Racial Disparities and Risk Factors of E-Cigarette Use

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Introduction

Background:

- Compared to non-Hispanic Whites, non-Hispanic Black and Hispanic individuals are less likely to become exclusive e-cigarette users.[1]
- Socioeconomic differences such as education and income also play a role in differences in e-cigarette use, e.g., adults with lower educational attainment using more tobacco products and low-income smokers being less likely to use e-cigarettes.[1]
- Blacks and Asians are more likely to trust e-cigarette companies with information about the health effects of e-cigarettes than whites.[2]
- Black and Hispanic smokers are more likely to have positive tobacco-related social norms[1], and non-Hispanic Blacks have been found to have the highest prevalence of cigarette use and cigar use.[3]

Gaps:

- Even though there is significant literature exploring racial differences in e-cigarette use, there is a lack of systematic research examining risk factors that may contribute to these racial differences.

Objective:

- Our study sought to identify racial disparities in e-cigarette use and to determine risk factors that help to explain these differences.

Methods

Dataset

The Wave 5 Adult Population Assessment of Tobacco and Health (PATH) Study.

Subjects

US adults (≥18) who self-identify and do not self-identify as current, established e-cigarette smokers.

- Race-ethnicity was categorized into non-Hispanic White, non-Hispanic Black, non-Hispanic other, and Hispanic.

Potential risk factors

Total household income, education level, self-perception of mental health, perception of e-cigarette harm, social influences, former smoking, and reception of e-cigarette discounts or coupons.

Analysis

All analysis was conducted through R.

- Descriptive statistics of e-cig use across our risk factor variables and chi-square tests to determine the significance of these factors in explaining e-cigarette use.
- Multiple logistic regression to check the risk effects adjusting all covariates.
- Mediation analysis[4] to determine whether identified risk factors showed evidence of influencing the association between race and e-cigarette use.

Tables and Figures

Figure 1: Risk factor relationship to race and e-cigarette

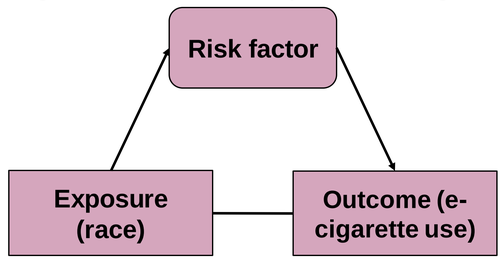
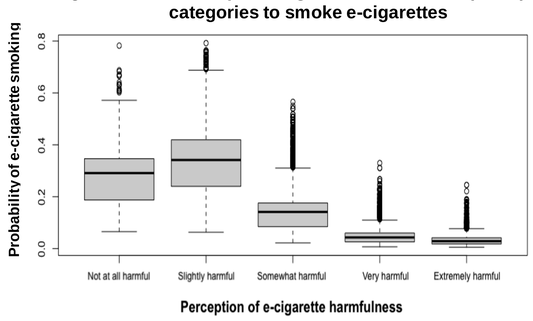


Table 2: Multiple Logistic Regression Adjusted Odds Ratios (aoR)

Factor		aOR
Race	Non-Hispanic White	(ref)
	Non-Hispanic Black	0.472**
	Hispanic	0.615**
	Non-Hispanic Other	0.994
Education	Less than HS	(ref)
	GED	1.368*
	HS grad	1.279**
	Some college	1.355**
	Bachelor's or higher	0.511**
Income	0-10k (ref)	(ref)
	10-25k	0.902
	25-100k	0.774**
	100k+	0.846
Received e-cig ads	Yes	(ref)
	No	0.266**
Mental Health	Excellent, very good, good	(ref)
	Fair	1.551**
	Poor	2.094**
Perception of Harmfulness	Not at all	(ref)
	Slightly	0.991
	Somewhat	0.275**
	Very	0.066**
	Extremely	0.044**
People important to you use cigs	Yes	(ref)
	No	0.951**
Former smoker	Yes	(ref)
	No	0.692**

Figure 2a: Probability of e-cigarette harmfulness perception categories to smoke e-cigarettes



*: $p < 0.05$, **: $p < 0.01$

Table 1: Descriptive Analysis Prevalence of E-Cigarette Use Between Races

Race	Prevalence of e-cigarette use
non-Hispanic White	0.062**
non-Hispanic Black	0.036**
Hispanic	0.036**
non-Hispanic other	0.05**

Table 3: Mediation Analysis Odds Ratios of E-Cigarette Use between Races

Race	Odds Ratios
non-Hispanic White	(ref)
non-Hispanic Black	0.352 (0.295-0.414)**
Hispanic	0.553 (0.483-0.63)**
non-Hispanic other	0.961 (0.807-1.133)

Figure 2b: Comparison of e-cigarette harm perception by race

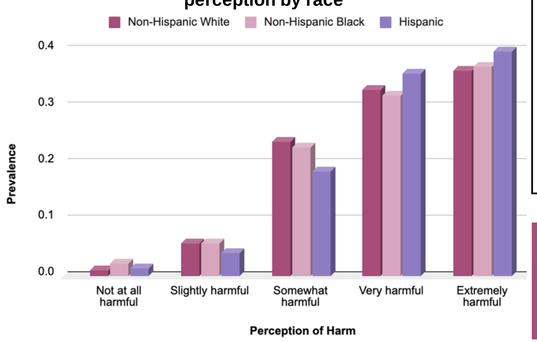


Figure 3a: Probability of participants who have/have not received e-cigarette advertising to smoke e-cigarettes

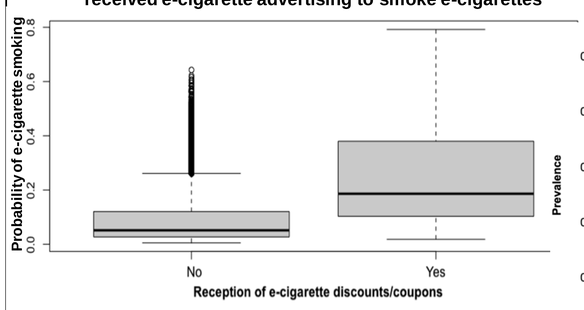


Figure 3b: Comparison of e-cigarette discount/coupon reception (Yes) by race

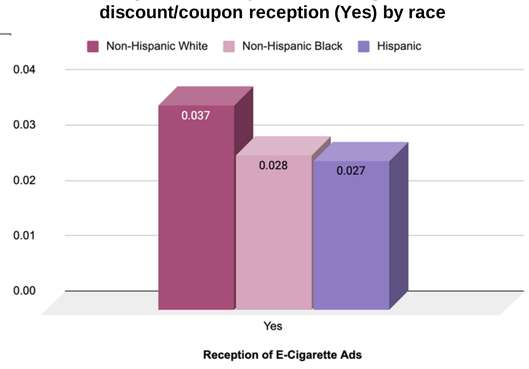
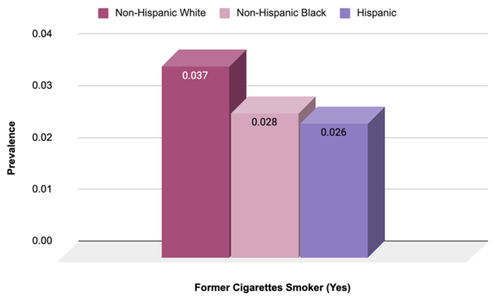


Figure 4a: Probability of participants who are/are not former cigarette smokers to smoke e-cigarettes

Figure 4b: Comparison of former cigarette smoker status (Yes) by race



Results (cont'd.)

- Compared with non-Hispanic Whites, both the non-Hispanic Black and the Hispanic populations were significantly less likely to use e-cigarettes.
- There is no significant difference in e-cigarette use between non-Hispanic White and non-Hispanic other populations.
- Mediation analysis found risk factors that significantly (p-value < 0.05) help explain differences in the e-cig use between non-Hispanic Black and non-Hispanic White populations and between Hispanic and non-Hispanic White populations. The factors include former cigarette smoking, receiving e-cigarette advertising, and perception of e-cigarette harm.
- Between Hispanic and non-Hispanic White populations, the included risk factors collectively explain 17.5% of racial difference (95% C.I.: 8.8-26.9%), where former cigarette smoking explains 7.6% (95% C.I.: 5.3-10.6%), receiving e-cigarette advertising 2.6% (95% C.I.: 1.2-4.3%), and perception of e-cigarette harm explains 27.8% (95% C.I.: 21-36.4%) of the racial difference.
- Between non-Hispanic Black and non-Hispanic White populations, former cigarette smoking, receiving e-cigarette advertising, and perception of e-cigarette harm explain 5.2% (95% C.I.: 3.3-10.3%), 1.8% (0.9-2.7%), and 6.8% (95% C.I.: 3.7-7.8%) of the racial difference, respectively.

Conclusion

- E-cigarette use is most prevalent in the non-Hispanic White population compared to non-Hispanic Black and Hispanic populations, which may be explained by former cigarette smoking, receiving e-cigarette advertising, and e-cigarette harm perception.
- These findings suggest that racial differences in e-cigarette use may be reduced by increasing knowledge of dangers associated with e-cigarette use and reducing exposure to e-cigarette advertisement.
- This study's results may be useful in helping policy-makers determine, by examining racial demographics in their communities, where to focus their smoking cessation efforts.

References

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