Brief report

Menthol cigarette use in young adult smokers with severe mental illnesses

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ABSTRACT

Introduction: Smokers with severe mental illness (SMI) are more likely to start smoking and less likely to quit. Menthol may facilitate smoking progression, dependence, and maintenance by reducing harshness and irritation from smoking and providing a unique sensory experience during use. High rates of menthol use have been reported in smokers with SMI, but information on young adults with SMI has not been reported.

Methods: This study provides a secondary analysis to assess the impact of menthol use in a pilot trial of brief tobacco interventions. Participants were assessed at baseline and again at a 3-month follow-up with structured interviews and breath carbon monoxide to confirm self-reported 7-day abstinence at follow-up.

Results: Participants included 81 young adult smokers with SMI, mean age of 24.2 years ($SD = 3.6$; range 18–30). Overall, 58% of the group reported that they recently used a menthol-flavored product. Menthol use was correlated with race (African American [18/21, 85.7%] vs. White [24/53, 45.3%] or other race [5/7, 71.4%]; $\chi^2 = 10.7$, $p = .005$) and more lifetime psychiatric hospitalizations ($t = 2.39$, $p = .02$), but not with cigarettes per day, nicotine dependence, quit attempts over the follow-up period, nor with achieving biologically confirmed abstinence at the follow-up assessment.

Conclusions: The high prevalence of menthol-flavored cigarette use in this study group is consistent with previous reports of high rates of menthol use among young adults, Blacks, and middle-aged SMI smokers. This study supports existing evidence that policies to restrict menthol flavoring in combustible tobacco products could reduce smoking in young adults with SMI.

Implications: High rates of menthol use have been reported in middle-aged smokers with SMI, but information on young adults with SMI has not been reported. In this study, more than half (58%) of 81 young adult smokers with SMI used a menthol-flavored product. Menthol use was associated with race and with history of psychiatric hospitalizations. The research supports existing evidence that policies to restrict menthol flavoring in combustible tobacco products could reduce smoking in young adults with SMI.

Introduction

In contrast to the general decline in rates of smoking in the United States, rates of smoking in people with severe mental illnesses (SMI;

eg, schizophrenia, severe mood disorders) or severe psychological distress are declining at a slower rate.¹ Smokers with SMI are still more likely to start smoking and less likely to quit. These disparities

Table 1. Characteristics and Outcomes of Young Adult Smokers With SMI by Menthol Product Use

	Menthol smoker	Non-menthol smoker	Total sample
Baseline demographics	<i>n</i> = 47 (58.0%)	<i>n</i> = 34 (42.0%)	<i>N</i> = 81
Age, mean (<i>SD</i>)	24.4 (3.8)	25.2 (3.4)	24.8 (3.6)
Gender, men, <i>N</i> (%)	30 (63.8%)	21 (61.8%)	51 (63.0%)
Years of education, mean (<i>SD</i>)	11.8 (1.7)	11.32 (1.8)	11.6 (1.8)
Race			
White, <i>N</i> (%)**	24 (51.1%)	29 (85.3%)	53 (65.4%)
Black, <i>N</i> (%)**	18 (38.3%)	3 (8.8%)	21 (25.9%)
Other, <i>N</i> (%)	5 (10.6%)	2 (5.9%)	7 (8.8%)
Ethnicity, Hispanic, <i>N</i> (%)	7 (14.9%)	4 (11.8%)	11 (13.8%)
Marital status, single, <i>N</i> (%)	44 (93.6%)	31 (91.2%)	75 (92.6%)
Baseline clinical characteristics	<i>n</i> = 47 (58.0%)	<i>n</i> = 34 (42.0%)	<i>N</i> = 81
Diagnosis			
Schizophrenia/affective, <i>N</i> (%)	24 (51.1%)	11 (32.4%)	34 (42.0%)
Mood/anxiety, <i>N</i> (%)	23 (48.9%)	23 (67.7%)	47 (58.0%)
Lifetime hospitalizations, mean (<i>SD</i>)*	7.7 (10.0)	3.8 (4.0)	6.0 (8.2)
Alcohol use past 6 mo (yes)	30 (63.8%)	28 (82.4%)	58 (71.6%)
Marijuana use past 6 mo (yes)	15 (31.9%)	13 (38.2%)	28 (34.6%)
Baseline smoking history and characteristics	<i>n</i> = 47 (58.0%)	<i>n</i> = 34 (42.0%)	<i>N</i> = 81
Cigarettes/d, mean (<i>SD</i>)	12.8 (8.6)	16.0 (11.9)	14.2 (10.2)
Fagerström Dependence Score, mean (<i>SD</i>)	4.5 (2.0)	4.9 (2.1)	4.6 (2.0)
Age at first puff, mean (<i>SD</i>)	14.0 (4.7)	14.7 (3.2)	14.3 (4.1)
Age began daily smoking, mean (<i>SD</i>)	17.8 (3.5)	17.5 (3.7)	17.7 (3.6)
Intervention group	<i>n</i> = 47 (58.0%)	<i>n</i> = 34 (42.0%)	<i>N</i> = 81
Interactive	21 (44.7%)	9 (30.0%)	30 (37.0%)
Static	17 (36.3%)	11 (39.3%)	28 (34.6%)
None	9 (19.2%)	14 (60.9%)	23 (28.4%)
Three-month abstinence outcomes	<i>n</i> = 42 (58.3%)	<i>n</i> = 30 (41.7%)	<i>N</i> = 72
Reported quit attempt with ≥1-d abstinent (%)	19 (45.2%)	13 (43.3%)	32 (44.4%)
Self-report at least 7-d abstinent, <i>N</i> (%)	7 (16.7%)	3 (10%)	10 (13.9%)
Confirmed abstinent at 3-mo follow-up*, <i>N</i> (%)	2 (4.8%)	2 (6.7%)	4 (5.6%)

SMI, severe mental illness.

*Missing at follow-up assigned as smoking.

p* < .05; *p* < .01.

are seen even when looking at vulnerable subgroups such as young adults: Smoking among young adults with schizophrenia is two to three times more prevalent than in general population young adults.² Importantly, smoking is a key cause of excess morbidity and mortality in adults with SMI.³

Flavors in tobacco products may contribute to smoking prevalence in young adults with SMI. Recent studies have shown higher menthol cigarette prevalence in young adults in general,⁴ in young adults with anxiety and depression symptoms,⁵ and in middle-aged adults with severe psychological distress and with SMI.^{6,7} To date, no research has been published regarding the prevalence of menthol cigarette use among young adult smokers with SMI. The aim of this article is to report the prevalence and correlates of menthol use in this group.

Methods

We enrolled 81 English-speaking, daily smoking young adults with SMI into a pilot study of brief cessation interventions for smoking.⁸ Subjects were psychiatrically stable in outpatient treatment for SMI. They were assessed at baseline and 14-week follow-up. Within 2 weeks of baseline, those assigned to an intervention received it.

At baseline, trained research staff used a structured interview to assess demographics, history of psychiatric hospitalization, smoking history, nicotine dependence, and their current (past 3 mo)

tobacco product use. Participants were asked if they currently used any menthol cigarette/cigar products (yes/no). At baseline and follow-up, level of nicotine dependence was assessed with the Fagerström Test for Nicotine Dependence⁹ (with scores ranging from 0 to 10). Biologically verified abstinence and quit attempts during the follow-up period were assessed at 14 weeks. When participants reported past 7-day abstinence, this was verified with expired breath carbon monoxide levels less than 9 ppm (Smokerlyzer Breath Carbon Monoxide Monitor, Bedfont Scientific, Kent, England). Additionally, any self-reported quit attempts with at least 1 day of abstinence during the follow-up period were captured with the Timeline Follow-Back method. We used descriptive statistics, *t* tests, chi-square tests, and logistic regressions to compare characteristics and outcomes among menthol versus non-menthol users, controlling for study condition and ethnicity, which was different between study conditions.⁸

Results

As shown in Table 1, the group included 81 young adults with a mean age of 24.8 years (*SD* = 3.6; range 18–30). Almost two-thirds of the group were men (51; 63.0%), 21 participants (25.9%) reported their race was Black, and 11 participants (13.6%) reported their ethnicity was Hispanic. Just under half of the group (*n* = 34, 42.0%) had diagnoses of schizophrenia-spectrum disorders, and the rest had

diagnoses of severe mood or anxiety disorders ($n = 47$; 58.0%). The group reported a mean of 6.0 ($SD = 8.2$) psychiatric hospitalizations over their lifetime. Mean Fagerström Nicotine Dependence Score was 4.6 ($SD = 2.0$).

Almost half of the group ($n = 32$; 44.4%) reported quit attempts with at least 1 day of abstinence over the follow-up; four participants (5.6%) were assessed as having biologically confirmed abstinence at the 14-week assessment.

Overall, 58% of the group (47 of 81 participants) reported that they used a menthol-flavored product. Menthol use was correlated with race (African American [18/21, 81.8%], White [24/53, 45.3%], and other race [5/7, 71.4%]; $\chi^2 = 10.7$, $p = .005$) and more lifetime psychiatric hospitalizations ($t = 2.39$, $p = .02$), but not with cigarettes per day ($t = 1.35$, $p = .18$) and nicotine dependence ($t = 1.01$, $p = .31$). Use of menthol was not significantly associated with quit attempts over the follow-up period, nor with achieving biologically confirmed abstinence at the follow-up assessment.

Discussion

In this study, sample of young adult smokers with SMI recruited from treatment settings, a majority (58%) used menthol-flavored cigarettes. Our results are consistent with general population surveys that have reported high rates of use of menthol-flavored products among young adult smokers (50%),⁴ among adult smokers with severe psychological distress (38%),^{6,7} and among African American smokers.⁴ Specifically, among young adult SMI smokers in this study, 24/53 (45.3%) of Whites and 18/22 (81.8%) of Blacks reported menthol use. In comparison, among National Survey on Drug Use and Health (NSDUH) survey general population young adults aged 18–24 years, 41.7% of Whites vs. 84.3% of Blacks reported menthol use.⁴ Although most participants had used cigar products, we did not assess whether the cigar products used were menthol flavored.

In the only other study that addressed menthol cigarette use in adult smokers with SMI,⁷ psychotic disorder and severity of psychotic symptoms were correlated with menthol cigarette prevalence. We did not find significant differences in menthol cigarette use by diagnosis, but found a novel correlation between severity of mental illness and menthol cigarette use when examining lifetime number of psychiatric hospitalizations. These two studies are consistent in highlighting that menthol cigarettes appear to be preferred by those with the most SMI, and our study found this relationship within a highly vulnerable subgroup of smokers with SMI: young adults. These two studies are also consistent in finding no relationship between menthol cigarette use and addiction-related factors (ie, number of cigarettes per day, level of dependence) in smokers with SMI.^{6,7} Additionally, our study, which tested brief interventions, found no difference in cessation outcomes in menthol versus non-menthol smoking young adults with SMI.

Menthol may facilitate smoking progression, smoking maintenance, and higher levels of addiction by reducing harshness and irritation from smoking and providing a unique sensory experience during use,¹⁰ both of which might be particularly relevant to smokers with SMI, who tend to smoke more deeply and heavily.¹¹ This notion is supported by some laboratory studies. For example, Williams et al. found higher levels of nicotine, cotinine, and breath carbon monoxide in menthol smokers with and without schizophrenia than in non-menthol smokers,¹² and Ross et al. used predictive models finding that menthol, as well as puff volume, cigarettes per day, and gender, predicted greater levels of total nicotine metabolites in African American smokers.¹³ However, survey research such as data from the National Health and Nutrition Examination Survey (NHANES) study has not

documented greater serum cotinine concentrations related to menthol smoking,¹⁴ and other laboratory studies examining the relationship between smoking topography and menthol use have had varied methodological quality and mixed results (eg, ^{15–17}).

Other factors may also be important in explaining why young adults with SMI may have higher rates of menthol use. Demographics that predict menthol use in the general population, such as low socioeconomic status, could be prevalent in young adult SMI smokers, but we did not measure income. Marketing of menthol cigarettes targeted either to people with these overlapping demographic characteristics or to people with mental health concerns^{18,19} may be implicated in the higher prevalence of menthol use in young adult smokers with SMI. Future research is needed to understand the mechanisms that increase preference for menthol versus non-menthol cigarettes in many populations, including smokers with SMI.

This pilot intervention study was not designed to evaluate the prevalence of menthol use and was limited by its small sample size recruited in only three states; thus, our findings must be interpreted with caution and need replication in larger samples that are representative of young adults with SMI. Nevertheless, these data provide novel information about a previously understudied group. This study extends previous research on higher prevalence of menthol cigarette use in smokers with SMI to the subpopulation of young adult smokers with SMI. It also identifies a potential new indicator of disease severity to be used in future studies among those with SMI: lifetime number of psychiatric hospitalizations.

This study supports existing evidence that policies to restrict menthol flavoring in combustible tobacco products could reduce smoking in young adults with SMI. Additionally, such restrictions on menthol flavoring might help to address future disparities in tobacco-related morbidity and mortality in people with SMI.

Funding

This study was funded by the National Cancer Institute (USA). ACV was supported by the Centers of Biomedical Research Excellence P20GM103644 award from the National Institute of General Medical Sciences.

Declaration of Interests

MFB had funding from Alkermes to conduct research on medication treatment for schizophrenia and alcohol disorder. The remaining authors did not report potential conflicts of interest.

Acknowledgments

The authors gratefully acknowledge the support of the study participants, the service providers at the participating Agency's programs, and the Research Departments at these agencies for their contributions to this study.

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