences in nicotine effects and self-administration: Review of human and animal evidence. *Nicotine & Tobacco Research* 4: 301–315.
- Sawyer W (2017) How much do incarcerated people earn in each state? Available at: <https://www.prisonpolicy.org/blog/2017/04/10/wages/>
- Spaulding AC, Eldridge GD, Chico CE, et al. (2018) Smoking in correctional settings worldwide: Prevalence, bans, and interventions. *Epidemiological Reviews* 40: 82–95.
- Trinidad DR, Pérez-Stable EJ, White MM, et al. (2011) A nationwide analysis of US racial/ethnic disparities in smoking behaviors, smoking cessation, and cessation-related factors. *American Journal of Public Health* 101: 699–706.
- Turan O (2015) Smoking status and the presence of chronic obstructive pulmonary disease in prison. *Journal of Addiction Medicine* 9: 118–122.
- U.S. Department of Health and Human Services (HHS) (1998) *Tobacco Use among U.S. Racial/ethnic Minority Groups—African Americans, American Indians and Alaska Natives, Asian Americans and Pacific Islanders, and Hispanics: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- U.S. Department of Health and Human Services (HHS) (2010) *How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- Valera P, Bachman L and Rucker AJ (2016) A qualitative study of smoking behaviors among newly released justice-involved men and women in New York City. *Health & Social Work* 41: 121–128.
- Valera P, Cook SH, Darout R, et al. (2014) “They are not taking cigarettes from me . . . I’m going to smoke my cigarettes until the day I die. I don’t care if I get cancer”: Smoking behaviors of men under community supervision in New York City. *Nicotine & Tobacco Research* 16: 800–806.
- Wakeman SE and Rich JD (2015) Addiction treatment within U.S. correctional facilities: Bridging the gap between current practice and evidence-based care. *Journal of Addictive Medicine* 34: 220–225.
- Western B and Pettit B (2010) *Collateral Costs: Incarceration’s Effect on Economic Mobility*. Washington, DC: The Pew Charitable Trusts.