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Life Stressors and Sleep Problems as Predictors of the Likelihood of Lifetime Cannabis Use among Black Adults with Criminal Justice Contact

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Background: The criminal justice system is the second largest referral source to publicly funded marijuana use disorder treatment. Individuals with criminal justice contact (being unfairly treated or abused by the police, lifetime arrest, incarceration, or parole) have reported notably high levels of stress, sleep problems, and marijuana use. There are well-known race and sex disparities in marijuana use and criminal justice contact. However, understanding is limited on the role that stressors and sleep problems contribute to marijuana use among Black adults who experience criminal justice contact.

Objectives: To determine whether life stressors and sleep problems contribute to lifetime marijuana use among Black adults with criminal justice contact and if there are sex differences.

Methods: We performed multivariate logistic analysis, using nationally representative data of a non-institutionalized population sample (n=1508) of the National Survey of American Life from 2001 to 2003. We compared life stressors and sleep problems between Black adults with criminal justice contact who had lifetime marijuana use and those who did not have lifetime marijuana use. All analyses were stratified by sex.

Results: In the sample of Black males with criminal justice contacts, individuals who reported financial stress (PR: 1.34, 95% CI: 1.12-1.60) had a higher prevalence of experiencing lifetime marijuana use than Black males who reported no financial stress. Black males who reported that they were spiritual (PR: .76, 95% CI: .61-.93) had a lower prevalence of experiencing lifetime marijuana use than Black males who indicated that they were not spiritual. Black females who reported family stress (PR: 1.38, 95% CI: 1.04-1.82) had a higher prevalence of experiencing lifetime marijuana use than Black females who reported no family stress.

Conclusions: These results underscore the importance of considering sex differences in life stressors when developing etiologic models of marijuana use disorder for Black adults who have experienced criminal justice contact. *Ethn Dis.* 2021;31(2):187-196; doi:10.18865/ed.32.1.187

Keywords: Criminal Justice Contact; Stressors; Sleep Problems; Marijuana Use; Black Adults

Introduction

Black adults who are most likely to have criminal justice contact (defined as being unfairly treated or abused by the police, lifetime arrest, incarceration, or parole) are often predisposed to disproportionately high levels of chronic stress. These chronic stress exposures have been linked to disparities in sleep patterns leading to poor health behaviors including marijuana use.[1-5] When compared with White adults, Black adults are exposed to relatively greater stressful life events (eg, health, family, crime, economics, segregated neighborhood) that intersect with many aspects of their identity (eg, race, sex, social class) and related to marijuana use disorder.[6] Exposure to multiple stressors or exposure to same stressors repeatedly over time makes it difficult to develop and/or maintain adaptive coping leading to maladaptive coping strategies such as marijuana use.[7,8] In addition, Black adults with criminal justice contact tend to frequently engage disadvantaged environments that increase their risk for cumulative chronic stress exposure, sleep problems, and marijuana use.[2-4]

The relationship among marijuana use, sleep problems, and

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stress for Black adults with criminal justice contact seemed to be fueled by the war on marijuana efforts in the late1990s.[9] During that period, marijuana offenses accounted for 82.4% of the increase in drug arrests across the United States, of which 78.7% were for marijuana possession arrests. Also, during that period, Black adults were 2.5 times more likely to be arrested for marijuana possession than White adults, although their marijuana prevalence estimates were similar if not lower than White adults.[10] More recently, across all age groups, the odds of having contact with the criminal justice system were 1.6 to 4.1 higher among Black females than White female sand 3.8 to 10.5 higher among Black men than White men.[11,12] This points to the living-while-Black phenomenon identified by Gabbidon and Peterson,[13] which proposed that being Black in the United States is associated with a multiplicity of social costs that influence health behaviors and status.[14,15]

This current study examines whether life stressors and sleep problems contribute to marijuana use among Black adults with criminal justice contact and if there are sex differences.

In the United States, persons with criminal justice contact reported high rates of marijuana use ranging from 68% to 93%, which provides some insight into the criminal justice system being the second largest referral source to publicly funded marijuana use disorder treatment.[16-19] In fact, 52% of the marijuana use disorder admissions to publicly funded treatment come from criminal justice referrals.[18] When race is considered, Black adults (61%) were more likely to be referred to publicly funded marijuana use disorder treatment by the criminal justice system compared with White adults (55%).[17]

Black adults with criminal justice contact seem to engage multiple stress pathways that increase their vulnerability to sleep problems and marijuana use.[1,17,20,21] This current study examines whether life stressors and sleep problems contribute to marijuana use among Black adults with criminal justice contact and if there are sex differences. There are well-known race and sex disparities in marijuana use and criminal justice contact.[11,12,22,23] However, understanding the role that life stressors and sleep problems contribute to lifetime marijuana use among Black adults who experience criminal justice contact is limited. These relationships are examined utilizing a nationally representative survey among Black adults in the United States.

Methods

Study Population

The National Survey of American Life (NSAL) was a large-scale survey of African American (n= 3570), Black Caribbean (n= 1438), and non-Hispanic White (n= 891) adults from 252 geographic areas across the United States. The survey was conducted between February 2001 and March 2003 through face-to-face and some telephone interviews with an integrated national household probability sample of individuals aged ≥18 years. Detailed description of methods is published elsewhere.[1,2,24,25] Although this dataset is dated, this is currently the most comprehensive large national survey of ethnically diverse Black populations.[24-26] The analytic sample for this study consists of Black or African American US citizens who reported a criminal justice contact (eg, ever unfairly treated/abused by police?; ever been arrested as an adult or juvenile?; ever sent to a jail/prison/correctional facility?; or currently on parole) and had complete information on life stressors, sleep issues, and marijuana use (N=1508). Data from the NSAL were made available through the Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan (http://www.icpsr.umich.edu/).

Outcome Measure

Lifetime marijuana use was derived from these two questions: Have you ever used marijuana? (0, no; 1, yes); and Have you used marijuana in the past 12 months (0, no; 1, yes).

Independent Variables

Multiple questions assessed each of the following independent, binary variables (family stressors, personal stressors, neighborhood stressors, financial stressors, work-related stress, and sleep problems). Responses were coded as 1 or 2, where participants who responded to at least one of the response categories coded as 1 were deemed to be experiencing the stressor(s) related to that variable. Participants who responded to all of the response categories coded as "0" were deemed to be experiencing none of the stressors related to that variable.

Family Stressors

Family stressors were derived from 12 questions. Respondents answered yes (coded as 1) or no (coded as 2) to four questions: 1) Over the past month have you had family or marriage problems; 2) Over the past month have you had problems with children; 3) Over the past month have you had problems with love life; 4) Uncomfortable with your family. Respondents answered either 1, not too often or never or 0, very often or fairly often for these seven questions: 5) Frequency family helps you out; 6) Frequency family makes you feel loved, excluding spouse; 7) Frequency family listens to your problems; 8) Frequency family expresses concern for your well-being; 9) Frequency family makes too many demands of you; 10) Frequency family criticizes you; and 11) Frequency family takes advantage of you. Respondents were asked 12) How close do you feel to family members and could respond 1, not too close or close at all or 0, very close or fairly close.

Personal Stressors

Personal stressors (1, stressed; 0, not stressed) were assessed from responses to the following five questions: 1) Over the past month had you been a victim of a crime; 2) Over the past month did you have problems with police; 3) Over the past month have you been treated badly because of your race; 4) Over the past month have you had health problems. Question 5 and responses were: Faced serious personal problem in your life, (1, problem; 0, no problem). Participants who responded to at least one of the response categories coded as "1" were deemed to be experiencing personal stressors.

Neighborhood Stressors

Neighborhood stressors were assessed by participants' answers of either no (coded as 1) or yes (coded as 0) to four questions: 1) Park/playgrounds/open space in neighborhood; 1) Supermarket in neighborhood; 3) Medical clinic in neighborhood; and 4) Uncomfortable with neighborhood. Respondents were also asked: 5) How often are there problems with muggings, burglaries, assaults or anything else like that in your neighborhood (1, very often and fairly often; 0, not too often, hardly ever, never); 6) How much of a problem is the selling and use of drugs in your neighborhood (1, very serious and fairly serious; 0, not too serious, not serious at all).

Financial Stressors

Financial stressors were assessed by five questions: 1) Over the past month have you had money problems (1,yes; 0, no); 2) Amount money problems upset you (1, a great deal; 0, only a little or not at all); 3) Over the past month have you failed to meet financial obligations (1, true; 0, false); 4) Are you better/worse financially than 10 years ago (1, worse; 0, same or better); and 5) Have you or any member of your family living here received food stamps (1, yes; 0, no).

Work-Related Stress (WRS)

WRS was derived from responses to these five questions: 1) Over the past month have you had job problems (1,yes; 0, no); 2) worried about losing job in near future (1, worried a lot; 0, somewhat worried to not worried); 3) Blacks treated unfairly at job (1, yes; 0, no); 4) extent to which satisfied with job (1, very dissatisfied; 0, somewhat dissatisfied to very satisfied; and 5) number of hours worked (1, >40 hours per week; 0, ≤40 hours per week).

Sleep Problems

Sleep problems were assessed by participant's answers of either yes (coded as 1) or no (coded as 0) to these five questions: 1) Did you have a lot more trouble than usual either falling asleep, staying asleep,

or waking too early nearly every night? 2) Did you sleep a lot more than usual nearly every night? 3) Did you sleep much less than usual and still not feel tired or sleepy? 4) Did you often have trouble falling or staying asleep? 5) Did you take sleeping pills or other sedatives (such as ambient or sonata) under the supervision of a doctor? Question 6 asked respondents: Have you had restless sleep? (1,most or all the time; 0, rarely or never, some of the time, occasionally).

Covariates

Spirituality

Spirituality was a binary variable derived from the following three questions: 1) How important is spirituality in your life (1,very and fairly important; 0, not too important or not important at all); 2) How spiritual would you say you are (1, very and fairly spiritual; 0, not too spiritual or not spiritual at all); 3) Do you look to God for strength (1, strongly agree; 0, somewhat agree, somewhat disagree, strongly disagree).

Religiosity

Religiosity was a binary variable derived from the following six questions: 1) How important is religion in your life (1, very and fairly important, 0, not too important or not important at all); 2) How religious would you say you are (1, very and fairly religious; 0, not too religious or not religious at all); 3) How often do you usually attend religious services (1, nearly every day; 0, at least once a week, a few times a month, at least once a month, few times a year, never); 4) How often do you read religious books or other religious materials (1, nearly every day; 0, at least once a week, a few times a month, at least once a month, few times a year, never); 5) Watch religious programs on TV (1, nearly every day; 0, at least once a week, a few times a month, at least once a month, few times a year, never); 6) Listen to religious programs on the radio (1, nearly every day; 0, at least once a week, a few times a month, at least once a month, few times a year, never).

Demographic

Male sex was categorized as a binary variable (1, male; 0, female). Age was categorized as aged 18-29 years; 30-44 years, 45-59 years and ≥60 years. Marital status was categorized as a binary variable (1, married/cohabitating; 0, divorced/separated/widowed/never married).

Socioeconomic Status (SES)

Education level was categorized as a binary variable (1, high school graduate or more; 0, less than high school graduate). Household income was categorized as $0-$17,999; $18,000-$31,999; $32,000-$54,999; and ≥$55,000). Employment status was categorized as a binary variable based on each participant's report of whether they were employed (1, employed; 0, not employed).

Statistical Analysis

Sample characteristics were summarized for the entire sample. Rao-Scott chi-square and Student's *t* test statistics are used to compare Black adult males to Black adult females with criminal justice contact. The relationships between sex (male, female) and study variables were examined using logistic regression in combination with *F*-tests of statistical significance. The medical and public health literature have identified that when the outcome variable has a prevalence of 10% or more, prevalence ratio estimations should be utilized in order to reduce overestimation between the exposure and the outcome variable.[27] Because the prevalence of marijuana use was 60.1%, a modified Poisson regression with robust standard errors was used to derive the prevalence ratios and corresponding 95% CIs. Analyses were performed to determine the association of lifetime marijuana use with family, personal, neighborhood, financial, work stressors, sleep problems, socio-demographics, SES, and coping strategies. The analyses were then stratified by sex. Statistical procedures accounted for the complex multistage probability sampling design of NSAL incorporating weights and design factors. P values <.05 were considered significant. All the analyses for the study were performed using the complex survey design feature in STATA version 14.

Results

The descriptive characteristics of respondents (N=1508) and weighted percentages are presented by sex in Table 1. In this sample of Black adults with criminal justice contact,

Black women were less apt to be married than Black men (31.1% vs 49.1%). Nearly half (49.6%) of the women were in the lowest stratum of income ($0-17,999), compared with only 25.7% of the men. Only 9% of the women were in higher income stratum (≥$55,000), vs 22.2% of men. Sleep problems were more common for Black women (44.9%) than Black men (24.5%), (P<.001). Black women (84.3%) experienced financial stress more than Black men did (69.5%), P<.001.

The associations among sleep problems, life stressors, covariates (demographic, socioeconomic status, and coping) and lifetime marijuana use among the total sample of Black adults and stratified by sex with criminal justice contact are reported in Table 2. In Model 1when examining associations among sleep problems, life stressors, covariates (demographic, socioeconomic status, and coping) and lifetime marijuana use among the total sample: Black male adults (prevalence ratio [PR]: 1.24, 95% CI:1.09-1.41) had a higher prevalence of experiencing lifetime marijuana use than Black female adults. Black adults aged 18 to 29 years had a higher prevalence of experiencing lifetime marijuana use than Black adults aged 30 to 44 years (PR: .87, 95% CI: .77-.99) and Black adults aged ≥60 years (PR: .26, 95% CI: .18-.39). Black adults who reported financial stress (PR: 1.24, 95% CI: 1.06-1.44) had a higher prevalence of experiencing lifetime marijuana use than Black adults who reported no financial stress. Black adults who reported that they were spiritual (PR: .81, 95% CI: .67-.98) had a lower prevalence of experiencing lifetime marijuana use than non-spiritual Black adults. No other significant relationships were observed between lifetime marijuana use and the remaining variables.

In Model 2 when examining associations among sleep problems, life stressors, covariates (demographic, socioeconomic status, and coping) and lifetime marijuana use: Black males aged 18 to 29 years had a higher prevalence of experiencing lifetime marijuana use than Black males aged ≥60 years (PR: .34, 95% CI: .22-.54). Black males with an income of ≥$55,000 (PR: 1.23, 95% CI: 1.01-1.50) increased the likelihood of experiencing lifetime marijuana use more than Black males who had an income of <$17,999.

Black males who reported financial stress (PR:1.34, 95% CI:1.12-

Table 1. Distribution of characteristics of Black adults with criminal justice contact by sex in the 2001–2003 National Survey of American Life, N=1508

Characteristics	Overall, N = 1508	Male, n = 811	Female, n = 697
Demographic			
Age			
18-29	24.5	23.1	26.8
30-44	38.5	37.4	40.5
45-59	24.1	25.4	21.9
≥60	12.9	14.1	10.9
Married, %	42.4	49.1	31.1[a]
Socioeconomic			
High-school graduate, %	29.6	30.8	27.5
Income			
$0-17,999	34.7	25.7	49.6[a]
$18,000-31,999	24.0	23.3	25.3
$32,000-54,999	23.8	28.8	15.4
≥$55,000	17.5	22.2	9.7
Employed, %	66.1	70.0	59.6[a]
Sleep status			
Sleep problems, %	32.2	24.5	44.9[a]
Stressors			
Family stress, %	80.5	79.8	81.4
Personal stress, %	72.8	74.1	70.4
Neighborhood stress, %	95.2	95.2	95.1
Financial stress, %	75.0	69.5	84.2[a]
Work-related stress, %	66.1	64.5	68.7
Coping			
Religious, %	97.5	96.8	98.6
Spiritual, %	94.9	94.0	96.5
Lifetime marijuana use, %	60.1	63.7	53.9[a]

a. P<.05.

Table 2. Life stressors and sleep problems as predictors of the likelihood of lifetime marijuana use among Black adults with criminal justice contact for the total sample and by sex, 2001-2003 National Survey of American Life, N = 1,508

	Lifetime Marijuana Use		
Variable	**Overall, PR (95% CI)**	**Male, PR (95% CI)**	**Female, PR (95% CI)**
Demographic			
Male	1.24 (1.09-1.41)[a]		
Age			
18-29 (referent)	-	-	-
30-44	.87 (.77-.99)[a]	.92 (.78-1.09)	.89 (.71-1.10)
45-59	.93 (.80-1.07)	.97 (.82-1.15)	.86 (.64-1.15)
≥60	.26 (.18-.39)[a]	.34 (.22-.54)[a]	.12 (.05-.29)[a]
Married	.96 (.85-1.09)	.90 (.78-1.05)	1.07 (.85-1.35)
Socioeconomic			
High-school graduate	.98 (.87-1.12)	.95 (.82-1.10)	1.08 (.86-1.37)
Income			
$0-17,999 (referent)	-	-	-
$18,000-31,999	.87 (.74-1.02)	.94 (.76-1.15)	.76 (.59-.98)[a]
$32,000-54,999	1.00 (.84-1.18)	1.09 (.89-1.34)	.84 (.62-1.15)
≥$55,000	1.06 (.90-1.27)	1.23 (1.01-1.50)[a]	.77 (.50-1.18)
Employed	1.02 (.89-1.18)	1.00 (.83-1.21)	1.05 (.85-1.30)
Sleep Status			
Sleep problems	1.01 (.89-1.15)	1.01 (.86-1.19)	1.13 (.95-1.42)
Stressors			
Family stress	1.13 (.97-1.31)	1.05 (.88-1.25)	1.38 (1.04-1.82)[a]
Personal stress	1.14 (.99-1.32)	1.15 (.95-1.38)	1.18 (.94-1.49)
Neighborhood stress	1.26 (.90-1.76)	1.32 (.81-2.17)	1.11 (.76-1.61)
Financial stress	1.24 (1.06-1.44)[a]	1.34 (1.12-1.60)[a]	.98 (.73-1.30)
Work-related stress	.97 (.86-1.10)	.92 (.80-1.07)	1.09 (.87-1.36)
Coping			
Religious	1.11 (.75-1.65)	1.04 (.71-1.53)	2.77 (.76-1.77)
Spiritual	.81 (.67-.98)[a]	.76 (.61-.93)[a]	1.03 (.63-1.70)

a. statistically significant at P<.05.
CI, confidence interval; PR, prevalence ratio.

1.60) had a higher prevalence of experiencing lifetime marijuana use than Black males who reported no financial stress. Black males who reported that they were spiritual (PR: .76, 95% CI: .61-.93) had a lower prevalence of experiencing lifetime marijuana use than Black adults who indicated that they were nonspiritual. No other significant relationships were observed between lifetime marijuana use and the remaining variables.

In Model 3, when examining associations among sleep problems, life stressors, covariates (demographic, socioeconomic status, and coping) and lifetime marijuana use, Black females aged 18 to 29 years had a higher prevalence of experiencing lifetime marijuana use than Black females ≥60 years (PR: .12, 95% CI: .05-.29). Having an income of $18,000-$31,999 (PR: .76, 95% CI: .59-.98) decreased the likelihood of Black females experiencing lifetime marijuana use more than Black females who had an income of <$17,999. Black females who reported family stress (PR: 1.38, 95% CI: 1.04-1.82) had a higher prevalence of experiencing lifetime marijuana use than Black females

who reported no family stress. No other significant relationships were observed between lifetime marijuana use and the remaining variables.

Discussion

The purpose of this study was to examine whether life stressors and sleep problems contributed to marijuana use among Black adults with criminal justice contact and if there were sex differences. The main findings of the study appear to reveal a correlation between some life stressors over others as they relate to the prevalence of marijuana use among Black males and females. Further research to clarify the distribution of marijuana use among Black adults with life stressors is warranted. Our results are consistent with other studies that found an association between marijuana use and financial and family stress.[8,22] Although sleep problems were found to be associated with lifetime marijuana use, personal, finance, and work-related stressors for both sexes, they were not significantly related to the prevalence of marijuana use among Black adults with criminal justice contact. These results contrast with research that shows marijuana use is associated with greater sleep problems.[2]

In the sample of Black adults with criminal justice contact, individuals who reported financial stress, had a higher prevalence of marijuana use than Black adults with criminal justice contact who reported no financial stress. Other studies have found a relationship between marijuana use and financial stress.[8,22] Although these studies included Black adults, they did not specifically identify a sample of Black adults with criminal justice contact. Thus, this study adds a layer to our understanding of this relationship between marijuana use and financial stress given that it occurs within a sample of Black adults with criminal justice contact. Research has demonstrated that Black adults with criminal justice contact most often live in racially segregated neighborhoods that are economically disadvantaged.[2] This exposes them to environments that are financially stressed and marked by high unemployment, lack of resources, and poor access to opportunities.[2,3,14] It has been hypothesized that individuals tend to utilize health-related, self-regulatory coping strategies that are acceptable in their communities, easily accessible, and affordable.[28] Thus, the exposure to neighborhoods riddled with the financial stress related to fewer material resources may influence access to coping strategies linked to poor health behaviors such as marijuana use.[6,10]

In our sample of Black males with criminal justice contact, individuals who reported experiencing financial stress had a higher prevalence of experiencing lifetime marijuana use than Black males who reported no financial stress. These results are consistent with other studies that found that marijuana use is associated with financial stress.[8,10,22] Interestingly, in this sample of Black adult males with criminal justice contact, individuals with an income >$55,000 were significantly engaged in greater marijuana use. More than 20% of the Black males in this study were in a higher income bracket, which could account for these results. Marijuana use being significantly associated with higher income and financial stress simultaneously in this sample of Black males presents a dilemma. This financial status dilemma could be explained by Wimer and colleagues' conceptualization of financial hardship.[29] They argue that financial hardship is the persistent exposure to a shortage of critical financial resources or episodic acute deprivation in finances. This could manifest as running out of money between paychecks or before the end of the month. It is possible that although the Black males in this sample have a higher income, they are still experiencing financial hardship or financial stress, which

Findings reveal a correlation between some life stressors over others as they relate to the prevalence of marijuana use among Black males and females.

increases the chance that they will use marijuana as a coping strategy to alleviate their level of stress.[5]

For Black females with criminal justice contact in this study, those who reported experiencing family stress had a higher prevalence of experiencing lifetime marijuana use than Black females who reported no family stress. These results give us some insight into an area of marijuana use among Black females that is often neglected, as it is consistently documented that the association with marijuana use is lower for Black females compared with Black males.[23] Research has revealed that families with members experiencing criminal justice contact are more likely to experience family stress related to the academic, psychological, and behavioral challenges of the children,[30] and increased exposure to intimate partner violence and greater partner relational discord.[31] To contend with these stressors, Black females often possess the superwoman schema as a means of surviving stressors associated with the intersection of race, sex, and social class; this may place them at risk for marijuana use.[32]

During and post-slavery, Black men were oppressed in their ability to provide for their families and the Black woman as a superwoman became a necessity to promote the socioeconomic survival of the family.[32] During the superwoman schema process, there is a resistance of the negative portrayal of Black womanhood that manifests during the political climate of oppression at the intersection of race and sex while accentuating the strength and resilience of the Black woman. This superwoman characteristic has been proposed to influence the way that Black females suppress and embody stress leading to episodes of numbing the pain with substance use in order to manifest strength in the midst of adversity.[32-34]

Strengths and Limitations

To the best of our knowledge, this is the first study to investigate within-race and sex differences in the area of marijuana use and its relationship with life stressors and sleep from a nationally representative sample of Black adults with criminal justice contact in the United States. Although, this study has several strengths, several limitations should be acknowledged. First, this study was observational and based on cross-sectional data which is limited in interpreting causal relationships and no directionality of relationships can be inferred. A longitudinal study following a cohort of Black adults through their adulthood would better quantify the trajectories of marijuana use, life stressors, and sleep problems over the adult life course. We did not include frequency of use, which may have yielded the exact consumption of marijuana among this population. The NSAL sample excluded persons who were: institutionalized in prisons, jails, nursing homes, and long-term care facilities; persons serving in the military that lived in non-civilian housing; and persons who were unable to complete the interview in English. Therefore, the results are not generalizable to those populations. This study's generalizability was confined to Black adults, so it should be replicated for other ethnic groups such as Black Caribbeans, Black Africans, or other Black persons who have migrated to America, as well as Hispanics, Asians, or Whites.

Conclusion

Since the criminal justice system is the second largest referral source to publicly funded marijuana use disorder treatment,[3,29,31] with Black adults referred more often than White adults, this study could inform our understanding of the factors that contribute to marijuana use among Black adults who experience criminal justice contact. Our findings suggest that a subgroup of Black adults with criminal justice contact could potentially be using marijuana to cope with specific life stressors. For example, we found a mechanism that links marijuana use to financial stressors among the study's Black males and family stressors among the study's Black females. These results underscore the importance of considering sex differences in life stressors when developing etiologic models of marijuana use disorder for Blacks who have experienced criminal justice contact. Culturally relevant intervention efforts to reduce stress and marijuana use must be tailored differently for Black males and Black females.

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Conflict of Interest

No conflicts of interest to report.

Author Contributions

Research concept and design: Archibald; Acquisition of data: Archibald; Data analysis and interpretation: Archibald, Thorpe; Manuscript draft: Archibald, Thorpe; Administrative: Archibald; Supervision: Thorpe

References

1. Binswanger IA, Redmond N, Steiner JF, Hicks LS. Health disparities and the criminal justice system: an agenda for further research and action. *J Urban Health*. 2012;89(1):98-107. https://doi.org/10.1007/s11524-011-9614-1 PMID:21915745
2. Conroy DA, Kurth ME, Strong DR, Brower KJ, Stein MD. Marijuana use patterns and sleep among community-based young adults. *J Addict Dis*. 2016;35(2):135-143. https://doi.org/10.1080/10550887.2015.1132986 PMID:26727193
3. Fuller-Rowell TE, Curtis DS, El-Sheikh M, Chae DH, Boylan JM, Ryff CD. Racial disparities in sleep: the role of neighborhood disadvantage. *Sleep Med*. 2016;27-28:1-8. https://doi.org/10.1016/j.sleep.2016.10.008 PMID:27938909
4. Grandner MA, Williams NJ, Knutson KL, Roberts D, Jean-Louis G. Sleep disparity, race/ethnicity, and socioeconomic position. *Sleep Med*. 2016;18:7-18. https://doi.org/10.1016/j.sleep.2015.01.020 PMID:26431755
5. Spradlin A, Cuttler C. Problems associated with using cannabis to cope with stress. *Cannabis*. 2019;2(1):29-38. https://doi.org/10.26828/cannabis.2019.01.003
6. Hyman SM, Sinha R. Stress-related factors in cannabis use and misuse: implications for prevention and treatment. *J Subst Abuse Treat*. 2009;36(4):400-413. https://doi.org/10.1016/j.jsat.2008.08.005 PMID:19004601
7. Parker LJ, Benjamin T, Archibald P, Thorpe RJ. The association between marijuana usage and discrimination among adult Black men. *Am J Men Health*. 2017;11(2):435-442. https://doi.org/10.1177/1557988316664896 PMID:27561924
8. Slopen N, Meyer C, Williams DR. Cumulative stress and health. In: Ryff CD, Kueger RF, eds. *The Oxford Handbook of Integrative Health Science*. Oxford, UK: Oxford University Press. 2018. https://doi.org/10.1093/oxfordhb/9780190676384.013.5
9. King RS, Mauer M. The war on marijuana: the transformation of the war on drugs in the 1990s. *Harm Reduct J*. 2006;3(1):6. https://doi.org/10.1186/1477-7517-3-6 PMID:16469094
10. Ramchand R, Pacula RL, Iguchi MY. Racial differences in marijuana-users' risk of arrest in the United States. *Drug Alcohol Depend*. 2006;84(3):264-272. https://doi.org/10.1016/j.drugalcdep.2006.02.010 PMID:16600529
11. Carson EA. *Prisoners in 2014. NCJ 248955*. Washington, DC: Bureau of Justice Statistics; 2015, Retrieved from http://www.bjs.gov/content/pub/pdf/p14.pdf.
12. Federal Bureau of Investigation. Uniform crime reports: Table 43a-c. Crime in the United States, 2015. Last accessed February 1, 2021 from https://ucr.fbi.gov/crime-in-the-u.s/2015/crime-in-the-u.s.-2015/tables/table-43
13. Gabbidon S, Peterson S. Living while black: A state-level analysis of the influence of select stressors on the quality of life among black Americans. *J Black Stud*. 2006;37(1):83-102. https://doi.org/10.1177/0021934705277475
14. LaVeist TA, Gaskin D, Trujillo A. *Segregated Spaces, Risky Places: The Effects of Racial Segregation on Health Inequalities*. Washington, DC: Joint Center for Political and Economic Studies; 2011.
15. Thorpe RJ Jr, Brandon DT, LaVeist TA. Social context as an explanation for race disparities in hypertension: findings from the Exploring Health Disparities in Integrated Communities (EHDIC) Study. *Soc Sci Med*. 2008;67(10):1604-1611. https://doi.org/10.1016/j.socscimed.2008.07.002 PMID:18701200
16. Belenko S, Hiller M, Hamilton L. Treating substance use disorders in the criminal justice system. *Curr Psychiatry Rep*. 2013;15(11):414. https://doi.org/10.1007/s11920-013-0414-z PMID:24132733
17. McElrath K, Taylor A, Tran KK. Black-White disparities in criminal justice referrals to drug treatment: Addressing Treatment Need or Expanding the Diagnostic Net? *Behav Sci (Basel)*. 2016;6(4):21. https://doi.org/10.3390/bs6040021 PMID:27706092
18. Substance Abuse and Mental Health Services Administration. *Treatment Episode Data Set (TEDS): 2003–2013. National Admissions to Substance Abuse Treatment Services*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2015.
19. Golub A, Liberty HJ, Johnson BD. The variation in arrestees' disclosure of recent drug use across locations, drugs, and demographic characteristics. *J Drug Issues*. 2005;35(4):917-940. https://doi.org/10.1177/002204260503500412 PMID:18852842
20. Archibald P. Criminal justice contact, stressors, and depressive symptoms among Black Adults in the United States. *Am J Crim Justice*. 2017;43(3):486-508. https://doi.org/10.1007/s12103-017-9421-7
21. Archibald PC, Parker L, Thorpe R Jr. Criminal justice contact, stressors, and obesity-related health problems among Black adults in the United States. *J Racial Ethn Health Disparities*. 2018;5(2):387-397. https://doi.org/10.1007/s40615-017-0382-9 PMID:28597246
22. Hasin DS, Kerridge BT, Saha TD, et al. Prevalence and correlates of DSM-5 cannabis use disorder, 2012-2013: findings from the National Epidemiologic Survey on Alcohol and Related Conditions-III. *Am J Psychiatry*. 2016;173(6):588-599. https://doi.org/10.1176/appi.ajp.2015.15070907 PMID:26940807
23. Wu LT, Zhu H, Swartz MS. Trends in cannabis use disorders among racial/ethnic population groups in the United States. *Drug Alcohol Depend*. 2016;165:181-190. https://doi.org/10.1016/j.drugalcdep.2016.06.002 PMID:27317045
24. Jackson JS, Caldwell CH. Conducting qualitative research with African American and Caribbean black adult and adolescent populations: strategies for training interviewers from experiences with the National Survey of American life. In: Jackson JS, Caldwell CH, Sellers SL, eds. *Researching Black Communities: A Methodological Guide*. Ann Arbor: University of Michigan Press; 2012:190-206. https://doi.org/10.3998/mpub.1050883
25. Jackson JS, Torres M, Caldwell CH, et al. The National Survey of American Life: a study of racial, ethnic and cultural influences on mental disorders and mental health. *Int J Methods Psychiatr Res*. 2004;13(4):196-207. https://doi.org/10.1002/mpr.177 PMID:15719528
26. Caldwell CH, Jackson JS, Tucker MB, Bowman PJ. Culturally competent research methods in African American communities: an update. In: Jones R, ed. *Advances in African American Psychology*. Hampton: Cobb & Henry; 1999:101-127.
27. Zou G. A modified poisson regression approach to prospective studies with binary data. *Am J Epidemiol*. 2004;159(7):702-706. https://doi.org/10.1093/aje/kwh090 PMID:15033648
28. Mezuk B, Abdou CM, Hudson D, et al. "White Box" epidemiology and the social neuroscience of health behaviors: The Environmental Affordances Model. *Soc*

Ment Health. 2013;3(2): 79-95. https://doi.org/10.1177/2156869313480892
29. Wimer C, Garfinkel I, Gelblum M, et al. *Poverty Tracker — Monitoring Poverty and Well-Being in NYC, Report 1*. New York, NY: Columbia Population Research Center and Robin Hood; 2014.
30. Shlafer RJ, Poehlmann J. Attachment and caregiving relationships in families affected by parental incarceration. *Attach Hum Dev*. 2010;12(4):395-415. https://doi.org/10.1080/14616730903417052 PMID:20582847
31. Siennick SE, Stewart EA, Staff J. Explaining the association between incarceration and divorce. *Criminology*. 2014;52(3):371-398. https://doi.org/10.1111/1745-9125.12040 PMID:25598544
32. Woods-Giscombé CL. Superwoman schema: African American women's views on stress, strength, and health. *Qual Health Res*. 2010;20(5):668-683. https://doi.org/10.1177/1049732310361892 PMID:20154298
33. Ehrmin JT. "That feeling of not feeling": numbing the pain for substance-dependent African American women. *Qual Health Res*. 2002;12(6):780-791. https://doi.org/10.1177/104973230201200605 PMID:12109723
34. Krieger N. Embodiment: a conceptual glossary for epidemiology. *J Epidemiol Community Health*. 2005;59(5):350-355. https://doi.org/10.1136/jech.2004.024562 PMID:15831681