The Role of Menthol in Nicotine Dependence Among Light Smokers

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Making the Difference in Tobacco-Related Health Disparities Science
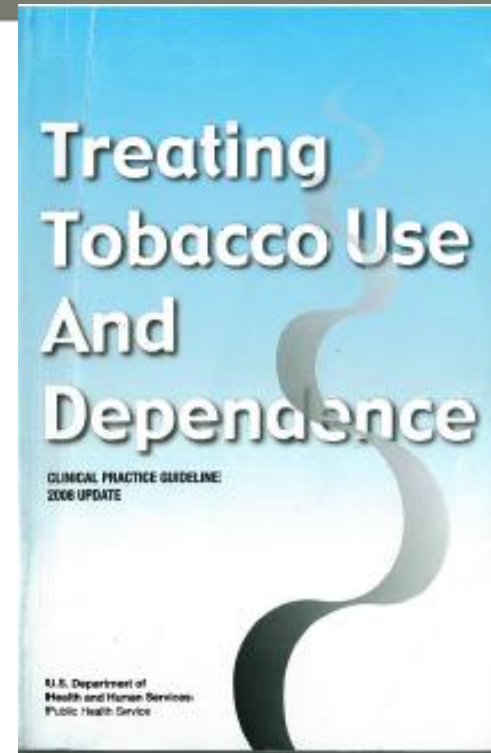Pooks Hill Marriott
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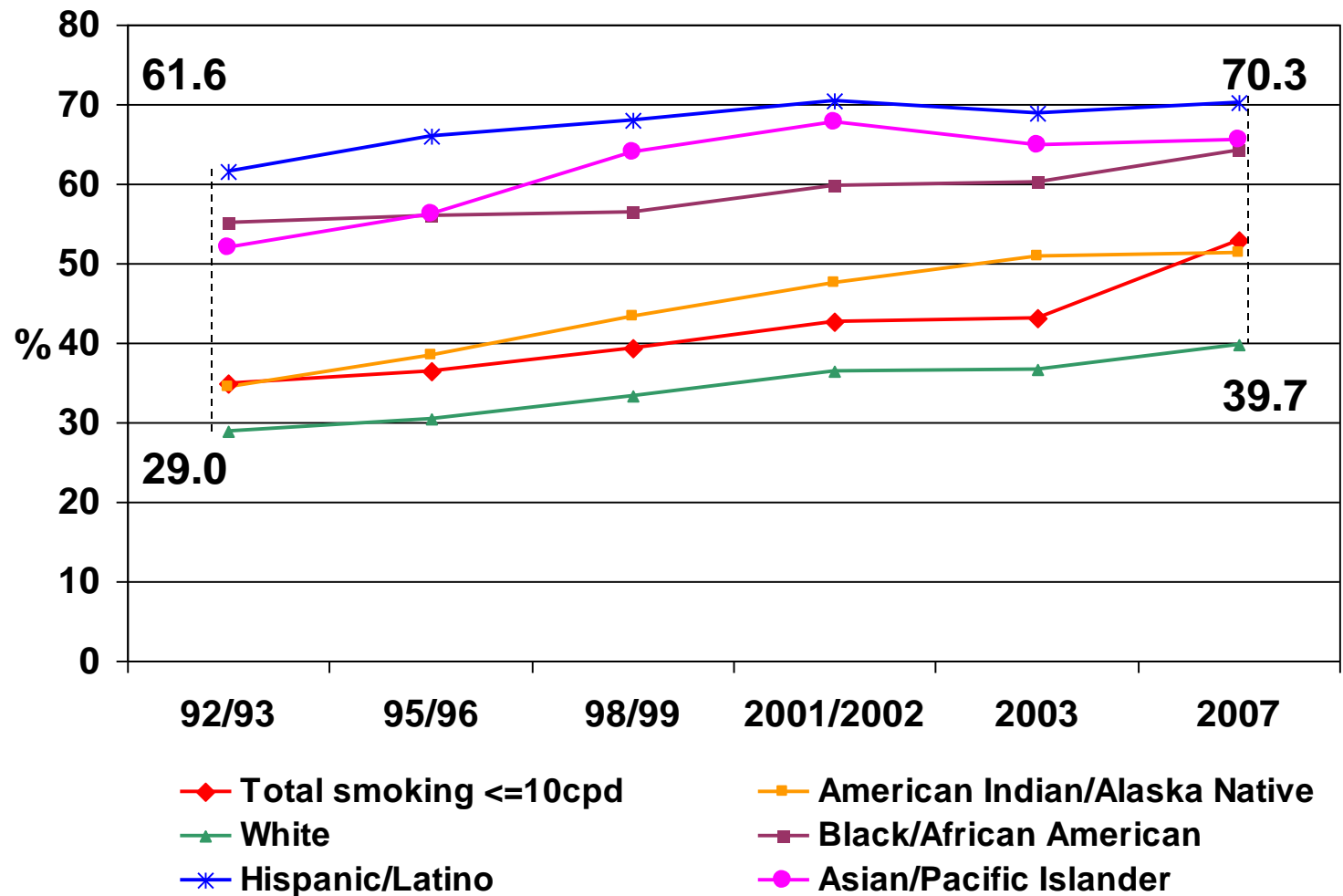October 25, 2010

Goals of Presentation

- Discuss importance of identifying appropriate behavioral targets for smoking

- Present data on light smoking prevalence

- Present data on nicotine dependence among menthol and non-menthol smokers with different levels of smoking intensity

- Discuss future directions for research, policy, and practice

# Identifying the Appropriate Behavioral Targets

- Cessation interventions, theoretical frameworks, and concepts of addiction modeled on heavy smoking.

- Harmful health effects remain for light smokers.

- Light smoking expected to increase as a result of demographics and policies.

- 2008 PHS Guidelines acknowledged

   that light smokers need to be identified, strongly urged to quit, and provided counseling cessation services (B).

- Additional research required with regard to evaluating the effectiveness of specific counseling and medication interventions with light smokers.

Treating Tobacco Use And Dependence

CLINICAL PRACTICE GUIDELINE
2008 UPDATE

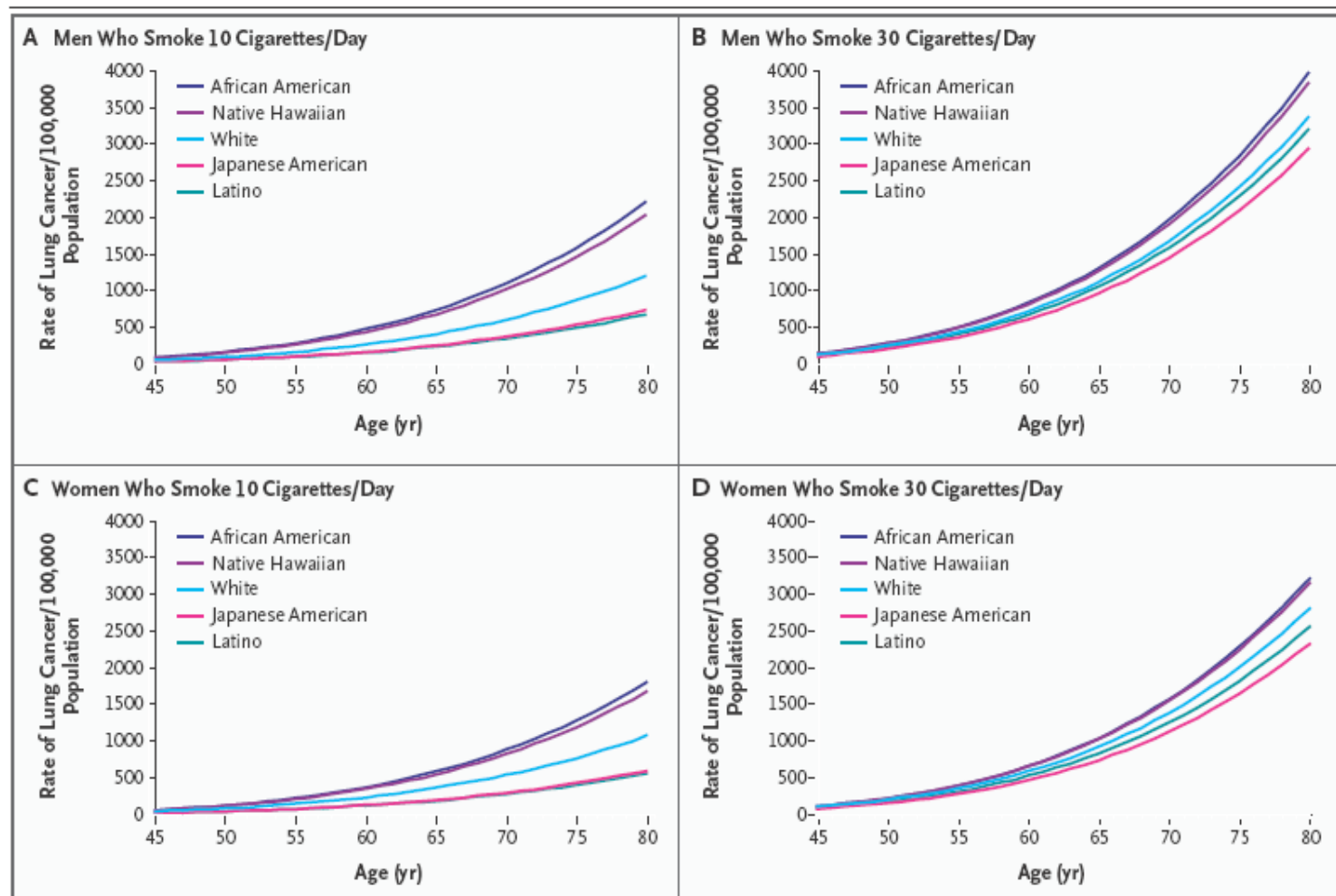U.S. Department of
Health and Human Services
Public Health Service

Percent of U.S. Adult Smokers Consuming ≤10 CPD By Race/Ethnicity: TUS-CPS, 1992-2007

Percent of Low Income (<25K) U.S. Adult Smokers Consuming ≤10 CPD by Race/Ethnicity: TUS-CPS, 1992-2007
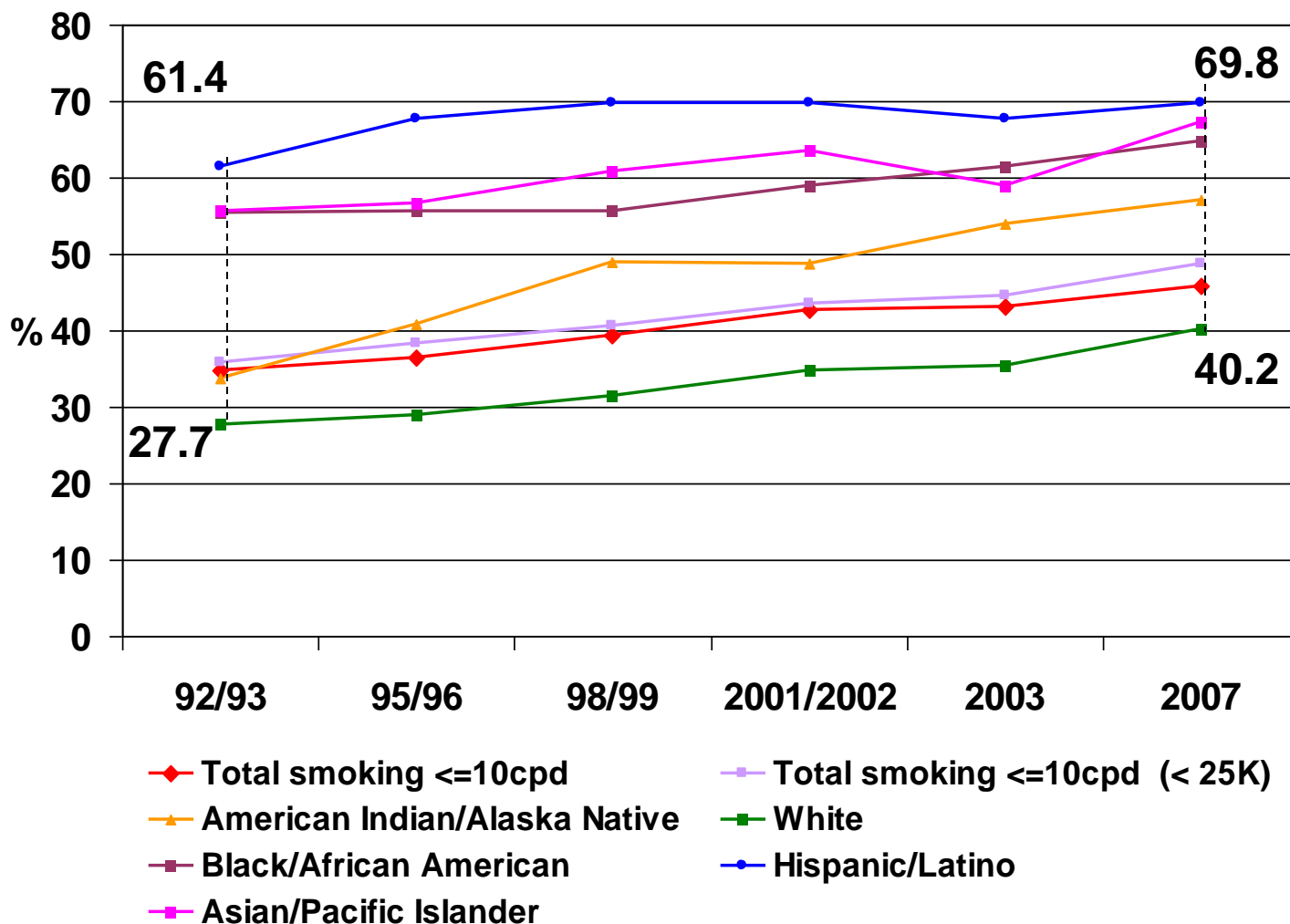
Predicted Rates of Lung Cancer among Men and Women Who Currently Smoke ≤10 CPD or ≥30 CPD: Multiethnic Cohort Study (1993-2001)

Figure 1. Predicted Rates of Lung Cancer among Men Who Currently Smoke 10 Cigarettes per Day (Panel A) or 30 Cigarettes per Day (Panel B) and among Women Who Currently Smoke 10 Cigarettes per Day (Panel C) or 30 Cigarettes per Day (Panel D).

Light Smoking and Menthol Cigarettes

- Studies show that menthol smokers consume fewer cigarettes per day compared with non-menthol smokers (1,2,3).

- Studies show that menthol smokers are more likely to report shorter time to first cigarette (4,5) and more likely than non-menthol smokers to show signs of nicotine dependence (6,7).

Aims

- To increase our understanding of the contribution of smoking intensity (cpd) in discriminating nicotine dependence and quitting behaviors among menthol and non-menthol smokers, we examined the associations between usual cigarette brand (i.e. menthol, non-menthol) and

  – 1) **markers for nicotine dependence (time to first cigarette within waking)**

  – 2) quitting behaviors among <u>daily</u> current smokers in the United States who smoking cigarettes only.

Design and Methods

- Cross-sectional data on daily current smokers aged 18+ (n=46,273) using 2003 and 2006/2007 Tobacco Use Supplements to the Current Population Survey.
    - http://riskfactor.cancer.gov/studies/tus-cps/

- The Current Population Survey (CPS) is administered by the United States Census Bureau. The U.S. Census Bureau uses a multistage probability design to collect data from about 59,000 households monthly to produce reliable national and state estimates on labor force characteristics among the civilian, non-institutionalized U.S. population aged 15 and older.

- Interviews are conducted in person and by telephone (70%) using computer assisted interviewing.

- The Tobacco Use Supplement (TUS) is conducted in conjunction with the CPS every three years to collect data on tobacco use and related attitudes and practices.

- Response rate 83% for 2003, 2006/2007

Measures

- CPS variables: gender, age, race/ethnicity, marital status, educational attainment, annual family income, employment/occupation, region, metropolitan status, survey year.

- TUS variables: age of onset, years smoked daily, smoking intensity, smoking status 12 months ago, usual brand, time to first cigarette, quit attempts, period of abstinence among those who had a quit attempt, intention to quit in next 30 days.

Key Questions:

- Is your usual brand of cigarette menthol or non-menthol?
- How soon after you wake up do you typically smoke your first cigarette of the day?
- How many times in the past year did you stop smoking one day or longer because you were trying to quit smoking?
- Longest period of abstinence in past 12 months because you were trying to quit smoking?

Outcomes

Nicotine Dependence
- **Time to first cigarette ≤30 min vs. >30 minutes**
- **Time to first cigarette ≤5 minutes vs. > 5 minutes**

Quit attempts
- One or more quit attempt vs. none in past 12 months

Period of smoking abstinence
- >2 weeks vs. ≤ 2 weeks (in past 12 months)

Analysis

- Bivariate and multivariate logistic regression models were stratified by smoking intensity: ≤5, 6-10, 11-19, and 20+ cigarettes per day.

- No usual type and persons who use multiple forms of tobacco excluded (N=46,273)

- SUDANN 9.0.1 to account for complex sample design and weight of respondents.

Smoking Characteristics Among Adult Daily Current Smokers: TUS-CPS 2003, 06/07 (n=46,273)

	Menthol (n=11,671)	Non-menthol (n=33,644)	No Usual Type (n=958)
Age Of Onset			
<15	17.94 (2109)	19.65 (6758)	21.94 (220)
15-17	36.71 (4167)	38.54 (12753)	36.98 (348)
18+	44.15 (5265)	40.92 (13850)	37.85 (360)
Total Years Smoked Daily			
0-10	30.03 (2869)	24.48 (6909)	29.53 (239)
11-20	23.11 (2732)	24.51 (8390)	22.10(208)
21-30	23.22 (2864)	22.34 (7875)	20.40 (216)
31+	21.46 (2944)	26.94(9916)	23.49(254)
Unknown	2.17 (262)	1.73 (554)	4.48 (41)
Cigarettes Per Day			
≤5	10.75 (1168)	7.83 (2373)	14.12 (127)
6-10	32.41 (3693)	24.52 (8180)	29.36 (275)
11-19	13.82 (1649)	13.89 (4756)	10.14 (109)
20+	43.03 (5161)	53.76 (18335)	46.38 (447)

National Cancer Institute

Smoking Characteristics Smoking Characteristics Among Adult Daily Current Smokers: TUS-CPS 2003, 2006/07 (n=46,273)

	Menthol (n=11,671)	Non-menthol (n=33,644)	No Usual Type (n=958)
First Cigarette Within 30 Minutes After Waking			
Yes	42.21 (4916)	43.09 (14917)	34.39 (342)
No	55.28 (6484)	54.62 (18034)	54.17 (504)
Varies	2.51 (271)	2.29 (693)	11.44 (112)
Time to First Cigarette			
0-5	22.27 (2562)	22.17 (7704)	15.26 (156)
6-10	9.11 (1066)	9.51 (3274)	9.08 (81)
11-15	7.03 (842)	7.50 (2599)	6.34 (66)
16+	59.09 (6930)	58.52 (19374)	57.88 (543)
Varies	2.51 (271)	2.29 (693)	11.44 (112)
Smoking Status 12 Months Ago			
Every day	90.71(10616)	92.47 (31192)	87.08 (842)
Some days	5.88 (644)	4.19 (1329)	7.39 (66)
Not at all	3.36(402)	3.28 (1105)	5.53 (50)

Smoking Characteristics Smoking Characteristics Among Adult Daily Current Smokers: TUS-CPS 2003, 2006/07 (n=46,273)

	Menthol (n=11,671)	Non-menthol (n=33,644)	No Usual Type (n=958)
Quit Attempt One Day or Longer in Past 12 Months			
Yes	33.79 (3825)	31.94 (10848)	20.38 (217)
No	66.21 (7846)	68.06 (22796)	79.62 (741)
Longest Quit Attempt in Past 12 Months			
≤2 weeks	67.55(2561)	67.20(7311)	61.58(135)
>2 weeks -<1 month	6.61(272)	7.25(805)	2.77(10)
1-3 months	15.92 (606)	15.60 (1690)	17.77 (40)
>3-6 months	4.51 (187)	5.14 (558)	9.85 (19)
>6 months	5.31 (199)	4.81 (484)	8.02(13)

Mean Smoking Characteristics Among Adult Daily Smokers:TUS-CPS, 2003, 2006/07

	Menthol mean (SE)	Non-menthol mean (SE)	No usual type mean (SE)
Cigarettes Per Day	13.05 (0.09) +*	15.01 (0.06)†*	12.53 (0.38)
Time to First Cigarette After Waking (minutes)	22.46 (0.40)	21.77(0.23)†***	27.07 (1.86)
Number of Quit Attempts One Day or Longer in Past 12 Months Among Smokers Who Made a Quit Attempt	2.23(0.04)+***	2.14(0.02)	2.25 (0.17)
Longest Length of Abstinence in Past 12 Months Among Smokers Who Made a Quit Attempt (months)	0.32 (0.01)	0.32 (0.01) †***	0.46(0.07)^***

Note:

+ = significant differences between menthol vs. non-menthol p-value < .001* , .01**, .05***

^=significant differences between menthol vs. no usual type p-value < .001* , .01**, .05***

†= significant differences between non-menthol vs. no usual type p-value < .001* , .01**, .05***

Adjusted and Unadjusted Odds Ratios for Time to First Cigarette Among Daily Smokers Consuming ≤5 and 6-10 Cigarettes Per Day: TUS-CPS, 2003, 2006/07[a]

	≤5cpd				6-10cpd			
Variable	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
First cigarette within 30 minutes of waking (yes)								
Menthol	**1.35 (1.12,1.61)**	**0.00**	1.19 (0.96,1.50)	0.11	**1.25 (1.13,1.38)**	**0.00**	1.09 (0.97,1.22)	0.15
Non-menthol	1.00		1.00		1.00		1.00	
First cigarette within 5 minutes of waking (yes)								
Menthol	1.24 (0.89,1.74)	0.20	0.94 (0.60,1.47)	0.79	**1.51 (1.31,1.74)**	**0.00**	**1.22 (1.05,1.43)**	**0.01**
Non-menthol	1.00		1.00		1.00		1.00	

a.The denominator for all analyses included daily smokers who reported cigarette use only. b. Covariates varied for each model depending on level of significant and included race/ethnicity, gender, age, marital status, educational attainment, annual family income, education/occupation, region, metropolitan status, smoking status 12 months ago, age of onset, years smoked daily, and survey year.

Summary

National Cancer Institute

- Menthol smokers reported significantly lower mean cpd than non-menthol smokers.

- Daily menthol smokers consuming 6-10 cigarettes per day show greater signs of nicotine dependence compared to non-menthol smokers.

Future Directions for Research, Practice, and Policy

Research

- Additional studies on nicotine dependence in laboratory to increase our understanding of what we observe at the national level, such as studies that examine multiple measures of dependence and smoking topography among smokers at different levels of intensity.

- Studies to determine the role of taste as a function of genetics and its role in influences smoking and quitting among light smokers.

- Studies to determine how taste preference based on genetics may be used to prevention smoking uptake among groups who tend to be light smokers.

- Studies to determine the role that menthol may play in increasing risk for exposure to carcinogens and lung cancer risk among light smokers of different ethnicities.

Practice

- Need to work with practitioners to increase awareness of the risk of light smoking.
- Need to test the efficacy of evidence-based cessation interventions among light smokers in multiple settings.

Policy

- Studies are needed to examine how the implementation of multiple policies including the Family Smoking Prevention and Tobacco Control Act, impact smoking behaviors, brand choice, cpd, design and delivery of menthol, and marketing practices impact smoking among lighter smokers.

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National Cancer Institute

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