

Sociodemographic correlates of intention to quit smoking for good among U.S. adult menthol and non-menthol smokers: Evidence from the 2013–2014 National Adult Tobacco Survey

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ABSTRACT

INTRODUCTION In the U.S. significant progress has been made to reduce cigarette use, yet menthol cigarette use is a continuing public health problem, especially among young adults and Black/African Americans. Smoking cessation is warranted to reduce smoking-related diseases and premature death. Ample evidence has demonstrated that having an intention to quit smoking is strongly associated with attaining cessation. The objective of this study was to identify and compare the sociodemographic correlates of intention to quit smoking for good between menthol and non-menthol adult smokers in the U.S..

METHODS A cross-sectional secondary data analysis was conducted on the 2013–2014 National Adult Tobacco Survey. Multivariable logistic regression was used to analyze individual factors and their relation to intention to quit smoking for good. The total sample was nationally representative of the U.S. population and included 10 121 adult smokers aged ≥ 18 years.

RESULTS Among menthol smokers, non-Hispanic Blacks (adjusted odds ratio, AOR=1.31, 95% confidence interval, CI: 1.03–1.67) were significantly ($p=0.03$) more likely to have an intention to quit smoking for good compared to non-Hispanic Whites. Young adults aged 18–25 years (AOR=0.70, 95% CI: 0.58–0.85) were significantly ($p=0.01$) less likely to have an intention to quit compared to adults aged 50 years and older, and sexual minorities (i.e. lesbian, gay, bisexual) (AOR=0.69, 95% CI: 0.49–0.93) were significantly ($p=0.03$) less likely to have the intention to quit compared to heterosexuals. Among non-menthol smokers, adults aged 26–34 years (AOR=1.46, 95% CI: 1.13–1.88) and 35–49 years (AOR=1.71, 95% CI: 1.34–2.20) were significantly ($p=0.01$; $p<0.001$, respectively) more likely to have an intention to quit smoking for good compared to those aged 50 years and older.

CONCLUSIONS Study findings provide insight into the association of menthol cigarette consumption with intention to quit smoking for good, notably among Black Americans, young adults and sexual minorities. Smoking cessation efforts should consider demographics and menthol smoking status.

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INTRODUCTION

Menthol and non-menthol cigarette smoking is associated with smoking-related diseases (i.e. lung cancer, chronic obstructive pulmonary disease, heart disease) and premature death¹. While the overall

prevalence in cigarette smoking has decreased since the mid-20th century, the proportion of menthol cigarette smokers has increased in recent years^{2,3}. Notably, sociodemographic disparities in menthol cigarette smoking persist in the U.S.³. A higher

prevalence of menthol cigarette smoking has been documented among vulnerable groups, including Black/African Americans, women, young adults, and lesbian, gay, bisexual, and transgender individuals^{4,5}. Such disparities are due, in part, to the targeted marketing of menthol cigarettes by the tobacco industry^{6,7}. Moreover, menthol cigarettes appeal more to novice smokers, and evidence⁸⁻¹⁰ indicates that the flavor and cooling sensations of menthol mask the harshness of inhaling cigarette smoke and help to facilitate smoking initiation and nicotine dependence.

Smoking cessation is critical to address among smokers, given the risks of smoking-related diseases and premature mortality. Previous research⁶⁻⁸ suggests that menthol smokers may be less likely to have an intention to quit smoking due, in part, to menthol sensory qualities. This is significant because evidence^{11,12} indicates that having an intention to quit smoking is strongly associated with attaining cessation. Additionally, increasing a smoker's intention to quit is a key factor in smoking cessation interventions¹³. Given this knowledge, and because intention to quit smoking is an essential element of behavior change models^{14,15}, the association with menthol smoking status warrants investigation.

Thus, the objective of this study was to draw upon recent nationally representative data and identify and compare the sociodemographic correlates of intention to quit smoking for good between menthol and non-menthol adult smokers. Such knowledge of the ways in which menthol and non-menthol smokers differ with regards to sociodemographic factors underlying intention to quit for good, may help inform interventions and tobacco control policies that could improve smoking cessation outcomes.

METHODS

Data source

Data came from the 2013–2014 National Adult Tobacco Survey (NATS) public use files¹⁶. NATS is a landline and cellular telephone survey of non-institutionalized U.S. adult civilians aged 18 years and older. The sample comprised 70% landline and 30% cellular telephone only households. A total of 75 233 interviews were completed from October 2013 to October 2014, and the overall response rate was 36.1% (47.6% landline, 17.1% cellular). The complete

NATS methodology is published elsewhere¹⁶. This study was exempt from Institutional Review Board approval because NATS data were de-identified and available to the public.

Measures

Two questions from NATS were used to define current cigarette use: 'Have you smoked at least 100 cigarettes in your entire life?', with dichotomized 'yes/no' response options, and 'Do you now smoke cigarettes every day, some days, or not at all?' Respondents who reported smoking at least 100 cigarettes in their lifetime and reported now smoking cigarettes 'every day' or 'some days' were classified as current smokers. Menthol cigarette use was examined using the question: 'Currently, when you smoke cigarettes, how often do you smoke menthol cigarettes?' with response options 'all of the time', 'most of the time', 'some of the time', 'rarely', and 'never'. Because cigarette use has been shown to be occasional among certain sociodemographic groups (e.g. young adults, racial/ethnic minorities)¹⁷⁻²¹, respondents who reported smoking menthol cigarettes 'all of the time', 'most of the time' or 'some of the time' were classified as menthol smokers. Respondents who reported 'rarely' or 'never' were classified as non-menthol smokers.

Dependent variable

Intention to quit smoking for good was defined based on an affirmative response to the question: 'Are you thinking about quitting cigarettes for good?', with dichotomized 'yes/no' response options.

Independent variables

Sociodemographic variables were sex (male, female), age at survey (18-25=1, 26-34=2, 35-49=3, 50 and older=4), race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, non-Hispanic Other — Asian Americans/Hawaiian Pacific Islanders/American Indians/Alaskans), and highest education level (some high school, high school/general education diploma, some college, associate degree, bachelor degree, graduate degree). Sexual identity was determined using the question 'Do you identify yourself as...?' with the response options 'gay' (male respondents), 'lesbian' or 'gay' (female respondents), 'straight', 'bisexual' or 'something else'. Due to

sample size constraints, the sexual minority category created by Johnson et al.²², combining ‘gay’, ‘lesbian’, or ‘gay’, ‘bisexual’, and ‘something else’, which denoted a non-heterosexual identity, was used in this analysis.

Statistical analysis

The analytic sample size was 10 121. All estimates were weighted by NATS survey weights, which account for selection probabilities from the sampling design and adjust for survey non-response¹⁶. All estimates were computed in R V.3.2.0. Multivariable logistic regression models were used to identify the

significant correlates of intention to quit smoking for good separately for menthol and non-menthol smokers. A p-value of less than 0.05 was considered significant.

RESULTS

Among menthol smokers, non-Hispanic Blacks (AOR=1.31, 95% CI: 1.03–1.67, were significantly (p=0.03) more likely to have an intention to quit smoking for good compared to their non-Hispanic White counterparts (Table 1). Young adults aged 18–25 years (AOR=0.70, 95% CI: 0.58–0.85) were significantly (p=0.01) less likely have an

Table 1. Adjusted odds of intention to quit smoking for good among menthol and non-menthol smokers, by sociodemographics, National Adult Tobacco Survey, 2013–2014

Menthol smokers (N=5380)					Non-menthol smokers (N= 4771)				
	Quit Cigs Yes	Quit Cigs No	AOR	p		Quit Cigs Yes	Quit Cigs No	AOR	p
	Mean or (%) 95% CI	Mean or (%) 95% CI	95% CI			Mean or (%) 95% CI	Mean or (%) 95% CI	95% CI	
Sex									
Male (N=2652)	49.5 (48.0, 51.1)	51.3 (48.5, 54.2)	Ref	Ref	Male (N=2309)	48.5 (46.8, 50.2)	51.5 (48.7, 54.4)	Ref	Ref
Female (N=2637)	50.4 (48.8, 51.9)	48.6 (45.7, 51.4)	0.96 (0.79–1.16)	0.72	Female (N=2378)	51.4 (49.7, 53.1)	48.4 (45.5, 51.2)	1.03 (0.73–1.45)	0.65
Sexual identity									
Heterosexual (N=5026)	94.3 (93.6, 95.0)	92.6 (91.0, 94.0)	Ref	Ref	Heterosexual (N=4543)	95.9 (95.2, 96.6)	95.5 (94.1, 96.5)	Ref	Ref
Sexual minority (N=324)	5.6 (4.9, 6.3)	7.3 (5.9, 8.9)	0.69 (0.49–0.93)	0.03	Sexual minority (N=198)	4.0 (3.3, 4.7)	4.4 (3.4, 5.8)	0.87 (0.54–1.42)	0.51
Age									
18–25 (N=839)	14.5 (13.4, 15.6)	18.8 (16.7, 21.2)	0.70 (0.58–0.85)	0.01	18–25 (N=324)	6.9 (6.1, 7.8)	6.0 (4.8, 7.6)	1.24 (0.96–1.60)	0.29
26–34 (N=1005)	19.3 (18.1, 20.6)	16.7 (14.7, 18.9)	1.11 (0.87–1.43)	0.36	26–34 (N=503)	11.4 (10.3, 12.5)	8.8 (7.3, 10.6)	1.46 (1.13–1.88)	0.01
35–49 (N=1174)	22.4 (21.1, 23.7)	20.4 (18.2, 22.8)	1.06 (0.82–1.37)	0.57	35–49 (N=1072)	24.2 (22.7, 25.7)	19.1 (16.9, 21.4)	1.71 (1.34–2.20)	<0.001
≥50 (N=2332)	43.6 (42.0, 45.2)	43.9 (41.1, 46.7)	Ref	Ref	≥50 (N=2842)	57.4 (55.7, 59.1)	65.9 (63.1, 68.5)	Ref	Ref
Race/ethnicity									
NH White (N=3178)	58.8 (57.2, 60.4)	69.3 (66.5, 71.9)	Ref	Ref	NH White (N=3871)	82.6 (81.2, 83.8)	85.3 (83.1, 87.2)	Ref	Ref
NH Black (N=1012)	21.9 (20.6, 23.2)	12.4 (10.6, 14.5)	1.31 (1.03–1.67)	0.03	NH Black (N=161)	3.9 (3.3, 4.6)	2.0 (1.3, 3.1)	1.41 (1.12–1.54)	0.23
Hispanic (N=522)	10.1 (9.2, 11.1)	8.9 (7.4, 10.7)	1.23 (0.98–1.55)	0.26	Hispanic (N=278;0.05)	5.9 (5.2, 6.8)	5.4 (4.2, 6.9)	0.69 (0.44–1.07)	0.10
NH Other (N=503;0.09)	9.5 (8.6, 10.5)	9.7 (8.1, 11.6)	1.05 (0.81–1.36)	.73	NH Other (N=344)	7.4 (6.6, 8.4)	7.0 (5.7, 8.7)	0.90 (0.57–1.37)	0.53

Continued

Table 1. Continued

	Menthol smokers (N=5380)				Non-menthol smokers (N=4771)				
	Quit Cigs Yes	Quit Cigs No	AOR	p	Quit Cigs Yes	Quit Cigs No	AOR	p	
	Mean or (%) 95% CI	Mean or (%) 95% CI			Mean or (%) 95% CI	Mean or (%) 95% CI			
Education									
Some high school (N=788)	14.6 (13.5, 15.7)	15.2 (13.3, 17.4)	Ref	Ref	Some high school (N=606)	11.9 (10.8, 13.0)	14.8 (12.9, 17.0)	Ref	Ref
High school/GED (N=1799)	32.8 (31.3, 34.3)	35.2 (32.6, 38.0)	0.98 (0.84-1.44)	0.93	High school/GED (N=1521)	31.6 (30.0, 33.2)	33.6 (31.0, 36.3)	1.20 (0.96-1.58)	0.14
Some college (N=1012)	19.7 (18.5, 21.0)	16.4 (14.4, 18.6)	1.28 (1.02-1.62)	0.10	Some college (N=825)	17.6 (16.4, 19.0)	16.3 (14.3, 18.5)	1.31 (1.07-1.69)	0.06
Associate degree (N=870)	16.7 (15.5, 17.9)	15.1 (13.2, 17.3)	1.03 (0.86-1.23)	0.83	Associate degree (N=785)	17.0 (15.8, 18.3)	14.9 (13.0, 17.1)	1.36 (1.06-1.75)	0.03
Bachelor degree (N=559)	10.3 (9.4, 11.3)	11.1 (9.5, 13.1)	1.21 (0.96-1.53)	0.29	Bachelor degree (N=618)	13.3 (12.2, 14.6)	12.5 (10.7, 14.5)	1.46 (1.24-1.84)	0.02
Graduate degree (N=240)	4.3 (3.7, 4.9)	4.9 (3.8, 6.3)	0.83 (0.64-1.06)	0.46	Graduate degree (N=317)	6.9 (6.1, 7.9)	6.0 (4.7, 7.5)	1.39 (1.15-1.77)	0.12

AOR: adjusted odds ratio, CI: confidence interval, NH: non-Hispanic, cigs: cigarettes. Ref: reference. AORs control for the covariates shown. Bold values indicate a significant difference at $p < 0.05$.

intention to quit smoking for good compared to their counterparts aged 50 years and older. Additionally, sexual minorities (AOR=0.69, 95% CI: 0.49–0.93) were significantly ($p=0.03$) less likely to have an intention to quit smoking for good compared to their heterosexual counterparts.

Non-menthol smokers aged 26–34 years (AOR=1.46, 95% CI: 1.13–1.88) and 35–49 years (AOR=1.71, 95% CI: 1.34–2.20) were significantly ($p=0.01$; $p < 0.001$, respectively) more likely to have an intention to quit smoking for good compared to those aged 50 years and older. Non-menthol smokers with an associate degree (AOR=1.36, 95% CI: 1.06–1.75) and a Bachelor's degree (AOR=1.46, 95% CI: 1.24–1.84) were significantly ($p=0.03$; $p=0.02$, respectively) more likely to have the intention to quit smoking for good compared to those with some high school education.

DISCUSSION

This study is among the first to document an association between sexual identity and intention to quit smoking menthol cigarettes. Findings revealed that among menthol smokers, identifying with a sexual minority was associated with low intention to quit smoking for good compared to identifying as heterosexual. Black menthol smokers were

more likely to have an intention to quit smoking for good than their White counterparts, and young adult menthol smokers aged 18–25 were less likely to have an intention to quit compared to their older counterparts. Among non-menthol smokers, being aged 26–34 years, 35–49 years, and having an associate's or bachelor's degree was associated with high intention to quit smoking for good, compared to their counterparts aged 50 years and older, and those with less education. These findings highlight the need for increased effort to stimulate interest in quitting, including among sexual minority and young adult menthol smokers.

Previous research^{11,12} has associated long-term smoking cessation with intention to quit. Although higher odds of intention to quit for good among Black menthol smokers complements existing research²³, previous studies^{24,25} have found that Black smokers are less successful in quitting compared to White smokers. The reason for lower smoking cessation outcomes among Blacks is relatively understudied but this could be due to racially-targeted tobacco industry marketing^{6,7}, greater nicotine dependence^{26,27} and stress²⁸. Additional factors that have been suggested are perceived lack of social support²⁹, access and availability of evidence-based cessation resources³⁰, and advice to quit

smoking from primary care providers³¹. Given that most Black smokers prefer menthol cigarettes^{3,32,33}, culturally-specific smoking cessation interventions targeting Black menthol smokers may help reduce this disparity.

For more than a decade, the tobacco industry has increasingly targeted young adults aged 18–25 years^{34,35}. The 2009 Family Smoking Prevention and Tobacco Control Act (FSPTCA) gave the Food and Drug Administration (FDA) authority to regulate tobacco products in the U.S.³⁶. The FSPTCA banned the manufacture, import, and sales of characterizing flavors in cigarettes, except for menthol. Despite the FDA Tobacco Products Scientific Advisory (TPSAC) Board's comprehensive review of the scientific literature and recommendation⁸ that menthol be removed from the market, to date no regulatory actions have been taken. This study demonstrates the need to further examine quit intention among young adult menthol smokers. Young adult smokers are at increased risk for smoking-related diseases and premature mortality; quitting smoking before age 40 years can reduce smoking-related premature mortality by about 90%³⁷. In this study, non-menthol smokers aged 26–34 years and those aged 35–49 years were more likely to have an intention to quit for good compared to their older counterparts. Thus, interventions for educating young adult smokers about the increased risks of developing smoking-related diseases might be a useful strategy to increase their intention to quit smoking for good. Further, policy-level interventions regulating menthol cigarettes could also improve smoking cessation outcomes.

There remains a dearth of empirical evidence^{5,17} documenting the role of sexual identity in cigarette smoking and cessation in a nationally representative sample of adult smokers. Adding to the literature, this study found that menthol smokers who identified themselves with a sexual minority were less likely to have an intention to quit smoking for good compared to their heterosexual counterparts. Such results have implications for the development of prevention and cessation programs and highlight the need to understand the factors influencing these disparities. Moreover, the relationship between menthol smoking and smoking cessation among sexual minority subgroups (i.e. lesbian, gay, bisexual)

merits examination in longitudinal, population-based samples.

This study has limitations. NATS data are cross-sectional, and causality and temporal sequences cannot be defined. Therefore, factors beyond those examined in this study need further exploration. NATS data are subject to self-report response bias (e.g. recall, social desirability). To advance research in this area, future studies would benefit from a focus on quit attempts or smoking cessation among menthol and non-menthol smokers, with a distinction between daily and non-daily smokers. Notwithstanding, strengths of the NATS include reliability and weighted data, which make it possible to examine the generalizability of the study findings to U.S. adult cigarette smokers.

CONCLUSIONS

This study provides estimates of intention to quit smoking cigarettes for good among menthol and non-menthol smokers. Study findings inform a more recent description in the U.S. population and suggest that young adult menthol smokers aged 18–25 years have less intention to quit for good compared to their older counterparts. Additionally, findings indicate that sexual minority menthol smokers have less intention to quit smoking for good than their heterosexual peers. Identifying pathways and mechanisms underlying these disparities associated with menthol status, age and sexual identity, and developing intervention practices and policies to eliminate them, may help reduce inequalities in quitting smoking. Future research should focus on determining whether intention to quit smoking for good is associated with quit attempts and smoking cessation among menthol and non-menthol smokers of various levels (i.e. daily, non-daily) across sociodemographic groups.

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CONFLICTS OF INTEREST

The author has completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

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