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PA26-1 EVIDENCE FOR A CAUSAL EFFECT OF COFFEE CONSUMPTION ON HEAVINESS OF SMOKING AND SMOKING CESSATION: A TWO-SAMPLE MENDELIAN RANDOMISATION ANALYSIS

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Coffee consumption is associated with a range of smoking behaviours. Given the widespread use of coffee worldwide, and the substantial health burden posed by smoking, determining the causal impact of coffee consumption on smoking behaviour is of clear public health importance. However, traditional observational studies do not allow us to confidently determine direction of causality between variables, and cannot rule out the possibility of confounding. Mendelian randomisation (MR) offers a solution to these issues. This approach uses genetic variants which robustly associate with an exposure of interest (e.g., coffee consumption) as proxies for said exposure. We performed two-sample MR analyses, using publicly available data, to explore the causal effect of coffee consumption on smoking initiation, smoking heaviness, and smoking cessation. Data from the Coffee and Caffeine Genetics Consortium and the Tobacco and Genetics consortium were used to estimate gene-exposure and gene-outcome associations respectively. Summarised estimates from multiple genetic variants were combined using fixed effects meta-analysis. No evidence for a causal effect of coffee consumption on smoking initiation was observed. However, we observed evidence consistent with a causal effect of coffee consumption on smoking heaviness. Each additional cup of coffee consumed per day corresponded to a ~1.5 cigarette per day decrease in daily consumption (beta -1.49, 95% CI -2.88 to -0.09, $p=0.037$). This relationship may be mediated by caffeic acid, a polyphenol present in coffee which inhibits the activity of CYP2A6, a nicotine metabolising enzyme. We also observed evidence consistent with a causal impact of coffee consumption on smoking cessation. Each additional cup of coffee consumed per day corresponded to a 26% reduction in the odds of being a former (relative to current) smoker (OR 0.74, 95% CI 0.56 to 0.98, $p=0.038$). This effect may be due to the impact of cigarette smoke on caffeine metabolism, and the resultant experience of caffeine toxicity following smoking cessation. These results have the potential for clinical application, and would benefit from follow-up in an experimental setting.

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JUSTIFICATION: We observed evidence that was consistent with a causal impact of coffee consumption on smoking heaviness and smoking cessation: increased coffee consumption reduces daily cigarette consumption, but also reduces the odds of successful smoking cessation. These observations, which are supported by plausible biological mechanisms, hold the potential for clinical application and would benefit from follow-up in an experimental setting.

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PA26-2 EFFECT OF VOLUNTARY E-CIGARETTE WARNING LABELS ON RISK PERCEPTIONS AMONG ADULT SMOKERS AND DUAL USERS

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Unlike tobacco products, electronic vapor products (e.g., e-cigarettes, vape pens) are not currently required by law to contain a Surgeon General warning on their packaging. In September 2014, Nu Mark, an Altria subsidiary, began

voluntarily adding a self-designed warning label to its packages of MarkTen brand e-cigarettes. This study assesses awareness of the MarkTen warning label and whether exposure to the warning label influences beliefs about e-cigarettes. A national convenience sample of 1,201 adult smokers (current use of cigarettes only) and dual users (current users of cigarettes and e-cigarettes) was surveyed in November 2014 with respondents being randomized to one of three conditions: MarkTen pack image with warning label, MarkTen pack image without warning label, or no pack image. Self-reported awareness of the warning label was high in the warning label condition (70.0%) and no warning label condition (50.6%), indicating that consumers may already expect these products to contain warning labels. Logistic regression models compared risk perceptions and beliefs among those in the two pack image conditions (with and without warning label), controlling for dual use, awareness of the MarkTen brand, age, gender, race/ethnicity, and income. Respondents in the warning label condition were three times more likely to agree that "MarkTen brand e-cigarettes contain dangerous chemicals" (aOR=3.29, $p<0.001$) and twice as likely to agree that "MarkTen brand e-cigarettes are dangerous to your health" (aOR=2.39, $p<0.001$) than those in the no label condition. Respondents in the warning label condition were also less likely to agree that they would buy MarkTen brand e-cigarettes "to reduce health risks of smoking" (aOR=0.75, $p=0.048$) and that "nicotine in MarkTen brand e-cigarettes provides the help that smokers need to quit" (aOR=0.71, $p=0.023$) than those in the no label condition. These results suggest that MarkTen's voluntary warning labels on e-cigarettes were noticed by consumers and may influence perceptions about the dangers of these products, the risks of e-cigarettes relative to cigarettes, and e-cigarette use as a cessation aid.

FUNDING: This work was funded under a RTI International contract with the Florida Department of Health's Bureau of Tobacco Free Florida.

JUSTIFICATION: This research provides policymakers with evidence regarding the influence of a voluntary, manufacturer-designed warning label on e-cigarette packaging on smokers' and dual users' perceptions of e-cigarettes.

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PA26-3 GLOBAL APPROACHES TO E-CIGARETTE REGULATION

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Background: E-cigarettes and other electronic nicotine delivery systems vaporize liquid that can produce an aerosol. A policy scan was conducted to identify strategies taken by national governments to regulate ENDS.

Methods: Countries that contributed to the Report on e-cigarettes to WHO Framework Convention on Tobacco Control (July, 2014) and additional high income countries (OECD member countries) were initially included in the policy scan ($n=102$). Websites of respective Ministries of Health or similar were searched to identify regulatory mechanisms used to regulate ENDS including legislation, decrees, or resolutions issued by governments. This search identified 60 national jurisdictions with policies. Searches of targeted media and e-cigarette industry websites identified an additional 10 countries that had taken regulatory action for a total of 70 countries included in the scan.

Results: Regulatory strategies were categorized according to the country's approach to: (1) product classification (tobacco product, medicinal/pharmaceutical product, consumer product, or ENDS), (2) sales restrictions (total bans or minimum age for purchase), (3) restrictions on product advertising, promotion and sponsorship, (4) manufacturing, importation and distribution bans, (5) public use bans, and (6) the application of a tax.

Many countries make a regulatory distinction between ENDS products that contain nicotine and those that do not. Jurisdictions such as Bahrain have banned the importation, sales and distribution of ENDS with a decree; however, the use of ENDS is regulated using existing tobacco control legislation. The majority of countries studied regulate ENDS through existing legislation ᲠÇö such as Australia where ENDS with nicotine are not permitted for sale under a law that classifies nicotine as a poison. Other countries, such as Singapore, regulate ENDS from

existing bans on the importation of products that imitate cigarettes. Some countries have minimum age restrictions, public use bans or taxes. Although many countries have placed restrictions on advertising/promotion, few had restricted sponsorship.

FUNDING: Funding was provided by the RWJF.

JUSTIFICATION: The variation in approaches across countries could be used to understand public health impacts.

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PA26-4 THE USE OF E-CIGARETTES AND LICENSED NICOTINE PRODUCTS BY NEVER SMOKERS: FINDINGS FROM A POPULATION SURVEY

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Background: Concerns have been expressed that e-cigarettes may draw significant numbers of people into nicotine addiction who would never have smoked. England is a country with relatively lax regulation of e-cigarettes and so might be considered one of the countries at highest risk for this. This study assessed prevalence of e-cigarette use in never smokers in the English population aged 16 years and above between November 2013 and October 2014. It compared the figures with licensed nicotine products.

Methods: Data were collected using monthly cross-sectional household surveys of representative samples of adults in England between November 2013 and October 2014. Current use of an e-cigarette and licensed nicotine products and socio-demographic information were assessed among 12,610 never smokers. Data were weighted using a rim weighting technique to match English census data on age, sex, and socioeconomic group.

Findings: A total of 0.22% (95%CI=0.14-0.30) of never smokers reported currently using an e-cigarette. The prevalence remained stable across the period of study ($\chi^2(3)=0.82$, $p=0.84$) and there was no association with age ($\chi^2(5)=7.47$, $p=0.19$), sex ($\chi^2(1)=2.77$, $p=0.10$) or having a manual occupation or being unemployed ($\chi^2(1)=0.04$, $p=0.83$). The figure was similar for licensed nicotine product users: 0.16% (95%CI=0.09-0.23).

Conclusion: The use of e-cigarettes by never smokers is negligible in a country with relatively lax regulation and similar to the use of licensed nicotine products in that population.

FUNDING: JB's post is funded by a fellowship from the UK Society for the Study of Addiction; RW is funded by Cancer Research UK. CRUK funded data collection for this study. At various times, the STS has been funded by CRUK the English Department of Health, Pfizer, GlaxoSmithKline and Johnson and Johnson.

JUSTIFICATION: The use of e-cigarettes by never smokers is negligible in a country with relatively lax regulation and similar to the use of licensed nicotine products in that population.

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PA26-5 USE OF ELECTRONIC CIGARETTES, SUSCEPTIBILITY TO SMOKING, AND ASTHMA ATTACK AMONG METROPOLITAN, NON-METROPOLITAN AND RURAL FLORIDA YOUTH WITH ASTHMA

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Prevalence of electronic cigarette (EC) use has increased dramatically among youth in the recent years. However, little is known about EC use among youth with asthma, and how it differs by rural-urban status. Data from the 2012 Florida Youth Tobacco Survey (n=75550 middle and high school students) were used to examine the prevalence of EC use by asthma status, its associations with susceptibility to smoking and asthma attack, and how they vary by rural-urban status (as defined by the US Department of Agriculture Economic Research Service). Weighted multivariate regression models were used. Overall, 8.5% and 4.6% of Florida youth with asthma have ever used and used EC in the past 30 days, which is higher than youth who did not have asthma (ever use=5.6% and past 30-day use=2.1%; $p<0.01$). Comparing to youth who did not have asthma, non-metropolitan and rural (NM&R) youth with asthma were more likely to have ever used and used EC in the past 30 days than their metropolitan (Metro) counterparts, after adjusting for demographics and smoking status (Odds ratio [OR] ever EC use in NM&R asthma youth=1.64, OR ever EC use in Metro asthma youth=1.33; OR past 30-day EC use in NM&R asthma youth=2.13, OR past 30-day use in Metro asthma use=1.67; $p<0.05$). Among Florida youth with asthma and never tried cigarettes (n=6242), past 30-day EC use was positively associated with susceptibility to smoking (OR=19.17, $p<0.01$) after adjusting for demographics. Among Florida youth with asthma (n=11278), those who use EC in the past 30 days were more likely than those who did not use EC in the past 30 days to report having asthma attack in the past 12 months, after adjusting for demographics, smoking status and exposure to secondhand smoke (OR=1.68, $p<0.01$). These associations did not vary by rural-urban status (interaction $p>0.29$). In conclusion, Florida youth with asthma are more likely than youth without asthma to use EC, especially in non-metropolitan and rural areas. EC use is associated with susceptibility to smoking and asthma attack in this population. Additional national and longitudinal research is needed to understand the effect of EC use among youth with asthma.

FUNDING: Dr. Choi's effort on the abstract is funded by the Division of Intramural Research, National Institute on Minority Health and Health Disparities, National Institutes of Health. Dr. Bernat's effort is supported with a grant from the National Cancer Institute (R03 CA168411; D. Bernat, Principal Investigator).

JUSTIFICATION: The data call for further research on preventing electronic cigarette use in youth (particularly rural youth) with asthma, and document the health consequences of electronic cigarette use in this population.

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PA26-6 TOXICOLOGICAL EFFECTS OF ELECTRONIC CIGARETTE VAPOR ON LUNG CELL VIABILITY WITH COMPARISONS BY FLAVOR, GENERATION, AND BRAND

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Electronic cigarettes' (e-cigs) health impacts are still being debated, with a general consensus that more toxicological research is needed. This study adds to the research, with the aim of assessing toxicological effects of e-cig vapor on lung cell viability, and how effects vary by e-cig technology, brand, and flavor. E-cig vapor was captured using a condenser device, with each sample containing vapor from 200mg of fluid smoked in 2-second intervals. Four e-cig brands were used: Blu, Greensmoke, V2, and Vaporfi. Each brand was tested for Tobacco, Menthol, and Coffee flavors. Lung cells were exposed to cell media solutions containing e-cig vapor in varied concentrations (10%, 5%, 2%, and 1%), plus an untreated control. After 24 hours of exposure, a hemocytometer and Trypan Blue dye were

used to calculate lung cell death. The Chi Square Test for Independence showed a statistically significant difference in cell death between the control compared to samples with the lowest concentration of e-cig vapor ($\chi^2(1, n=988)=50.05, p=.000$), with the control showing a lower rate of mortality (1.9% vs. 20.3%). The Chi Square Test for Independence also showed significant differences in cell death among flavors ($\chi^2(2, n=2961)=10.80, p=.005$), brands ($\chi^2(3, n=2961)=10.563, p=.01$), and generations ($\chi^2(1, n=2961)=9.36, p=.002$). Adjusted Standardized Residuals for flavor indicated the lowest prevalence of cell death for menthol (41.2%), and the highest for tobacco (48.8%). Adjusted standardized residuals indicated Blu had the lowest prevalence of cell death (41.97%) and V2 had the highest (49.2%), while second-generation e-cig vapor had a lower rate of cell death (42.3%) compared to third-generation (47.9%). In conclusion, samples treated with all concentrations of e-cig vapor had significantly higher incidences of lung cell death compared to untreated control lung cells. Other e-cig variables tested in this study -- flavor, brand, and generation -- had significant differences in terms of e-cig vapor effects on lung cell mortality. While the health effects of e-cigs are still being debated, this study indicates that e-cigs have negative toxicological impacts on lung cells.

FUNDING: This research was conducted while the researcher was a Scholar at the University of Pennsylvania Teen Research and Education in Environmental Science program.

JUSTIFICATION: This study adds to the body of research on toxicological effects of electronic cigarettes.

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PA26-7
OVER-TIME IMPACTS OF PICTORIAL HEALTH WARNING LABELS: TRAJECTORIES OF RESPONSE AMONG SMOKERS IN AUSTRALIA, CANADA AND MEXICO.

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BACKGROUND: Countries with pictorial health warning labels (HWLs) on tobacco products often rotate HWL content to prevent "wearout". Three countries that innovated HWL policies implemented changes in 2012: 1) In Canada (CA), pictorial HWLs were changed for the first time since 2001, including for package inserts with cessation information; 2) In Australia (AU), pictorial HWLs were changed for the first time since 2006 and were accompanied by "plain" packaging (i.e., no brand imagery); 3) In Mexico (MX), pictorial HWL content continued to be changed every six months, the fastest rate in the world. This study examines changes in smokers' responses to pictorial HWLs both across and within these three countries.

METHODS: Adult smokers were recruited from online consumer panels in AU (n=2,756), CA (n=3,155) and MX (n=3,466). From September 2012 - May 2013, data were collected from 1,000 smokers in each country every 4 months, using replenishment to maintain sample size. Both country-specific and pooled latent growth curve models were estimated to assess HWL responses (i.e., attention to HWLs; cessation-related cognitive responses to HWLs; forgoing of a cigarette due to HWLs) over this period to: 1) estimate trajectory parameters (i.e., intercepts, slopes) for each HWL response; and 2) determine socio-demographic (e.g., age, sex, education, income, country) and smoking-related (e.g., quit intentions, smoking intensity) correlates of trajectories.

RESULTS: Across countries, attention to HWLs significantly decreased over time, cognitive HWL reactions increased and forgoing cigarettes remained stable in AU & MX while forgoing significantly decreased over time in CA. Correlates of slope were similar across countries. Within all three countries, trajectories of attention

to HWLs were similar across population sub-groups, whereas there were some sub-group differences in trajectory parameters for cognitive reactions and forgoing.

CONCLUSIONS: HWLs appear effective over time and across key smoker sub-groups. "Wearout" of attention to HWLs appears accompanied by strengthening of cognitive responses that predict cessation attempts.

FUNDING: Data collection and analyses for this project were supported by a grant from the U.S. National Cancer Institute (R01 CA167067).

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POS5-1

SENSORIMOTOR REPLACEMENT OF SMOKING WITH NICOTINE-FREE ELECTRONIC CIGARETTES: SHORT-TERM EFFECTS ON URGES TO SMOKE AND WITHDRAWAL SYMPTOMS

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Background: There is some evidence that replacing the sensory and behavioural aspects of smoking without nicotine (e.g. via nicotine-free electronic cigarettes [EC], de-nicotinised cigarettes), can acutely alleviate urge to smoke and cigarette withdrawal symptoms (WS). This is because sensory and behavioural factors are thought to acquire reinforcing properties via Pavlovian conditioning. However, puffing on a novel device may alleviate WS, not because it triggers conditioned reinforcement, but because it distracts users from their discomfort. This study investigated to what extent sensorimotor stimuli which mimic smoking can surpass behavioural distraction in reducing WS. **Methods:** In a counterbalanced cross-over design, 35 smokers used nicotine-free EC or stress ball (SB; distraction control) on 2 separate days. Participants used their allocated product for 5 minutes, and rated WS at baseline, 5, 10, 30 and 60 minutes post-product use, in the morning (after overnight abstinence), and in the evening after a day's use of the product and cigarette abstinence. WS experienced during the day, product ratings and preferences were also reported in the evening. **Results:** Reduction in urge to smoke, from baseline to 10 minutes following overnight abstinence (primary outcome), was marginally larger with EC vs SB (mean[SD]: 1.20[1.92] vs 0.63[0.63] respectively; $p=0.062$). In those who abstained during the study ($N=17$), urge to smoke and WS ratings over the hour in the morning were significantly lower with EC ($p<0.001$ and $p=0.010$, respectively). The difference diminished by the evening. EC had a modest effect on urge to smoke over the day vs SB (mean[SD]= 3.26[0.71] vs. 3.65[1.14] respectively; $p=0.038$), but there were no differences in other WS. EC received consistently higher product ratings than SB. **Conclusion:** Sensorimotor stimuli provided by EC were more effective in reducing urge to smoke than distraction control, though the effect was not as robust as previously hypothesised and weakened during the day. The strong preference for EC however, suggests that a product which can mimic the effects of smoking has added user appeal over behavioural distraction techniques.

FUNDING: This research was supported by the Economic and Social Research Council, UK, and the UK Centre for Tobacco and Alcohol Studies.

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POS5-2

PUBLIC OPINION ABOUT E-CIGARETTE REGULATIONS AND EXPOSURE TO CONTRADICTIONARY E-CIGARETTE INFORMATION AMONG U.S. ADULTS

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Background: Local and state governments are increasingly regulating e-cigarette use in smoke-free areas, youth access, and taxation. This study assessed public support for 6 e-cigarette regulations and examines potential correlates of policy support. The findings will inform efforts to garner broad public support for e-cigarette regulations and ensure successful implementation and enforcement of these policies.

Methods: Online survey data were collected in July 2014 from 527 U.S. adults (mean age 52 years, 50% female, 75% white) invited through KnowledgePanel (GfK). Support for 6 policies (regulating e-cigarette use in smoke-free areas, youth access, addiction warnings, use of flavors, labeling nicotine and harmful ingredients, and marketing to youth) was categorized into "agree", "disagree", or "no opinion". Predictors were exposure to contradictory e-cigarette information, demographics, tobacco use, health status, political affiliation, and ideology. We

utilized multinomial logistic regression to predict support for each policy (base outcome was "disagree" and the relative risk ratios (RRRs) are reported). Analyses were weighted to represent the general U.S. adult population.

Results: Agreement with e-cigarette policies ranged from 34-72% across the 6 policies (disagreement 6-24%; no opinion 18-38%). Exposure to contradictory e-cigarette information predicted lower odds of agreeing (vs. disagree) with limiting youth access (RRR=0.43, 95% CI=0.24 to 0.80) and requiring labeling of nicotine and harmful ingredients (RRR=0.23, 95% CI=0.11 to 0.49). For 5 policies (with the exception of e-cigarette use in smoke-free areas), more exposure to contradictory e-cigarette information was associated with lower odds of having no opinion (vs. disagree). Other significant predictors for one or more policies were race/ethnicity, education, income, past e-cigarette use, health status, party affiliation, and ideology.

Conclusions: Contradictory information may pose challenges to garnering broad public support for some e-cigarette regulatory policies. We recommend further research on the effects and content of contradictory information surrounding e-cigarettes.

FUNDING: Chul-joo Lee received institutional support from the University of Illinois at Urbana-Champaign and Seoul National University for conducting this research.

JUSTIFICATION: Findings from this study provide useful insights into the level of public support for e-cigarette policies and the potential role of exposure to contradictory e-cigarette communications for state and local policymakers; these insights would inform policymakers in considering strategies that effectively communicate the purpose and intent of e-cigarette policies to garner broad public support for these policies.

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POS5-3

RISK PROFILES OF YOUTH SINGLE, DUAL AND POLY TOBACCO USERS

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With the growing market of tobacco products, youth are at increased risk of experimenting with and using multiple products. Sparse literature on population-level rates and determinants of single, dual, or poly tobacco use among youth limits our understanding of and response to the problem. We address this gap by determining the prevalence of and factors associated with single, dual, and poly tobacco use among US youth.

Data from the 2012 National Youth Tobacco Survey ($n=24,658$), were analyzed to create mutually exclusive categories of single, dual, and poly tobacco use defined as use of only one, any two, and any three or more tobacco products in the last 30 days. Multinomial logistic regression was used to identify factors associated with these three exclusive tobacco groupings as they relate to well-documented risk domains: socio-demographics, nicotine dependence, cessation behavior and harm perceptions.

Among youth who reported using tobacco in the past 30 days ($n=4,001$), the majority were single tobacco product users (41.5%), followed by poly (32.8%), and dual users (25.7%). Dual and poly users were more likely to be older (15-17 years). Males were 1.5 times more likely than females to be dual users and 2.7 times more likely to be poly users ($p<0.01$). High nicotine dependence was twice as likely for poly compared to dual users, and nearly 3 times as likely for poly compared to single users ($p<0.001$). Compared to single users, dual users were 1.5 times more likely and poly users were 1.8 times more likely to perceive high tobacco use among peers ($p<0.05$). Dual users were 1.4 times more likely than poly users to express quit intentions and 1.8 times more likely to have high harm perceptions ($p<0.05$).

Single, dual, and poly tobacco user profiles illuminate important differences in race, gender and several tobacco risk domains. As the number of tobacco products used increased nicotine dependence and perceived peer tobacco use increased,

whereas quit intentions and harm perceptions decreased. Data-driven risk profiles of tobacco use should inform intervention design and policy recommendations to address the changing landscape of tobacco use among youth.

FUNDING: No Funding

JUSTIFICATION: Exclusive profiles of single, dual and poly tobacco product use among US youth can tailor interventions and policy recommendations that address tobacco use behaviors.

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POS5-4
PHARMACOKINETICS OF NICOTINE AND SUBJECTIVE EFFECTS FOLLOWING THE SINGLE USE OF A NON-MENTHOL AND MENTHOL VERSION OF TOBACCO HEATING SYSTEM 2.2 IN TWO STUDIES IN JAPAN: A COMPARISON WITH SINGLE USE OF A COMBUSTIBLE CIGARETTE AND NICOTINE GUM

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The two studies presented here are part of a global clinical program to assess the Tobacco Heating System 2.2 (THS 2.2), a candidate modified risk tobacco product. The study objective was to evaluate the pharmacokinetic (PK) profile of nicotine following single use of THS 2.2 non-menthol or menthol as compared to combustible cigarettes (CC) and nicotine gum.

Two open-label, randomized, two-period, four-sequence crossover studies were conducted, each in 62 healthy Japanese smokers in 2013. Each period consisted of 2 days, with 1 day of smoking abstinence (nicotine wash-out), and 1 day of single use of THS 2.2, CC or nicotine gum with every subject being exposed to 2 of the 3 study products (THS 2.2/CC and THS 2.2/nicotine gum). During the single use day, a total of 16 venous blood samples were collected including 1 sample prior to product use and at various time points up to 24 hours. PK parameters were calculated using a non-compartmental model. Urge-to-smoke was assessed using the Questionnaire of Smoking Urges-brief (QSU-b). The studies were and registered with ClinicalTrials.gov, number NCT01959607 and NCT01967706.

The overall shape of the nicotine concentration-time curves for both, THS 2.2 non-menthol and menthol were similar to CC. The values for AUC(0-last) and Cmax were comparable for THS 2.2 and CC for both studies. AUC(0-last) and Cmax were higher in THS 2.2 as compared to nicotine gum. The tmax was not different for CC and THS 2.2 and shorter for THS 2.2 compared to the nicotine gum. The reduction of QSU-b total score observed after single use of THS 2.2 was similar to the reduction observed in CC, but greater than the reduction following nicotine gum use. THS 2.2 was well tolerated.

The PK profile for both THS 2.2 was comparable to CC in both studies. A transient reduction in urge-to-smoke was observed with THS 2.2, comparable to CC and higher than nicotine gum after single use.

FUNDING: Philip Morris Products S.A., Neuchâtel, Switzerland

JUSTIFICATION: As short-term clinical pharmacokinetic/pharmacodynamic study can inform about the acceptance of candidate modified risk tobacco products.

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POS5-5
REDUCED EXPOSURE TO HARMFUL AND POTENTIALLY HARMFUL CONSTITUENTS AFTER FIVE DAYS OF USE OF TOBACCO HEATING SYSTEM 2.2: A COMPARISON WITH CONTINUED COMBUSTIBLE CIGARETTE USE OR SMOKING ABSTINENCE

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This study is part of a clinical program to assess the Tobacco Heating System 2.2 (THS 2.2), a candidate modified risk tobacco product. The objective of this study was to assess the reduction in exposure to selected harmful and potentially harmful constituents (HPHCs) after 5 days of ad libitum use of THS 2.2 in confined conditions compared to continued smoking of combustible cigarettes (CC) and smoking abstinence (SA). Biomarkers of exposure (BoExp) to fourteen HPHCs were evaluated.

The open-label, randomized, controlled, 3-arm parallel group, confinement study was done in 160 healthy smokers aged between 21 and 65 years. Smokers smoked their CC at baseline for 2 days, and were subsequently randomized to continue to smoke CC, to switch to THS 2.2, or to stop smoking for 5 days. Twenty-four hour urine was collected to evaluate the levels of BoExp using validated analytical methods. This study was conducted in Poland according to GCP and is registered in ClinicalTrials.gov, number NCT01959932.

The average daily product use between baseline and the end of exposure slightly increased in the THS 2.2 arm (from 16 CC to 20.7 THS Sticks) and remained in the same range in the CC arm (from 16.2 CC to 16.6 CC). The total nicotine exposure measured as nicotine equivalents were similar in both arms throughout the exposure period (THS 2.2: CC ratio of 104.9% [95% CI: 92.0, 119.6]). At the end of exposure period of five days, the levels of evaluable BoExp were significantly reduced in the range of 50% to 96% in the THS 2.2 arm as compared to CC and approaching results obtained in the SA arm. The reductions in BoExp levels were observed within 24 hours of starting THS 2.2 use. Product evaluation, as assessed by the modified cigarette evaluation questionnaire, showed that THS 2.2 was slightly less satisfying than CC. The questionnaire of smoking urges (QSU-brief) total score showed an equally efficient in craving reduction between THS 2.2 and CC over the study period. THS 2.2 was well tolerated.

THS 2.2 showed a significant reduction in exposure to HPHCs after 5 days of THS 2.2 use, as compared to CC, approaching levels of HPHCs observed after 5 days of smoking abstinence.

FUNDING: Philip Morris Products S.A., Neuchâtel, Switzerland

JUSTIFICATION: A one week biomarker of exposure clinical study in a controlled setting provides evidence that smokers who switch to the candidate modified risk tobacco product are less exposed to smoke constituents.

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POS5-6
INVESTIGATION ON PUFFING TOPOGRAPHY PARAMETERS AND PRODUCT EVALUATION RECORDED DURING FIVE DAYS OF USE OF THE TOBACCO HEATING SYSTEM 2.2: A COMPARISON WITH CONTINUED COMBUSTIBLE CIGARETTE USE

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Puffing topography (PT) and product evaluation were recorded within a study designed to demonstrate reduction in exposure to selected harmful and potentially harmful constituents after 5 days of use of THS 2.2 compared to combustible cigarettes (CC).

The open-label, randomized, controlled, 3-arm parallel group, confinement study was done in 160 healthy smokers. Subjects used their preferred brand of CC at baseline, and were subsequently randomized to continuing to smoke CC, to switch to THS 2.2 or to stop smoking for 5 days. This was an ad-libitum product

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use study. PT is the description of puff characteristics (e.g. puff volume, duration or interval) and was assessed using a Smoking Puff Analyzer Mobile (SODIM_{T-α}) with pressure and flow measurement capabilities. PT parameters were recorded at baseline for all subjects, and at Day 1 and Day 4 for both the CC and THS 2.2 arms. Product evaluation was assessed daily using the Modified Cigarette Evaluation Questionnaire (mCEQ). 24-hour urine was collected to evaluate the levels of biomarkers of exposure, and nicotine equivalents. This study was conducted in 2013 according to GCP and is registered with ClinicalTrials.gov, number NCT01959932.

After switching from CC to THS 2.2 for 4 days, the inter-puff intervals were significantly shorter. Larger and longer puffs, and a slightly higher total inhalation volume was observed for THS 2.2 compared to CC. No notable difference was seen between the THS 2.2 and CC arm on Day 5 in any of the mCEQ subscales. The average daily product use between baseline and the end of exposure slightly increased in the THS 2.2 arm (from 16 CC to 20.7 THS sticks), and remained in the same range in the CC arm (from 16.2 CC to 16.6 CC). The nicotine equivalents were similar in both arms throughout the exposure period.

In conclusion, a slight increase in THS 2.2 use, and minor modifications of PT parameters were recorded. No notable difference in mCEQ and the similar levels of nicotine uptake in CC and THS 2.2 were observed indicating effective adaptation to the THS 2.2 product during this short-term study.

FUNDING: Philip Morris Products S.A., Neuchâtel, Switzerland

JUSTIFICATION: Puffing topography can inform about the adaptation process of smokers who switch to an alternative, candidate modified risk tobacco product.

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POS5-7

LONG-TERM STATEWIDE LEGALIZATION OF MEDICAL MARIJUANA IS ASSOCIATED WITH USE, SOCIAL ACCEPTABILITY, AND CIGARETTE DEPENDENCE AMONG OLDER ADULT SMOKERS

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Introduction: The majority of marijuana users are cigarette smokers. As of 2013, nearly half of U.S. states have legalized medical marijuana, and the long-term effects of such policies are largely unknown.

Methods: Cross-sectional analyses were conducted using data from the U.S. Tobacco Attitudes and Beliefs Survey 2014 among smokers aged ≥ 45 years (N=453). Participants were categorized by state residence where medical marijuana was (1) illegal, (2) legalized < 10 years ago, and (3) legalized ≥ 10 years ago. The web-based survey asked prevalence of marijuana ever-use and current-use (past 7 days). Logistic regression models calculated odds of residing in states with ≥ 10 years of legalized medical marijuana according to respondents' responses to survey items including social acceptability of marijuana and nicotine dependence.

Results: Marijuana use was positively associated with residing in states where medical marijuana was legalized the longest, for ever-use: illegal (75%), < 10 years (80%) and ≥ 10 years (90%) ($p=.01$); and current-use: illegal (12%), < 10 years (8%) and ≥ 10 years (16%) ($p=.07$). Odds of state residence where medical marijuana was legalized ≥ 10 years were greater in those who responded "strongly

agree" or "agree" that friends think it is okay to use marijuana (OR=1.57; 95% CI: 0.93-2.67; $p=.09$) and "yes" to having tried to quit but could not (OR=1.83; CI: 0.93-3.60).

Conclusions: States that have legalized medical marijuana the longest was positively associated with marijuana use, social acceptability of marijuana, and cigarette dependence. Nationally representative longitudinal data are needed to elucidate these findings.

FUNDING: National Cancer Institute Grant CA-113710

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POS5-8

THE ASSOCIATION BETWEEN MENTAL ILLNESS AND TOBACCO SMOKING: EVIDENCE FROM STUDIES IN ADOLESCENCE.

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Introduction: Tobacco Use Disorder (TUD) is a highly prevalent psychiatric disorder, by itself and in concurrency to diverse psychopathologies among adolescents, with enormous impact on physical and mental well-being of the smoker teen and his environment. We were aiming to explore the association between tobacco smoking and adolescent's major psychopathologies as evident in clinical trials.

Methods: Systematic review of peer-reviewed literature on adolescent psychopathology from 1980 to 2013.

Results: Among clinical trial reports on adolescent major psychopathologies (N=12,582), we found 71 (0.6%) records reported on tobacco smoking status. Of these, 14 (20%) reported smoking status to be part of other measurable demographic variables. Leading concurrent diagnosis were ADHD and Mood Disorders. We could match 4 records that did not report on smoking status with reports that did, based on PICO framework.

Conclusions: TUD, as measured by tobacco smoking, is only seldom taken in account and reported on clinical trials, dealing with adolescent psychopathology, which are at-risk population for substance use. This under reporting not only creates a false reality of low tobacco prevalence, but may also confound other study results and affect clinical decision making. We believe all mental health personnel working with adolescents, should adopt evidence-based intervention tools to provide an effective diagnosis and treatment of Tobacco Use Disorder concurrently, as part of a client-centered holistic care.

FUNDING: No Funding.

JUSTIFICATION: We believe all mental health personnel working with adolescents, should adopt evidence-based intervention tools to provide an effective diagnosis and treatment of Tobacco Use Disorder concurrently, as part of a client-centered holistic care.

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POS5-9

THE ASSOCIATION OF CIGARETTE SMOKING WITH DEPRESSION AND ANXIETY: A SYSTEMATIC REVIEW

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Background: The high co-occurrence of smoking and mental illness is a major public health concern, and smoking accounts for much of the reduction in life expectancy associated with mental illness. Many studies report a positive association between smoking and mental illness, with smoking rates increasing with the severity of the disease. However, the literature is divided on the direction of causality – that is, whether smoking is associated with the development of depression and anxiety, depression and anxiety are associated with the onset of smoking, or the relationship is bidirectional. We conducted a systematic review evaluating the association of smoking and depression and/or anxiety in longitudinal studies.

Methods: Studies were identified using a predefined search criteria on PubMed, Scopus, and Web of Science. Studies were included if they: 1) used human participants, 2) were longitudinal, 3) reported primary data, and 4) had smoking as an exposure and depression and/or anxiety as an outcome, or had depression and/or anxiety as the exposure and smoking as an outcome.

Results: Outcomes from 155 studies were grouped into 5 categories: smoking onset, smoking status, smoking heaviness, tobacco dependence and smoking trajectory. In each category there was a large variation of both positive and null findings in both directions. Overall, nearly half the studies reported that baseline depression/anxiety was associated with some type of later smoking, while over a third found evidence that any smoking exposure was associated with later depression/anxiety. However, there were few studies directly supporting a bidirectional model of smoking and anxiety, and very few studies providing null results.

Conclusions: This review produced inconsistent findings on whether smoking leads to depression and anxiety, depression and anxiety result in smoking or increased smoking behaviour, or there is a bidirectional relationship between the two. Overall, this conflicting evidence suggests the need for future studies that employ different methodologies, such as Mendelian randomisation, which will allow us to draw stronger causal inferences.

FUNDING: No Funding.

JUSTIFICATION: This review displays the inconsistent evidence in the current literature regarding smoking and depression/anxiety, and suggests future studies employ different methodologies, such as Mendelian randomisation, which will allow us to draw stronger causal inferences.

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POS5-11

A TRAIN THE TRAINER MODEL TO INCREASE ACCESSIBILITY TO TOBACCO TREATMENT SPECIALIST TRAINING

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Background: The UMass Tobacco Treatment Specialist (TTS) Core Training is one of only 11 TTS training programs accredited by the Association for the Treatment of Tobacco Use and Dependence (ATTUD). The "Train the Trainer in Tobacco Treatment" (T4) was developed to prepare Certified UMass Trainers to implement the TTS Core Training and build training capacity nationally. **Implementation:** The 2 day training was completed in June 2014 by 14 TTSs from 8 states, including nurses, mental health and substance abuse counselors, respiratory therapists, and social workers. Training involved didactic and interactive components, including administration tasks and ATTUD core competencies, review of TTS Core

training modules, and practice of sessions. Adherence to UMass standards will be evaluated through participants' course evaluations and test scores. Trainers will apply for re-certification every 2 years.

Evaluation: Participants completed anonymous, written surveys following the T4 training and interviews 4 months after training. On the survey (n=8 to 11 participants, depending upon the module), the highest rated module with respect to meeting goals and satisfaction was the Intake, Assessment and Treatment Planning module. Lectures were consistently rated on average as more than satisfactory/excellent. Participants rated more highly exercises that were similar to those they would lead during Core training. The highest rated activity was the case study discussion during the Intake module. In the interview (n=9) all but one participant felt confident or very confident in conducting trainings. The majority found the review of training content helpful, particularly in the Pharmacotherapy module. Most reported willingness to do readings prior to training, had reviewed materials provided and liked the thoroughness.

Lessons Learned: The T4 application has been revised to clarify the intent and agenda for the training. We will include additional exercises from Core and focus the didactic more closely on how to deliver each module. We are setting up a webpage for Trainers with resources and materials needed for trainings, recent literature, and a message board for communication.

FUNDING: This project was funded through training registration fees; there is no external funding source.

JUSTIFICATION: A train the trainer model has the potential to advance tobacco treatment interventions through increased accessibility to training based upon accepted standards of practice.

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POS5-12

NO EFFICACY SIGNALS FOR ABT-089, A NICOTINIC RECEPTOR PARTIAL AGONIST: RESULTS OF A PROOF-OF-CONCEPT PILOT STUDY IN TREATMENT-SEEKING SMOKERS

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Background: Novel therapies for nicotine dependence treatment are needed to address this public health problem. In this pilot study, we tested whether ABT-089, an $\alpha 4\beta 2$ nicotinic acetylcholine receptor partial agonist, showed promise as a potential treatment.

Methods: Thirteen treatment-seeking smokers completed two identical 10-day medication periods (one with 40 mg daily ABT-089 and one with matched placebo) in a randomized, double-blind, within-subject crossover design. The primary endpoint was number of days of successful abstinence during a 4-day monitored quit period. Secondary outcomes included medication effects on subjective withdrawal, craving, and cognitive performance after 24-hours of mandatory abstinence (prior to the 4-day quit attempt), and subjective responses to a programmed cigarette lapse.

Results: There were no observed effects of ABT-089 on days of abstinence, nor on craving, withdrawal symptoms, or working memory performance. Participants rated the lapse cigarette as slightly less satisfying during the ABT-089 treatment period compared to placebo.

Conclusions: These pilot data do not support further development of ABT-089 for nicotine dependence treatment.

FUNDING: Funding for this study was provided by the National Institutes of Health (P50 CA143187 to CL). Study medication and placebo were provided by AbbVie

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POS5-13

E-CIGARETTE KNOWLEDGE OF SMOKERS AND NON-SMOKERS AT THE LOMA LINDA VETERANS AFFAIRS MEDICAL CENTER AND CURRENT POLICY OF VETERANS HEALTH AFFAIRS (VHA) FACILITIES, 2014

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Intro: After 5 years of marketing expansion, reported use of e-cigarettes (e-cigs) by veterans in our tobacco treatment program has increased from 0% in 2009 to 65% in 2014. Emerging reports of street drugs added to e-cig devices now pose new public health concerns based on clean indoor air recommendations.

Methods: We queried opinions about e-cigs (10 items) at the 2014 Loma Linda VAMC Great American SmokeOut event from veterans, guests and staff, and conducted telephone interviews of VHA Tobacco Lead Clinicians randomly selected from all regions of the country.

Results: We queried 180 tobacco (tob)-users and 166 non-tob users. Over half of tob-users have used e-cigs (59.4%); 85% state they plan to quit smoking in the future. Nearly one-third (31.9%) of ALL participants (37.5% tob-users vs. 27.4% non-tob-users, NS) believe that e-cigs are a good way to stop using tobacco permanently. Three times more tob-users believed e-cigs were "completely safe" compared to non-tob users (31.7% vs. 11.5%, ChiSq .000). Over 1/3 of ALL participants (35.2%) knew that tank-filled e-cigs can deliver street drugs for inhalation (marijuana, heroin, cocaine, methamphetamine). Tob-users are 7 times more likely than non-tob users (38% vs. 5.7%, ChiSq .000) to believe e-cigs can be allowed indoors for clinic or hospital settings. VHA Lead Clinicians do not recommend e-cigs to stop smoking (based on the 2011 Under Secretary for Health Information Letter, IL-10-2011-008). However, many VHA facilities have not formally added e-cigs into their indoor smoking policy.

Conclusions: Clean indoor-air VHA policies that formally include e-cigs need to be written to protect employees, patients and visitors from illicit drugs combined in e-cigs. This also has practical implications for VHA drug-treatment programs. Because 1/3 of smokers believe e-cigs are helpful to stop smoking, high-risk veterans may postpone medically-assisted quit attempts and e-cig use should also be monitored in VHA tobacco treatment.

FUNDING: None

JUSTIFICATION: This shows that it is important to develop national and institutional health care policies for e-cigarettes.

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POS5-14

PROVIDER DELIVERY OF THE 5AS TOBACCO INTERVENTION TO YOUTH

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Background: Youth tobacco research has historically focused more on prevention than cessation. The Public Health Service (PHS) 5As intervention (Ask-Advise-Assess-Assist-Arrange) has shown success with adult smokers; PHS has called for research on use with youth.

Objective: Describe youth-reported receipt of the 5As and factors associated with provider delivery of the 5As during a national RCT of 142 primary care practices from the AAP Pediatric Research in Office Settings Network.

Methods: Youth (14-25y) completed a baseline survey during an office visit and a phone interview 4-6 weeks later. Chi-square tests assessed youth-report of provider delivery of the 5As Screener (Ask-Advise; intended for all youth) & Brief Counseling (Assess-Assist; intended for smokers only) in providers trained in the 5As, compared to providers trained in a media use intervention. Youth-reported receipt of each possible element of the 5As was assessed and used to calculate a provider Screener score & Brief Counseling score for each visit. Provider scores were averaged over all study visits. Multivariable linear regression was used to examine predictors of receipt of the 5As and providers' average scores.

Results: In data from 1175 youth (58% female, 78% white, med. age 16y, 45% smokers), 5As-trained providers were more likely to Ask if youth smoked (72% v 52%) and Advise against smoking (71% v 55%). In data from 533 smokers, 5As-trained providers were more likely to Assess readiness to quit (62% v 34%) and Assist in quitting (57% v 26%), (all p<.001). In multivariable logistic regressions, youth with a 5As-trained provider were twice as likely to receive the Screener (OR=2.33, 95% CI=1.79-3.03) and smokers with a 5As-trained provider were 3 times as likely to receive Brief Counseling (OR=3.11, 95% CI=2.04-4.76). In multivariable linear regressions, 5As training was associated with provider Screener and Brief Counseling scores (beta estimates= 0.73 and 0.40 respectively; both p<.001).

Conclusion: Effective youth tobacco cessation interventions are needed. This study demonstrates that providers can be trained to deliver a guidelines-based youth tobacco cessation intervention. **FUNDING:** This study is funded by the National Cancer Institute, Grant R01-CA140576

JUSTIFICATION: This study demonstrates that pediatric clinicians can be trained to deliver a guidelines-based youth tobacco cessation intervention during primary care visits; delivery of this intervention during clinical visits may have the potential to help teens stop tobacco use.

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POS5-15

ADOLESCENT AND YOUNG ADULT PERCEPTIONS OF HOOKAH AND LITTLE CIGARS/CIGARILLOS

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"Background: Use of hookah and little cigars/cigarillos (LCC) is increasing among adolescents and young adults. These products have similar health effects as cigarettes, but adolescents and young adults erroneously believe them to

be safer. Use of these products can also lead to use of other nicotine products and lifelong addiction to nicotine. In this study, we sought to understand how adolescents and young adults think about these products.

Method: Ten focus groups were conducted with 77 adolescents and young adults (ages 13-25, 56% female, 56% White, 26% Black). Participants were novel tobacco product users (N=47) and susceptible non-users (N=30). Two investigators independently coded transcripts for emergent themes on participants' perceptions of hookah and LCC.

Results: Adolescents and young adults discussed positive and negative attributes of hookah and LCC. Young adult users liked that going to a hookah bar was an activity they could do with their friends if they were not of legal age to go to a bar. Participants also liked that hookah and LCC come in a variety of flavors and can be purchased in small quantities. Young adult users discussed the nostalgia associated with LCC because that was often their first tobacco product. Cigarette smokers reported that LCC "trained them" how to smoke cigarettes. The smell associated with these products was also discussed. Many said that they have a good, distinct smell that is better than cigarettes. Interestingly, though, adolescents and young adults said that LCC have a bad taste and are generally "gross." All participants discussed the negative health outcomes of using these products, such as secondhand smoke and lung cancer. However, they did not perceive these outcomes to be serious or likely to happen given 1) their infrequency of using these products, and 2) the perception that hookah and LCC are more pure and less harsh and dangerous than cigarettes.

Conclusions: Findings highlight important regulatory considerations for flavoring bans and minimum pack sizes for novel tobacco products. Results also suggest that focusing on long-term health effects may be ineffective for risk messaging to discourage use."

JUSTIFICATION: This paper will provide much-needed data on adolescents' and young adults' perceptions of hookah and little cigars/cigarillos to help inform policy and practice.

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POS5-16 FLAVORED TOBACCO PRODUCTS IN THE UNITED STATES: A SYSTEMATIC REVIEW ASSESSING USE AND ATTITUDES

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Objectives: To prohibit flavors in non-cigarette tobacco products, the FDA needs to consider scientific evidence regarding the population-level effects of enacting such a ban. We systematically reviewed research examining use of and attitudes towards flavored tobacco products to provide a scientific basis for regulating these products in the future.

Methods: We searched 5 electronic databases for eligible studies and obtained additional studies via grey literature searches, expert contacts and hand searching citations of relevant and included articles. We conducted a qualitative synthesis for included studies.

Results: The 32 studies included in this review exhibited substantial heterogeneity and were of varied methodological quality. Findings from observational, experimental and quasi-experimental studies suggest that flavored tobacco use is associated with young age and that consumers may perceive flavored products more favorably than non-flavored products. Evidence from qualitative studies indicates that flavoring in tobacco is viewed favorably by users and nonusers of these products.

Conclusion: Our findings confirm the FDA's view that young populations are engaging in flavored tobacco use. More research is needed to assess how flavoring impacts consumers' responses to tobacco products and to understand

the role of flavoring in impacting patterns of tobacco use over time. This review can serve as a resource for regulators and researchers who are interested flavored tobacco. **FUNDING:** Support for this research was provided by the Department of Health, Behavior and Society at the Johns Hopkins Bloomberg School Public Health and by the Schroeder Institute for Tobacco Research and Policy Studies, Legacy.

JUSTIFICATION: We reviewed research examining flavored tobacco products to provide a scientific basis for regulating these products in the future.

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POS5-17 FEASIBILITY OF USING TABLETS FOR A LARGE-SCALE, SCHOOL-BASED, SELF-ADMINISTERED SURVEY: EXPERIENCES FROM THE TEXAS ADOLESCENT TOBACCO AND MARKETING STUDY (TATAMS)

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Student-level, school-based, self-administered surveys have traditionally been conducted with pencil and paper. Computerized tablets present a new possibility for survey administration and have many advantages, such the ability to use skip patterns, insert photos, and reduced data entry; however, they have largely been untested in large-scale studies. TATAMS is a three-year, longitudinal cohort study of youth living in the four largest cities of Texas (Houston, Dallas-Ft. Worth, San Antonio, Austin). In the fall of 2014, TATAMS administered its tablet-based, baseline survey, to 2,721 subjects recruited from 35 traditional public, 1 charter public, and 11 private schools. Subjects individually completed the survey during the school day in groups, with sizes ranging from 8 to 69 subjects. All survey administrations were conducted by project staff. The TATAMS survey contains 340 items focusing on tobacco and e-cigarette use behaviors and exposure to tobacco and e-cigarette marketing. Of the 2,721 students who completed the survey, 44% (n=1,189) were male, 59% (n=1,612) were non-White, and 33% (n=894) were Hispanic; the average age of respondents was 13.4 years and ranged from (10) to (17). This presentation will present our detailed procedure for using tablets including data safety considerations, as well as the pros and cons of using tablets. One important finding is that subjects were receptive to using tablets and required no instructions to operate them. Additionally, the presentation will include how the use of a computer-based survey can improve the survey instrument. Specially, for TATAMS using tablets presented two major benefits over pencil and paper; 1) they allow for the more efficient use of skip patterns in order to ask in depth questions of product users, without overburdening non-users with "not applicable" questions and 2) photos of the various tobacco and e-cigarettes queried on can be embedded in the survey.

FUNDING: Tobacco Regulatory Science Program, NIH/FDA

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POS5-18

PHARMACY STUDENTS' CONFIDENCE IN AND KNOWLEDGE OF TOBACCO CESSATION COUNSELING: CIGARETTES VS. HOOKAH

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Objective: To assess pharmacy students' confidence in counseling on cigarette smoking and hookah tobacco use cessation.

Methods: A cross-sectional study was conducted in Spring 2014, with a total of 203 PharmD students completing the study. Students were asked to complete a 34-item survey, measuring their perceived confidence in general counseling skills and ability to counsel using the Ask, Advise, Assess, Assist, and Arrange Follow-up (5 A's) model.

Results: Eighty-two percent and 16 percent of the students reported receiving training on cigarette smoking and hookah tobacco use cessation, respectively. Students were moderately confident in their general counseling skills and ability to counsel using the 5 A's model. Compared to counseling skills in hookah tobacco use cessation, students were more confident in their counseling skills and ability to counsel on cigarette smoking cessation using the 5 A's ($p < 0.001$ in each case). Students were more knowledgeable about cigarette smoking cessation than about hookah tobacco use cessation. Almost half of the students (42.01 percent) thought hookah tobacco was less harmful than traditional cigarettes.

Conclusions: Our findings imply that further training is needed to address alternative tobacco products, such as hookah, for supporting patient cessation needs as use can increase risks for tobacco-related mortality and morbidity and decreased medication effectiveness. This research has implications for promoting a broader context of tobacco use cessation screening and counseling needs among licensed pharmacists, who are healthcare professionals increasingly being recognized for their ability to address cessation needs with patient smokers. In general, pharmacist involvement can play a key role in reducing tobacco-related morbidity and mortality in society and help reduce health disparities among patient smokers. This involvement can especially help the underserved and minority populations who may be facing barriers (e.g., low income, lack of transportation), which can limit cessation treatment from primary care providers. **FUNDING:** Funds for this research were provided to Dr. Kentya Ford, from The University of Texas at Austin, College of Pharmacy and The Division of Diversity and Community Engagement.

JUSTIFICATION: This research has implications for promoting a broader context of tobacco use cessation screening and counseling needs among licensed pharmacists, who are healthcare professionals increasingly being recognized for their ability to address cessation needs with patient smokers.

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POS5-19

PUFF TOPOGRAPHY AND NICOTINE INTAKE FROM THE FIRST CIGARETTE OF THE DAY COMPARED TO ONE AFTER AD LIB SMOKING IN AFRICAN AMERICANS

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Introduction: Smoking topography is a useful tool for understanding smoking behavior. While highly reliable when measured at the same time of day within subjects, no studies to our knowledge have compared the puff topography of the first cigarette of the day to a subsequent cigarette smoked after ad lib smoking.

The aim of this study was to compare the puff volume, puff duration, puff velocity, and nicotine intake from a cigarette smoked after waking (Cig1), to one smoked after 4 hours of ad lib consumption (Cig2).

Methods: 60 African American smokers smoked their preferred brand of cigarette each time (Cig1 vs Cig2) through the CReSS topography device. Plasma nicotine and expired CO boost as well as changes in subjective measures of mood, withdrawal, craving, and smoking satisfaction were measured after each cigarette.

Results: There was no main effect of time on puff volume, duration, velocity, nicotine boost, or CO boost. Typical sex differences were observed, such that males took in larger and longer puffs than females. Cigarettes per day (CPD) was included as a covariate in the model and produced significant interactions with puff velocity, and subjective withdrawal and craving relief. Those who smoked more cigarettes (greater than 13 CPD) increased their smoking intensity after ad lib smoking, and experienced greater withdrawal and craving relief after the first cigarette of the day. Furthermore, intraclass correlation coefficients (ICCs) were computed to assess reliability. These indicated excellent ($ICC > .75$) test-retest reliability for puffing variables, and fair-to-good range ($.4 < ICC < .75$) for CO and nicotine boost.

Conclusions: Ad lib smoking behavior, nicotine intake, and subjective responses do not differ substantially when comparing the first morning cigarette smoked after overnight abstinence to one smoked after 4 hours of ad lib smoking. However, special attention should be paid when comparing smokers with different smoking rates, since greater CPD influences puff velocity and subjective withdrawal and craving relief.

FUNDING: This research was funded by NIH grant DA02277 from the National Institute on Drug Abuse. KCR is funded as a postdoctoral scholar in the Center for Tobacco Control Research and Education at the University of California, San Francisco (National Cancer Institute grant CA-113710).

JUSTIFICATION: This research should inform clinical research that uses topography devices to assess smoking behavior, since time of day/abstinence is not shown to substantially affect smoking behavior and nicotine intake.

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POS5-20

DOES THE MAGNITUDE OF REDUCTION IN CIGARETTES PER DAY PREDICT SMOKING CESSATION? A QUALITATIVE REVIEW

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Introduction: Reduction in cigarettes per day (CPD) aided by nicotine replacement therapy (NRT) increases cessation in smokers; however, it is unclear whether this is due to use of NRT or reduction per se. If the latter, a greater magnitude of reduction in CPD should increase the likelihood of cessation.

Methods: The authors searched PubMed, Cochrane, PsychINFO, clinicaltrials.gov and their personal libraries for studies on smoking reduction. Seven of the 76 (9%) identified intervention trials and four of 28 naturalistic studies (14%) reported on the magnitude of reduction in relation to the likelihood of cessation.

Results: Five of the seven intervention trials and three of the four naturalistic observational (cohort) studies found that increased reduction in CPD was associated with increased cessation. The intervention trials that reported effect sizes found that every one percent decrease in CPD or carbon monoxide (CO) was associated with a 3-4% increase in the odds of cessation. The naturalistic studies found that ordinal (e.g., quartile) increases in participants' magnitude of reduction in CPD were associated with 50% to 290% increases in the odds of

cessation. All of the naturalistic studies and four of the intervention trials included covariates; however, reduction's association with cessation could still be due to its association with NRT use or motivation.

Conclusion: These findings suggest reduction in CPD is a mechanism for the increased cessation in prior NRT-aided reduction studies.

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POS5-21 PREVALENCE AND CORRELATES OF E-CIGARETTE USE ON A LIBERAL ARTS CAMPUS

Eugene Olaiya, BS*, Jessica Petri, BA, Candace Tomes, MA, Olivia Robinson, BA, Alexandra Layton, Madeline Judge, David Baum, MA and Susan L. Kenford, PhD, Xavier University

Use of e-cigarettes by youth and young adults has been steadily increasing. College students have traditionally shown lower use of tobacco products as compared to community samples; it is unknown if these findings generalize to e-cigarettes. This study explored e-cigarette use in a sample of 422 (39% male; 80% white) undergraduates at a private liberal arts university located in a high tobacco use state (Ohio). Results indicated that 25% (n=105) of the sample had tried e-cigarettes; 11% (n =47) were current users. Use rates did not significantly differ by class standing or race. The majority of current users (77%) used every few weeks to every few months. Men were significantly more likely to have tried e-cigarettes than women (40% vs 16%) and comprised 64% of current users. All levels of e-cigarette use (daily, weekly, monthly) were viewed as significantly safer than comparable use levels of tobacco cigarettes by the full sample; however, e-cigarette users rated the risks as significantly lower than did non-users. All differences were robust (p<.000) and exceeded bonferroni corrected significance levels. Use of e-cigarettes was significantly correlated with use of tobacco cigarettes (r=.59) and illicit drugs (r=.37); both tobacco cigarette use (16% of sample) and illicit drug use (20% of sample) were more common than e-cigarette use. Among e-cigarette users, 24% did not use tobacco cigarettes and 38% did not use illicit drugs. At a univariate level, binge drinking frequency, illicit drug and tobacco cigarette use all showed significant relations with e-cigarette use. However, multivariate analyses indicated that illicit drug use (OR=2.9; CI:1.3-7.1) and tobacco cigarette use (OR=24.4; CI=10.0-59.7) accounted for unique variance in e-cigarette use but binge drinking (OR = .97; CI = .84 - 1.2) did not. The findings suggest that e-cigarettes, although viewed as less risky than tobacco cigarettes, at present are most likely to be used by individuals who use tobacco cigarettes or other drugs. Annual assessment of e-cigarette use will be necessary to establish the stability of these patterns given the growth of e-cigarette experimentation/use among adolescents.

FUNDING: No funding

JUSTIFICATION: Baseline data for longitudinal assessment of e-cigarette use prevalence and correlates among college student population.

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POS5-22 PREDICTORS OF CIGARETTE AND MARIJUANA USE AMONG ADOLESCENTS: A SYSTEMATIC REVIEW

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Background: Cigarette and marijuana use are increasingly prevalent among U.S. adolescents. In addition to the adverse health effects from each substance alone, dual use can create an even greater health concern and elevate future

health risks. Understanding the predictors of adolescent substance use in the years immediately preceding and during adolescence is vital for future prevention efforts.

Purpose: The purpose of this systematic review is to identify the evidence-based predictors of both cigarette and marijuana use in adolescence through a comprehensive search of the literature from 1990 to October 2014.

Methods: Four databases were searched (PubMed, PsychINFO, MEDLINE, PsychArticles) for terms related to cigarette and marijuana predictors among adolescents. In particular, longitudinal national studies including youth predictors from ages 6-11 years through adolescence were captured.

Results: Nine studies met inclusion criteria. Results of these studies highlight a variety of predictors of use, including social predictors, behavioral factors, mental health issues and family characteristics as categories of predictors.

Conclusion: Deviant peer influence, aggression, risk-taking, lack of self-control, stressful life events, depression, larger family size, and negative family events were all identified as predictors of both cigarette and marijuana use among adolescents. Future research is needed to further understand the impact of these factors across the lifespan and to validate the findings of the included studies.

FUNDING: No Funding

JUSTIFICATION: This systematic review highlights key predictors of adolescent dual use of cigarettes and marijuana which may inform the development of targeted age-specific interventions to prevent subsequent adolescent substance use.

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POS5-23 EVIDENCE FOR A CAUSAL EFFECT OF COFFEE CONSUMPTION ON HEAVINESS OF SMOKING AND SMOKING CESSATION: A TWO-SAMPLE MENDELIAN RANDOMISATION ANALYSIS

Jennifer J. Ware, PhD*, Amy E. Taylor, PhD, Philip Haycock, PhD, Peter J. Rogers, PhD, George Davey Smith, MD, and Marcus R. Munafò, PhD, University of Bristol.

Coffee consumption is associated with a range of smoking behaviours. Given the widespread use of coffee worldwide, and the substantial health burden posed by smoking, determining the causal impact of coffee consumption on smoking behaviour is of clear public health importance. However, traditional observational studies do not allow us to confidently determine direction of causality between variables, and cannot rule out the possibility of confounding. Mendelian randomisation (MR) offers a solution to these issues. This approach uses genetic variants which robustly associate with an exposure of interest (e.g., coffee consumption) as proxies for said exposure. We performed two-sample MR analyses, using publicly available data, to explore the causal effect of coffee consumption on smoking initiation, smoking heaviness, and smoking cessation. Data from the Coffee and Caffeine Genetics Consortium and the Tobacco and Genetics consortium were used to estimate gene-exposure and gene-outcome associations respectively. Summarised estimates from multiple genetic variants were combined using fixed effects meta-analysis. No evidence for a causal effect of coffee consumption on smoking initiation was observed. However, we observed evidence consistent with a causal effect of coffee consumption on smoking heaviness. Each additional cup of coffee consumed per day corresponded to a ~1.5 cigarette per day decrease in daily consumption (beta -1.49, 95% CI -2.88 to -0.09, p=0.037). This relationship may be mediated by caffeic acid, a polyphenol present in coffee which inhibits the activity of CYP2A6, a nicotine metabolising enzyme. We also observed evidence consistent with a causal impact of coffee consumption on smoking cessation. Each additional cup of coffee consumed per day corresponded to a 26% reduction in the odds of being a former (relative to current) smoker (OR 0.74, 95% CI 0.56 to 0.98, p=0.038). This effect may be due to the impact of cigarette smoke on caffeine metabolism, and the resultant experience of caffeine toxicity following smoking cessation. These results have the potential for clinical application, and would benefit from follow-up in an experimental setting.

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the National Institute for Health Research, under the auspices of the UK Clinical Research Collaboration, is gratefully acknowledged. Support from the Medical Research Council (MC_UU_12013/6) is also gratefully acknowledged.

JUSTIFICATION: We observed evidence that was consistent with a causal impact of coffee consumption on smoking heaviness and smoking cessation: increased coffee consumption reduces daily cigarette consumption, but also reduces the odds of successful smoking cessation. These observations, which are supported by plausible biological mechanisms, hold the potential for clinical application and would benefit from follow-up in an experimental setting.

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POS5-24 REACHING VULNERABLE POPULATIONS: TOBACCO USE AMONG YOUTH EXITING FOSTER CARE

Jordan Braciszewski, PhD, Decision Sciences Institute/PIRE*, Suzanne M. Colby, PhD, Center for Alcohol and Addiction Studies, Brown University

Although rates of smoking have declined for adolescents and young adults in recent years, prevalence remains high among underserved and vulnerable populations. Sexual minorities, individuals with mental illness or physical disabilities, and those experiencing homelessness are among such subgroups. Youth "aging out" of the foster care system (i.e., those who reach the age of majority and do not achieve reunification) can also be counted among those facing tobacco-related health disparities. A plethora of research with foster youth has focused on negative outcomes such as unemployment, homelessness, and physical health issues. Few studies, however, have examined substance use – particularly tobacco use – in this population.

The aim of the current study was to determine the prevalence of lifetime and current tobacco use in a sample of 116 youth exiting the foster care system, and to compare obtained rates to national surveillance data. Results indicate that nearly two-thirds (62%) have used tobacco in their lifetime, more than 1.5 times the national rate (38%). Current tobacco use is also extraordinarily high with almost half (46%) identifying as current smokers, nearly triple the national rates (16%). Finally, almost one-third (32%) reported daily smoking, 3.8 times the national rate of 8.5%.

These smoking prevalence data paint a concerning picture for these youths' transition into adulthood, as substantial rates of tobacco dependence and disproportional burden of tobacco-related disease looms likely. Nearly three-quarters of the tobacco users in this sample also currently use alcohol (70%) or marijuana (72%), and 26% use both tobacco and marijuana daily, further increasing the risk of disease and premature mortality. In addition to presenting these data, we also propose the development of a population-specific cessation intervention. Such tailoring of interventions is not only generally advisable, but previous reports have stressed the importance of acknowledging the specific needs of youth in foster care, as traditional approaches may not be appropriate for this vulnerable group.

FUNDING: National Institutes on Drug Abuse Grant 5R34DA034822

JUSTIFICATION: Vulnerable populations, such as youth aging out of the foster care system, remain at disproportional risk for tobacco-related diseases, thus requiring innovative means of intervention.

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POS5-25 E-CIGARETTE USE AMONG TEXAS YOUTH: RESULTS FROM THE 2014 TEXAS YOUTH TOBACCO SURVEY

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Introduction: Electronic cigarettes (e-cigarettes) are currently unregulated by the FDA and have neither been determined as safe in general nor as effective for smoking cessation. Several characteristics of e-cigarettes, such as candy flavorings, are worrisome for attracting youth. The current cross-sectional study uses data on e-cigarette use from the 2014 Texas Youth Tobacco Survey (TYTS), a representative statewide sample of Texas middle school and high school students. This study's aims are to determine the prevalence of current e-cigarette use, including rates of concurrent use with other tobacco products among Texas youth and to describe the demographic and tobacco use differences between e-cigarette current users and non-users.

Methods: Participants were 13,602 6th through 12th grade students in Texas. Logistic regression analyses were conducted to determine the prevalence of current e-cigarette use across demographic and tobacco use behaviors and examine differences in demographic characteristics and tobacco use behaviors for current e-cigarette users versus non-current users.

Results: Almost one quarter of all middle and high school students reported lifetime e-cigarette use and 14.0% were past 30-day users of these products. Current e-cigarette users were more likely to be white, male and older than non-current users. Current e-cigarette users were also more likely than their peers to use other tobacco products, although 20.7% of current e-cigarette users had never smoked cigarettes, and 6.6% had never used any other type of tobacco product besides an e-cigarette. It is particularly alarming that current e-cigarette use in the TYTS was higher than current conventional cigarette use (11.7%). This study is the first to demonstrate that trying flavored tobacco products is linked to current e-cigarette use. Sixty-eight percent of current e-cigarette users indicated that they had ever tried flavored tobacco products as compared to only 9.2% of non-current users.

Conclusions: Findings highlight the urgency to regulate e-cigarettes as well as to include these products in tobacco prevention programs.

FUNDING: This work was supported by grant number [1 P50 CA180906-01] from the National Cancer Institute at the National Institutes of Health and the Food and Drug Administration, Center for Tobacco Products (CTP). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the Food and Drug Administration.

JUSTIFICATION: This study has implications for the regulation of new and emerging tobacco products.

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POS5-26 THE ASSOCIATION BETWEEN CRAVINGS AND SMOKING IS MODERATED BY DIETARY RESTRAINT

Amanda M. Palmer*, BA, Michelle A. Kovacs, MA, and Thomas H. Brandon, PhD., University of South Florida and Moffitt Cancer Center

Research shows that females are more likely to smoke for weight control, and this pattern tends to be exacerbated in those with high dietary restraint (Pomerleau et al., 1993). The current study aims to examine the mechanisms involved in this relationship, as they will have treatment implications for both maladaptive eating behaviors and smoking cessation. As part of a larger laboratory study, female participants reported their cigarette cravings through the Questionnaire of Smoking Urges-Brief (Cox et al., 2001), and then were presented with an ad-lib "taste test" in which they had the option to eat, smoke, and/or use a computer tablet. Sessions were videotaped and smoking topography (number of puffs) was scored after completion. The current analysis is an examination of factors associated with cigarette consumption among 50 participants during the ad-lib phase. Participants were categorized into high-restraint and low-restraint eaters based on a median

split on Restraint Scale scores (Herman & Polivy, 1980). High-restraint eaters reported higher scores on the Weight-Control Smoking Scale (Pomerleau et al., 1993) than low-restraint eaters ($p < .05$), indicating that they smoke in part in an effort to control weight. Additionally, high-restraint eaters smoked significantly more puffs during the session ($M = 22.47$) than low-restraint eaters ($M = 13.82$, $p < .0001$). Finally, we tested if restraint status moderated the association between craving and smoking behavior. Multiple regression revealed an interaction between urge and restraint status on number of puffs smoked ($p < .05$). Simple regression analyses revealed that urge to smoke positively predicted smoking behavior among high-restraint women ($p < .05$) but not among low-restraint women. These findings suggest that in the presence of tempting food, smoking behaviors in those with high dietary restraint are more responsive to the effects of cigarette cravings, which manifests in increased smoking behavior. Overall, these findings contribute to the understanding of smoking for weight control purposes.

FUNDING: This study is funded by University of South Florida and Moffitt Cancer Center, Tampa FL

JUSTIFICATION: The current study aims to examine the mechanisms involved in smoking behaviors among those with high dietary restraint, which will have treatment implications for both maladaptive eating behaviors and smoking cessation.

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POS5-27 DOES ACUTE NICOTINE VIA ELECTRONIC CIGARETTES HAVE REINFORCEMENT ENHANCING EFFECTS?

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Recent studies with humans confirm animal research showing that nicotine acutely enhances reinforcement from rewards unrelated to the nicotine. These acute effects of nicotine via tobacco smoking may also occur when consumed via electronic cigarettes (e-cigarettes). Procedures in this within-subjects study were adapted from our prior research on reinforcement enhancing effects of nicotine via tobacco (e.g. Perkins & Karelitz 2013 *Psychopharmacol* 228: 479-486). Thus, we compared reinforced responding for different rewards after acute use of unmarked e-cigarettes ("Prime Vapor") containing nicotine (labeled as 36 mg/ml) or no nicotine (i.e. placebo, 0 mg/ml), or after no e-cigarette use, in 28 adult dependent smokers (12 M, 16 F). E-cigarette ("e-cig") use was standardized via CReSS, adapted for e-cigs, with 10 "puffs" prior to each of 4 task trials per session, each session following overnight smoking abstinence (>12 hr; CO<10 ppm). In each session, subjects responded on an operant computer task using the same schedule of reinforcement (PR50%) for small units of each reward type, available singly on 4 separate 15-min trials: music or video (30-sec clips each), money (\$.10), or no reward (control). We hypothesized nicotine effects on responding for sensory rewards (music, video) but not money. The overall ANOVA showed a trend toward an interaction of e-cig condition x reward type on reinforced responding, $F(6, 162)=1.91$, $p=.08$. In planned comparisons, reinforcing effects of video, but not the other rewards, were greater due to the nicotine vs. placebo e-cig (i.e. nicotine per se; $p<.005$), as well as between the nicotine e-cig vs. no e-cig sessions ($p<.02$). As expected, no differences were seen between the placebo e-cig and no e-cig ($p=0.9$). Partly consistent with hypotheses, reinforced responding did not differ due to nicotine from the e-cig for monetary reward or no reward, but also (unexpectedly) for music reward. Our results confirm some reinforcement enhancing effects of nicotine intake in humans from means other than tobacco smoking, and they suggest these effects may help foster use of e-cigarettes.

FUNDING: Supported by NIH Grant DA35774.

JUSTIFICATION: Results confirm reinforcement enhancing effects of nicotine in humans other than via tobacco smoking, suggest effects that may foster use of e-cigarettes.

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POS5-28 INITIAL TEST OF FIBRATE MEDICATION EFFICACY FOR SMOKING CESSATION

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Recent preclinical research with primate and rodent models shows that peroxisome proliferator-activated receptor-alpha (PPAR- α) ligands significantly reduce nicotine reinforcement, reward, and related effects. PPAR- α agonists showing such effects include fibrate medications, which have been FDA-approved for decades to improve lipid control. We tested the most common fibrate, fenofibrate, for initial evidence of clinical efficacy in smoking cessation using an efficient and validated cross-over procedure for early Phase 2 tests of initial efficacy in novel cessation medications (Perkins & Lerman 2014 *Psychopharmacol* 231: 1-11). Subjects were 38 adult dependent smokers (27 M, 11 F) already intending to quit permanently in 2 months, with means (SD) of 30.3 (11.5) years old, 16.4 (7.0) cigarettes per day, and FTND score of 4.7 (2.4). To attract those high in quit interest, a benefit for participation was free counseling and bupropion to make a permanent quit after they completed all study sessions. Across this within-subjects 4-week study, all smoked ad lib during weeks 1 (baseline) and 3 (washout) and began fenofibrate (160 mg/day; dosing approved for lipid control) or placebo at the end of weeks 1 and 3. Following each 4-day dose run-up, they were to try and quit for 4 days (Tues-Fri) during weeks 2 and 4, with medication conditions counter-balanced and double-blind. Abstinence (24-hr) was verified daily by CO<5 ppm. To maintain quit motivation, all received \$15 each day they met abstinence criteria. Results showed no differences between fenofibrate vs. placebo for days quit, means (SEM) of 1.8 (0.3) vs. 1.9 (0.3), respectively, $F(1,36)<1$. We also found no differences in withdrawal or craving. Although higher dosing may show efficacy, these data indicate that fenofibrate may not aid ability to stop smoking during a brief practice quit period. Other fibrates or PPAR- α agonists may still warrant testing for efficacy in smoking cessation, but this study suggests fenofibrate lacks cessation efficacy.

FUNDING: Supported by NIH Grant P50 CA143187.

JUSTIFICATION: Preclinical findings suggest fibrate drugs, or PPAR- α agonists, may have efficacy in smoking cessation in humans, warranting early Phase 2 testing.

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POS5-29 ACUTE SUBJECTIVE EFFECTS OF CIGARETTES DIFFERING IN NICOTINE CONTENT BASED ON SUCCESS OF DISCRIMINATION BEHAVIOR

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Nicotine produces interoceptive stimulus effects in the brain, likely relevant to understanding its reinforcing efficacy. These effects are assessed via discrimination behavior that distinguishes between varying drug conditions (e.g. active vs. placebo). To better understand the basis by which smokers can perceive nicotine, we compared acute subjective responses to cigarettes differing in nicotine content between smokers who were, versus were not, able to discriminate between them. Participants (N=29; 16 M, 13 F) had means (SD) of 31.8 (12.0) years old, 16.1 (6.0) cigarettes per day, and 4.6 (2.1) FTND score. All were abstinent overnight (>12 hrs; verified by CO <10 ppm) prior to the session, in which they were administered two different Spectrum research cigarettes labeled "A" or "B", with yields of 0.8 mg or 0.03 mg nicotine, obtained from the NIDA Drug Supply Program. Subjects were first informed of the letter code for each cigarette administered singly in 2 separate "training" trials. They were then given one or the other cigarette, blind and in counter-balanced order, every 15 minutes across 6 "testing" trials, with intake standardized at 4 puffs via Cress. Each correct identification was reinforced by \$1. Reliable ability to discriminate was defined by correctly identifying the cigarette on >80% of testing trials (i.e. 5 out of 6). Results showed 12 subjects

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did, but (surprisingly) 17 did not, discriminate the two cigarettes. As hypothesized, subjective responses between cigarettes were greater in those able vs. unable to discriminate (i.e. interaction of discriminability x nicotine), $F(8,20)=4.01$, $p<.005$ in MANOVA. In follow-ups, this interaction was $p<.001$ for each rating of pleasure (e.g. "liking", "satisfying") and drug perception ("how much nicotine", "how strong") but not for most effects not expected to differ due to nicotine (e.g. "how smooth", "how harsh"). Results are consistent with the notion that behavioral discrimination of cigarettes varying in nicotine is strongly driven by their concomitant subjective effects. Further evaluation as to why some smokers appear unable to discriminate the nicotine in these cigarettes warrants study.

FUNDING: Supported by NIH Grant U54 DA31659 (Donny).

JUSTIFICATION: The ability to differentiate cigarettes based on their nicotine content is associated with their concurrent subjective effects.

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POS5-30 TOBACCO SMOKE POLLUTION ON OUTDOOR PATIOS: DOCUMENTING SOURCES OF PM2.5 USING WEARABLE IMAGING TECHNOLOGY

Andrea Soong, MSPH*; Ryan David Kennedy, PhD; Joanna E Cohen, PhD, MPH. Johns Hopkins Bloomberg School of Public Health, Institute for Global Tobacco Control

Background: Measuring tobacco smoke pollution (TSP) on patios is challenging because the traditional proxy measure of particulate matter (PM2.5) is not specific to tobacco smoke. Further, it is difficult to discretely document outdoor smoking events on the patio of a restaurant or bar.

Research objectives: (1) Test the feasibility of using wearable imaging technology to discretely collect observational data, (2) Pair observational data with environmental data to understand how observed sources of PM2.5 impact air quality.

Methods: Researchers visited a convenience sample of 21 patio environments in Atlanta, GA in the fall of 2014. One researcher wore glasses with a built-in digital camera to take pictures every 30 seconds while a second researcher measured concentrations of PM2.5 using a SidePak AM510. Data were collected for approximately 40 minutes per venue. Researchers noted feedback from staff/patrons with respect to the special glasses. PM2.5 concentrations were calculated for time spent on the patio and during specific particulate generating 'events' observed such as smoked cigarettes.

Results: Researchers did not receive any comments regarding wearing the glasses throughout the entire collection period. Researchers did experience challenges capturing exact start and stop times for smoked tobacco events largely due to poor sightlines or multiple smoking events in different sections of the patio. Ambient PM2.5 concentrations in Atlanta during the days of monitoring were generally below $8\mu\text{g}/\text{m}^3$. Tobacco smoking was observed at 15 venues. One venue was visited for 43 minutes; the arithmetic average PM2.5 concentration was $38\mu\text{g}/\text{m}^3$. Observations recorded using photos identified 2 time periods when cigarettes were being smoked; the arithmetic mean concentration of PM2.5 during these periods was $75\mu\text{g}/\text{m}^3$, and $59\mu\text{g}/\text{m}^3$.

Discussion: Wearable technology was useful to record tobacco smoking events on outdoor patios without drawing any undue attention. Photos did support pairing of observational data with environmental data to understand how TSP impacted air quality, although researchers also relied on written notes to augment digitally recorded observations.

FUNDING: This project was supported by a grant from the Flight Attendant Medical Research Institute (FAMRI) to the Johns Hopkins FAMRI Center of Excellence.

JUSTIFICATION: Measuring tobacco smoke pollution on patios is challenging because traditional proxy measure of particulate matter (PM2.5) is not specific

to tobacco smoke. Further, it is difficult to discretely document outdoor smoking events in public hospitality venues.

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POS5-31 THE ASSOCIATION BETWEEN TOBACCO RETAILER DENSITY AND PROXIMITY TO SCHOOLS

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Background: The link between the availability of retail tobacco and youth tobacco use must begin to distinguish between the effects of 1) tobacco retailer density across the study area and 2) the immediate proximity of tobacco retailers to youth.

Purpose: The primary purpose of this study was to understand the relationship between tobacco retailer density and tobacco retailers' proximity to public middle/high schools among every tobacco outlet located within six counties of West Virginia. The secondary aim of this study was to examine how tobacco retailer characteristics vary across proximity – density groups.

Methods: Kernel density estimation assessed the availability of retail tobacco across six counties in West Virginia. The proximity from each tobacco retailer (N = 276) to the nearest public middle/high school (N = 33) was calculated utilizing street network routes. Chi-square tests assessed the relationship between increasing levels of tobacco retailer density and levels of tobacco retailers' proximity to the nearest school. Three-way fixed effects analysis of variance assessed the effects and interactions between proximity – density groups, metropolitan/non-metropolitan status, and store type on various tobacco retailer store characteristics (e.g., exterior tobacco marketing and lowest non-menthol pack price).

Results: A significant positive relationship (Chi-square = 116.54, p-value < 0.001) existed between levels of tobacco retailer density and tobacco retailer proximity to school levels. The amount of exterior tobacco marketing displayed in each tobacco retailer showed a significant ($F(6, 254) = 3.528$, p-value < 0.01) two-way interaction between proximity – density groups and tobacco retailer store types. While a significant ($F(4,254) = 5.593$, p-value < 0.001) three-way interaction between proximity – density groups, metropolitan/non-metropolitan status, and tobacco retailer store types existed for the average pack price of non-menthol cigarettes.

Conclusions: The study illustrates the need systemically contrast the inter-relationships between tobacco retailer density and tobacco retailers' proximity to schools within youth smoking studies.

FUNDING: Legacy internal seed funds.

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POS5-32
FEASIBILITY AND VALIDATION STUDY OF CARBON MONOXIDE VALUES SUBMITTED OVER THE INTERNET

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Previous studies have established the feasibility of collecting expired-air carbon monoxide (CO) values over the Internet, to biochemically validate smoking abstinence, such as from participants enrolled in a contingency management program for cessation. This method requires participants to submit video recordings of themselves correctly using a CO monitor. Cessation trials or studies of abstinence effects (e.g., studies on nicotine withdrawal) may require daily visits to confirm continuous abstinence via expired-air CO, placing a burden on participation. One way to ease this burden could be to collect CO values remotely, over the Internet, but it has not been demonstrated that video-submitted CO values obtained outside of the lab are the same as monitored CO values obtained in a lab. In the current feasibility study, CO values submitted through the Internet were directly compared to those collected in subsequent same-day lab visits via Bland-Altman analysis to determine if the methods could be used interchangeably. Participants, a subset from a short-term cessation study, agreed to record and submit videos of themselves using a lab-supplied Bedfont piCO+ Smokerlyzer. They did so daily during two 4-day practice quit attempts (while continuing to also come into the lab each day), for a total of eight videos each. Videos were submitted using the participants' own cell phone or webcam, after brief training. Of the 24 total videos, 13 were submitted when abstinence (CO <5 ppm) was verified in the lab visit. To eliminate any bias introduced by non-abstinent smokers smoking between the two CO samples on a given day, only these 13 video CO values were compared to their subsequent in lab CO values, with a mean (SD) difference between samples of 5.09 (2.95) hours. CO values obtained through the video were on average <1ppm higher than CO values obtained in the respective lab session. Inspection of the Bland-Altman plot confirmed the abstinence CO values obtained over the Internet can be used interchangeably with those obtained during a lab visit, and this procedure may be a less burdensome alternative to multiple daily lab visits for CO checks.

FUNDING: Supported by NIH Grant UH3 TR00958 from NCATS.

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POS5-33
PUFF-BY-PUFF NICOTINE DELIVERY FROM SPECTRUM RESEARCH CIGARETTES

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Background: SPECTRUM research cigarettes have recently become available for investigators through the NIDA Drug Supply & Analytical Services Program. Despite specified FTC nicotine yield, little is known about nicotine delivery by these cigarettes at different smoking intensity conditions.

Methods: Three types of SPECTRUM non-menthol cigarettes NRC700, NRC600 and NRC400 with FTC nicotine yield 1.74, 0.76 and 0.23 mg, respectively, were assessed for puff-by-puff and total per cigarette nicotine delivery using a smoking machine approach. Each type of cigarette was assessed with the FTC protocol and 5 additional conditions in which puff flow rate was constant at 38 mL/sec while puff volumes and inter-puff intervals (IPI) were 40 mL, 35 sec; 65 mL 35 sec; 90 mL 35 sec; 65 mL 15 sec and 65 mL, 55 sec, respectively. Main stream smoke nicotine was trapped by Cambridge filters, extracted with isopropanol and analyzed by gas chromatography.

Results: 1) Across all conditions, NRC700 cigarettes generated more puffs per cigarette than NRC600 which, in turn, generated more puffs than NRC400. For example, at FTC conditions the averages ± SD for puff number and total smoke volume with NRC700, NRC600 and NRC400 cigarettes were 8.9 ± 0.6, 311 ± 22 mL (n=7); 7.7 ± 0.8, 270 ± 27 (n=6) and 6.9 ± 0.7, 240 ± 24 (n=7), respectively. 2)

At all conditions the nicotine delivery per puff gradually increased along with puff number (cumulative smoke volume). The average nicotine yield across all study conditions from the last three puffs were 1.9, 2.0 and 1.5 fold of that for the first three puffs from NRC700, NRC600 and NRC400 cigarettes, respectively. 3) The maximal nicotine delivery per cigarette was observed at the smoking condition of 65 mL per puff and 15 sec IPI. At this condition, the observed values for NRC700, NRC600 and NRC400 were 2.5, 3.0 and 2.3 fold of those observed at the FTC condition, respectively.

Conclusions: The estimation of daily nicotine exposure based only on number of SPECTRUM cigarettes smoked and their FTC yield may result in severe biases. For better assessment of nicotine exposure, smoking topography should be taken into consideration.

FUNDING: FUNDING: This research was supported by grant R01DA034862 from the National Institute on Drug Abuse and FDA Center for Tobacco Products.

JUSTIFICATION: The presented results have direct implications for clinical research with SPECTRUM research cigarettes and investigation of smoking behavioral pharmacology.

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POS5-34
ASSESSING TRENDS IN SMOKING CESSATION IN DIVERSE PATIENT POPULATIONS USING ELECTRONIC MEDICAL RECORDS

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Objective: To examine change in smoking over four years in six diverse health care organizations. Study Design: Longitudinal observation.

Methods: The study cohort (N = 34,393) included patients age 18 years or older who were identified as smokers in 2007, and who then had at least one primary care visit in each of the following four years. In the first observation year the mean age of this cohort was 50.6 years and 46.3% were women.

Results: In the four years following 2007, this patient cohort had a median of 13 primary care visits, and 38.6% of the patients quit smoking at least once. At the end of the fourth follow-up year, 15.4% had stopped smoking for one year or more. Those more likely to become long-term quitters were 65 or older (OR=1.32, 95% CI= [1.16, 1.49]), or had a diagnoses of cancer (1.26 [1.12, 1.41]), cardiovascular disease (1.22 [1.09, 1.37]), asthma (1.15 [1.06, 1.25]) or diabetes (1.17 [1.09, 1.27]). Characteristics associated with lower likelihood of becoming a long-term quitter were female gender (0.90 [0.84, 0.95]), African-American race (0.84 [0.75, 0.94]) and those who were non-Hispanic (0.50 [0.43, 0.59]).

Conclusions: Among adult smokers who regularly use these care systems, one in seven had achieved long-term cessation after 4 years. These preliminary results show the feasibility of using patient electronic medical records for monitoring patient smoking status over time. Similar methods could be used to assess tobacco use in any health care organization to evaluate the impact of environmental and organizational programs.

FUNDING: This project was funded by the Agency for Health Care Research and Quality (AHRQ), US Department of Health and Human Services, R01HS019828.

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JUSTIFICATION: Patient electronic health records can be used in health care organizations for monitoring patient smoking status over time, and to evaluate the impact of environmental and organizational programs.

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POS5-35 PHARMACOKINETICS OF NICOTINE AND SUBJECTIVE EFFECTS FOLLOWING THE SINGLE USE OF A MENTHOL VERSION OF TOBACCO HEATING SYSTEM 2.2 IN THE US: A COMPARISON WITH SINGLE USE OF A COMBUSTIBLE CIGARETTE AND NICOTINE NASAL SPRAY

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This study is part of a global clinical program to assess the Tobacco Heating System 2.2 (THS 2.2), a candidate modified risk tobacco product. The objective of this study was to evaluate the pharmacokinetic (PK) profile of nicotine following single use of THS 2.2 menthol as compared to combustible menthol cigarettes (CC) and nicotine nasal spray (NNS).

This was, an open-label, randomized, two-period, four-sequence crossover study conducted in 62 healthy smokers in 2013. Each period consisted of 2 days, 1 day of smoking abstinence (nicotine wash-out), and 1 day of single product use (THS 2.2 menthol, CC or NNS) with every subject being exposed to 2 of the 3 products (THS 2.2 menthol/CC or THS 2.2 menthol/NNS). During the single use day, a total of 16 venous blood samples were collected including 1 sample prior to product use and at various time points up to 24 hours. PK parameters were calculated using a non-compartmental model. Urge-to-smoke was assessed using the Questionnaire of Smoking Urges-brief (QSU-b). This study was conducted in 2013 in the US according to ICH GCP and was registered with ClinicalTrials.gov, number NCT01967719.

For THS 2.2 menthol, the values for AUC(0-last) and C_{max} were lower compared to CC (44% (95% CI:19%, 56%) lower for AUC(0-last) and 43% (95% CI: 28%, 56%) lower for C_{max}). AUC(0-last) and C_{max} were higher for THS 2.2 menthol compared to NNS. The t_{max} was longer for CC than for THS 2.2 menthol (6 min for THS 2.2 and 10 min for CC) while the t_{max} for NNS was slightly longer than for THS 2.2 menthol (8 vs. 9 min). A reduction from baseline in QSU-b score was observed 15-30 minutes after single use for both, THS 2.2 menthol and CC (about 21% for THS 2.2 and 36% for CC), greater than the reduction after 45-60 minutes following NNS. THS 2.2 menthol was well tolerated.

The differences observed in PK parameters (C_{max}, AUC(0-last) and t_{max}) for THS 2.2 menthol compared to CC, might be best explained due to differences in product use behavior. A transient reduction in urge-to-smoke was observed with THS 2.2 menthol, with the reduction for THS 2.2 slightly less compared to CC but higher than NNS after single use.

FUNDING: Philip Morris Products S.A., Neuchâtel, Switzerland

JUSTIFICATION: The presented study is part of the global clinical program for a candidate modified risk tobacco product.

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POS5-36 TRENDS IN YOUTH USE OF E-CIGARETTES AND ALTERNATIVE TOBACCO PRODUCTS

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Background: While national smoking rates have fallen, electronic cigarettes (e-cigarettes) and alternative tobacco products have entered the market. Use of these products, whether alone or along with traditional cigarettes, poses added risk of nicotine addiction in youth.

Objective: Describe trends in youth-reported use of alternative tobacco products, including e-cigarettes, hookah, chewing tobacco and cigarillos, during 3 years of enrollment in a national RCT of smoking cessation counseling in pediatric primary care.

Methods: Data were collected from 142 practices from the AAP Pediatric Research in Office Settings Network as part of the Adolescent Health in Pediatric Practice study. 10550 youth (14-27y) completed a baseline survey of tobacco use upon arrival for office visits; 2196 (21%) were excluded from analyses because of missing data on at least one tobacco product, leaving a final sample of 8354. Chi-square analyses were used to compare ever-use of tobacco products across each year of baseline data collection.

Results: 8354 youth (58% female, 74% white, mean age 16y) enrolled over 3 years: 669 in 2012, 3665 in 2013, 4020 in 2014. In the full sample, 23% reported use of cigarettes, 11% e-cigarettes, 14% hookah, 6% chewing tobacco, 8% cigarillos. E-cigarette use rose from 5% in 2012 to 13% in 2014 (p<.001) and was especially high among current cigarette smokers: 34% in 2012 and 61% in 2014 (p<.001). Hookah use rose in youth who did not smoke cigarettes, from 8% in 2012 to 12% in 2014 (p<.001). Dual use of cigarettes and at least one other product was most common in older youth, but was still significant in youth age 14-17, with rates as high as 62% for e-cigarettes, 39% for hookah, 28% for chewing tobacco, and 40% for cigarillos. Dual/poly use of tobacco products was more common in males than females (20% v 15%, p<.001).

Conclusion: Youth use of alternative tobacco products and dual/poly use of tobacco products is evolving. The rapid rise in e-cigarettes is particularly concerning, as there is no evidence for their safety and they are heavily marketed to youth. Clinical interventions should address both traditional and alternative tobacco products.

FUNDING: This study is funded by the National Cancer Institute, R01-CA140576.

JUSTIFICATION: This paper demonstrates that youth use of e-cigarettes, alternative tobacco products, and dual/poly use of tobacco products is evolving; increased awareness of trends in youth tobacco use can prompt pediatric clinicians to screen for traditional and alternative tobacco products and increase delivery of clinical interventions in practice.

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POS5-37
EFFECT OF VOLUNTARY E-CIGARETTE WARNING LABELS ON RISK PERCEPTIONS AMONG ADULT SMOKERS AND DUAL USERS

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Unlike tobacco products, electronic vapor products (e.g., e-cigarettes, vape pens) are not currently required by law to contain a Surgeon General warning on their packaging. In September 2014, Nu Mark, an Altria subsidiary, began voluntarily adding a self-designed warning label to its packages of MarkTen brand e-cigarettes. This study assesses awareness of the MarkTen warning label and whether exposure to the warning label influences beliefs about e-cigarettes. A national convenience sample of 1,201 adult smokers (current use of cigarettes only) and dual users (current users of cigarettes and e-cigarettes) was surveyed in November 2014 with respondents being randomized to one of three conditions: MarkTen pack image with warning label, MarkTen pack image without warning label, or no pack image. Self-reported awareness of the warning label was high in the warning label condition (70.0%) and no warning label condition (50.6%), indicating that consumers may already expect these products to contain warning labels. Logistic regression models compared risk perceptions and beliefs among those in the two pack image conditions (with and without warning label), controlling for dual use, awareness of the MarkTen brand, age, gender, race/ethnicity, and income. Respondents in the warning label condition were three times more likely to agree that "MarkTen brand e-cigarettes contain dangerous chemicals" (aOR=3.29, p<0.001) and twice as likely to agree that "MarkTen brand e-cigarettes are dangerous to your health" (aOR=2.39, p<0.001) than those in the no label condition. Respondents in the warning label condition were also less likely to agree that they would buy MarkTen brand e-cigarettes "to reduce health risks of smoking" (aOR=0.75, p=0.048) and that "nicotine in MarkTen brand e-cigarettes provides the help that smokers need to quit" (aOR=0.71, p=0.023) than those in the no label condition. These results suggest that MarkTen's voluntary warning labels on e-cigarettes were noticed by consumers and may influence perceptions about the dangers of these products, the risks of e-cigarettes relative to cigarettes, and e-cigarette use as a cessation aid.

FUNDING: This work was funded under a RTI International contract with the Florida Department of Health's Bureau of Tobacco Free Florida.

JUSTIFICATION: This research provides policymakers with evidence regarding the influence of a voluntary, manufacturer-designed warning label on e-cigarette packaging on smokers' and dual users' perceptions of e-cigarettes.

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POS5-38
PROTOBACCO ADVERTISING ONLINE AND ON TV, AND ITS MODERATING EFFECT ON THE RELATIONSHIP BETWEEN SMOKING IMAGERY AND SMOKING BEHAVIOR

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Introduction: Exposure to protobacco advertising has been shown to impact smoking behavior. With more youth watching TV shows and other videos online, it becomes important to assess whether exposure to protobacco ads is different based on platform (i.e., watching online vs on a traditional TV set). Additionally, the role of protobacco ads in moderating the established relationship between seeing non-advertising smoking imagery (in movies, TV shows, etc.) and smoking is explored.

Methods: Legacy's cross-sectional Media Monitoring online questionnaire surveys 15-21 year olds weekly. This analysis includes data from 7/23/14 to 11/4/14 (n=1736). Multivariate models examined the relationship between video

consumption platform and protobacco advertising, and whether protobacco advertising moderates the relationship between smoking imagery exposure and smoking.

Results: Controlling for demographics and time spent watching video, young people who watch video largely via online platforms (i.e., watching online such as through Hulu, YouTube, etc. vs watching on a TV set) are 1.36 times more likely to see protobacco ads (p=0.004). The relationship between imagery exposure and smoking is stronger for those that see protobacco ads (current smoking OR=2.46, p=0.001; ever smoking OR=2.22, p=0.000) than those that do not (current smoking OR=1.30, p=0.199; ever smoking OR=1.42, p=0.022), with the moderating effect of protobacco advertising on the imagery/smoking relationship being stronger for current than ever smoking.

Conclusions: These results highlight the importance of better understanding protobacco ad exposure across media channels, and whether differences in advertising restrictions and capabilities on cable/network TV versus online play a role. The difference in moderating effect of protobacco advertising suggests the way protobacco ad exposure affects the relationship between imagery exposure and experimentation may be different than the way it affects the relationship between imagery exposure and more regular tobacco use; more research is needed to understand if and how protobacco ad exposure impacts how individuals process smoking imagery they see.

FUNDING: This study was funded by Legacy.

JUSTIFICATION: This study has implications for tobacco advertising restrictions across media channels, including online.

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POS5-39
RELATIONSHIP BEHAVIORS UNRELATED TO SMOKING INFLUENCE RELAPSE INDEPENDENT OF PARTNER SUPPORT FOR QUITTING

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The partner's support for quitting is a robust predictor of smoking cessation. Yet, interventions that have attempted to increase partner support for quitting have been largely unsuccessful, perhaps because they failed to target the most influential partner behaviors. To identify better targets for intervention, the current study tested a new contextual model of direct and indirect partner influences on smoking cessation. Couples in which one partner was a current smoker (n = 47) participated in a 21-day ecological momentary assessment study of self-quitting. Analyses focused on the self-quitters' baseline relationship functioning, randomly-sampled assessments of "typical" interactions, and lapse reports. Consistent with previous research, the partner influenced smoking directly: when self-quitters reported positive support for quitting, they were less likely to lapse, but when they reported negative support for quitting, they were more likely to lapse. Extending this previous work, we also found that the partner influenced smoking indirectly, through interactions unrelated to smoking. When self-quitters reported positive interactions with their partner, they were less likely to lapse, but when they reported effortful or conflictual interactions with their partner, they were more likely to lapse. These indirect influences depended heavily on perceptions of the partner's responsiveness (PPR), a global perception of the extent to which the partner understands, values, and supports the self. Those with higher PPR were particularly unlikely to lapse after a positive interaction. Conversely, those with lower PPR were considerably more likely to lapse after an effortful interaction. Similar analyses using baseline perceptions of the partner's support for quitting in place of PPR were not significant. Results held controlling for gender, nicotine dependence, motivation to quit, and interactions with people other than the partner. Results indicate that enhancing relationship functioning more generally, not merely support for quitting, may improve smoking cessation rates.

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JUSTIFICATION: Targeting global relationship functioning and interactions unrelated to smoking in partner support interventions may improve smoking cessation outcomes.

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POS5-40 SECONDHAND SMOKE EXPOSURE IN A CROSS-SECTIONAL STUDY IN BRNO, CZECH REPUBLIC: PRELIMINARY RESULTS

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Background: Secondhand smoke (SHS) is a major health risk. Smoke-free policies have been shown to reduce SHS exposure followed by reductions in cardiovascular mortality and morbidity. This study presents preliminary results on prevalence of SHS exposure in Brno, Czech Republic, where smoking is legally banned in most public places, but not in restaurants and bars.

Methods: A cross-sectional survey KardioVize was conducted in 2013-2014 to assess cardiovascular risk factors in a stratified random sample of Brno district residents aged 25-64. This study included the assessment of SHS exposure based on a structured, face-to-face administered questionnaire. Data analysis included descriptive statistics, chi-square test, and logistic regression

Results: The analysis included the first 1954 participants, 55.1% women; mean age 47.5 years (± 11.3). Non-smokers comprised the majority of the sample population (51.1%), followed by smokers (25.6%) and ex-smokers (21.6%). A total of 31.9% of respondents reported a regular exposure to SHS, mostly in restaurants. The reported SHS exposure varied by age, gender, education and marital status. The highest exposure of 58.0% was found in men aged 25-34 yrs and the lowest of 18.6% in 55-64 yrs women. Men were exposed to SHS more often than women (38.6% and 26.5%, $p < 0.001$); however, after adjustment for smoking status, this association remained significant only for non- and ex-smokers. The SHS exposure was as high as 50.0% in the youngest age group (25-34 yrs) as opposed to 23.1% in those aged 55-64 yrs ($p < 0.001$) and was inversely associated with the educational attainment (39.9%, 32.2%, and 27.5% among participants with primary, secondary, and higher education, respectively ($p < 0.001$).

In a regression model with SHS exposure as a binary outcome variable, younger age, male gender, lower education and income, and current smoking were significant predictors of SHS exposure.

Conclusion: About one third of adults aged 25-64 are exposed to SHS at public places, mostly restaurants, in Brno, Czech Republic. This calls for implementation of the comprehensive regulations through the extension of smoking ban to dining places.

FUNDING: Supported in part by the European Regional Development Fund, project FNUSA-ICRC (No. CZ.1.05/1.1.00/02.0123), Czech Ministry of Health (NT13434-4/2012)

JUSTIFICATION: The study findings can be translated into a policy paper to advocate for the amendment of the current Czech legislation and implementation of a comprehensive smoking ban.

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POS5-41 DO TEXTUAL STYLES IN CIGARETTE HEALTH WARNING LABELS MATTER?

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Objectives: To determine whether different textual styles (testimonial vs. didactic) on cigarette health warning labels influence responses to the warning labels.

Methods: A field experiment was conducted with adult smokers ($n=584$) and 15- to 18-year-old adolescents ($n=593$) in Indonesia using intercept recruitment strategies. Respondents were randomly assigned to one of two conditions: 1) warning labels with didactic text (i.e., smoking causes lung cancer); or 2) warning labels matched on all characteristics except that they contained testimonial text (i.e., "I am suffering from lung cancer because of smoking"). For each condition, respondents were randomly assigned to evaluate warnings for two out of eight possible health topics, with each topic containing four to six warnings that systematically varied key characteristics (i.e., presence vs. absence of picture; pictorial types: graphic organ damage, personal suffering, symbolic representation of risk). Respondents rated each warning for overall effectiveness, believability, relevance, and negative emotional arousal. Linear mixed effects models regressed ratings on dummy variables for textual conditions, for image types, and the interaction between them, both for the entire population and when estimating models separately for adults and adolescents.

Results: In linear mixed effects models, effectiveness ratings were significantly higher for didactic than testimonial text only among adolescents. When estimating model for entire population, significant interactions were found between condition and age group, and between condition and image type. Similarly, believability ratings were also significantly higher for didactic than testimonial only among adolescents and when considering pictorial images. Negative emotional arousal and relevance ratings were not significantly affected by condition. However, when estimating relevance model for adolescents, significant interaction was found between condition and smoking status.

Conclusions: Didactic text style appears to influence youth responses to cigarette warning labels. Future research should determine its effects on cessation-related outcomes.

FUNDING: This study was supported by a subagreement from Johns Hopkins University Bloomberg School of Public Health with funds provided by the Bloomberg Initiative to Reduce Tobacco Use. The contents of this report are solely the responsibility of the authors and do not necessarily represent the official views of the Bloomberg Philanthropies or The Johns Hopkins University Bloomberg School of Public Health.

JUSTIFICATION: This research aimed to enhance the implementation of pictorial health warning label regulation in Indonesia.

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POS5-42

INDOOR AIR CHEMISTRY: COMPARATIVE STUDY BETWEEN CONVENTIONAL CIGARETTE AND HEAT-NOT-BURN TECHNOLOGY

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Philip Morris International (PMI) is developing products with the potential to reduce the risk of smoking related diseases in comparison to combustible cigarettes (CC). The Tobacco Heating System (THS 2.2) operates by heating tobacco rather than burning it and results in an aerosol with substantially lower levels of harmful or potentially harmful constituents when compared to CC smoke. Additionally, THS 2.2 does not produce sidestream aerosol in the same manner as CC, since aerosol is only generated when puffs are taken. The impact on indoor air quality of using THS 2.2 is expected to be very different to CC. To verify this hypothesis, PMI built an environmentally controlled, furnished room and developed analytical methods to measure air pollutants under diverse simulated indoor environments focusing on: (i) ISO measurement standards for Environmental Tobacco Smoke and, (ii) selected carbonyls and volatile organic compounds.

A study was conducted with 3 simulated conditions (office, hospitality, residential) defined according to CEN standard EN 15251:2007. Three test items were compared: CC (Marlboro Gold 6 mg), THS 2.2 and background (people in the room without product use). Each study was duplicated, resulting in 18 separate sessions in total, each with a duration of 5 hours, with 4 hours of sample collection. For each analyte and condition, THS 2.2 and CC measured levels were compared to background levels. In case of statistical equivalence, no impact on air quality is reported. When levels are statistically above background, the levels are adjusted by subtraction of the background and reported (in mass per cubic meters).

For CC, all analytes for the 3 conditions were above background. For THS 2.2, no difference was detected between background and THS 2.2 for fifteen of the eighteen analytes investigated, irrespective of the environmental conditions applied. For the 3 analytes that were demonstrated to be statistically increased between THS 2.2 and background (nicotine, acetaldehyde and nitric oxides), the levels measured for THS 2.2 were only slightly increased compared to the background, 1 or 2 orders of magnitude lower than those measured for CC.

FUNDING: Philip Morris Products S.A., Neuchâtel, Switzerland

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POS5-43

CHANGES IN THE RATE OF NICOTINE METABOLISM ACROSS PREGNANCY: A LONGITUDINAL STUDY

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Background/Aims: Nicotine replacement therapy (NRT) is effective in reducing smoking rates in non-pregnant populations, but there is no evidence it is effective in pregnancy. Nicotine metabolism has been shown to increase in late pregnancy; if increases in metabolism are established by early pregnancy, this could explain why NRT is not effective in pregnancy. However, it is not known when the rate of nicotine metabolism begins to change, so this study describes longitudinal variations in nicotine metabolism during pregnancy and postpartum.

Methods: Saliva samples were collected from 101 pregnant smokers at 8-14, 18-22 and 32-36 weeks of pregnancy, and also after delivery at 4 and 12 weeks. A nicotine metabolite ratio (NMR) was measured using the ratio of cotinine (COT) to its primary metabolite trans-3"-hydroxycotinine (3HC). Multi-level modelling was used to detect any overall difference in NMR between time points. Also, the 12 week postnatal sample was defined as a "non pregnant" comparison sample and paired t-tests compared nicotine metabolism at this time with all other time points.

Results: NMR changed over time during pregnancy and postnatally ($p=0.0006$). Pairwise comparison of "non-pregnant" NMR with other time points found NMR was 15% higher at 8-14 weeks gestation (95% CI, 1% to 26%, $p=0.034$), 26%

higher at 18-22 weeks (95% CI, 12% to 38%, $p=0.001$) and 23% higher at 32-36 weeks (95% CI, 9% to 35%, $p=0.003$). The 4 week postnatal sample was not statistically different from the 12 week postnatal one.

Conclusions: In this sample of pregnant women an increased rate of nicotine metabolism was established by 8 weeks gestation and after pregnancy, metabolism returned to "non-pregnant" rates by 4 weeks. Changes in metabolism occurring early in gestation may explain why NRT has not been shown to have efficacy in pregnancy.

FUNDING: This study was conducted while the first author was at the University of Nottingham, funded by the School of Community Health Sciences at the University of Nottingham and the National Institute for Health Research (NIHR) and National School of Primary Care.

JUSTIFICATION: This research may help inform future clinical research which involves giving pregnant smokers nicotine replacement therapy.

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POS5-44

ACUTE SUBJECTIVE RESPONSES TO SMOKELESS TOBACCO PRODUCTS

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The last few decades have witnessed a substantial increase in the use of smokeless tobacco (ST) products such as snuff, chewing tobacco, snus, and dissolvable nicotine products. The characterization of new ST products is vital to understanding their rise in popularity and the consequences of their use. The current study administered a series of cross-over trials to rapidly characterize the abuse liability and likelihood of adoption of a variety of ST products. In Trial 1, reported here, 30 smokeless tobacco users used Skoal tobacco, Camel snus, Ariva dissolvables, Verve nicotine discs, or Nicorette lozenges (control product) on each of five separate laboratory visits. Differences between products in self-reported liking, change in craving, and change in withdrawal were measured. Repeated measures mixed model analyses revealed significant differences between products in the aversion ($p<.001$), reduced craving ($p=.002$), and satisfaction factors ($p=.014$), plus overall reinforcement ($p<.001$), as measured by the Cigarette Evaluation Scale modified for Smokeless Tobacco. Significant differences were also found between products in ratings of liking ($p=.014$), satisfaction ($p=.032$), nicotine content ($p<.001$), and strength of the tobacco ($p<.001$) as measured by the Duke Sensory Questionnaire modified for Smokeless Tobacco. No significant differences were found between products in overall relief of craving or withdrawal. Skoal tobacco consistently produced the highest ratings of liking and reduction in craving across measures. These preliminary findings reveal diversity in the abuse liability and likelihood of adoption across ST product types. Relationships between the characterization (nicotine content) and ratings of sensations and relief of craving from these products, and between neurocognitive boost measures (ERP) and ratings of relief from craving and withdrawal, are currently being examined.

FUNDING: Funding Sources: National Institute on Drug Abuse

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POS5-45

THE EFFECTS OF NICOTINE AND STRESS DIFFER DEPENDING ON SEX FOR ACTIVITY AND DEPRESSIVE-LIKE BEHAVIOR IN RATS

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The health hazards of tobacco and the addictive effects of nicotine are well-established and well-known. Yet, there are potential benefits of nicotine and nicotine analogues that merit consideration and experimental analysis. The present experiment examined whether nicotine has anti-depressive and anxiolytic effects with and without exposure to stressors. Tobacco use is linked to stress in the military. Given this relationship, the experiment utilized a stress paradigm that models the stressful experience of military deployments. The experiment used 32 male and 32 female late adolescent/young adult Sprague Dawley rats in a 2 (saline, 6 mg/kg nicotine) x 2 (no stress, stress) x 2 (female, male) full-factorial mixed design with behavioral measures collected at three time-points (baseline, approximately one and two weeks after nicotine or saline administration). Nicotine was administered subcutaneously by osmotic minipump. The stress manipulation consisted of exposure to predator stress in the form of synthetic fox urine along with non-painful unpredictable environmental stimuli (e.g., lights, noise) to prevent habituation to the fox urine. This dosage of nicotine was chosen to model effects of humans smoking ½ to 1 pack of cigarettes per day. General activity, depressive-related behavior and anxiety-related behavior were assessed by measuring open field activity (OFA), vertical activity (VA), center-time (CT), respectively. Overall, results differed based on sex, stress, and time. Female rats displayed a nicotine x stress x time interaction after one week of drug administration, such that nicotine increased activity in non-stressed rats but decreased activity in stressed rats ($F[1, 27] = 13.50, p = .001, \eta^2 = .33$). In contrast, male rats displayed a main effect of nicotine two weeks after drug administration ($F[1, 13] = 5.82, p = .03, \eta^2 = .31$). Additionally, results revealed that nicotine decreased depressive-related behavior in non-stressed, female rats and stressed, male rats. There were no findings with regard to anxiety-related behaviors. The present findings suggest that nicotine may be an effective anti-depressant when gender and stress are considered.

FUNDING: This research project was funded by Uniformed Services University of Health Sciences Grant EO 7219.

JUSTIFICATION: The present findings suggest the applicability of nicotine as an effective anti-depressant for females in non stressed environments and males in stressed environments.

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POS5-46

SMOKING IN THE HOME AFTER CHILDBIRTH: PREVALENCE AND DETERMINANTS IN A UK COHORT

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Children's exposure to secondhand smoke (SHS) has been causally linked to childhood morbidity and mortality. Over 50% of English children (age 4-15) whose parents are smokers are regularly exposed to SHS at home, but little is known about the prevalence of SHS exposure in the home in early infancy.

Aim: To estimate the maternal self-reported prevalence of SHS exposure amongst newborn infants of women who smoked either just before or during pregnancy and to identify factors associated with this exposure.

Method: Pregnant women who currently smoked or had smoked during the 3 months prior to pregnancy were recruited in Nottingham, England. Women completed questionnaires during routine antenatal appointments (8-26 weeks gestation) and 3 months after childbirth. Exploratory logistic regression was used to identify factors associated with smoking in the home at 3 months after childbirth.

Findings: Data on smoking in the home were available for 472 households. The prevalence of smoking in the home at 3 months after childbirth was 16.3% (95% CI 13.2-19.9), and after controlling for non-response bias using multiple imputation, was 18.7% (95% CI 15.3-19.1). By 3 months after childbirth, 59.3% of mothers were current smokers; the prevalence for smoking in the home was 4.7% for non-smoking mothers and 24.3% for current smoking mothers. In multivariate logistic regression, mothers who were smoking ≥ 11 cigarettes per day 3 months after childbirth were over 8 times (OR 8.3, 95% CI 3.5-19.8) more likely to report that people smoked in their home. Young maternal age, being of non-White ethnicity (Asian, Black, mixed ethnicity) and increased deprivation were also significantly associated with reported smoking in the home.

Conclusion: This is the first UK survey of smoking in the home immediately after pregnancy. The prevalence was lower than has been reported in older children, suggesting that the early postnatal period may be an ideal time to intervene to prevent future SHS exposure in the home. Interventions to support smoking parents to quit, or to restrict smoking in their homes, should be targeted towards socially disadvantaged, younger or non-white ethnic groups.

FUNDING: This article presents independent research funded by the National Institute for Health Research's Programme Grants for Applied Research programme and School of Primary Care Research (NIHR SPCR). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health.

JUSTIFICATION: This is the first UK survey of smoking in the home behaviour immediately after pregnancy; identifying the factors associated with child SHS exposure is important for the development of effective future SHS and smoke-free home interventions.

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POS5-47
CHANGES IN ANXIETY FOLLOWING INITIAL SMOKING
ABSTINENCE IN OPIOID-DEPENDENT SMOKERS

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Introduction: Anxiety disorders are highly prevalent among opioid-dependent adults and may influence the increased rates of smoking and reduced rates of smoking cessation in this vulnerable population. While smoking is often endorsed as a means of reducing anxiety, research in the general population shows that smoking may in fact increase anxiety symptoms. Little is known however, regarding the effects of smoking cessation on anxiety in opioid-dependent smokers.

Participants and Method: We conducted a behavioral intervention wherein 90 opioid-maintained adults first received an intensive 2-week incentive intervention to promote initial smoking abstinence, and were then randomly assigned to receive abstinence-contingent or -noncontingent incentives for an additional 10 weeks. Primary outcomes demonstrated the efficacy of extended contingent incentives for sustaining smoking cessation. The Beck Anxiety Inventory was administered at baseline and at the end of the initial 2-week intervention, providing an opportunity to compare changes in anxiety among those who did and did not achieve initial smoking abstinence. For the current analyses, we utilize data from a subset of participants (n = 63) who were retained throughout the end of Week 2 and completed both assessments of anxiety. We hypothesized that individuals who successfully quit smoking (Quitters) would have significantly decreased levels of anxiety compared to those who did not quit smoking (Non quitters).

Results: A 2 (quit) x 2 (time) ANOVA showed a significant interaction between groups on change in anxiety ($F(1,61) = 5.72, p = .02$). Specifically, Quitters reduced their anxiety scores by 33% following brief abstinence, while Non quitters increased their scores by 19%.

Conclusions: Similar to research in the general population, opioid-dependent smokers who achieve smoking abstinence experience significant reductions in anxiety while those who do not experience modest increases. These reductions in anxiety were observed relatively early following cessation and suggest that smoking may indeed be anxiogenic.

FUNDING: R01 DA019550 & P20 GM103644

JUSTIFICATION: This study provides initial evidence that opioid-dependent smokers who achieve smoking abstinence may also experience concurrent reductions in anxiety symptoms.

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POS5-48
HARM REDUCTION IN U.S. TOBACCO CONTROL: COMPETING
DISCOURSE IN TEXTUAL NEWS MEDIA

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Despite marked decreases, smoking remains the leading preventable cause of mortality in the United States. Incumbent tobacco control policies have long emphasized abstinence-only strategies, yet quitting is notoriously difficult and cessation rates low. Alternative strategies of harm reduction espouse substituting cigarettes with purportedly safer tobacco forms, including smokeless and vaporizing electronic nicotine delivery systems. Despite recent Federal policy shifts and research supporting its efficacy, uncertainty and concern surrounds promoting tobacco products as harm reduction. Abstinence-only ideology predominates U.S. tobacco control policy but heightened media salience surrounding tobacco harm reduction challenges existing policy hegemony. Using discourse analysis this study explores ideology expressed toward tobacco harm reduction in 478 (308 original) textual news media articles spanning 1996 through June, 2014. Constructions of tobacco harm reduction have shifted yet it remains contentious given competing,

untenable discursive accounts surrounding science, claims of efficacy, the actions of antagonistic, powerful stakeholders, and inherent conflict between tobacco industry profits and public health.

FUNDING: No Funding.

JUSTIFICATION: This study applies to tobacco control policy and relevant public health recommendations.

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POS5-49
SMOKING OUTCOME EXPECTANCIES AMONG MENTHOL AND
NON-MENTHOL SMOKERS

*Myrto Papakonstantinou, Christine Muench, and Laura M. Juliano

A growing body of research suggests that menthol smokers are more tobacco dependent and have greater difficulty quitting smoking than non-menthol smokers. Smoking outcome expectancies, or beliefs about the effects of smoking, have been shown to predict smoking initiation, maintenance, and cessation, with greater positive expectancies and lower negative expectancies associated with greater tobacco use and cessation failure. The goal of the present investigation was to examine smoking outcome expectancies among menthol and non-menthol smokers. Data were derived from 6 laboratory studies in which smokers completed the 55-item Smoking Consequences Questionnaire-Adult (SCQ-A), consisting of 10 factors (Copeland, Brandon & Quinn, 1995). Participants also completed a demographics and smoking history questionnaire, which included the Fagerström Test of Nicotine Dependence (FTND). The sample (N = 676; 40% female, 14.60 cigarettes per day) consisted of 379 menthol (87% Black) and 297 non-menthol smokers (21% Black). Menthol smokers had significantly higher FTND scores (4.52 vs. 3.92) than non-menthol smokers. Black smokers reported smoking fewer cigarettes but had higher FTND scores than White smokers. Controlling for FTND scores, non-menthol smokers reported significantly greater expectancies for taste/sensorimotor manipulation, weight control, boredom reduction, stimulation/state enhancement, social facilitation, craving/addiction, negative physical feelings, and negative social impression than menthol smokers. There were no differences for negative affect reduction or health risk expectancies. When the sample was divided by Black or White race and when controlling for relevant covariates, White smokers reported significantly greater expectancies on all 10 SCQ-A factors. Sub-group analyses comparing menthol and non-menthol smokers among only Black smokers and only White smokers revealed a few expectancy differences, albeit sample sizes were highly unequal. Follow-up studies are needed to understand the observed group differences in smoking outcome expectancies. Implications and future research directions are discussed.

FUNDING: This research was supported by the following grants from the National Institute on Drug Abuse: R03DA18709 and R01DA033235

JUSTIFICATION: A better understanding of the role of menthol in tobacco dependence could inform regulatory decisions regarding menthol flavorings in cigarettes

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POS5-50
EXAMINING THE RELATIONSHIP BETWEEN CUE-INDUCED
 CRAVING AND ACTUAL SMOKING

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Fifty years of smoking cue reactivity studies have demonstrated heightened self-report craving, as well as moderate autonomic reactivity, among smokers exposed to salient drug-related cues. However, few studies have examined whether exposure to smoking cues affects smokers' actual smoking, or examined the predictive relationship between cue-induced craving and smoking behavior. In

the present study, we investigated the impact of smoking-related cues relative to neutral cues on subjective craving and smoking behavior (assessed via CReSS measures of latency to smoke, puff volume, and number of puffs). In addition, we examined the predictive value of cue-induced craving on subsequent smoking behavior. Sixty non-deprived daily smokers completed two experimental sessions involving exposure to either smoking-related or neutral pictorial cues. Following initial exposure to cues, smokers rated their craving and were then allowed to smoke freely if they chose to during a subsequent 6-minute cue exposure period. Result revealed that exposure to smoking cues relative to neutral predicted significantly greater craving and increases in smoking behavior (all $p < .001$). Likewise, the magnitude of the difference in cue-induced craving when exposed to smoking cues relative to neutral cues (i.e., the cue reactivity effect) was predictive of shorter latency to smoke ($p = .002$), as well as increased number of puffs ($p = .002$), and puff volume ($p = .02$). Findings confirm the notion that exposure to smoking cues increases both craving and actual smoking behavior, and that cue-induced craving is highly predictive of immediate subsequent smoking.

FUNDING: This research was supported by NIDA grants DA023646 & DA027508 awarded to Cynthia Conklin.

JUSTIFICATION: Finding that cue-induced craving increases actual smoking and that the level of increase predicts smoking behavior suggests a need for better behavioral and pharmacologic interventions that target this source of potential relapse risk.

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POS5-51

USE OF ELECTRONIC NICOTINE DELIVERY SYSTEMS AND NICOTINE REPLACEMENT THERAPY AMONG INDIVIDUALS WHO HAVE A MENTAL HEALTH CONDITION

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Individuals who have a mental health condition (MHC) have higher rates of smoking compared to the general population. They are also at elevated risk of mortality from tobacco-related illnesses. Little is known about the use of electronic nicotine delivery systems (ENDS) among this population. The purpose of this analysis was to compare the use of ENDS and nicotine replacement therapy (NRT) among callers to the Arizona Smokers' Helpline (ASHLine) who reported having a MHC versus those who did not report a MHC. Between April and August 2014, 2,036 clients were enrolled in the ASHLine. Approximately 46% of clients (N=944) self-reported having been treated for a mental health condition, including anxiety disorders, depressive disorders, bipolar disorder, alcohol/drug abuse, or schizophrenia. Clients with a MHC were more likely to report current use of ENDS as compared to clients without a MHC (54% versus 46%, $p < .01$). In contrast, clients with a MHC were less likely to report requesting or receiving an NRT (patch or gum) compared to clients without a MHC (48% versus 70%, $p < .001$). Among clients with a MHC who reported using ENDS, 51% requested NRT as part of their ASHLine services. Overall, a higher percentage of clients with a MHC reported using ENDS, and many of them reported combined use of ENDS and NRT. Additional research is needed to determine the safest and most effective quit aids for smokers with a MHC.

FUNDING: This project was supported by Arizona Department of Health Services Grants ADHS13-026130, ADHS11-007339, and HS160051-0/E1H37741 and a National Cancer Institute Grant P30CA023074-32.

JUSTIFICATION: The findings highlight the need for additional research regarding smoking cessation strategies for smokers who report having a mental health condition.

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POS5-52

E-CIGARETTE USE, SMOKING CESSATION AND CHANGE IN SMOKING INTENSITY IN THE 2010/2011 TUS-CPS LONGITUDINAL COHORT

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Background: Electronic cigarettes (e-cigarettes) are heavily marketed, including for use as a smoking cessation aid. There is limited data to address impacts on US smoking behavior.

Methods: A representative cohort of US cigarette smokers (N=2,454) in 2010 Tobacco Use Supplement to the Current Population Survey (TUS-CPS) was re-interviewed 12 months later. Measures included ever-use of e-cigarettes for cessation or other reasons, use of pharmaceutical cessation aids (NRT or prescription medication), cigarette consumption level, and quitting history. The association of e-cigarettes with attempted cessation, with changes in cigarette consumption, and with 30-day abstinence at follow-up was assessed using multivariate regression models, adjusting for demographics and baseline cigarette dependence level.

Results: In this representative sample of US cigarette smokers, 11% (n=279) had ever used e-cigarettes and 42% (n=118) of ever-users reported use to help quit smoking. Among smokers who made a quit attempt, the percent abstinent 30+ days at follow-up was 11.1% (95% CI 6.0,16.2) for those who used e-cigarettes for cessation, compared to 17.8% (95% CI 8.8, 26.8) for those who used e-cigarettes for other reasons, and 21.6% (95% CI 19.4, 23.8) for those who did not use e-cigarettes. For those who used an approved pharmaceutical aid 16.0% (95% CI 13.2, 18.8) were abstinent 30+ days at follow-up compared to 22.4% (95% CI 21.8, 25.0) of those who did not use such aids. In an adjusted model, the use of e-cigarettes for cessation was associated with a 66% reduction in odds of 30+ day abstinence at follow-up (ORadj=0.44, 95%CI=0.24-0.79), and the use of pharmaceutical aids with a 33% reduction in odds of 30+ day abstinence (ORadj=0.67, 95%CI=0.50-0.88), compared to use of neither aid. Among continuing smokers, only lighter smokers who used e-cigarettes to quit showed an association with reduced cigarette consumption.

Conclusions: US smokers who used e-cigarettes as a cessation aid were less successful at quitting than other smokers. The effect of e-cigarette use on smoking intensity was restricted to light smokers who used e-cigarettes for a quit attempt.

FUNDING: This project has been funded in whole or in part with Federal funds from the National Institute on Drug Abuse, National Institutes of Health, and the Food and Drug Administration, Department of Health and Human Services, under Contract No. HHSN271201100027C, UC Tobacco-Related Disease Research Program grants 21RT-0135, and National Cancer Institute grant No. 1R01CA172058-02.

JUSTIFICATION: This study informs public health policy regarding the population-level effectiveness of electronic cigarettes on smoking cessation.

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POS5-53

THE ASSOCIATION OF SELF-REPORTED EXPOSURE TO POINT-OF-SALE CIGARETTE MARKETING WITH CRAVING TO SMOKE IN A POPULATION-BASED STUDY

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Objective: Little is known about the association of self-reported point-of-sale (POS) cigarette marketing with craving to smoke while visiting a store that sells cigarettes. Our aim was to examine this association using a population-based sample of smokers.

Methods: We conducted a telephone survey to collect data on 999 smokers in Omaha, Nebraska. Cigarette marketing was measured by asking respondents three questions about noticing ads, promotions, and displays of their usual brand as well as any brand of cigarettes within their respective neighborhoods. Survey items were combined into two composites for respondents' usual brand ($\alpha = 0.73$) and any brand ($\alpha = 0.64$). We measured craving to smoke by combining into a scale responses to three survey items about cravings for a cigarette when visiting a store in one's neighborhood ($\alpha = 0.77$). We estimated OLS linear regression models and controlled for nicotine dependence, sex, age, race/ethnicity, income, education, frequency of visiting stores in one's neighborhood, study recruitment method, and length of residence in one's neighborhood.

Results: There was overwhelming evidence that higher levels of POS marketing pertaining both to one's usual brand of cigarettes ($p < 0.001$) and cigarettes in general ($p < 0.001$) were associated with higher levels of craving to smoke, after adjusting for covariates.

Conclusion: Self-reported exposure to POS cigarette marketing is strongly associated with craving to smoke during a visit to a store in one's neighborhood. Policies that eliminate or limit POS cigarette marketing might reduce cravings and possibly increase smoking cessation rates.

FUNDING: National Institute of Health: Grant Number 5R01CA166156.

JUSTIFICATION: This study provides insights into how point-of-sale tobacco marketing policies could be modified to help improve smoking cessation.

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POS5-54

ELECTRONIC CIGARETTES AMONG AMERICAN INDIAN YOUTH

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Purpose: Although American Indians (AI) have the highest rates of tobacco use among youth in the US, the uptake of electronic cigarettes (e-cigs) is unknown. We provide the first report of e-cig use and its correlates among a sample of AI adolescents. **PROCEDURES** Participants included AI youth ages 11-17 recruited from three Indian Health Service clinics and activities such as health fairs in Oklahoma in 2014. We adapted the National Youth Tobacco Survey and an e-cig survey to assess demographic, social, behavioral, and perception of harm factors associated with ever use of e-cigs.

Summary of Data: Of 181 participants, 48% were 14 years of age or older, 43% were in high school (HS; grades 9-12), and 57% were female. While 22% had ever tried e-cigs, 44% of the HS students and 5% of students in lower grades

reported any use. Significant ($P < .05$) univariate associations with ever use of e-cigs included: age; cigarette use; would try e-cig if offered by best friend; and having close friends who vape. Also significant were perceptions that: vaping looks cool; people who vape have more friends; e-cigs are not dangerous; and e-cigs are less harmful than cigarettes. A marginal association ($P = .07$) was found for living with a smoker. Sex was not associated with e-cig use ($P = .77$). Factors that remained significant in multivariate logistic regression analysis included: age (Odds Ratio [OR] 1.7 per 1-year increment, 95% Confidence Interval [CI] 1.2, 2.4); would use e-cig if best friend offered (OR 20.3, CI 6.1, 67.5); and having tried cigarettes (OR 8.3, CI 2.8, 25.2). Of note, 28% of persons who tried e-cigs had never used cigarettes.

Conclusion: The prevalence of e-cig use in this sample of AI youth was high, strikingly so among HS students whose prevalence of 44% was more than three times the 12% reported among all-races US HS students. While cigarette use was associated with e-cig use, more than one fourth of e-cig users had never tried cigarettes, indicating that e-cigs are potential gateways to future nicotine addiction for these youth. **FUNDING:** Cancer Health Disparities Program, Stephenson Cancer Center, University of Oklahoma Health Sciences Center, Oklahoma City, OK 73104

JUSTIFICATION: Electronic cigarette use is growing rapidly but has never been reported among American Indian youth, a group at high risk of future nicotine addiction. Our data provide essential initial information toward understanding the expanding presence of electronic cigarettes in this population.

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POS5-55

NICOTINE METABOLISM IN MULTIPLE POPULATIONS

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The overall smoking rate has been reduced significantly through tobacco control, public health, and pharmacological interventions. Metabolic enzyme variation, as well as other patient and environmental characteristics, influences smoking behavior, treatment success, and risk of related diseases. Population-specific variation in nicotine and other tobacco smoke constituent metabolic genes contributes to challenges in developing and optimizing interventions. We applied novel molecular genetic technology, public pharmacological data, and three laboratory-based studies of nicotine metabolism with oral and/or venous administration of labeled nicotine and cotinine to provide an integrated approach to modeling nicotine metabolism in multiple populations.

260 individuals (160, 48, and 52 self-identified European, African, and Asian American ancestry individuals) were genotyped using the Smokescreen platform, a targeted genotyping array for addiction research. The model predicted natural log transformed nicotine metabolite ratio (NMR) of trans-3'-hydroxycotinine to cotinine, and included ancestry represented by principal components, age, sex, BMI, and smoking status. Analysis demonstrates adequate Type I error control with genome-wide significant results at the chr19q13.2 cytochrome P450 locus (minimum meta-analysis p-values provided; $P = 1.11E-11$) and variants within nicotine metabolism pathway genes such as AOX1 ($P = 0.011$), FMO1 ($P = 0.020$), POR ($P = 0.002$), UGT2B10 and UGT2B17 (p-values < 0.036). Additionally, we observed an emerging multi-ethnic meta-analysis peak on chr10q ($P = 7.02E-7$).

This study indicates a promising start to finding population-specific and non-specific biomarkers for tobacco-related diseases, smoking cessation treatment, and smoking behavior in future studies. Our results also have the potential to create links with other tobacco-related disease datasets and discovery and treatment oriented research groups (e.g., Indonesia's Smokescreen consortium).

FUNDING: This project has been funded in whole or in part with: Federal funds from the National Institute on Drug Abuse, National Institutes of Health, Department of Health and Human Services, under Contract No. HHSN271201300004C, by research and development funds from SRI International and Bina Nusantara University, and by a research project grant from the National Institute on Drug

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Abuse (Rockville, MD), DA033813 (PI: AWB), entitled: "DMET Genes, Nicotine Metabolism and Prospective Abstinence

JUSTIFICATION: This research will identify genetic factors predictive of nicotine metabolism in multiple populations, leading to development of models that may enable better predictions on smoking behavior, treatment success, and attributable disease.

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POS5-56

THE ASSOCIATION OF SELF-REPORTED EXPOSURE TO POINT-OF-SALE CIGARETTE MARKETING WITH URGE TO BUY CIGARETTES AND MAKE AN UNPLANNED PURCHASE OF CIGARETTES IN A POPULATION-BASED STUDY

Mohammad Siahpush*, University of Nebraska Medical Center, USA, Raees Shaikh, University of Nebraska Medical Center, USA, Kenneth Michael Cummings, Medical University of South Carolina, USA, Andrew Hyland, Roswell Park Cancer Institute, USA, Michael Dodd, University of Nebraska - Lincoln, USA, Les Carlson, University of Nebraska - Lincoln, USA, Asia Sikora-Kessler, University of Nebraska Medical Center, USA, Jane Meza, University of Nebraska Medical Center, USA, Melanie Wakefield, The Cancer Council Victoria, Australia, Wan Neng, University of Utah, USA.

Objective: Little is known about the association of self-reported point-of-sale (POS) cigarette marketing with craving to smoke while visiting a store that sells cigarettes. Our aim was to examine this association using a population-based sample of smokers.

Methods: We conducted a telephone survey to collect data on 999 smokers in Omaha, Nebraska. Cigarette marketing was measured by asking respondents three questions about noticing ads, promotions, and displays of their usual brand as well as any brand of cigarettes within their respective neighborhoods. Survey items were combined into two composites for respondents' usual brand ($\alpha = 0.73$) and any brand ($\alpha = 0.64$). We measured craving to smoke by combining into a scale responses to three survey items about cravings for a cigarette when visiting a store in one's neighborhood ($\alpha = 0.77$). We estimated OLS linear regression models and controlled for nicotine dependence, sex, age, race/ethnicity, income, education, frequency of visiting stores in one's neighborhood, study recruitment method, and length of residence in one's neighborhood.

Results: There was overwhelming evidence that higher levels of POS marketing pertaining both to one's usual brand of cigarettes ($p < 0.001$) and cigarettes in general ($p < 0.001$) were associated with higher levels of craving to smoke, after adjusting for covariates.

Conclusion: Self-reported exposure to POS cigarette marketing is strongly associated with craving to smoke during a visit to a store in one's neighborhood. Policies that eliminate or limit POS cigarette marketing might reduce cravings and possibly increase smoking cessation rates.

FUNDING: National Institute of Health: Grant Number 5R01CA166156.

JUSTIFICATION: This study could help guide tobacco control policies dealing with point of sale marketing to help reduce smoking and increase cessation.

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POS5-57

SEX DIFFERENCES IN NICOTINE INTAKE AND CARCINOGEN EXPOSURE AMONG AFRICAN AMERICAN LIGHT SMOKERS

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Black smokers are disproportionately affected by smoking-related diseases even though a majority are light smokers (smoke ≤ 10 cigarette per day (CPD)). Historically, black males have had higher rates of lung cancer than black females but that gap may be narrowing. To better understand sex-based health disparities among black smokers, we assessed sex differences in nicotine and carcinogen intake among black light smokers.

Baseline behavioral measures, plasma cotinine, and urine biomarkers of nicotine and tobacco-specific nitrosamine exposure were obtained from 426 black light smokers (287 females) enrolled in Kick It at Swope III, the first treatment study of bupropion for black light smokers. Sex differences were examined (shown as average for female vs. male, p-value).

Cigarette consumption (both sexes 8.0 CPD, $p = .71$) and dependence, measured by Fagerström Test for Nicotine Dependence (FTND) (both sexes 3.1, $p = .79$), time to first cigarette after waking (71.5% females vs. 70.5% of males had TFC ≤ 30 min, $p = .91$), and Wisconsin Inventory of Smoking Dependence Motives (WISDM-30) (36.4 vs. 36.6, $p = .89$) were not significantly different by sex. However, females had significantly higher urine total nicotine equivalents (molar sum of nicotine and major metabolites) (48.3 vs. 36.8 nmol/mg creatinine, $p < .001$); NNAL (293.4 vs. 199.0 pg/mg creatinine); and smoke intake per cigarette, measured as nicotine equivalents/CPD (6.31 vs. 4.83 nmol/mg creatinine per cigarette, $p < .001$) and NNAL/CPD (38.5 vs. 26.4 pg/mg creatinine per cigarette, $p < .001$). Plasma cotinine (195.2 vs. 191.0 ng/mL, $p = .45$); plasma cotinine/CPD (25.5 vs. 25.3 ng/mL per cigarette, $p = .51$), and plasma 3-hydroxycotinine/cotinine (0.32 vs. 0.30, $p = .38$) were not significantly different by sex.

Despite similar cigarette consumption, tobacco dependence, and plasma cotinine levels, black female light smokers were exposed to significantly higher levels of nicotine and tobacco-specific nitrosamines and appeared to smoke each cigarette more intensely compared to black male light smokers. Black light female smokers may be at particularly increased risk for tobacco-related diseases.

FUNDING: This study was supported by NIH grants from the National Cancer Institute at the National Institutes of Health (CA091912 to L.S.C.) and the National Institute on Drug Abuse (DA 02277 to NLB, and supported in part a California Tobacco Related Disease Research Program (TRDRP) postdoctoral fellowship award 22FT-0067 to GS.

JUSTIFICATION: Black light female smokers may be at particularly increased risk for tobacco-related diseases and should be a focus of smoking cessation efforts.

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POS5-58

USING A WEB-BASED EDUCATIONAL PROGRAM TO ENHANCE NURSES' REFERRAL OF PATIENTS TO THE QUITLINE IN 2 STATES.

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Background: Adequately educated nurses are pivotal to national smoking cessation efforts and to drive traffic to state quitlines. The goal of this project was to assess changes in nurses' clinical practice for smoking cessation interventions 6 months after an educational program including a webcast and nurse-tailored

printed materials. The program highlighted the important role nurses can play in supporting quit efforts and promoted referral to the quitline as follow-up post-discharge to support abstinence.

Methods: A pre-post design with a cross-sectional sample of nurses from 4 hospitals in Louisiana and 4 hospitals in Kentucky. Nurses completed an online survey at baseline, and 3 and 6 months post implementation of the educational program. An increase in the proportion of nurses who usually/always intervene and refer to quitline was the outcomes of interest.

Results: Response rates were N = 396 at baseline, N = 269 at 3 months and N = 231 at 6 months. 283 nurses completed both the baseline and at least one follow up survey. The majority (71%) were never smokers, had a BSN degree (57%), and worked in Medical-Surgical and Rehabilitation Units (60%). At 6 months, a significantly higher proportion of nurses advised patients to quit ($p=0.0006$), assessed patients' willingness to quit ($p=0.0002$), assisted patients with a quit plan ($p=0.004$) and referred patients to the quitline ($p<0.0001$).

Conclusion: This project demonstrates that it is feasible to increase nurses' smoking cessation interventions and referral to the quitline through a distance-learning program. Efforts to widely disseminate these resources to other nurses in these two states could result in an increase in the number of patients that receive support for their quit attempts and are referred to the quitline for follow-up post discharge.

FUNDING: Pfizer Medical Education Grant #45844

JUSTIFICATION: Using web-based educational programs for nurses have the potential to increase the delivery of tobacco dependence treatment

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POS5-59 **NEURAL CORRELATES OF CIGARETTE HEALTH WARNING AVOIDANCE AMONG SMOKERS**

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Background: We found using eye-tracking technology that smokers actively avoid cigarette package health warnings, an effect that may be a result of two different biases. Through repeated warning exposure, a pre-cognitive perceptual bias may develop, leading to the reduced attentional salience of the warnings. Alternatively (or additionally), avoidance may be a result of higher order cognitive biases, such as reduced emotional processing. Using electroencephalography (EEG), the aim of this study was to distinguish between these two possibilities.

Method: Non-smokers ($n = 20$) and daily smokers ($n = 20$) attended a single EEG testing session where they completed a battery of tasks involving viewing cigarette package health warnings and control stimuli. These elicited the Event Related Potentials of interest: visual Mismatch Negativity (vMMN), which is a proxy measure of early sensory processing, the P3a, an index of selective attentional orientation, and the Late Positive Potential (LPP), a measure of higher order cognitive biases.

Results: Non-smokers and daily smokers showed a similar vMMN response to health warning stimuli ($F(1,38) = 0.35$, $p = 0.560$). By contrast, non-smokers showed an increased P3a amplitude ($F(1,38) = 4.26$, $p = 0.046$) and a larger LPP ($F(1,38) = 5.16$, $p = 0.029$) as compared to daily smokers.

Conclusion: We find no difference in vMMN between non-smokers and daily smokers, indicating that there is no early perceptual bias in smokers' visual perception of health warnings. By contrast, we see evidence of a difference in both the P3a response and the LPP response between these groups when viewing health warnings. Together these findings suggest that daily smokers are less sensitive to the emotional content of cigarette health warnings, indicating that in

order to design effective warnings, their content and framing should be changed to increase their emotional salience, thereby overriding the higher order cognitive mechanisms we observe here.

FUNDING: University of Bristol, School of Experimental Psychology Research Committee

JUSTIFICATION: Our data suggest that in order to design effective tobacco health warnings, the focus should be upon changing the content and framing of the health warnings.

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POS5-60 **EVALUATING THE EFFECTIVENESS OF CIGARETTE HEALTH WARNING LABELS (HWLS) ABOUT SMOKING DURING PREGNANCY AMONG DIFFERENT GENDER/AGE GROUPS**

Christy Kollath-Cattano, University of South Carolina, Amira Osman, University of South Carolina, James F. Thrasher, University of South Carolina

Background: HWLs on cigarette packages that address risks of smoking during pregnancy target a relatively small smoker subpopulation - women of reproductive age. Their impact on this and other socio-demographic groups is not well understood. Furthermore previous studies on HWL content, including pregnancy imagery, have used experimental, forced exposure designs. Results from these studies may not predict general population responses under conditions of repeated, naturalistic exposure. This current study analyzes responses to pregnancy-related HWLs after they have appeared on cigarette packages.

Methods: Data were analyzed from four waves of an online longitudinal study with adult smokers aged 18-64 in Australia, Canada, Mexico, and the US. Participants rated several HWLs, including 1-2 pregnancy-related labels. To determine if warning label content (i.e., pregnancy-related vs. non pregnancy-related) appear more effective than other warning content among women of reproductive age, a series of 8 interactive indicator variables between age (i.e., ≤ 40 vs. > 40), gender (i.e., men vs. women), and warning label content (i.e., pregnancy vs. non pregnancy) was created. Country-specific linear mixed effects models were estimated, regressing ratings of HWLs for worry, believability, and quit motivation on the eight groups. All models adjusted for socio-demographics, smoking related variables, wave of data collection, and time spent in sample.

Results: In Mexico and Australia, where graphic HWL imagery was used (i.e., premature infant, dead fetus), women aged 40 and under reported stronger believability, worry, and quit motivation than all other groups. In Canada, where HWL imagery features a pregnant woman's belly, ratings were unassociated with gender/age groups. Stronger effects among women of reproductive age were limited to pregnancy HWLs in each country, except in Canada where women of reproductive age rated non-pregnancy HWLs higher in worry and quit motivation than pregnancy HWLs.

Conclusions: HWLs that depict graphic effects to illustrate smoking-related pregnancy risks appear to be particularly effective among women of reproductive age.

FUNDING: P01 CA138389, R01 CA167067

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POS5-61

A RANDOMIZED TRIAL OF THE EFFECT OF E-CIGARETTE TV ADS ON INTENTIONS TO USE E-CIGARETTES

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Background: Adolescents' use of electronic cigarettes (e-cigarettes) and exposure to e-cigarette television advertising have increased in recent years, despite questions about their safety.

Purpose: To test whether exposure to e-cigarette television advertisements influenced intentions to use e-cigarettes in the future and related attitudes.

Methods: A parallel-group randomized control experiment was conducted in May 2014 using an online survey with a convenience sample of 3,691 U.S. adolescents aged 13 to 17 who had never tried e-cigarettes. Adolescents in the treatment group viewed 4 e-cigarette television ads.

Results: Adolescents in the treatment group reported a greater likelihood of future e-cigarette use compared with the control group. Odds ratios for the treatment group were 1.54 (P=0.001) for trying an e-cigarette soon, 1.43 (P=0.003) for trying an e-cigarette within the next year, and 1.29 (P=0.02) for trying an e-cigarette if a best friend offered one. Adolescents in the treatment group had a higher odds of agreeing that e-cigarettes can be used in places where cigarettes are not allowed (OR=1.71, P<0.001), can be used without affecting those around you (OR=1.83, P<0.001), are a safer alternative to cigarettes (OR=1.19, P=0.01), and are less toxic (OR=1.16, P=0.03).

Conclusions: Exposure to e-cigarette advertising had relatively large and consistent effects across experimental outcomes. Together with the simultaneous increase in e-cigarette advertising exposure and e-cigarette use among adolescents, findings strongly suggest that e-cigarette advertising is persuading adolescents to try this novel product. This raises concerns that continued unregulated e-cigarette advertising will contribute to potential individual- and population-level harm.

FUNDING: Florida Department of Health

JUSTIFICATION: This study can help inform the regulation of e-cigarette advertising.

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POS5-62

AUTOREGRESSIVE LATENT TRAJECTORY ANALYSIS OF PEDIATRIC SECONDHAND SMOKE EXPOSURE AND ASTHMA FUNCTIONAL MORBIDITY FOLLOWING AN ASTHMA EXACERBATION: THE ROLE OF PARENTAL SOCIAL SUPPORT

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Background: Existing parental social support (SS) may predict longitudinal changes in pediatric secondhand smoke exposure (SHSe) and asthma functional morbidity (AFM) after an asthma exacerbation. The current study examined the longitudinal changes in pediatric SHSe and AFM, the relationship between them, and the role of parental SS.

Methods: Participants were 334 smokers enrolled in a smoking cessation induction/asthma education intervention. All were caregivers of children with asthma that had experienced a recent exacerbation. SHSe and AFM were measured at baseline and 4, 6, and 12 month follow-ups. Child SHSe, AFM, and

SS (appraisal, belonging, tangible, and self-esteem support) were assessed via validated parent-report measures. Analyses controlled for study group, seasonality, and baseline home smoking ban. An autoregressive latent trajectory (ALT) model examining the intercept, linear, and quadratic growth factors and autoregressive and cross-lagged effects of SHSe and AFM was used.

Results: The ALT model fit the data well. Regarding AFM, the intercept was significantly different from zero (M=3.72) with linear decreases (M=-8.54, p=.01) followed by increases over time (M=6.81, p=.005). The intercept of SHSe was significantly different from zero (M=1.79); however, no significant changes in SHSe over time were detected and the autoregressive effects were non-significant. Cross-lagged effects between AFM and SHSe were not detected until later follow-ups: Higher SHSe at 6 months predicted higher AFM at 12 months, and higher AFM at 6 months predicted higher SHSe at 12 months. This indicates that SHSe and AFM were only reciprocally related at 6 and 12 months. Parental self-esteem SS seems to be a protective factor as higher baseline self-esteem SS was associated with lower baseline AFM (Beta=-.23, p=.04) and less increase in AFM over time (Beta=-.72, p=.02).

Conclusions: Following an asthma exacerbation, interventions aimed at reducing SHSe and enhancing asthma management are needed. Increasing parental SS may be a mechanism for reducing the rebound of AFM to levels associated with an exacerbation.

FUNDING: This study was funded by NIH 5 R01 HL062165-09 (B. Borrelli, PI) and 5 T32 HL076134-09 (R. Wing, PI).

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POS5-63

VARENICLINE HELPS SMOKERS WITH SUD STOP SMOKING WITHOUT HARMING RECOVERY

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Aim: Smokers with substance use disorders (SUD) have great difficulty quitting smoking during their first year of sobriety. Varenicline (VAR) is the most effective medication for smoking cessation, has few contraindications, targets nicotine receptors selectively, and reduces alcohol use, so may be best in this population. The aim was to investigate effects of treatment with varenicline versus nicotine replacement (NRT), both combined with brief advice adapted for sobriety concerns, for smokers in treatment for SUD.

Methods: Smokers abstinent < 12 months in any SUD treatment (n = 137) from the community were randomized to 12 wks varenicline vs. nicotine patch, double-placebo, plus 8 sessions brief advice adapted to address sobriety concerns. Randomization was stratified by depression diagnosis and gender. Smoking point-prevalence (7-day) abstinence was assessed during the 12 weeks and at 3, 6 and 12 months after treatment start using self-report and cotinine confirmation of past 7 days point-prevalence abstinence.

Results: Within treatment, 12% had complete abstinence at 8 weeks in each condition (ns). At 3 months, 13% with VAR and 3% with NRT had point-prevalence abstinence (p < .05) and at 6 months 9% with VAR and 3% with NRT had

point-prevalence abstinence ($p = .18$). At 6 months, heavy drinking was reported by 29% in VAR and 16% in placebo, and drug use by 29% in VAR and 32% in placebo (all non-significant).

Conclusions: Varenicline with brief advice greatly increased the odds of smoking abstinence at 3 months and did not harm SUD recovery. While varenicline resulted in 3 times as much abstinence as placebo at 6 months, the results were no longer significant. Thus, varenicline has utility in this population.

FUNDING: This research was supported by a grant from the National Institute on Drug Abuse (R01DA024652), and a Senior Research Career Scientist Award from the Department of Veterans Affairs

JUSTIFICATION: Varenicline and brief advice may aid smokers with SUD in smoking cessation without harming recovery.

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POS5-64

TOBACCO CONTENT IN NATIONALLY PRODUCED FILMS FROM EUROPE AND LATIN AMERICA COMPARED TO US PRODUCED FILMS, FROM 2004-2009

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Background: Studies in multiple countries have found a relationship between exposure to onscreen movie smoking and adolescent smoking. Many of these studies have focused only on tobacco content in U.S. produced films, neglecting nationally produced films. Our aim is describe tobacco portrayals in nationally produced films from six European countries (Germany, Iceland, Italy, Netherlands, Poland, UK) and two Latin American countries (Mexico and Argentina) and compare them to US-produced films.

Methods: The sample included 337 national films (220 European & 117 Latin American) and 548 US films that were among the top grossing films in each country from 2004 to 2009. A reliable methodology for coding tobacco appearances was used. Logistic regression models assessed whether films from each country were more likely than US-produced films to include tobacco, both when considering all films and just youth-rated films (Ages 0-14). Linear regression models assessed differences between countries in seconds of tobacco use.

Results: Films from Iceland, Italy, Argentina, Mexico were more likely than US films to contain tobacco, and as were youth-rated films from Germany, Iceland, Italy, and Argentina.

The lowest prevalence of tobacco was in The Netherlands for youth-rated (53%) and for all films (58%), which was even lower than the US at 54% for youth-rated films and 63% for all films. Overall and when considering just youth-rated films, Argentine films had longer duration of tobacco use than US films.

Conclusions: Nationally produced movies depict characters that may embody shared cultural values and therefore have a larger impact on youth than Hollywood films. In addition more of these nationally produced films contain tobacco than US produced films. Because of this, research is needed to assess youth exposure to tobacco content in nationally produced films and determine their impact relative to Hollywood.

FUNDING: R01 TW009274-01, Fogarty Institute, NIH

JUSTIFICATION: To inform policy makers of the need to develop policies that reduce adolescent exposure to tobacco consumption in nationally produced films

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POS5-65

TIME TRENDS FOR TOBACCO CONTENT IN US AND NATIONALLY PRODUCED FILMS POPULAR IN MEXICO AND ARGENTINA, FROM 2004-2012

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Background: Studies in 13 different countries have shown that exposure to tobacco in movies is associated with initiation of youth smoking. Public health advocacy appears to have lowered tobacco content in US-produced films over the past decade. Monitoring of tobacco content in other developed film industries, as in Argentina and Mexico, are necessary in order to determine the need for policy development in those countries.

Method: The sample was drawn from the top 100 grossing movies in Mexico and Argentina for each year from 2004-2009. The sample included 82 Argentine produced, 92 Mexican produced, and 559 US-produced films that were popular in both countries. A reliable methodology for content coding tobacco appearances was used that involved timing onscreen duration of tobacco use and recording appearances of tobacco brands. The prevalence of films that portrayed any tobacco use and any tobacco brands, and mean seconds of use for films containing tobacco were calculated and compared within each rating category by year and country of production.

Results: Overall 80% of Mexican produced and 86% of Argentine produced movies contained tobacco. The percentage of US-produced movies popular in Mexico and Argentina that contained tobacco was lower than nationally produced films at 47%. For US films the percentage of movies with tobacco decreased from 2004 to 2010, yet this percentage began to increase again from 2011 to 2012. Percentage of films with tobacco decreased over time in Mexican produced films, while for Argentine produced films there was no change. In terms of mean seconds of tobacco use in films containing tobacco, there has been an increase in seconds in the most recent years for movies produced in all three countries. Both Mexican and Argentine films had higher percentages of tobacco brand appearances (24% in Mexico, 14% in Argentina) compared to the 5% of US films popular in Mexico and Argentina.

Conclusion: Films produced in Mexico and Argentina were more likely to contain tobacco compared to US-produced films, which suggests these countries need more public health advocacy efforts to address tobacco in films.

FUNDING: NIH, Fogarty 1 R01 TW009274-01

JUSTIFICATION: This information could be used to impulse public policies for limiting tobacco in movies

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POS5-66

GEOGRAPHIC VARIATION IN MATERNAL SMOKING DURING PREGNANCY: FINDINGS FROM THE MISSOURI ADOLESCENT FEMALE TWIN STUDY (MOAFTS)

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Background: Maternal smoking during pregnancy is associated with increased risks of preterm birth and offspring disruptive behavior. It remains unclear if maternal smoking varies geographically and if neighborhood socioeconomic deprivation (SED) imposes a contextual effect on maternal smoking during pregnancy.

Methods: The MOAFTS is a follow-up cohort study of about 1700 female like-sex twin pairs born in Missouri to Missouri-resident parents during 1975-85. Participants were recruited and biological mothers completed a baseline interview in 1995-98. We examined maternal smoking during pregnancy with the twins. Residential addresses of the mothers were geocoded to obtain their census tracts. We developed a census tract-level SED index using 1980 Census data. Two-level logistic regressions estimated geographic variation in and neighborhood effects on maternal smoking during pregnancy.

Findings: In all, 35.2% of MOAFTS mothers reported any smoking during pregnancy (21.9% beyond the 1st trimester). Maternal smoking varied geographically ($P < 0.05$), and neighborhood SED was associated with any smoking during pregnancy (the most vs. the least deprived quartile: odds ratio [OR]=1.91, 95% confidence interval [CI]=1.39-2.61, P for trend < 0.001) and smoking beyond the 1st trimester of pregnancy (OR=1.99, 95% CI=1.37-2.88, P for trend < 0.001). After adjusting for individual covariates (age, race, parental education and cohabitation, family income, maternal drinking during pregnancy, and maternal alcohol dependence), these associations were no longer significant, but geographic variation in maternal smoking still persisted.

Conclusions: Neighborhood SED was associated with maternal smoking during pregnancy but its effect could be explained by individual characteristics. Significant geographic variation in maternal smoking persisted in MOAFTS mothers and was not attributed to socioeconomic factors. To develop effective interventions aiming to reduce maternal smoking during pregnancy, further studies are necessary to explore underlying reasons for its geographic heterogeneity.

FUNDING: This study is in part supported by NIH grants: # R01 AA021492, # K07 CA178331.

JUSTIFICATION: The findings of this study can help develop effective interventions (geographic prioritization/targeting) aiming to reduce maternal smoking during pregnancy.

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POS5-67

RELATIVE EFFICACY OF VARENICLINE COMPARED TO NICOTINE PATCH IS GREATER FOR WOMEN THAN MEN

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Among smokers attempting to quit, women may have more difficulty successfully achieving abstinence than men. Further, there is a wealth of evidence demonstrating important sex differences in factors related to smoking. Yet, there is an absence of clinical guidance for sex-sensitive treatment of nicotine addiction. Sex differences in cessation medication efficacy may be one important factor when considering sex-sensitive treatment. Nicotine patch, a widely used

smoking cessation therapy, has demonstrated reduced efficacy among women compared to men. Varenicline may be more efficacious among women than men, but is less commonly used. We conducted a comparative treatment meta-analysis to examine sex differences in the relative efficacy of varenicline vs. nicotine patch. Patch data were extracted from a previous meta-analysis (Perkins and Scott, 2008). Sex-stratified varenicline data were provided by Pfizer, with one additional study identified through a systematic literature review. The analysis included 98% of all available published data on varenicline. Ten patch studies ($n=2086$ women; $n=2193$ men) and 11 varenicline studies ($n=1761$ women, $n=3371$ men) were included in analyses. The outcome of interest was point-prevalence abstinence at 6-months. Meta-regression analyses were conducted in R using the Metafor package, modeling effect sizes on the interaction between sex and treatment. Varenicline was more efficacious than patch for both women (OR=2.67, 95% CI=1.86, 3.84) and men (OR=1.66, 95% CI=1.26, 2.18). The relative difference between varenicline and patch was 61% greater for women than men ($p < 0.05$). The findings suggest varenicline should be considered as a first-line treatment for smoking cessation, particularly among women.

FUNDING: Funding for this study was provided by the Grace J. Fippinger Foundation. Funding was also provided by Grant Number P50 DA033945 from the National Institute on Drug Abuse (NIDA), the Food and Drug Administration's Office of Women's Health (FDA), and the Office of Research on Women's Health (ORWH), OD, awarded to SAM. PHS was partially funded by the YALE BIRCWH Scholar Program on Women's Health and Addictive Behaviors (NIDA, NIAAA; K12 DA031050; PI: Carolyn Mazure).

JUSTIFICATION: The findings suggest gains associated with prescribing varenicline vs. NRT patch may be greater for women who smoke compared to men.

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POS5-68

MENTHOL CIGARETTES AND SMOKING CESSATION AMONG AFRICAN AMERICAN SMOKERS IN THE UNITED STATES

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Objectives. Evidence has shown that menthol flavoring makes cigarettes more appealing to some smokers, especially among some subgroups. This study examines the association of menthol smoking status with smoking cessation among non-Hispanic African American adults in the United States.

Methods. We draw our data from the 2006-2007 and 2010-2011 Tobacco Use Supplements to the Current Population Survey (TUS-CPS), which is nationally representative of U.S. adults. Our study sample is limited to the non-Hispanic African Americans in these datasets who are recent active smokers, including both current smokers and former smokers who were smoking every day or some days twelve months before the interview ($N = 4,497$). We examine three cessation measures: any quit attempts in the past 12 months, successful cessation for at least 6 months, and intention to quit smoking in the next 30 days. Multivariate logistic regression models are used to analyze the association of menthol use with these outcomes while controlling for other confounding factors, including degree of nicotine dependence (time to first cigarette in the morning), sociodemographic characteristics, and census region

Results. 72.3% of recent active smokers in the study sample regularly smoked menthol cigarettes. Among recent active smokers who regularly smoke mentholated cigarettes, 49.9% had any quit attempts, 4.6% had successfully quit smoking for at least 6 months, and 22.1% intended to quit smoking in the next 30 days. By comparison, among non-menthol smokers, these percentages were 43.4%, 5.9%, and 18.0%, respectively. Multivariate logistic regression results show that menthol smokers are more likely to have any quit attempts (OR=1.25;

95% CI=1.05–1.49) and intentions to quit smoking (OR=1.36; 95% CI=1.07–1.73) compared to non-menthol smokers. Menthol smoking is not significantly associated with successful cessation.

Conclusion. Within our non-Hispanic African American study sample, menthol smoking is associated with a desire to quit but not associated with successful cessation. Researchers might explore the common cause (possibly latent) factors associated with both menthol use and the desire to quit.

FUNDING: This study was funded by grant from the Tobacco Related Disease Research Program (TRDRP) #22RT-0112.

JUSTIFICATION: This research informs prevention and policy efforts targeting mentholated cigarette use and smoking cessation in the African American community.

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POS5-69

ALL PHYSICAL ACTIVITY MAY NOT PROTECT ADOLESCENTS FROM SMOKING UPTAKE

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Adolescent cigarette smoking is a significant public health problem. A growing body of evidence provides a strong case for smoking prevention trials to evaluate whether physical activity interventions prevent adolescent smoking initiation and progression. While research has documented that physical activity is protective against smoking uptake, it is unclear whether this relationship is present across all types of physical activity that adolescents typically engage in. This study sought to determine whether certain types of physical activity prevent or promote adolescent smoking uptake. Adolescents (n=1,356) were surveyed every six months for four years (age 14 to 18 years old) as part of a longitudinal cohort study of physical activity and smoking. Smoking and physical activity were measured at each of the eight time-points. Different types of physical activity were categorized as positive physical activity (PPA) or negative physical activity (NPA) depending on their significant correlations with smoking. Associative Processes Latent Growth Curve Modeling revealed that each 30-minute increase in NPA per week at baseline was associated with a 4-fold increased odds of smoking progression (OR=4.10, 95% CI=2.14, 7.83). By contrast, each 30-minute increase in PPA at baseline was associated with a 51% decrease in the odds of smoking progression (OR=.49, 95% CI=.25, .93). This longitudinal cohort study shows that the certain types of physical activity decrease the odds of smoking uptake, while other types of physical activity increase the likelihood of adolescent smoking uptake. These findings suggest that the types of physical activity that an adolescent engages in may be more predictive of cigarette smoking than the amount of physical activity per week. These relationships warrant consideration in planning interventions to increase overall physical activity and those promoting physical activity to prevent smoking uptake.

FUNDING: This study was supported by National Cancer Institute RO1 CA126958 (JAM).

JUSTIFICATION: These findings suggest that the types of physical activity that an adolescent engages in may be more predictive of cigarette smoking than the amount of physical activity per week. These relationships warrant consideration in planning interventions to increase overall physical activity and those promoting physical activity to prevent smoking uptake.

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POS5-70

REINFORCING VALUE OF SMOKING RELATIVE TO PHYSICAL ACTIVITY AND THE EFFECTS OF PHYSICAL ACTIVITY ON SMOKING ABSTINENCE SYMPTOMS

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The negative reinforcing effects of physical activity have been well documented among smokers in the laboratory. However, exercise-based smoking cessation interventions have not consistently produced greater quit rates. Identifying individual differences in the response to physical activity may highlight smokers who benefit most from physical activity as a smoking cessation aid, and those that benefit least. The present study sought to evaluate whether individual differences in the reinforcing value of smoking relative to physical activity (RRVS) moderated the effects of physical activity (versus rest) on smoking abstinence symptoms. Participants were daily smokers (n=79) 18-26 years old. The design was a repeated measures within-subjects design. RRVS was measured with a validated behavioral choice task. On two subsequent visits, participants completed self-report measures of craving, withdrawal, mood, and affective valence before and after they engaged in passive sitting or a bout of physical activity. Mixed-models regressions revealed that RRVS did not moderate any effects of physical activity (p's > .05). Main effects analyses indicated that physical activity compared to passive sitting predicted decreased withdrawal symptoms ($\beta=-5.23$, CI= -6.93, -3.52; $p<0.001$), negative mood ($\beta=-2.92$, CI= -4.13, -1.72; $p<0.001$), and urge to smoke ($\beta=-7.13$, CI= -9.39, -4.86; $p<0.001$). Also, physical activity compared to passive sitting predicted increased positive affect ($\beta=3.08$, CI= 1.87, 4.28; $p<0.001$) and pleasurable feelings ($\beta=1.07$, CI= 0.58, 1.55; $p<0.001$), and greater time to first cigarette during the ad-libitum smoking period ($\beta=211.76$, CI= 32.54, 390.98; $p=0.02$). RRVS predicted increased odds of smoking versus remaining abstinent during the ad-libitum smoking period ($\beta=0.04$, CI= 0.01, 0.08; $p=0.02$), and reduced time to first cigarette ($\beta=-163.00$, CI = -323.50, -2.49; $p=0.047$). Regardless of the RRVS, physical activity produces effects that may aid smoking cessation in young adult smokers. However, young adult smokers who have a higher RRVS will be less likely to choose to engage physical activity, especially when smoking is an alternative.

FUNDING: This study was supported by National Institute on Drug Abuse DA029751 (JAM).

JUSTIFICATION: Bridging the gap between the smoking cessation-related benefits of physical activity and the motivation to engage in physical activity will require a better understanding of how to increase the relative reinforcer efficacy of physical activity among smokers.

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POS5-71

IMPACT OF AN INPATIENT TOBACCO USE TREATMENT PROGRAM ON 30 DAY READMISSION RATE

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Tobacco treatment programs that are initiated during a patient's hospital stay and include at least one month of follow-up post discharge are effective [1]. The University of North Carolina at Chapel Hill's Nicotine Dependence Program (NDP) follows this model. Research studies have shown that this type of intervention may reduce readmission rates and therefore it may be highly cost-effective for hospitals to invest resources to ensure that all hospitalized tobacco users receive comprehensive evidence-based treatment [2,3]. We report findings from a retrospective study examining whether UNC's inpatient tobacco use treatment program, which currently sees about 30% of hospitalized tobacco users, reduces 30 day readmission rates.

Methods: The medical records of patients who indicated current smoking on admission were pulled over a two-year time period and 30-day readmission rates were calculated. The control group consisted of patients who indicated current smoking and did not receive a NDP consult while hospitalized, whereas the study

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group consisted of patients who indicated current smoking and received a NDP consult. Readmission rates were compared between the control group and the study group.

This data has the potential to strengthen the financial case for providing tobacco use treatment to all hospitalized tobacco users. Such expanded access would lead to more people quitting tobacco use, thereby improving the health of individuals and reducing healthcare costs.

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FUNDING: The UNC Nicotine Dependence Program receives funding from UNC Health Care, the UNC Department of Family Medicine, the North Carolina Cancer Hospital and the Lineberger Comprehensive Cancer Center.

JUSTIFICATION: These findings may strengthen the financial case for providing comprehensive tobacco use treatment to all hospitalized tobacco users, thereby increasing the number of patients who become tobacco free.

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POS5-72

NO CHANGE IN COGNITIVE PERFORMANCE WITH TOBACCO ABSTINENCE IN SMOKERS WITH SCHIZOPHRENIA SPECTRUM DISORDERS FOLLOWING A 12-WEEK INTERVENTION WITH VARENICLINE AND CBT

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Background: People with schizophrenia spectrum disorders (SSD) have higher prevalence and severity of nicotine dependence (ND) than those in the general population and have nicotinic receptor abnormalities in brain, suggesting that nicotine may be therapeutic for cognitive dysfunction associated with the disorder. Thus, pharmacologic cessation aids may need to substitute for nicotine to prevent exacerbation of the illness with abstinence.

Methods: To evaluate whether abstinence was associated with worsening of cognitive performance, a test battery was administered to 147 nicotine-dependent, adults with SSD at baseline and at the end of a 12-week smoking cessation intervention with varenicline and cognitive behavioral therapy (CBT). The cognitive battery focused on attention, memory and motor functioning, including the Brief Visuospatial Memory Test-Revised (BVM-T-R), Wechsler Memory Scale-Digit Span (WMS), Identical Pairs Continuous Performance Test (CPT-IP) and Finger Tapping.

Results: No worsening was observed with abstinence on any test. Significant time by abstinence interactions were observed on the BVM-T-R, such that non-abstinent individuals improved at a steeper rate than their abstinent counterparts (Trial 1 $p=0.01$, Total Recall $p=0.01$, Delayed Recall $p=0.02$). There was a main effect for abstinence, such that those who were abstinent performed better at baseline and week 12 on tasks of auditory attention/working memory (WMS; $p=0.01$) and sustained attention (CPT-IP; p -values <0.04). Finally, there were main

effects of time, consistent with a learning effect, such that participants improved in working memory, learning, and motor performance from baseline to week 12 regardless of abstinence status ($p < .02$).

Conclusion: There was no evidence for worsening of cognitive performance with tobacco abstinence in adults with SSD and ND after 12 weeks of smoking cessation treatment with varenicline and CBT. Those who attained abstinence tended to have superior performance at baseline and week 12 and both abstinent and non-abstinent individuals tended to improve in attention, memory and motor speed over the 12 weeks.

FUNDING: This study was funded by grants R01 DA021245 by National Institute on Drug Abuse with supplemental financial and material support from an investigator-initiated award from Pfizer for study medications and funding, and by 05B1MACMHS to the Massachusetts Department of Mental Health from the Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Treatment Strategies for Smoking Cessation in Patients with Schizophrenia to the North Suffolk Mental Health Association (Dr Evins). Pfizer provided study medication and supplemental support through an investigator-initiated award after the protocol was approved by the institutional review board and the data and safety monitoring board.

JUSTIFICATION: These data call into question widely held beliefs that abstinence from tobacco is associated with cognitive decrements that may, in turn, make it more difficult for someone to stay quit.

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POS5-73

USAGE PATTERNS, BLOOD NICOTINE AND COTININE LEVELS, AND PUFF TOPOGRAPHY AMONG EXCLUSIVE USERS OF TANK TYPE ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS)

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Introduction: Tank type ENDS have grown in popularity but information on usage patterns has primarily come from survey data. In this study we recruited former smokers, who had switched to ENDS and were currently exclusively using tank type models, to determine real-world usage patterns including nicotine concentration, flavors and amount of e-liquid used. After one week of collecting diary data subjects participated in a 10-minute ad lib vaping session in the lab to determine baseline nicotine and cotinine levels as well as nicotine boost, puffing patterns and puff duration.

Subjects: Eighteen subjects completed both visits. Before switching to ENDS they smoked an average of 16 CPD and had been using an ENDS for an average of 1.8 years.

Nicotine concentration: (72%) used 6 mg e-liquid, (23%) used 12 mg and (5%) used 18mg. This was an experienced group of long-term users who had started on higher nicotine concentrations and titrated down over time.

Usage and Flavors: During the diary week subjects used an average of 4.1 ml of e-liquid per day with a range of 1-7ml; used a mean of 3.4 flavors with 39% using >1 flavor per day; 90% used primarily fruit or dessert flavors.

Steady state cotinine levels: The mean baseline blood cotinine level was 194.2 ng/ml with a median of 184.4 and a range of 12.3 to 442.1 ng/ml. This roughly corresponds to a nicotine intake of 15 mg per day, the equivalent of approximately 15 CPD, the mean number that the group smoked prior to switching.

Nicotine pharmacokinetics: At baseline the mean blood nicotine levels was 11.9 ng/ml after 10-45 minutes abstinence. At the end of the 10 minute vaping period the mean had risen to 17.9 ng/ml. Twenty minutes later nicotine levels had fallen close to baseline with a mean of 12.9 ng/ml.

Puff topography: During the vaping period subjects took a mean of 13.5 puffs with a mean puff duration of 5.2 seconds.

Conclusions: For this group of very experienced tank type ENDS users, mean daily nicotine delivery was similar to what would be predicted for their mean CPD when smoking. They almost exclusively used non-tobacco flavors and were using fairly low nicotine concentrations.

FUNDING: Funding provided as a research grant to Los Angeles Clinical Trials from NJOY, Inc., Scottsdale, AZ

JUSTIFICATION: The ENDS data on pharmacokinetics and cotinine levels will inform product developers, regulators and clinical research.

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POS5-74 HARMS OF TOBACCO AND EFFECTIVENESS OF CESSATION RESOURCES: PERSPECTIVES OF VIETNAMESE AMERICAN SMOKERS AND THEIR FAMILIES

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Background: Families are a promising, untapped resource for promoting smoking cessation in Asian Americans, whose smoking prevalence remains disproportionately high, for example, among Vietnamese men. This study aimed to describe the perceptions of Vietnamese male smokers and their family members regarding harms of tobacco and effectiveness of cessation resources.

Methods: Cross-sectional baseline data were analyzed from 108 Vietnamese male daily smokers and their non-smoking family members (54 smoker-family dyads) recruited by lay health workers for a randomized trial testing a family-based approach to promote smoking cessation. Multilevel models using GEE methods accounting for clustering among smoker-family dyads and lay health workers were used to compare perceptions of smokers and their family members.

Results: Among the 108 participants, 96% had limited English proficiency and 49% had educational attainment below high school. Among the 54 smokers (mean age = 57 years; mean cigarettes smoked per day = 7.9), 30% were precontemplators who had no intent to quit within 6 months. Overall, 84% of the 108 participants knew that tobacco impairs one's immunity and 74% knew that secondhand smoke causes heart disease. Fewer participants understood the harms from light smoking (52%) and thirdhand smoke (17%). Regarding cessation resources, participants trusted physicians' advice the most (75%) and quitlines the least (32%). Compared to the smokers, family members showed greater understanding of tobacco harms to immunity (93% vs 76%; p=0.02) and risks of secondhand smoke (82% vs 67%; p=0.01) and were more ready to endorse effectiveness of nicotine replacement therapy (NRT) (69% vs 37%; p< 0.001).

Conclusions: Findings suggest that physicians, the most trusted resource among these smokers and families, could be an effective gateway to facilitating quitline and NRT use. Given family members' greater recognition of tobacco harms and NRT effectiveness, tobacco control efforts should involve family members who can be a promising channel to enhance Vietnamese smokers' understanding of tobacco harms and receptiveness to cessation resources.

FUNDING: Tobacco-Related Disease Research Program (TRDRP) grant 22RT-0089H and the TRDRP Cornelius Hopper Diversity Award Supplement

JUSTIFICATION: In hard-to-reach populations with high smoking prevalences, understanding smoker's and their family member's perceptions of tobacco's health risks and cessation resources provides insights to guide clinical practice and public health efforts in advancing tobacco control.

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POS5-75 VALIDATION OF A MEASURE OF NORMATIVE BELIEFS ABOUT SMOKELESS TOBACCO USE

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Background: Validated methods to evaluate consumer responses to modified risk tobacco products (MRTPs) are needed. The Theory of Reasoned Action/Planned Behavior, which may explain how consumers respond to new tobacco products, describes a key role for social norms, including normative beliefs. The primary goals of this research were to (1) develop a measure for normative beliefs about smokeless tobacco (ST) and establish the underlying factor structure, (2) evaluate the structure with confirmatory factor analysis (CFA) utilizing an independent sample of youth, and (3) establish the measure's predictive validity to discriminate between those who do and do not use ST and those who express an interest in low-nitrosamine snus.

Methods: Respondents (smokers and non-smokers aged 15 ΓÇô 65; N=3001) completed a web-based survey which included questions on demographic characteristics, tobacco use history and dependence, and a measure to assess attitudes about ST adapted from the 11-item Normative Beliefs about Smoking scale developed by Primack et al. (2007). A second sample of youth (ages 14 ΓÇô 17; N=305) completed a similar questionnaire. Logistic regression was used to evaluate the predictive validity.

Results: Exploratory factor analysis of data from the first sample produced the anticipated 3 factor solution and accounted for nearly three quarters of the variance reflecting (1) perceived prevalence of ST use, (2) popularity of ST among Successful/Elite, and (3) approval of ST use by Parents/Peers. CFA with data from the second sample demonstrated good model fit and the scales effectively discriminated between users and non-users and predicted interest in trying snus.

Conclusions: Social norms surrounding use of new and reduced exposure products, including snus, have the potential to change toward greater acceptability. Assessment of MRTPs for regulatory purposes, which allows manufacturers to employ messages of reduced risk, should include measurement of social norms. Ongoing surveillance efforts that track use of new and modified risk products should also include measures of social norms to determine how social norms change with prevalence of use.

FUNDING: Funding for this research was provided by a cooperative agreement with the National Cancer Institute (U19 CA157345). The NCI did not contribute to the study design, data collection, analysis or interpretation of the data, or to composing and submitting the manuscript.

JUSTIFICATION: Assessment of MRTPs for regulatory purposes, which allows manufacturers to employ messages of reduced risk, should include measurement of social norms.

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POS5-76 GLOBAL APPROACHES TO E-CIGARETTE REGULATION

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Background: E-cigarettes and other electronic nicotine delivery systems vaporize liquid that can produce an aerosol. A policy scan was conducted to identify strategies taken by national governments to regulate ENDS.

Methods: Countries that contributed to the Report on e-cigarettes to WHO Framework Convention on Tobacco Control (July, 2014) and additional high income countries (OECD member countries) were initially included in the policy scan (n= 102). Websites of respective Ministries of Health or similar were searched to identify regulatory mechanisms used to regulate ENDS including legislation, decrees, or resolutions issued by governments. This search identified 60 national

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jurisdictions with policies. Searches of targeted media and e-cigarette industry websites identified an additional 10 countries that had taken regulatory action for a total of 70 countries included in the scan.

Results: Regulatory strategies were categorized according to the country's approach to: (1) product classification (tobacco product, medicinal/pharmaceutical product, consumer product, or ENDS), (2) sales restrictions (total bans or minimum age for purchase), (3) restrictions on product advertising, promotion and sponsorship, (4) manufacturing, importation and distribution bans, (5) public use bans, and (6) the application of a tax.

Many countries make a regulatory distinction between ENDS products that contain nicotine and those that do not. Jurisdictions such as Bahrain have banned the importation, sales and distribution of ENDS with a decree; however, the use of ENDS is regulated using existing tobacco control legislation. The majority of countries studied regulate ENDS through existing legislation — such as Australia where ENDS with nicotine are not permitted for sale under a law that classifies nicotine as a poison. Other countries, such as Singapore, regulate ENDS from existing bans on the importation of products that imitate cigarettes. Some countries have minimum age restrictions, public use bans or taxes. Although many countries have placed restrictions on advertising/promotion, few had restricted sponsorship.

FUNDING: Funding was provided by the RWJF.

JUSTIFICATION: The variation in approaches across countries could be used to understand public health impacts.

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POS5-77 A QUALITATIVE STUDY OF SMOKING CESSATION EXPERIENCES AND PERCEPTIONS AMONG HOMELESS YOUTH

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Introduction: This study examined the reasons for quitting smoking, previous experiences quitting smoking, and preferences for smoking cessation programs among homeless youth.

Methods: Qualitative data from focus groups were used to assess the perspectives of homeless youth recruited from one shelter and three drop-in centers serving homeless youth in Los Angeles County. Focus group sessions were audio recorded, transcribed, and analyzed by a systematic procedure for qualitative analysis to identify key themes on the topics of interest.

Results: Twenty-seven youth (mean age: 22.1 years, range: 18-25) participated in four focus groups. The main reasons for quitting among homeless youth were the short-term health-related consequences of smoking, such as decreased energy levels, shortness of breath, and possible infections caused by GÇ£snipingGÇ¥ (smoking discarded butts or filters). Many participants had family members with smoking-related illnesses and displayed knowledge of long-term consequences of smoking. For youth who were interested in quitting or reducing their smoking, the main reasons were related to health concerns and the cost of cigarettes; barriers to quitting included high levels of stress and being around other smokers. Although some youth had previously used smoking cessation products, participants generally expressed a preference for quitting on their own. Nonetheless, youth responded positively to the possibility of attending a smoking cessation program if incentives were provided.

Conclusions: Homeless youth are knowledgeable about the health-related consequences of smoking, express a desire to quit, and are receptive to the idea of attending smoking cessation programs.

FUNDING: This research was supported by funds from the California Tobacco-Related Disease Research Grants Program Office of the University of California, Grant Number 21RT-0118. The study sponsor played no role in the study design,

data collection, data analysis, writing of the report, or decision to submit the article for publication.

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POS5-78 CORRELATION ANALYSIS OF TOBACCO SMOKING AND WORKING YEARS WITH RESPIRATORY DISEASES AMONG MALE COAL MINERS IN CHINA

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Cigarette smoking and coal mine dust contribute greatly to the etiology of respiratory diseases. However, there has been no reported study on the effects of the two factors in China. The primary objective of this study was to determine whether tobacco smoking and duration of coal dust exposure confer any increase in the risk of respiratory diseases in Chinese coal miners. A total of 6,097 male workers were recruited into the study from three mines (Wangtai, Gukuang, and Sihe) in Jincheng city in Shanxi province. A set of structured questionnaires on demographic characteristics, working status, smoking status, and respiratory and related diseases was administered to each participant. Of these participants, 4,054 (66.5%) were current smokers, and 1,570 (26.0%) were highly nicotine dependent, with a Fagerström Test for Nicotine Dependence (FTND) score >4.0. As expected, the prevalence of respiratory diseases among current smokers was significantly higher than among non-smokers ($P < 0.05$). The most significant differences in the prevalence were in respiratory symptoms ($OR = 1.50$, 95% CI 1.32, 1.70; $P < 0.0001$), chronic cough ($OR = 1.55$, 95% CI 1.36, 1.78; $P < 0.0001$), and phlegm ($OR = 1.79$, 95% CI 1.53, 2.09; $P < 0.0001$). Highly nicotine-dependent miners had a higher risk of all respiratory symptoms ($P < 0.01$), whereas low-dependent miners had a higher risk only of chronic cough and phlegm ($P < 0.01$). Both FTND and cigarettes per day correlated positively with the higher risk of respiratory symptoms. The duration of coal dust exposure, measured by working years, was highly correlated with the prevalence of respiratory diseases. Together, our results indicate that cigarette smoking and duration of coal dust exposure are both strongly correlated with the risk of respiratory diseases, as has been found elsewhere. We also found a significant interactive effect of smoking and working years on the incidence of respiratory disease in Chinese coal miners. FUNDING: Supported by the Research Center for Air Pollution and Health of Zhejiang University

JUSTIFICATION: This study shows the impact of smoking is as serious as coal mine dust exposure on respiratory disease of coal workers.

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POS5-79 IMPACT OF SMOKING AND COAL MINE DUST EXPOSURE ON DIFFICULTY FALLING ASLEEP IN CHINESE MALE COAL MINERS

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The purpose of this study was to examine whether coal mine dust exposure and tobacco smoking have any impact on sleep quality in Chinese coal miners. A total of 5,645 male miners of Jincheng city in Shanxi province were recruited. Information on demographics, smoking status, working situations as coal miners, sleep quality, and other medical conditions were obtained through various questionnaires. The smoking status was categorized into three groups: non-smokers, low-dependent

smokers (Fagerström Test for Nicotine Dependence [FTND] <4), and highly dependent smokers (FTND ≥4). The working years as a coal miner were categorized into two groups: ≥10 and >10 years. Various statistical methods were used to analyze the relations between smoking status, working years, and difficulty falling asleep (DFA). We found that more working years (>10 years) significantly increased the risk of DFA in non-smokers as well as low- and highly dependent smokers ($P < 0.001$) compared with shorter working spans, with an odds ratio (OR) of 2.396 (95% confidence interval [CI] 1.772, 3.239), 1.610 (95% CI 1.288, 2.011), and 1.606 (95% CI 1.240, 2.079), respectively. Also, we observed a significant trend to DFA in smokers compared with non-smokers even with fewer working years (OR=1.381, 95% CI 1.1207, 1.691; $P = 0.002$). Consistent with the linear regression results of FTND score with the risk of DFA ($R^2 = 0.924$, $P < 0.001$), our analysis showed that highly dependent smokers had a greater risk of DFA than did low-dependent smokers (OR=1.384, 95% CI 1.114, 1.719; $P = 0.003$). The risk of DFA was even greater when highly dependent smokers also had more working years, with an OR of 2.747 (95% CI of 2.121, 3.558); $P < 0.001$. We conclude that smoking status and working years have a significant impact on DFA in Chinese male coal miners.

FUNDING: Supported by the Research Center for Air Pollution and Health of Zhejiang University

JUSTIFICATION: This study shows both smoking and duration of coal dust exposure have significant impact on sleeping quality of Chinese male coal nine workers.

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POS5-80 POLYCYCLIC AROMATIC HYDROCARBONS LEVELS IN MAINSTREAM SMOKE OF LITTLE CIGARS AND CIGARETTES DIFFER FOR ISO AND HUMAN SMOKING

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Background: Polycyclic aromatic hydrocarbons (PAHs) are considered as one of the sources of carcinogenicity in cigarette smoke. Little cigars (LCs) resemble cigarettes but have different design which may influence smoking behavior and toxicant exposure in main-stream smoke (MS). To date, there are very limited data on PAHs concentration in little cigar products and comparison to cigarettes.

Aim: To compare selected PAHs levels in machine generated MS smoke from LCs and cigarettes using ISO and human puff topography.

Methods: Five brands each of LCs and cigarettes popular in the U.S. were investigated. MS smoke was generated in the laboratory with smoking machine (Palaczbob) according to two regimens: 1) ISO method and 2) human (average topography data measured in 17 LCs + cigarettes dual users). Each LC and cigarette product was smoked in triplicates until 9mm from a product's filter. Simultaneously, blank samples were collected to adjust for background compounds. MS was collected on 44mm glass filter. PAHs were analyzed by HPLC with fluorescent detection (AT1200, Agilent Technologies Inc.).

Results: Topography data from smoking LCs/cigarettes differed from ISO method: (puff volume: 42, 52 vs. 35mL; interpuff interval: 21, 21 vs. 60sec.; puff velocity: 22, 27 vs. 17.5mL/sec., respectively). Significant differences in PAH levels were detected as a function of the smoke generation condition (ISO vs human puff parameters) and LC and cigarettes as follows: phenanthrene (484 vs. 841 and 405 vs. 915), anthracene (107 vs. 175 and 56 vs. 112), pyrene (207 vs. 292 and 117 vs. 226), benzo[a]anthracene (115 vs. 185 and 79 vs. 184) and chrysene (50 vs. 102 and 30 vs. 54 ng/g of tobacco).

Conclusions: Selected PAH levels in MS smoke vary between LCs and cigarettes and smoking conditions. ISO method for laboratory tobacco smoke generation leads to underestimating PAH levels in LCs and cigarettes. Smoking LCs may expose users to higher levels of some PAHs than cigarette smoking.

FUNDING: This research was funded by a grant from the National Cancer Institute 1R01CA158045 and by the Department of Chemical Hazards, Institute of

Occupational and Environmental Health in Poland. The authors declare no conflict of interest.

JUSTIFICATION: This study will inform policy on main-stream smoke toxicity of little cigars available in the US.

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POS5-81 PEAK PLASMA NICOTINE CONCENTRATION AMONG ELECTRONIC CIGARETTE USERS DURING AD LIB USE

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Background: Electronic cigarettes (ECIGs) heat a nicotine-containing solution to produce an aerosol for user inhalation. ECIGs can deliver nicotine to users effectively. Few studies have examined the plasma nicotine concentration achieved by users using their own ECIGs ad lib.

Methods: Plasma nicotine concentration, withdrawal symptom severity, and puff count were measured in 20 experienced ECIG users using their preferred ECIG and liquid (12-30 mg/mL nicotine concentration) during an ECIG-use session consisting of a directed bout (10 puffs at 30 second intervals) followed by a 30-minute break and then a 90-minute ad lib use period.

Results: Repeated-measures ANOVAs were conducted for plasma nicotine and subjective measures. Participants' plasma nicotine concentration significantly increased during the sessions [$F(7,133) = 17.69$; $p < .05$]. Mean peak plasma nicotine concentration was 19.9 ng/mL in the directed bout and 35.8 ng/mL in the ad lib bout with high variability in the ad lib period (7.4-108.4 ng/ml). In a linear regression model [$R^2 = 0.35$, $F(2,17) = 4.6$, $p < 0.05$], peak ad lib plasma nicotine concentration was not significantly associated with liquid nicotine concentration, but was strongly associated with puff count ($\beta = .60$, $p < .05$). Puff count and liquid nicotine concentration were correlated negatively ($r = -0.46$, $p < .05$). A main effect of time was also observed for four withdrawal items: "Anxious," "Craving," "Irritable," and "Urge to use an ECIG" [$F_s(2,38) > 4.7$, $ps < 0.05$]. Post-hoc tests revealed that withdrawal symptoms were reduced significantly immediately after the ad lib session compared to the pre-ECIG use baseline values [$t_s(19) > 2.2$, $ps < 0.05$].

Conclusions: In this study, some ECIG users were able to achieve remarkably high plasma nicotine concentration, some four to five times greater than those typically observed after smoking a cigarette. Additionally, users' puff number, not liquid nicotine concentration, predicted peak plasma concentrations. These findings suggest policy makers likely will need to consider user behavior when attempting to regulate ECIG nicotine delivery.

FUNDING: This research was supported by the National Institute on Drug Abuse of the National Institutes of Health under Award Number P50DA036105 and the Center for Tobacco Products of the U.S. Food and Drug Administration. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the Food and Drug Administration.

JUSTIFICATION: Findings from this study can inform policy makers interested in regulating nicotine delivery in electronic cigarette devices.

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POS5-82
THE USE OF E-CIGARETTES AND LICENSED NICOTINE PRODUCTS BY NEVER SMOKERS: FINDINGS FROM A POPULATION SURVEY

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Background: Concerns have been expressed that e-cigarettes may draw significant numbers of people into nicotine addiction who would never have smoked. England is a country with relatively lax regulation of e-cigarettes and so might be considered one of the countries at highest risk for this. This study assessed prevalence of e-cigarette use in never smokers in the English population aged 16 years and above between November 2013 and October 2014. It compared the figures with licensed nicotine products.

Methods: Data were collected using monthly cross-sectional household surveys of representative samples of adults in England between November 2013 and October 2014. Current use of an e-cigarette and licensed nicotine products and socio-demographic information were assessed among 12,610 never smokers. Data were weighted using a rlm weighting technique to match English census data on age, sex, and socioeconomic group.

Findings: A total of 0.22% (95%CI=0.14-0.30) of never smokers reported currently using an e-cigarette. The prevalence remained stable across the period of study ($\chi^2(3)=0.82$, $p=0.84$) and there was no association with age ($\chi^2(5)=7.47$, $p=0.19$), sex ($\chi^2(1)=2.77$, $p=0.10$) or having a manual occupation or being unemployed ($\chi^2(1)=0.04$, $p=0.83$). The figure was similar for licensed nicotine product users: 0.16% (95%CI=0.09-0.23).

Conclusion: The use of e-cigarettes by never smokers is negligible in a country with relatively lax regulation and similar to the use of licensed nicotine products in that population.

FUNDING: JB's post is funded by a fellowship from the UK Society for the Study of Addiction; RW is funded by Cancer Research UK. CRUK funded data collection for this study. At various times, the STS has been funded by CRUK the English Department of Health, Pfizer, GlaxoSmithKline and Johnson and Johnson.

JUSTIFICATION: The use of e-cigarettes by never smokers is negligible in a country with relatively lax regulation and similar to the use of licensed nicotine products in that population.

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POS5-83
MENTHOL FLAVORED CIGARETTES AND E-CIGARETTES: WHERE DO THEY INTERSECT?

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In the U.S., the Food and Drug Administration has the authority to ban menthol cigarettes, which have been linked to greater youth initiation and addiction. Previous research has explored menthol smokers' behavioral intentions in the event of a ban on menthol cigarettes; however, e-cigarettes and in particular flavored e-cigarettes have added a new element to the debate. Despite broad interest in e-cigarettes in the general population of smokers, the use of e-cigarettes by menthol smokers has been unstudied. The purpose of this research was to examine e-cigarette use among menthol smokers and to explore the role of e-cigarettes in menthol smokers' responses to a ban on menthol cigarettes.

Data were obtained from the 2014 Minnesota Adult Tobacco Survey (MATS) (n=9304), a random digit dial, population level survey of adults in Minnesota.

Among Minnesota adult smokers, 25% use menthol cigarettes. Use is most common among young adults (31.6%). Half of menthol smokers responded that they would quit smoking if menthol cigarettes were no longer sold in the United States. Of those that said that they would not quit, 52% reported that they would switch to non-menthol cigarettes and 23% would switch to menthol e-cigarettes.

Almost three quarters of menthol smokers have tried e-cigarettes, while only 26% of menthol smokers reported using e-cigarettes in the past 30 days. Daily e-cigarette use was reported by 1.5% of menthol smokers. A third of menthol smokers reported using a menthol flavored e-cigarette, 28.9% reported using some other flavor, and 37.6% reported no usual flavor.

The high proportion of menthol smokers who reported an intention to quit supports the need for policy interventions to reduce the impact of menthol cigarettes. Previous research has suggested that switching to another tobacco product may be a stepping stone to quitting. Research is needed to examine whether making the transition to e-cigarettes or non-menthol cigarettes can help with complete abstinence among menthol smokers.

FUNDING: No Funding.

JUSTIFICATION: The high proportion of menthol smokers who reported an intention to quit supports the need for policy interventions to reduce the impact of menthol cigarettes.

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POS5-84
PREVALENCE AND CORRELATES OF INTERMITTENT SMOKING AMONG HIV-INFECTED MEN WHO HAVE SEX WITH MEN

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Background: Intermittent smokers have increased health risks compared with nonsmokers, including increased rates of cardiovascular disease, pulmonary infections, and all-cause mortality. Cigarette smoking remains common among men who have sex with men (MSM) and persons living with HIV (PLWH), yet most studies do not discriminate between daily smokers (DS) and non-daily (intermittent smokers). While the harms of being an intermittent smoker (ITS) have been explored in the general population, studies have yet to examine the prevalence and characteristics of ITS among PLWH.

Objective: This cross-sectional study sought to describe the prevalence, socio-demographic characteristics, and quit intentions of ITS in a cohort of heavy drinking HIV-infected MSM.

Results: Of the 123 participants, 66 (53.2%) reported having smoked cigarettes in the past 30 days; 30 (45.5%) were categorized as DS, and 36 (54.5%) as ITS (i.e., nondaily cigarette use). Compared with DS, ITS were more likely to be white, earn more than \$30,000 annually, and have a college degree (all p 's < 0.01). Compared with nonsmokers (18.0%), both ITS (32.4%) and DS (46.4%) were significantly more likely to report less than 95% antiretroviral adherence. DS reported significantly more heavy drinking days ($M = 34.1$; $p < 0.05$), compared with both ITS ($M = 25.9$) and non-smokers ($M = 19.3$). ITS were significantly more likely (27.5%) to report immediate quit intentions (in the next 30 days) or no intentions at all (37.1%), whereas, DS (70.0%) were more likely to report future quit intentions (i.e., in 6 months or more). In multinomial logistic regression analyses, ITS in comparison to DS had a reduced odds of reporting immediate quit intentions compared to future intentions (AOR = 0.21, 95%CI: 0.05, 0.91).

Conclusions: Our results highlight important distinctions between DS and ITS among a sample of heavy drinking HIV-infected MSM. Identifying ITS among PLWH, who may not view themselves as smokers, may have important clinical and research implications. Tobacco cessation efforts are needed that address the unique needs of both DS and ITS among HIV-infected MSM.

FUNDING: P01AA019072; K23NR014951; T32MH 078788

JUSTIFICATION: Intermittent HIV-infected smokers, who are men who have sex with men (MSM) may have unique cessation needs and may require unique tobacco cessation efforts or approaches.

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POS5-85

THE PURSUIT OF LONG TERM TOBACCO ABSTINENCE: A 12 MONTH, COMBINED APPROACH PROTOCOL AND DIFFERENCES BY GENDER

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The Southern California Permanente Medical Group measures how often tobacco users attend cessation classes but not subsequent abstinence rates. In a 2013 study at one of their medical centers, 1 month abstinence rates after participation in a 7 week tobacco cessation class were double what they were at 12 months with most relapses occurring within 6 months and with notable gender differences. Research on relapse prevention for participants of such classes is limited especially that studying combined approaches. While long term, live interventions have been proven, their cost makes an effective automated approach highly desirable.

We aimed to determine if extended follow up via both letters and automated phone calls for attendees of tobacco cessation classes in this organization would improve 12 month abstinence rates and whether gender plays a role.

Alternating enrollment across medical centers was used. The initial control group included those who attended a class at any center between September 2012 and February 2013 and were not given extended follow up. The intervention group included those who attended a class between March 2013 and August 2013 who had letters and automated phone calls at 2, 4, 6, 8, and 10 months after the class. A second control group included those who attended classes between September 2013 and January 2014 (no extended follow up). 12 month abstinence data was collected via self-report (phone interview) and medical record review.

889 subjects were enrolled; 400 control, 489 intervention. Data was available for 328 control and 356 intervention subjects. 12 month abstinence comparisons were as follows: total control 147/328 (45%) vs. total intervention 141/356 (40%), $P=0.2$; males 166/360 (46%) vs. females 122/324 (38%); $P=0.02$; male controls (50%) vs. male intervention (42%), $P=0.1$; female control (38%) vs. female intervention (37%), $P=0.8$; male control (50%) vs. female control (38%), $P=0.04$; and male intervention (42%) vs. female intervention (37%), $P=0.3$.

Inexpensive, 1 year follow up using automated calls and letters did not improve abstinence rates for class attendees. Males had higher abstinence rates vs. females.

FUNDING: No Funding

JUSTIFICATION: This study shows that more intensive efforts are needed to prevent relapse prevention and attention should be given to improve cessation programs for women.

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POS5-86

PERCEIVED STRESS AND SMOKING BEHAVIOR IN MEN AND WOMEN DURING AD LIB SMOKING

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Purpose: Cigarette smoking is the leading cause of preventable mortality worldwide. Stress has been found to be a significant risk factor for cigarette smoking. Stress affects males and females differently, as does the use of cigarette smoking for stress reduction. Few studies have examined gender differences of perceived stress on smoking habits and smoking related symptomatology. This study investigates this interaction, as well as the influence of sociodemographic variables by gender.

Methods: This is a retrospective analysis of a sample of 62 smokers (41 males, 21 females) enrolled in a smoking cessation study. At the screening visit sociodemographic information and several survey measures were completed, including the Perceived Stress Scale (PSS), Fagerström Test for Nicotine Dependence (FTND), Minnesota Nicotine Withdrawal Scale (MNWS) and personal smoking habits. Analyses were conducted using multiple linear regression models of each smoking-related measure on PSS and descriptive statistics were performed.

Results: Linear regression models showed perceived stress to have an inverse association with the number of cigarettes smoked per day (CPD) in males (slope estimate for one point higher on PSS = -0.29 CPD ± 0.084 ; $p=0.0009$). The effect of CPD on PSS in females was not statistically significant nor was the difference between genders. Linear regression of MNWS on PSS revealed a positive association for both males (slope estimate= 0.43 ± 0.075 ; $p<0.0001$) and females (slope estimate= 0.74 ± 0.15 ; $p<0.0001$) and there was a borderline difference in effect between genders ($p=0.08$). Linear regression of FTND on PSS revealed an inverse association in females (slope estimate= -0.12 ; $p=0.097$) and little correlation in males, nor a significant difference between genders.

Conclusions: A strong relationship exists between perceived stress and smoking related symptomatology due to nicotine withdrawal in smokers of both sexes, with a larger effect seen in women. These findings emphasize the importance of behavioral counseling for stress reduction in smokers, which may lead to less withdrawal symptoms and more effective smoking cessation.

FUNDING: NIH/NIDA/OWHR P50-DA033942

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POS5-89

EFFECT OF THE IMMINENT POSSIBILITY OF SMOKING ON BRAIN RESPONSES TO CIGARETTE-RELATED CUES

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Smoking relapse is often precipitated by exposure to cigarette-related cues. Functional magnetic resonance imaging (fMRI) studies have demonstrated that smokers have larger brain responses to cigarette-related cues than to neutral cues, suggesting that cigarette cues are motivationally significant. Prior fMRI research has only addressed smokers' responses to cues when smoking was not imminently possible (i.e., the earliest that they could smoke was after leaving the scanner). The goal of this study was to determine the extent to which brain responses to cigarette-related cues change when smoking is imminently possible inside the scanner, a condition that more closely resembles relapse. Nicotine-deprived smokers not currently interested in quitting ($n = 11$) completed a single fMRI session during which they smoked cigarettes using an fMRI-compatible device. Smokers viewed a series of cigarette-related and neutral pictures, each surrounded by a colored frame indicating whether or not smoking was possible on each trial. When the session began, they were told that they would smoke

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twice inside the scanner, and that this could occur on any trial where the smoking possible frame appeared. We analyzed data from trials that occurred before the first cigarette was smoked using a whole-brain 2 x 2 within-subjects ANOVA with picture category (cigarette, neutral) and smoking possibility (possible, not possible) as factors. Consistent with previous research, we found significant main effects of picture category (cigarette > neutral) bilaterally in the precuneus, and in the left insula and dorsal anterior cingulate cortex ($p < .005$). In the left precuneus, this cue reactivity effect was moderated by smoking possibility: brain responses to cigarette cues were larger when smoking was possible than when smoking was not possible, but brain responses to neutral cues did not differ as a function of smoking possibility (cue type x smoking possibility interaction: $p < .05$). Based on the involvement of precuneus in the perception of highly arousing stimuli, our results suggest that the imminent possibility of smoking increases the motivational significance of smoking cues.

FUNDING: This research was supported by a career development award from the National Institute on Drug Abuse to Jeffrey M. Engelmann (K01-DA034752) and through the National Cancer Institute through MD Anderson's Cancer Center Support Grant (CA-016672).

JUSTIFICATION: Improved understanding of the neurobiology of cue reactivity under conditions that more closely resemble relapse might inform the development of improved smoking-cessation interventions.

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POS5-90

EVIDENCE FOR A CAUSAL EFFECT OF SMOKING ON SOCIO-ECONOMIC POSITION: A MENDELIAN RANDOMIZATION ANALYSIS

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Socioeconomic position (SEP) is associated with various smoking outcomes. It is widely believed that smoking is a consequence of deprivation; however, it is possible that smoking also directly contributes to poverty, through illness and discrimination. Making causal inferences about this relationship from conventional epidemiological studies is difficult due to problems of confounding or reverse causation. Mendelian randomisation (MR) utilises the properties of genetic variants to assess causality in the absence of these problems.

We performed a MR analysis, using data from 6,681 mothers from the Avon Longitudinal Survey of Parents and Children, to investigate the causal nature of associations of smoking heaviness with SEP (binary variable; low/high). Analysis of the associations between rs1051730 (mothers genotype) and SEP (mother, partner, combined (highest SEP of a mother and partner pair)) were assessed using logistic regression, stratified by smoking status. An additive genetic model was assumed.

There was evidence that rs1051730 was associated with combined SEP (OR 1.15, 95% CI 1.00 to 1.32, $p=0.050$) and partner SEP (OR 1.23, 95% CI 1.07 to 1.42, $p=0.005$) in smoking mothers, each copy of the minor (i.e., smoking increasing) allele increasing odds of belonging to the lower SEP category. However, there was no evidence of association with mothers SEP (OR=0.93, 95% CI 0.79 to 1.10, $p=0.38$). Importantly, no evidence of association between rs1051730 and combined, partner or mother SEP was observed in non-smoking mothers, which suggests that rs1051730 is not influencing SEP directly. We observed evidence of

a difference in effects of rs1051730 on SEP in smoking and non-smoking mothers for fathers ($p=0.004$) and combined SEP analysis ($p=0.027$), but not in mothers SEP analysis ($p=0.54$).

We observed a negative, causal effect of mothers smoking heaviness on combined and partner SEP. Whilst no evidence for a causal effect of mothers smoking heaviness on mothers SEP was observed, this could be explained by the timing of SEP measurement (i.e., during pregnancy). Given the limited sample size, replication of these findings in an independent sample should be sought.

FUNDING: No funding

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POS5-91

EXPLORING PREDICTORS OF ENROLLMENT AMONG ELIGIBLE PARTICIPANTS IN A SMOKING CESSATION CLINICAL TRIAL

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Historically, smoking cessation studies have had a hard time recruiting African American (AA) and younger participants, despite their expressing a similar interest in quitting as other groups. A thorough study of demographics and smoking-related behavior (i.e., cigarettes/day (CPD) and dependence level) have not been compared between those who enroll in a smoking cessation study and those who do not. We aimed to explore various predictors of enrollment in a smoking cessation trial among eligible participants.

Men and women smokers between the ages of 18-40yrs were recruited via TV, radio, Internet and printed ads to participate in a study examining the effect of hormones on smoking cessation. Eligibility was determined by an in-person screening visit. Enrollment proportions were compared among eligible participants by demographics and smoking behavior using descriptive statistics and Chi-Square tests.

Eligible participants ($n=263$) were on average 30.2yrs old ($SD=6.4$), 56.7% white and 60.5% male. They reported smoking an average of 14.9 CPD ($SD=6.8$), smoked for an average of 12.8yrs ($SD=6.6$) and had a median longest successful quit duration of 21 days ($Q1=5$, $Q3=180$). White participants were more likely to enroll than AA participants ($p=.07$) and participants over 25yrs were more likely to enroll ($p=.01$). Participants who have had successful quits in the past were also more likely to enroll ($p=.03$), with longer successful cessation being a stronger predictor of enrollment. Participants with previous quit attempts were more likely to enroll than those with no previous quit attempts ($p=.05$).

Like previous research, we found that more effort is needed to enroll adults under 25yrs as well as AA and other minorities. We also found that more effort is needed to recruit participants with no previous quit attempts. Limitations of this project include the small sample size and lack of information gathered on the reasons eligible participants choose not to enroll. However, recruitment for this study is on-going. Having this information is important for future recruitment efforts.

FUNDING: NIH/NIDA/OWHR P50-DA033942

JUSTIFICATION: This may be helpful for the recruitment of participants in other research studies.

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POS5-92 CORTICAL REACTIVITY TO PLEASANT AND CIGARETTE CUES: A CONDITIONING PARADIGM

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Smokers report that cigarette-related stimuli trigger cravings and compulsive smoking. Animal models explain this phenomenon as the result of Pavlovian conditioning: When paired with nicotine (i.e., a rewarding unconditioned stimulus, US), a neutral cue (the conditioned stimulus, CS: cigarettes, ashtrays) acquires motivational significance. Once imbued with motivational significance, CSs can activate affective states and trigger compulsive smoking. Few human studies have investigated the brain mechanisms underlying conditioned responses to cigarette-related stimuli using second-order conditioning paradigms. Current smokers were randomly assigned to either a nicotine satiated (N = 21) or a 24h nicotine-deprivation condition (N = 22). The control group consisted of 30 non-smokers. During the conditioning procedure, we used cigarette-related, erotic, and neutral images as USs, and geometric patterns as CSs. We measured brain responses to USs and CSs using dense-sensor array event-related potentials (ERPs). During US presentation, both cigarette-related and erotic images prompted higher cortical positivity than neutral images over centro-parietal sensors between 300 and 600 ms post US onset (late positive potential, LPP). The LPP evoked by erotic images was significantly larger than the LPP evoked by cigarette images. Smoking status did not modulate this effect. During CS presentation, there was no difference in ERP amplitude elicited by the geometric patterns preceding erotic and cigarette-related images, and both were significantly greater than the amplitude elicited by the CS preceding neutral images. This effect was maximal over occipital sites between 316 and 344 ms post-CS onset. Understanding how neutral stimuli acquire motivational significance using higher-order conditioning paradigms could contribute to bridging the gap between basic and clinical addiction research. The paradigm proposed here could allow addiction researchers to test in humans the clinical value of hypotheses developed in animal models, potentially fostering the development of new interventions aimed at reducing the motivational significance of cigarette-related stimuli. FUNDING: This study was supported in part by a Global Research Award for Nicotine Dependence (GRAND) grant, an independent competitive grants program supported by Pfizer, to Francesco Versace, and by the National Cancer Institute through MD Anderson's Cancer Center Support Grant (CA-016672).

JUSTIFICATION: The paradigm proposed here could allow addiction researchers to test in humans the clinical value of hypotheses developed in animal models, potentially fostering the development of new interventions aimed at reducing the motivational significance of cigarette-related stimuli.

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POS5-93 HOW TO DEFINE E-CIGARETTE PREVALENCE? FINDING CLUES IN THE USE FREQUENCY DISTRIBUTION

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E-cigarette use has rapidly increased. Recent studies have defined prevalence based on A) ever use, B) 30 day use, C) >4 days in 30, D) daily use, E) "every day/some days," and other measures. Competing definitions challenge cross-study comparison. We sought to understand patterns of use by investigating the distribution of number of days current, former, and never smokers used e-cigarettes, and thus contribute evidence towards a standard definition.

The Minnesota Adult Tobacco Survey is a population based RDD survey. In 2014, 17.7% (95% CI = [16.6, 18.8]) of adults had tried e-cigarettes, however most ever-users had not used in the past 30 days (current smokers 61.1%, [56.5, 65.6]; former smokers 69.7%, [63.3, 76.1]; never smokers 78.5%, [72.3, 84.7]).

Histograms of number of days used were visually inspected for current, former, and never smokers with any use in the past 30 days. All distributions were bimodal with peaks at 1 and 30 days. Use ≤5 days in the past 30 demarcated a cluster of infrequent users at the low end of the distribution. Infrequent users were the majorities of current (59.0%, [51.5, 66.5]) and never smokers (89.5%, [81.5, 97.4]), but were fewer than half of former smokers (43.2%, [30.2, 56.1]). The peak at the upper end of the distribution was narrowly centered on 30 days. Daily use was more common among former smokers (40.9% [28.7, 53.0]) than current smokers (12.3% [7.2, 17.4]) or never smokers (5.1% [0.0, 11.4]).

A previous study found users motivated by curiosity often discontinued use. In the current study curiosity was the most common reason for trying e-cigarettes (78.2%, [75.3, 81.0]), suggesting many infrequent users were experimenters and unlikely to become regular users.

Defining prevalence as any use in the past 30 days failed to differentiate clearly distinct types of users (infrequent and daily). Defining current use as >5 days excluded the cluster of infrequent users. The resulting overall estimate was similar to other studies that defined prevalence as "use on every day or some days, but not rarely." We recommend adoption of either definition for future studies of e-cigarette prevalence.

FUNDING: All funding was provided by ClearWay Minnesota.

JUSTIFICATION: This empirical study facilitates adoption of a standardized measure of e-cigarette prevalence, which will be crucial for the tobacco control community to understand how the introduction of e-cigarettes is or is not changing the overall environment of tobacco use, especially combusted cigarettes.

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POS5-94 TOTAL AND FREE-BASE NICOTINE CONCENTRATIONS IN POPULAR ELECTRONIC CIGARETTE REFILL LIQUIDS IN THE UNITED STATES

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Significance: Nicotine is considered the primary addictive component of electronic cigarette refill liquid (e-liquid). E-liquid is a complex mixture of nicotine, solvents (mainly propylene glycol and glycerin), flavorings, additives and stabilizers. These ingredients may impact the pH of e-liquid. It is known that pH determines the fraction of total nicotine that is present in biologically available free-base form. This study examines pH, total and free-base nicotine concentrations in popular e-liquids in the United States.

Methods: Twenty-three e-liquids with varying labeled concentrations of nicotine were purchased from local e-liquid and convenience stores from four regions of the USA (Eastern, Midwestern, Western and Southern). Total nicotine concentrations were determined using gas chromatography. We measured the pH of the products and calculated free-base nicotine concentrations using the Henderson-Hasselbalch equation.

Results: The determined total nicotine concentrations varied from 2.9 to 24.4 mg/ml and the pH, ranged from 6.83 to 9.75. The majority of the samples have basic pH. The ratio of free-base nicotine to total nicotine ranged from 0.51 to 0.98 which corresponds to the variations in free-base nicotine concentration from 1.8 to 23.8 mg/ml. We found significant discrepancies between the labeled and determined total nicotine concentrations in tested products. We also found significant variations in free-base nicotine concentrations. For example, one of the tested products of candy flavor was labeled as 8 mg/ml but the determined concentrations of total and free-base nicotine were 4.1 and 2.7 mg/ml, respectively.

Conclusions: Bioavailability of nicotine from electronic cigarettes may be affected not only by its concentration but also by the pH of the product. The variation of pH in these products must be considered in studies on nicotine delivery and abuse liability of different electronic cigarettes.

FUNDING: This study was funded by NIH (R01 DA037446).

Rapids Poster Session 5 • Saturday, February 28, 2015 • 11:30 a.m.-1:00 p.m.

JUSTIFICATION: The variation of pH in these products must be considered in studies on nicotine delivery and abuse liability of different electronic cigarettes.

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POS5-96

RELATIONSHIP BETWEEN QUIT ATTEMPTS AND SMOKEFREE POLICIES AMONG NURSES WHO SMOKE: AN ANALYSIS OF THE TOBACCO USE SUPPLEMENT-CURRENT POPULATION SURVEYS (TUS-CPS) FROM 2003 TO 2010-2011.

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Background: Quit attempts are known to lead to long-term abstinence and smokefree policies are considered supportive of quit attempts. This study describes the impact of nonsmoking policies on recent quit attempts by nurses using data from the Tobacco Use Supplement-Current Population Surveys (TUS-CPS) from 2003 to 2010-11.

Methods: Current smoking nurses were identified using the TUS-CPS self-reported smoking status in 2003 (RNs, N=272; LPNs, N=116), 2006-07 (RNs, N=254; LPNs, N=111) and 2010-11 (RNs, N=116; LPNs, N=115). Recent quit attempts were determined by whether respondents made a quit attempt in the previous 12 months. Smokefree policies included those banning smoking at workplace's indoor public areas and indoor work areas, and inside the home.

Results: From 2003 to 2010-11, there were no significant differences in the percent of RNs or LPNs who made a quit attempt (44% in 2003, 41% in 2006-07, 40% in 2010-11 for RNs, and 35%, 47%, and 44% for LPNs). There was a significant increase in the percent of RNs reporting that smoking was not allowed anywhere in their home (36% to 46% to 63%, $p=.0006$), but no differences in the percent of LPNs reporting smokefree homes (39% to 39% to 41%). The percent of LPNs whose workplaces banned smoking in indoor work areas decreased from 2003 to 2006-2007 but increased in 2010-11 (82%; 61%; 74%, $p=.006$). Among RNs there were no significant changes in indoor work areas smoking bans (79%; 76%; 85%). Controlling for nursing degree (RN/LPN) and the 3 survey years, those with a smokefree home policy were more likely to have made a quit attempt compared with to those who did not (OR=1.93, 95% CI: 1.38, 3.81).

Conclusions: Despite an increase in smokefree workplace policies in 2010-11, 26% of LPNs reported that smoking was allowed in indoor work areas (compared to 15% of RNs). Quit attempts increased when nurses implemented smokefree home policies. It is possible that a decision to quit preceded the establishment of a home policy. Although quit attempts were not associated with workplace smokefree policies, efforts should continue to expand smokefree policies in all healthcare settings.

FUNDING: School of Nursing, University of California, Los Angeles

JUSTIFICATION: Enhanced promotion of home and workplace smoker policies might support quit attempts among nurses who smoke.

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POS5-97

TAILORING ANTI-SMOKING HEALTH COMMUNICATION USING THE HIGHLY-REPEATED-WITHIN-PERSON (HRWP) DESIGN

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Background: Counter-marketing of tobacco use is an important component of preventing tobacco initiation and encouraging quitting among current smokers, and has contributed to overall reduction of smoking prevalence in the US over the past 50 years. However, further reduction in smoking may require tailoring anti-smoking health messages for individuals and those groups among which smoking prevalence remains high, in order to reduce tobacco related health disparities, which have increased.

Objective: To test a novel technique (HRWP) to explore individual differences in people's responses to various types of anti-smoking messages by identifying the "active ingredients" of messages, and assessing which types of messages are effective in changing attitudes for each individual.

Method: A sample of young adult college students, aged 18-24, was recruited to participate in this pilot study (n=87). Using the HRWP design, each subject was exposed to a representative sample of national anti-smoking videos (from CDC, FDA and Legacy), followed by a survey to assess their responses to each of the messages. Messages that were effective in increasing anti-smoking attitudes for each participant were identified using multilevel modeling; individuals' reactions to the anti-smoking messages were assessed, and groups of people with similar response patterns were identified.

Results: There were significant individual differences in message effectiveness among the subjects, and also groups of people with similar response patterns. For example, while people who never smoked were responsive to messages that portray the harmful effects of one person's smoke on others, people who have ever smoked appear not to be responsive to such messages.

Conclusions: This study demonstrates an innovative method that can be used to increase effectiveness of anti-smoking messages for individuals who are both smokers and nonsmokers, and could be useful for tailoring individual anti-smoking messages in order to prevent or reduce smoking among young adults.

FUNDING: Tobacco Scholars Program at UW

JUSTIFICATION: This research produces a simple, effective and innovative way to tailor anti-smoking health communication to a wide audience.

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POS5-98

MEASUREMENT INVARIANCE OF EXISTING NICOTINE DEPENDENCE MEASURES AMONG CIGARETTE AND POLY-TOBACCO USERS

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Measures of nicotine dependence (ND) in cigarette smokers have also been used to assess ND among users of multiple tobacco products. Such use has been criticized due to different motivational, behavioral, and physiological factors associated with using various nicotine-containing products. Although recent studies have emphasized the need for standardized and/or separate product-specific assessments, little empirical work has examined the psychometric properties of existing tools in measuring ND across users of multiple products. In this study, we examined the measurement invariance of several current ND measures in two groups: cigarette vs. poly-tobacco users. Data for cigarette users (Study 1; N = 321; 62.0% female; age M = 21.5; 60.7% White) come from the 6-yr assessments of participants in a longitudinal study who had ever smoked at baseline. Data for poly-tobacco users (Study 2; N = 167; 34.8% female; age M = 22.6; 53.9% White) come from a second sample of young adults recruited for their use of non-cigarette tobacco products. All measures examined in this study assessed ND related to combustible tobacco use. Measurement invariance was investigated for the Fagerström Tolerance Questionnaire (FTQ), Nicotine Dependence Syndrome Scale (NDSS), and Wisconsin Inventory of Smoking Dependence Motives (WISDM). Multigroup confirmatory factor analyses showed that none of the measures were invariant across groups. The WISDM and NDSS exhibited factorial

but not scalar invariance, indicating that although respondents in the two groups interpret items and the latent dependence variable in similar ways, their respective dependence scores were associated with different reporting on items. The FTQ did not exhibit factorial invariance. Modification indices were examined in all scales to identify areas of poor fit. Results suggest that comparisons across product users with the WISDM and NDSS should be interpreted cautiously, acknowledging group differences in behavior. Comparisons using the FTQ will require additional adjustment. Further research may seek to develop novel measures to facilitate cross-product comparison or product-specific scalings for extant ND measures.

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POS5-99

DEPRESSION MODERATES THE RELATIONSHIP BETWEEN ADHD AND SMOKING PROGRESSION

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This study examined whether depression and gender moderate the relationship between ADHD symptoms and smoking among a sample of young adults (N=939; mean age: 21.4; 60.3% female; 58.2% white). ADHD symptoms, depression symptoms, and gender have been consistently related to smoking, but rarely are their combined effects examined longitudinally. We hypothesized that depressive symptoms would exacerbate the ADHD-smoking association, but more so for females than males. Participants were oversampled for ever smoking at baseline (at 9th or 10th grade) and followed for 7 years. Data for this study come from the 5- and 6-year follow-ups. 55.4% of participants at 5-years and 52.5% at 6-years smoked during the past 30 days. Mean number of past-month days smoked was 9.92 at 5-years and 9.68 at 6-years with an average rate of cigarettes smoked/day of 2.61 and 2.47, respectively. Regression analyses predicting progression beyond initial trials of smoking at 6 years found significant main effects for ADHD symptoms among the whole sample (OR (95% CI) = 1.15 (1.06-1.25), Wald = 0.14, p < .05) and within smokers (β = 0.05, z = 4.42, p < .05). Depression moderated the relationship between ADHD and any past month smoking for the whole sample, OR (95% CI) = 1.01 (1.002-1.02), Wald = 0.01, p < .05, such that the association between ADHD and smoking was stronger for those reporting higher levels of depression symptoms. Among smokers higher levels of depression were associated with more past month smoking days (β = 0.01, z = 2.53, p < .05), and there was no depression by gender interaction. There was, however, a significant ADHD by gender interaction, β = -0.058, z = -4.19, p < .05. For males, ADHD symptoms had a positive relationship with smoking, but for females, this relationship was negative. This study suggests that the relationship between ADHD and smoking varies by sex, and may be exacerbated for those with higher depressive symptoms.

FUNDING: This work was supported by grant 5P01 CA98262 from the National Cancer Institute and was conducted at the University of Illinois at Chicago.

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POS5-100

CIGARETTE SMOKING AND THE RELATIONSHIP WITH RETENTION IN HIV PRIMARY CARE, 2008-2010

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Introduction: Of the more than 1.2 million persons living with HIV (PLWH) in North America, over one-third whom are not linked to HIV primary care. Reports state twice as many PLWH smoke cigarettes compared with non-HIV-infected individuals. Despite the substantially greater population-attributable risk of death associated with smoking among PLWH compared with others, little research has addressed the relationship between smoking and retention in HIV care. Improved retention may increase smoking cessation opportunities and decrease mortality. **Methods:** We analyzed data from participants in six North American AIDS Cohort Collaboration on Research and Design-contributing cohorts who had a minimum of ≥ 2 smoking observations from 2008 to 2010. Smoking status (exposure) was time-varying and defined as either never, ever, or current at each visit. Retention (outcome) was defined using the Institute of Medicine-endorsed indicator of ≥ 2 HIV primary care visits ≥ 90 days apart in a calendar year. Cox proportional hazard models were used to estimate adjusted hazard ratios (aHR) and 95% confidence intervals (CI). **Results:** Among 3,575 adults included in this analysis who contributed 2,023 person years, 17% failed to be retained in care. 615 person-years (30%) were from current smokers, 777 (38%) from ever smokers, and 632 (31%) from never smokers. Compared with never smokers, current smokers were more likely to be male, have used injection drugs, have a lower median CD4 cell count, and have higher median plasma HIV RNA. After adjustment for age, sex, race, HIV transmission risk, geographic residence, and HAART use, there was a 36% decrease in the risk of failing to be retained in care among ever (vs. never) smokers (aHR=0.64 [0.50, 0.81]) and no difference in risk among current (vs. never) smokers (aHR=0.92 [0.73, 1.17]). **Conclusions:** Smoking status could be used to help identify PLWH who are at greater risk for failing to be retained in HIV primary care. Future efforts should explore the relationship of smoking cessation programs and retention in HIV clinical care among current smokers who are trying to quit.

FUNDING: No Funding

JUSTIFICATION: Our findings of the relationship between smoking and retention in HIV care are an important first step in generating ideas for policies and programs to reduce smoking prevalence and increase retention in HIV clinical care in the U.S. and Canada.

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POS5-101
EFFECTS OF MENTHOL ON NICOTINE PHARMACOKINETIC, PHARMACOLOGY AND DEPENDENCE IN MICE

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Although menthol, a common flavoring additive to cigarettes, has been found to impact the addictive properties of nicotine cigarettes in smokers, little is known about its pharmacological and molecular actions of menthol on nicotine and nicotinic receptors. We therefore investigated the effects of menthol on nicotine pharmacokinetics and pharmacological effects after systemic administration in the mouse. In the second part of the study, we investigated if menthol alters dependence-related behaviors of nicotine in the mouse. Mice chronically exposed to nicotine and menthol were challenged with mecamylamine, a nicotinic antagonist, and tested for physical (somatic and hyperalgesia) and affective (anxiety-related behaviors) precipitated withdrawal signs. In addition, we determined if menthol administration in the mouse affects the extent of $\alpha 4\beta 2$ nAChRs upregulation in the brain after chronic exposure to nicotine in the mouse. Intraperitoneal injection of menthol (100 mg/kg) significantly increased nicotine plasma AUC levels and reduced its clearance. Menthol dose-dependently prolonged the time-course of nicotine pharmacological responses (antinociception and hypothermia) after acute dosing in the mouse. Furthermore, repeated administration of menthol with nicotine increased the intensity of mecamylamine-precipitated withdrawal signs on test day. The potentiation of withdrawal intensity by menthol was accompanied by significant increase in nicotine plasma levels in these mice. Finally, chronic co-administration of menthol and nicotine appears to promote significant alterations in $\beta 2$ and $\alpha 4$ nAChR subunit expression in the hippocampus, amygdala, and striatum of mice. Interestingly, administration of menthol in the mouse alone $\beta 2$ and $\alpha 4$ nAChR subunit levels in these brain regions. Because the addition of menthol to tobacco products has been suggested to augment their addictive potential, the current findings reveal several new behavioral and molecular adaptations that may contribute to its unique addictive profile.

FUNDING: This work was supported by National Institute on Drug Abuse grant # DA-05274 (MID), DA020830 (RFT); the Endowed Chair in Addiction for the Department of Psychiatry (RFT); Canadian Institutes of Health Research (MOP86471 and TMH109787); CAMH and the CAMH foundation; the Canada Foundation for Innovation (#20289 and #16014) and the Ontario Ministry of Research and Innovation.

JUSTIFICATION: Impact of menthol on nicotine dependence and neurobiology

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POS5-102
EXAMINING HEAVY SMOKING IN A POPULATION OF ALCOHOL-DEPENDENT TREATMENT-SEEKERS

Krysten W. Bold*, Yale University and Rutgers, the State University of New Jersey; Lisa M. Fucito, Yale University; Allen Zweben, Columbia University; Stephanie S. O'Malley, Yale University

Research suggests alcohol-dependent smokers have poor treatment outcomes. Heavier smokers may be at even greater risk because nicotine dependence has been shown to positively correlate with alcohol craving and relapse. Identifying factors related to heavy smoking in alcohol-dependent populations may help inform intervention development for this at-risk group. Smoking characteristics were examined in a sample of 89 current smokers (N=26 female) enrolled in a randomized-controlled trial evaluating varenicline for heavy alcohol use. All participants met DSM-IV criteria for alcohol dependence and reported heavy drinking (greater than 4 standard drinks for women or 5 standard drinks for men)

at least twice a week at baseline. On average, participants were 42.5 years old (SD=11.95) and smoked 12.23 cigarettes per day (SD=8.04). Although participants were not recruited to stop smoking, many said they would try to cut down or stop smoking while trying to reduce their drinking: 10.1% "no" 40.4% "possibly" 49.4% "probably" 0% "definitely". Participants rated smoking as highly automated, enjoyable, and more desirable when drinking (average=4.5 from 1= "never" to 5= "always"). Bivariate correlations and multiple regression analyses were used to examine the relation between baseline smoking intensity and measures of mood (anxiety, depression, positive and negative affect), self-reported impulsive behavior (positive and negative urgency), and alcohol craving and sensitivity. Smoking heaviness was positively associated with needing to drink more to feel relaxed or calm ($r=.244$, $p=.024$). In multivariable models, lower positive affect predicted greater smoking intensity (Beta=-.293, $p=.004$), while controlling for smoking urge (Beta=.272, $p=.008$), baseline alcohol quantity (Beta=.224, $p=.030$), age (Beta=.118, $p=.268$), and gender (Beta=.082, $p=.433$). Other predictors were not significantly related to smoking heaviness. These results add to the literature about the interaction of heavy smoking and alcohol use highlighting the potential link with low positive affect and may suggest intervention targets to enhance cessation.

FUNDING: 5R01AA020388-03, 5R01A020389-03, and K23AA020000

JUSTIFICATION: Identifying factors related to heavy smoking in alcohol-dependent populations may help inform intervention development for this at-risk group.

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POS5-103
RISK PERCEPTIONS, SMOKING STATUS, AND NUMERACY

Britta L. Anderson*, NORC at the University of Chicago, Greta B. Raglan*, American University, Laura M. Juliano, American University

Smokers have been shown to demonstrate an optimistic bias by underestimating the risks associated with smoking and perceiving smoking as less risky than non-smokers. Numeracy, the ability to use and understand numeric information, is associated with incorrect risk perceptions in a variety of studies, with low numerate individuals having less accurate risk perceptions than high numerate individuals. Common cognitive biases (such as framing) are also more common in low numerate individuals than high numerate individuals. However, the relationship between numeracy and the optimistic bias in smokers has not been previously studied. Smokers, former smokers, and never smokers completed the 11-item Lipkus objective numeracy scale as part of a laboratory study along with a risk perception scale that asks participants to rate 11 statements about the riskiness of smoking. The sample was divided into high and low numeracy groups using a median split. We hypothesized that numeracy would be lowest among current smokers. We also hypothesized that numeracy would moderate the relationship between smoking status and risk perceptions such that group differences would be greatest among the low numerate group. In a sample of 39 smokers, 22 former smokers, and 29 never smokers, smoking status was not associated with race, employment, age, or level of education. As predicted, smokers had lower numeracy scores (6.2, SD = 2.4) than never smokers (8.3, SD = 2.3; $p=.001$) and former smokers (7.5, SD =2.0; $p=.101$). Smokers also perceived smoking as less risky (39.8, SD = 5.8) than former smokers (48.1, SD = 5.7; $p<.001$) and never smokers (49.4, SD = 6.1; $p<.001$). However, contrary to predictions, numeracy did not moderate effects. These findings provide initial evidence that the optimistic bias in smokers exists regardless of smokers' ability to use numbers. These findings also show that the optimistic bias is likely not present among former smokers. Future research should examine whether numeracy is associated with the understanding of numeric information about the risks of smoking, and how personal experiences and quit attempts may impact smokers' perceptions of smoking risks.

FUNDING: This study was supported in part by an American University Mellon Grant.

JUSTIFICATION: Better understanding the role of low numeracy and optimistic risk perceptions among smokers can inform smoking cessation interventions.

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POS5-104
NEUROCOGNITIVE MARKERS OF SMOKING CESSATION
TREATMENT OUTCOME

Brittany E. Hawkshead, BA*, Max M. Owens, BS, Cara Murphy, M.S., Josh C. Gray, M.S., James MacKillop, PhD, and Lawrence H. Sweet, PhD, University of Georgia.

Introduction: Although the majority of smokers want to quit, very few quit attempts are ultimately successful. Even with the use of evidence-based treatment, success rates are often in the range of 10-30%. To date, there has been mixed success in identifying pretreatment variables that may be used to predict and enhance outcome. Research suggests that verbal working memory (VWM) performance positively predicts smoking relapse, but there is still little known about the neurocognitive mechanisms of smoking cessation success and relapse. We hypothesized that both performance and neural activity during a VWM functional magnetic resonance imaging (fMRI) task may be sensitive markers for smoking cessation treatment outcome.

Methods: 17 treatment-seeking, community-recruited healthy smokers (mean cigarettes /day=18.4) enrolled in a smoking-cessation program (comprising 9 weeks of individual psychotherapy and nicotine replacement therapy). Prior to treatment, VWM-associated brain activity was assessed using a 2-back fMRI paradigm. The relationships between 2-back task performance (accuracy and reaction time [RT]), neural activity in 12 a priori ROIs, and treatment outcome were investigated.

Results: At the end of treatment, 35.3% of participants were considered unsuccessful (i.e., never-quiters, treatment drop-outs, and relapsers). As predicted, treatment success was significantly correlated with VWM task-performance, including accuracy ($r=.424, p<.05$) and RT ($r=-.757, p<.01$). Further, VWM-related brain activity was significantly correlated with treatment success ($r=.433, p<.05$). Baseline dependence severity (cigarettes/day) was controlled for in all analyses.

Conclusions: Both replicating and expanding upon previous findings, our results indicate that smoking cessation treatment outcome is strongly associated with both VWM performance and task-associated patterns of brain activity. This suggests that neural activity may be a sensitive marker for smoking cessation treatment outcome that complements task performance and provides novel insights into the neurocognitive mechanisms of treatment success.

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POS5-105
TOBACCO MARKETING THROUGH THE MAIL BEFORE
AND AFTER A TOBACCO TAX INCREASE: FINDINGS FROM
MINNESOTA

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On July 1, 2013, the excise tax on cigarettes in Minnesota increased dramatically from \$1.23 per pack to \$2.83 per pack and the tax on other tobacco products increased from 70 percent to 95 percent of wholesale price. Limited research suggests that tobacco companies actively respond to sizable tobacco tax increases by increasing price promotions. Coupons that are sent directly to consumers through the mail are one type of price promotion used by the tobacco industry. The current study collected a sample (N=2,114) of these direct mailings sent to Minnesota consumers before and after the tax increase (January, 2012-December, 2013) to assess the tobacco industry response to the increase. Data were analyzed using chi-square and t-tests and all analyses were repeated with adjustments for seasonality with similar results. The study sample contains marketing materials from ten different tobacco brands with the largest representation from the Marlboro (n=703), Skoal (n=669), Camel (n=363) and Black & Mild (n=169) brands. Among these brands, differences were observed

in the number, value, and type of coupons sent before and after the tax increase. The Camel ($p<0.001$), Skoal ($p<0.0001$), and Black & Mild ($p<0.0001$) mailings contained a higher average number of coupons per mailing after the tax increase. Further, after the tax increase the Black & Mild mailings contained a higher average coupon value per mailing (\$3.75 per mailing versus \$1.53, $p<0.0001$) while the Camel ($p=0.01$), Marlboro ($p<0.001$), and Skoal ($p<0.01$) mailings had significantly lower average coupon values per mailing post-increase. Throughout the study period Camel and Marlboro frequently cross-promoted snus and cigarettes together in the same mailing. After the tax increase, Camel mailings were significantly more likely ($p<0.0001$) to cross promote snus and cigarettes while Marlboro mailings were significantly less likely to cross promote ($p<0.0001$). In summary, a significant tobacco tax increase was associated with differences in the way that the tobacco industry uses direct mail marketing to reach consumers.

FUNDING: This study was conducted with funding from ClearWay Minnesota contract # PA20150003

JUSTIFICATION: More research is needed to better understand how tobacco companies use price promotions specifically to undercut tobacco tax increases and undermine the known public health benefits of these price increases.

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POS5-106
A NOVEL APPROACH TO MODELING THE INFLUENCE OF THE
SOCIAL ENVIRONMENT

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We used a novel analytic strategy to evaluate the effects of ambient smoking attitudes and behaviors of students clustered in schools on individual youth smoking status using data from the 2012 Florida Youth Tobacco Survey (n=75,550), a cross-sectional study of a state representative sample of middle and high school students. Multinomial logistic regression was used to investigate individual- and aggregated school-level factors that were associated with a youth being classified as “susceptible nonsmokers” (SN) or “current smokers” (CS) relative to “non- susceptible nonsmokers” (NN). Individual level characteristics were measured through self-report. We innovatively assessed ambient smoking attitudes and behaviors at the school-level using the percentage of students in the focal respondent’s school that had ever been regular smokers and the school-level average of a four-item positive social perception of smoking scale. Although individual-level factors (e.g., age, race, sex, in-home smoking, etc.) were statistically significant ($p<0.05$), adding aggregated school-level factors greatly increased both model fit and explained variance. Both the aggregated percentage of respondents who were ever regular smokers at a school (SN RRR=1.56, $p=0.001$; CS RRR=2.88, $p=0.000$) and the standardized difference between individual positive smoking perceptions and ambient school level smoking perceptions (SN RRR=2.12, $p=0.000$; CS RRR=2.98, $p=0.000$) were statistically significant after controlling for individual-level factors. Our innovative approach to model school-level factors raised the pseudo r-squared from 0.05 to 0.14. This approach can be applied to other studies that employ a multistage clustering sampling methodology (e.g., National Youth Tobacco Survey) to enhance our understanding on how the social environment influences individual’s smoking behaviors.

FUNDING: Dr. Bellatorre and Dr. Choi’s effort on the abstract is funded by the Division of Intramural Research, National Institute on Minority Health and Health Disparities, National Institutes of Health. Dr. Bernat’s effort is supported with a grant from the National Cancer Institute (R03 CA168411; D. Bernat, Principal Investigator).

JUSTIFICATION: The modeling strategy we employ could have significant useful applications in public health research involving ambient social influences.

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POS5-107 THE PREDICTIVE VALUE OF INTAKE QUESTIONS ON INFORMING TAILORED QUITLINE SERVICES

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The Arizona Smokers' Helpline (ASHLine) collects the Minimal Data Set, as well as other demographic, tobacco use, and health history questions when enrolling clients. These data are used to identify clients who may be at heightened risk for treatment failure. The relationship between many of the intake variables and cessation outcomes is inconclusive in previous research, and it is unclear how to differentially treat clients based on their responses to these questions. To help inform quitline treatment protocols, e.g., client assignment and call frequency, we modeled the relationship between intake questions and 7-month quit rate. In-program process and outcomes variables were also included in the model to identify possible mechanisms for any observed relationship between intake question and quit rate. All variable relationships were estimated in a single, comprehensive structural equation model (SEM) that specified the direct effect of ASHLine intake questions on in-program process variables, such as frequency and duration of counseling sessions and length of quit attempts. These process variables were specified to have a direct effect on in-program quit attempt outcomes, such as type and severity of withdrawal symptoms. Finally, the direct effect of the in-program outcomes on 7-month quit rate was estimated. A total of 9,656 clients who received ASHLine services between 2010 and 2013 were analyzed. The SEM revealed a very weak predictive value of the intake questions on the in-program process variables (R Squared = .01); however, the in-program process measures were moderately predictive of in-program quit attempt outcome measures (R Squared = .31). There was a weak relationship between the outcome measures and quit rate (Odds Ratio = .92). While very little information gathered at intake seems useful for informing tailored services, ASHLine behavioral support was related to in-program quit attempt outcomes that periodically relate to quit. It is possible that the use of Feedback Informed Treatment, by its inherent focus on individual clients' needs, creates equality across client types in the effectiveness of ASHLine's treatment program on quitting tobacco.

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JUSTIFICATION: This research is intended to inform quitlines of the utility of tailoring services based on client information provided at intake.

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POS5-108 THE ASSOCIATION OF E-CIGARETTE MARKETING WITH SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF NEIGHBORHOODS

Neng Wan, University of Utah, Mohammad Siahpush*, University of Nebraska Medical Center, Molly McCarthy, University of Nebraska Medical Center, Athena Ramos, University of Nebraska Medical Center, Antonia Correa, University of Nebraska Medical Center, Raees Shaikh, University of Nebraska Medical Center

Objective: Marketing of electronic cigarettes ("e-cigarette") has increased sharply in recent years in the United States since its introduction 2007. However, to date little is known about the socio-demographic and geographic patterns on e-cigarette marketing in tobacco stores in the United States. The purpose of this study was to examine the association of e-cigarette marketing with socioeconomic and demographic characteristics of neighborhoods in the Omaha Metropolitan Area of Nebraska.

Methods: Fieldworkers collected comprehensive e-cigarette marketing data from all of the stores (n=463) that sell tobacco in the Omaha Metropolitan Area. Geographic Information System was used to map e-cigarette advertisement density for the entire study area. Linear regression was used to examine the association between socio-demographic factors and the advertisement density.

Results: E-cigarette advertisement density is higher in downtown and the northern part of Omaha. Higher median household income, lower percentage of non-Hispanic whites, higher percentage of Hispanics, and higher percentage of young adults were associated with lower e-cigarette advertisement density. However, after adjusting for covariates, only median household income remained a significant factor for e-cigarette advertisement.

Conclusion: There are socioeconomic and racial/ethnic disparities in exposure to e-cigarette marketing in Omaha, Nebraska. Future studies are needed to understand how these disparities influence e-cigarette adoption in different social groups.

FUNDING: NIH Grant R01CA166156

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POS5-109 POINT-OF-SALE E-CIGARETTE MARKETING AMONG TOBACCO STORES

Neng Wan, University of Utah, Mohammad Siahpush*, University of Nebraska Medical Center, Molly McCarthy, University of Nebraska Medical Center, Athena Ramos, University of Nebraska Medical Center, Antonia Correa, University of Nebraska Medical Center, Raees Shaikh, University of Nebraska Medical Center

Objective: Electronic cigarettes ("e-cigarette") have become increasingly popular in the United States. However, to date little is known about the pattern of e-cigarette marketing among tobacco stores in the United States. The purpose of this study was to examine e-cigarette marketing differences among tobacco stores and the socio-demographic characteristics of these differences.

Methods: In-person store audit data marketing was collected in 2014 for all tobacco stores (n=463) in the Omaha Metropolitan Area of Nebraska. Geographic Information System was used to geocode all store locations and to derive neighborhood characteristics for each store. The neighborhood of a store was defined as the area within 2500m radius around that store. Our neighborhood factors included population density, race/ethnicity, income, poverty rate, education attainment, age (i.e., adolescent, young adults, mid-age adults), number of middle-and-high schools as well as number of middle-and-high school students within the neighborhood. Logistic regression was used to examine the association between these factors and e-cigarette marketing.

Results: 251 (54.2%) of the 463 tobacco stores had e-cigarette marketing. We found that stores with point-of-sale e-cigarette marketing have higher number and percentage of non-Hispanic whites (p<0.05) and high school graduates (p<0.05) in their neighborhoods than those without point-of-sale e-cigarette marketing. We did not find any significant associations between tobacco store e-cigarette marketing with income, poverty rate, or age. There was no significant difference in number of middle-and-high school students between the neighborhoods of stores with point-of-sale e-cigarette marketing and neighborhoods of those without point-of-sale e-cigarette marketing.

Conclusion: Point-of-sale e-cigarette marketing is related with neighborhood racial/ethnic and education characteristics of tobacco stores in Omaha, Nebraska. Future studies are needed to understand how these differences influence e-cigarette adoption among social groups.

FUNDING: NIH Grant R01CA166156

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POS5-110
WATERPIPE USE AND BIRTH WEIGHT AMONG A SAMPLE OF JORDANIAN WOMEN; INITIAL FINDINGS OF AN ONGOING STUDY

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Background: Tobacco use has been linked to a number of deleterious health outcomes including adverse pregnancy outcomes. Waterpipe (WP) use, an emerging tobacco use methods, is popular among women in the Eastern Mediterranean Region (EMR). Recent reports suggested an increased prevalence of WP use among pregnant women in Jordan. Little is known about the effect of WP use on pregnancy outcomes such as birth weight.

Methods: Data from an ongoing observational study that started on April 2014 was used. Tobacco use initial assessment is conducted for all pregnant women attending delivery rooms in three public hospital in Northern of Jordan. Accordingly, pregnant women are categorized as never tobacco users, WP-only, Cigarette-only smokers, or dual smokers according to their tobacco use throughout the entire pregnancy duration. Retrospective tobacco use assessment, along with possible confounders, is conducted using structured interviews. Birth weight is recorded as reported in the birth record.

Results: A total of 285 pregnant women are included in the current analysis. Of which, 84 (29.5%), 74 (26.0%), and 26 (9.1%), respectively, were cigarette-only, WP-only, dual smokers for the entire pregnancy duration. New-borns of none tobacco users (n=101) had an adjusted mean birth weight (SD) of 3.20 (0.57) Kg. New-borns of cigarette-only, WP-only, and dual users" mothers had an adjusted mean birth weight of 2.94(0.57), 2.73(0.56), and 2.61(0.58) Kg, respectively. Adjusted mean birth weights were significantly different by maternal tobacco use status (P=0.001). New-borns of cigarette-only (P=0.035), WP-only (P<0.001), and dual smokers (P<0.001) had significantly lower adjusted birth weight compared to those of none tobacco users. New-borns of WP-only users had significantly lower adjusted mean birth weight compared to those of cigarette-only smokers (P=0.45). New-borns of dual users had significantly lower adjusted birth weight than those of cigarette only (P=0.027) but not those of WP-only (P=0.78).

Conclusion: WP smoking during pregnancy negatively affects birth weight with evidence of higher risk of lower birth weight than that reported to cigarette smoking.

FUNDING: Jordan University of Science and Technology

JUSTIFICATION: Waterpipe use among pregnant women is socially considered a safe tobacco use method that needs to be properly addressed in clinical assessment, control and prevention during pregnancy.

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POS5-111
THE IMPACT OF SMOKING VERY LOW NICOTINE CONTENT CIGARETTES ON ALCOHOL USE

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Very low nicotine content (VLNC) cigarettes appear to reduce smoking and facilitate cessation. Relatively little is known about how switching to VLNC cigarettes could impact alcohol use, a closely related health behavior. The primary objective of this project was to examine the effect of smoking cigarettes with varying nicotine levels for 6 weeks on alcohol outcomes.

Non-treatment seeking daily smokers were randomly assigned to smoke cigarettes with a specific nicotine content. In addition to a usual brand condition, the nicotine content of study cigarettes included control (17.7 mg/g) and reduced (0.4, 1.3, 2.5, 5.8 mg/g) conditions. This analysis focused on drinkers who reported

past month alcohol use at baseline (n=418). At weekly visits, daily alcohol use (i.e., number of standard drinks, occurrence of binge drinking) was measured using timeline followback. Each nicotine condition was compared to the control condition with respect to the trajectories of average daily alcohol use and binge drinking (dichotomous outcome) using latent growth curve models adjusted for sex, age, and race.

On average, alcohol use increased in a piecewise fashion (not linear or quadratic). Alcohol use increased significantly during the initial two weeks post-randomization (Slope1=.16, 95%CI: .08-.23), and did not change thereafter (Slope2=.01, 95%CI: -.04-.04). Smoking reduced nicotine content cigarettes did not significantly impact change in alcohol use during either timeframe (p's>.10). On average, binge drinking increased linearly (Slope=.04, 95%CI: .02-.07), which did not differ based on cigarette nicotine content (p's>.10). There was significant variability in each slope terms suggesting unexplained individual variability in change of alcohol use and binge drinking over time.

Alcohol use and binge drinking increased during the trial regardless of nicotine content of cigarettes smoked. Future analyses will replicate the results after taking into account non-compliance, which may undermine nicotine reduction. Processes that may explain the individual variability in changes in drinking (e.g., co-occurring changes in cigarette use and withdrawal) will be investigated.

FUNDING: F31AA022291; U54 DA031659

JUSTIFICATION: The results suggest that tobacco control strategies that drastically reduce the nicotine content of cigarettes may not, on average, impact alcohol use during the first 6 weeks of implementation.

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POS5-112
USE OF ELECTRONIC CIGARETTES, SUSCEPTIBILITY TO SMOKING, AND ASTHMA ATTACK AMONG METROPOLITAN, NON-METROPOLITAN AND RURAL FLORIDA YOUTH WITH ASTHMA

Kelvin Choi,* PhD, MPH, National Institute on Minority Health and Health Disparities Division of Intramural Research, Debra Bernat, PhD, University of Maryland School of Public Health Department of Behavioral and Community Health

Prevalence of electronic cigarette (EC) use has increased dramatically among youth in the recent years. However, little is known about EC use among youth with asthma, and how it differs by rural-urban status. Data from the 2012 Florida Youth Tobacco Survey (n=7550 middle and high school students) were used to examine the prevalence of EC use by asthma status, its associations with susceptibility to smoking and asthma attack, and how they vary by rural-urban status (as defined by the US Department of Agriculture Economic Research Service). Weighted multivariate regression models were used. Overall, 8.5% and 4.6% of Florida youth with asthma have ever used and used EC in the past 30 days, which is higher than youth who did not have asthma (ever use=5.6% and past 30-day use=2.1%; p<0.01). Comparing to youth who did not have asthma, non-metropolitan and rural (NM&R) youth with asthma were more likely to have ever used and used EC in the past 30 days than their metropolitan (Metro) counterparts, after adjusting for demographics and smoking status (Odds ratio [OR] ever EC use in NM&R asthma youth=1.64, OR ever EC use in Metro asthma youth=1.33; OR past 30-day EC use in NM&R asthma youth=2.13, OR past 30-day use in Metro asthma use=1.67; p<0.05). Among Florida youth with asthma and never tried cigarettes (n=6242), past 30-day EC use was positively associated with susceptibility to smoking (OR=19.17, p<0.01) after adjusting for demographics. Among Florida youth with asthma (n=11278), those who use EC in the past 30 days were more likely than those who did not use EC in the past 30 days to report having asthma attack in the past 12 months, after adjusting for demographics, smoking status and exposure to secondhand smoke (OR=1.68, p<0.01). These associations did not vary by rural-urban status (interaction p>0.29). In conclusion, Florida youth with asthma are more likely than youth without asthma to use EC, especially in non-metropolitan

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and rural areas. EC use is associated with susceptibility to smoking and asthma attack in this population. Additional national and longitudinal research is needed to understand the effect of EC use among youth with asthma.

FUNDING: Dr. Choi's effort on the abstract is funded by the Division of Intramural Research, National Institute on Minority Health and Health Disparities, National Institutes of Health. Dr. Bernat's effort is supported with a grant from the National Cancer Institute (R03 CA168411; D. Bernat, Principal Investigator).

JUSTIFICATION: The data call for further research on preventing electronic cigarette use in youth (particularly rural youth) with asthma, and document the health consequences of electronic cigarette use in this population.

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POS5-113 POLY TOBACCO USE AMONG MINNESOTA ADULTS

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Introduction: Concurrent use of two or more tobacco products (poly tobacco use) is increasingly common nationwide. Tobacco control efforts often focus on cigarette smokers and do not address poly tobacco users. Poly tobacco use was studied in the 2014 Minnesota Adult Tobacco Survey (MATS). MATS is a statewide, cross-sectional, landline and cell telephone survey that collects tobacco-related information from adults aged 18 and older.

Method: MATS was administered using a CATI system between February 15 and July 10, 2014. The sample was identified and selected using standard random-digit dialing survey procedures. A total of 9,304 adults completed interviews, including questions about cigarettes, e-cigarettes, cigars, pipes, hookah, and smokeless tobacco.

Results: Poly tobacco use is defined as concurrent use of two or more products. For cigarettes, current use is defined as lifetime use of 100+ cigarettes and now smoking some days or every day. For non-cigarette products, current use is defined as past 30 day use. Defining use for non-cigarette products, especially e-cigarettes, is evolving in the literature. In 2014, 20.7% (± 1.1) of Minnesota adults were current users of any tobacco or e-cigarettes and 6.6% (± 0.7) were poly tobacco users. Young adults were more likely to be poly tobacco users (13.5% ± 3.1) compared to 45-64 year olds (4.6% ± 1.0) and those 65 and older (1.0% ± 0.5). Poly tobacco use was higher among males (9.2% ± 1.2) than females (4.2% ± 0.8) and among current (40.4% ± 3.8) than former (1.3% ± 0.6) cigarette smokers. The most common product combination used was cigarettes and e-cigarettes (4.0% ± 0.6) followed by cigarettes and cigars (1.4% ± 0.4) and cigarettes and smokeless tobacco (1.1% ± 0.3).

Conclusion: Poly tobacco use is fairly common in Minnesota, with statistically significant differences in use by age, sex and other tobacco use behaviors. Future tobacco control efforts need a broader focus on the use of any or all tobacco products.

FUNDING: This research was supported by ClearWay Minnesota (clearwaymn.org) - an independent, nonprofit organization that improves the health of all Minnesotans by reducing tobacco's harm

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POS5-114 VISITED A VAPE SHOP? PREVALENCE AND CORRELATES IN U.S. YOUNG ADULTS

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The increasing popularity of electronic nicotine delivery systems (ENDS) has brought with it the emergence of vape shops, retail outlets designed for the sale of ENDS, nicotine fluid, and related accessories. Vape shops allow users to sample a variety of ENDS devices and nicotine fluids, and some offer "vape lounges" where clients can use ENDS in a social setting. Nothing is known about the individuals who visit vape shops, or tobacco use and related behaviors are correlated with contact with a vape shop. The current study examined the prevalence and social and behavioral correlates of having ever visited a vape shop among U.S. young adults. Data were drawn from Wave 7 (n = 3,542) of the Legacy Young Adult Cohort, a nationally representative sample of men and women aged 18 to 34 (data collected October to November 2014). Using weighted estimates to account for non-response, bivariate analyses examined differences between vape shop visitors and non-visitors on demographics; mental distress; current use of alcohol, marijuana, and other drugs; use of cigarettes, LCCs, hookah, and e-cigarettes; smoker self-identification; and harm perceptions of e-cigarettes and marijuana (compared to cigarettes). Results showed that 11% of young adults aged 18-34 had ever visited a vape shop. Having ever visited a vape shop was significantly correlated with younger age (18-24); being non-White; current depression and anxiety; ever and past 30-day use of tobacco products (vs. never); and current use of marijuana and other drugs (excluding alcohol). Individuals who reported that e-cigarette and marijuana were less harmful than cigarettes and self-identified as "smokers" or "social/occasional smokers" were more likely to have ever visited a vape shop. Findings suggest that vape shop visitors show elevated risk on a variety of tobacco use characteristics and related risk factors, including marijuana and substance use. Future research should assess how contact with vape shops affects future tobacco and other substance use behavior among this high-risk population of young adults.

FUNDING: This study was funded by Legacy.

JUSTIFICATION: Findings have the potential to inform researchers about the degree to which vape shops might be a place where vulnerable groups of substance users learn new health-risk behaviors, and whether vape shops contribute to a slowing progression of tobacco cessation.

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POS5-115 TOXICOLOGICAL EFFECTS OF ELECTRONIC CIGARETTE VAPOR ON LUNG CELL VIABILITY WITH COMPARISONS BY FLAVOR, GENERATION, AND BRAND

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Electronic cigarettes' (e-cigs) health impacts are still being debated, with a general consensus that more toxicological research is needed. This study adds to the research, with the aim of assessing toxicological effects of e-cig vapor on lung cell viability, and how effects vary by e-cig technology, brand, and flavor. E-cig vapor was captured using a condenser device, with each sample containing vapor from 200mg of fluid smoked in 2-second intervals. Four e-cig brands were used: Blu, Greensmoke, V2, and Vaporfi. Each brand was tested for Tobacco, Menthol, and Coffee flavors. Lung cells were exposed to cell media solutions containing e-cig vapor in varied concentrations (10%, 5%, 2%, and 1%), plus an untreated control. After 24 hours of exposure, a hemocytometer and Trypan Blue dye were used to calculate lung cell death. The Chi Square Test for Independence showed a statistically significant difference in cell death between the control compared to samples with the lowest concentration of e-cig vapor (χ^2 (1, n=988)=50.05, p =.000), with the control showing a lower rate of mortality (1.9% vs. 20.3%). The Chi Square Test for Independence also showed significant differences in cell death

among flavors ($\chi^2(2, n=2961)=10.80, p = .005$), brands ($\chi^2(3, n=2961)=10.563, p = .01$), and generations ($\chi^2(1, n=2961)=9.36, p = .002$). Adjusted Standardized Residuals for flavor indicated the lowest prevalence of cell death for menthol (41.2%), and the highest for tobacco (48.8%). Adjusted standardized residuals indicated Blu had the lowest prevalence of cell death (41.97%) and V2 had the highest (49.2%), while second-generation e-cig vapor had a lower rate of cell death (42.3%) compared to third-generation (47.9%). In conclusion, samples treated with all concentrations of e-cig vapor had significantly higher incidences of lung cell death compared to untreated control lung cells. Other e-cig variables tested in this study -- flavor, brand, and generation -- had significant differences in terms of e-cig vapor effects on lung cell mortality. While the health effects of e-cigs are still being debated, this study indicates that e-cigs have negative toxicological impacts on lung cells.

FUNDING: This research was conducted while the researcher was a Scholar at the University of Pennsylvania Teen Research and Education in Environmental Science program.

JUSTIFICATION: This study adds to the body of research on toxicological effects of electronic cigarettes.

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POS5-116

JUST BECAUSE I SMOKE CIGARETTES DOES NOT MAKE ME A SMOKER: BEHAVIORS ASSOCIATED WITH DENIAL OF SMOKING

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Levinson (2006) found that 56% of college students who smoke cigarettes did not identify as smokers. We investigated if cigarette use and smoker identity have changed in the past 10 years. Our sample included 422 (39% male; 80% white) undergraduates at a small liberal arts university in a high tobacco use state (Ohio). Results revealed modest tobacco use: 15% (n=63) smoked cigarettes, with most (73%) smoking every few weeks or months. Over 96% of the sample reported they did not consider themselves a smoker, including 81% of those who reported smoking (deniers). Only 12 respondents identified as smokers. Examination of deniers (n=51) revealed that smoking was socially mediated and seen as belonging to the college years. When asked when they smoked, 87% reported when using alcohol, 81% when with friends and 80% at parties. In contrast, only 11% smoked around family, 17.5% at home or when studying and 22% when alone. Most deniers obtained their cigarettes from others: 67% never buy cigarettes. While only 51% reported a current desire to quit smoking, 79% indicated they did not intend to smoke after graduating. Consistent with their personal identity, 89% reported they wanted to date a non-smoker. When compared with true non-smokers, deniers had roughly twice as many smoking friends ($p=.001$) and experienced more social pressure to smoke ($p=.022$); Although deniers and true non-smokers both rated daily smoking as very bad for health, deniers viewed occasional smoking as significantly less risky than did non-smokers ($p<001$). Aperiodic smoking was associated with a constellation of appetitive behaviors as deniers engaged in more frequent binge drinking ($p<.001$) and recreational drug use ($p<.001$) compared to non-smokers. The current findings suggest that the label "smoker" may evoke a schema of a habitual, daily smoker. As such, aperiodic smokers do not identify with the smoker taxon and are likely to underestimate both the direct health effects of their use and their risk of transitioning to more routinized use. Interventions aimed at reducing aperiodic smoking would be wise to avoid the label smoker and to focus on reducing more generalized substance use.

FUNDING: No funding

JUSTIFICATION: Anti-smoking initiatives aimed at the college population may need to avoid the term smoker as most students who use cigarettes reject that identity.

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POS5-117

TOBACCO INDUSTRY TACTICS TO SUBVERT STRONG TOBACCO CONTROL MEASURES IN INDIA

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Background: India is the second largest producer and consumer of tobacco in the world. Tobacco use leads to 1.2 million deaths in India and this figure is expected to rise to 1.5 million by the year 2020. Prevalence of any tobacco use varies from 14.6% among youth, to 35% in adults. Tobacco control in India is further complicated due to the myriad varieties of tobacco products (smoking forms and smokeless-SLT forms) and tobacco packs available. In order to curb the tobacco epidemic, Indian government, on lines of the WHO FCTC, implemented Tobacco Control Act 2003, which along with other provisions include specified pictorial health warnings (PHWs) on tobacco packs. The Government has further notified stronger and effective PHWs (to cover 85% of the display area of tobacco packs) from April 2015, including ban on sale to loose cigarettes and increased penalties on violation of the regulations. State Governments had banned Gutkha and other SLT products under FSSAI Act.

Methods: Tobacco industry has vehemently opposed these new provisions to strengthen tobacco control measures in India. 121 media clippings from November 1-December 31, 2014 were collated and content analysis undertaken to organise Industry arguments aimed at diluting stronger PHWs and stricter tobacco control measures in a LMIC context.

Results: Of the 121 media reports, 36 appeared in leading English, 16 in Hindi national dailies and 69 appeared online. Greatest opposition to recent measures are based on farming and livelihood issues under inter-ministerial consultation. Concerns have been raised around tobacco and areca nut being cash crops and opposing stricter measures till alternatives are found for farmers. Socio-cultural relevance of Areca nut with betel leaf and such measures leading to product switching to cheaper tobacco products were also listed among arguments.

Conclusions: Indian tobacco control movement is at a crucial juncture where world is moving towards tobacco endgame, India's landmark tobacco control efforts will need to be protected against economic, export and socio-cultural arguments.

FUNDING: No funding

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POS5-118

ALTERED RESTING BRAIN FUNCTION IN CHRONIC SMOKERS AFTER OVERNIGHT NICOTINE WITHDRAWAL

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Chronic smokers are often unsuccessful in their attempts to quit smoking and relapse back to smoking after a short cessation period, partly due to withdrawal symptoms like increased craving, stress, and negative affect. A number of neuroimaging studies have shown altered brain function in smokers after acute nicotine abstinence. However, few studies have examined resting brain function changes in smokers after overnight withdrawal (WD), as compared to non-smoking healthy controls. In the present study, we used arterial spin labeling (ASL) perfusion fMRI and examined resting cerebral blood flow (CBF) changes after acute overnight WD in 24 chronic smokers (21 males, age: 22-55 years), as compared to these smokers during normal smoking as well as a cohort of matched healthy controls (12 males, age: 22-55 years). Each smoker was scanned twice, once during satiated normal smoking (SAT), and another after overnight withdrawal (WD). The order of two scans was counterbalanced between subjects. Healthy controls (HC) were also scanned twice with a 24-hours interval. Compared to HC, SAT smokers showed a trend of lower global CBF (47.4±11.2 vs. 50.4±8.8 ml/100g/min, $p=0.11$). After WD, global CBF (43.1±8.9 ml/100g/

min) was significantly and further reduced compared to NS smokers or HC (both $p < 0.01$). Both whole brain and regional of interest analyses showed no regional CBF differences between HC and SAT smokers. However, WD smokers showed significantly lower regional CBF in the mesolimbic reward pathway and frontal regions, including bilateral striatum, insula, thalamus, orbital frontal cortex (OFC), anterior cingulate cortex, and dorsal lateral prefrontal cortex areas, as compared to HC or SAT smokers. CBF differences in the OFC, striatum, thalamus and insula were still significant after controlling for global CBF differences. These findings indicate that regular nicotine intake in chronic smokers may raise CBF to that of healthy controls, suggesting that smokers smoke to normalize brain activity. Therapeutics that increase tonic resting brain blood flow in the reward network and in cognitive control regions may be helpful for successful smoking cessation.

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POS5-120 **TRENDS IN ELECTRONIC CIGARETTE AND ANY COMBUSTIBLE TOBACCO USE AMONG U.S. MIDDLE AND HIGH SCHOOL STUDENTS, NATIONAL YOUTH TOBACCO SURVEY, 2011-2013**

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Background: The long-term impact of electronic cigarette (e-cigarette) use on population-level health is unclear. However, nicotine consumption in any form among adolescents has health risks. We assessed trends in ever and current use of e-cigarettes and combustible tobacco products individually, as well as concurrent use of both e-cigarettes and any combustible product, among U.S. students during 2011-2013.

Methods: We analyzed data from the 2011 (N=18,600), 2012 (N=24,566), and 2013 (N=18,304) National Youth Tobacco Survey, a school-based survey of U.S. students in grades 6-12. Prevalence of ever (lifetime) and current (past 30 day) use of e-cigarettes and any combustible tobacco products (cigarettes, cigars, pipes, bidis, kreteks, and hookahs), as well as concurrent (past 30 day) use of e-cigarettes and any combustible product, was assessed among middle (grades 6-8) and high (grades 9-12) school students for each year. Statistical significance of linear trends ($p < 0.05$) was assessed using Wald's test in an unadjusted logistic regression model.

Results: Among high school students during 2011-2013, ever e-cigarette use increased from 4.7% to 11.9%, and current use increased from 1.5% to 4.5% ($p < 0.05$). Use of combustibles did not change significantly for either ever or current use during this period. However, an increase occurred in concurrent use (1.4% to 3.9%; $p < 0.05$). Among middle school students during 2011-2013, ever e-cigarette use increased from 1.4% to 3.0%, and current use increased from 0.6% to 1.1% ($p < 0.05$). For combustible tobacco products, ever use decreased from 20.6% to 17.7%, and current use decreased from 7.0% to 5.8% ($p < 0.05$). An increase occurred in concurrent use (0.4% to 0.7%; $p < 0.05$).

Conclusions: E-cigarette use and concurrent use of e-cigarettes and any combustible tobacco product increased significantly among U.S. middle and high school students during 2011-2013. Given that the use of multiple tobacco products increases risk for tobacco addiction and tobacco-attributable morbidity and mortality, continued surveillance of emerging utilization patterns of these products is critical for informing tobacco prevention and control efforts.

FUNDING: No Funding

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POS5-121 **MINNESOTA ADULT CIGARETTE SMOKERS' REACTIONS TO A TAX INCREASE**

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Introduction: In 2013, Minnesota more than doubled the combined cigarette excise and sales tax, from \$1.60 per pack (\$1.23 in excise tax and \$0.37 in sales tax) to \$3.35 per pack (\$2.83 in excise tax and \$0.52 in sales tax). Responses to the tax increase were studied in the 2014 Minnesota Adult Tobacco Survey (MATS). MATS is a statewide, cross-sectional, landline and cell telephone survey that collects data from adults aged 18 and older.

Method: MATS was administered using a CATI system between February 15 and July 10, 2014. The sample was identified and selected using standard random-digit dialing survey procedures. A total of 9,304 adults completed interviews, including questions about the effect the price increase had on their smoking.

Results: People who were smoking at the time of the tax increase include current smokers (N=1158) and recent former smokers (N=224) who last smoked regularly in the past year. This group was combined to examine the response to the tax increase. As a result of the tax increase, 60.8% (± 3.4) of current smokers and recent former smokers thought about quitting, while 48.1% (± 3.5) cut down on cigarettes and 44.2% (± 3.5) attempted to quit. More recent former smokers (62.8% ± 8.1) than current smokers (40.7% ± 3.8) attempted to quit as a result of the tax increase. Nearly 19 percent (18.8 ± 2.7) of adult current and recent former smokers maintained a quit attempt as a result of the tax increase. There was a large and statistically significant difference between current (10.7% ± 2.4) and recent former smokers (62.7% ± 8.1) in maintaining a quit attempt.

Conclusion: Most Minnesota adult current and recent former smokers thought about quitting as a result of the tax increase, and nearly 45% tried to quit. Among recent former smokers, nearly two thirds reported that the tax increase helped them maintain a quit attempt. These findings suggest the tax increase had a positive effect on encouraging smokers to make quit attempts and maintain them.

FUNDING: This research was supported by ClearWay Minnesota (clearwaymn.org) - an independent, nonprofit organization that improves the health of all Minnesotans by reducing tobacco's harm

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POS5-122 **ELECTRONIC CIGARETTE BEHAVIORS, INFLUENCERS AND EFFECTS IN COLLEGE STUDENTS**

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Background: Electronic cigarettes, also called "E-cigarettes," are battery-operated devices proposed by manufacturers to be a replacement for traditional cigarettes. E-cigarettes have flavor appeal and misperceptions of harmlessness, yet contain chemicals as well as the addictive component, nicotine. Increased usage has warranted understanding behavior initiation, physiological effects and perceptions.

Methods: This study consisted of cross-sectional quantitative and qualitative survey (n=766) conducted amongst students attending a private liberal arts college in the Southeast US. Data was collected through email recruitment among both smokers and nonsmokers of e-cigarettes. Data was collected on initiation influencers, behavior and physiological effects.

Results: Of the sample, nearly 46% of students had ever tried an e-cigarette with 42% of those being current smokers. Of ever-smokers only 14% currently smoked traditional cigarettes. Overwhelmingly, friends who smoked e-cigarettes and curiosity were the primary influencers of initiation. Findings from the survey

indicated that the primary negative effects experienced by users consisted of lightheadedness, throat burning sensation and coughing. The majority of respondents did not smoke e-cigarettes to quit smoking.

Discussion: E-cigarettes are becoming increasingly popular among all age groups. College students are at high risk for experimentation of novel smoking behaviors. College campuses can institute social marketing campaigns to educate students and aid them in making informed decisions about the constituents and potential addictive behavior related to nicotine exposure.

FUNDING: No funding was received for this research.

JUSTIFICATION: Public Health education and advocacy efforts are needed to educate and inform smokers of electronic cigarettes.

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POS5-123

THE RELATIONSHIP BETWEEN CONFORMITY TO MASCULINE NORMS, HELP SEEKING BEHAVIORS, AND SMOKING BEHAVIORS AMONG LOW-INCOME AFRICAN AMERICAN MEN: AN EXPLORATORY STUDY

Jesse Mason*, Michael Farr, Brandon Haygood, Joseph Coble, and Diane Plummer, Clark Atlanta University

Smoking behaviors and cigarette consumption patterns are influenced by racial and gender differences. African American males are more likely to develop smoking related lung cancer compared to all other groups. White, Oliffe, and Bortoff suggests (2013) suggest that style and masculinity may account for differences in patterns of smoking behaviors among White and African American males" consumption patterns of cigarettes. The purpose of this exploratory research project was to examine the relationship between conformity to masculine stereotypes and smoking behaviors among low-income, African American males. Smokers who smoked more than five cigarettes per day were invited to participate in a smoking study examining the role of menthol cigarettes in nicotine metabolism via flyers and advertisements on various social media sites. For this study, African American males were asked to complete the Conformity to Masculine Norms Inventory (CMNI). A total of 18 African American males met inclusion criteria to participate in the study. The average age of participants were 40.00 years of age (SD = 6.90); and the mean number of cigarettes smoked per day was 15.40 (SD = 10.19). Using the Pearson Product Moment Correlational Coefficients, we observed a significant negative correlation between smoking initiations and Total Score on the CMNI ($r = -0.508, p = .03$) and smoking initiation and scores on the CMNI subscale, Power Over Women, ($r = .492, p = .03$). In addition, we observed a significant negative correlation between the CMNI's subscale, Playboy image, and motivation to quit smoking ($r = 0.502, p = .03$). White, Oliffe, and Bortoff (2013) suggest that masculine behaviors which conform to the idea of $\Gamma\text{Ç}\text{£}\text{cool}\Gamma\text{Ç}\text{¥}$ may explain the differences in patterns and consumption of cigarettes among male smokers. Further analysis may be useful in designing anti-smoking prevention and interventions targeting male smokers.

FUNDING: Clark Atlanta University's Arts and Sciences Small Grant Pilot Award

JUSTIFICATION: This study provides exploratory data for the consideration of smoking intervention tailored for African American males.

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POS5-124

THE POPULATION ASSESSMENT OF TOBACCO AND HEALTH (PATH) STUDY: AN INTERIM PRELIMINARY FIRST LOOK AT TOBACCO USE FROM THE BASELINE WAVE

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This Preconference Plenary provides an update on the progress of the Population Assessment of Tobacco and Health (PATH) Study. The National Institutes of Health, through the National Institute on Drug Abuse, is partnering with the Food and Drug Administration's Center for Tobacco Products to conduct the PATH Study, under a contract with Westat. The PATH Study is an address-based nationally representative, longitudinal cohort study of approximately 45,675 adults and youth in the United States aged 12 years and older. The study uses Audio-Computer Assisted Self-Interviews for adults and youth to collect information on tobacco-use patterns across tobacco products on the U.S. market; risk perceptions and attitudes towards tobacco products including emerging tobacco products; and tobacco initiation, cessation, and relapse behaviors. Additionally, the PATH Study collects biospecimens among consenting adults aged 18 years of age and older for future evaluation of biomarkers of exposure and harm related to tobacco use.

In addition to describing the design, methods, and progress of the PATH Study, this Preconference Plenary will present a first glimpse at the demographic and tobacco use profiles of the adults and youth in the PATH Study from an interim, partial dataset of those enrolled from baseline until July 22, 2014. The current timeline for the PATH Study and the dissemination of baseline data will also be discussed. Following the presentation, there will be time for questions and discussion.

FUNDING: This project has been funded in whole with federal funds from the National Institute on Drug Abuse, National Institutes of Health, and the Food and Drug Administration, Department of Health and Human Services under Contract #HHSN271201100027C. The views and opinions expressed in this presentation are those of the authors only and do not necessarily represent the views, official policy or position of the US Department of Health and Human Services or any of its affiliated institutions or agencies.

JUSTIFICATION: Data from the PATH Study will help inform FDA regulatory measures considered.

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POS5-125

BEHAVIORAL ANALYSIS OF NICOTINE SELF-ADMINISTRATION

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Despite the high prevalence of nicotine use in humans, robust nicotine self-administration has been difficult to demonstrate in laboratory animals. A parametric analysis of nicotine self-administration was conducted in non-human primates to better understand the conditions that support or limit nicotine intake. Adult rhesus macaques (N=6) were trained to self-administer intravenous nicotine (0.01 mg/kg) under a fixed ratio (FR) 1 schedule of reinforcement during daily 90 min sessions. After self-administration of vehicle and a range of nicotine doses (0.001-0.1 mg/kg) was evaluated, subjects were given access to each of several doses of nicotine (0.0032, 0.01, and 0.032 mg/kg) and the FR was increased across multiple sessions in an ascending order (i.e. 1, 3, 6, 10, 18, 30, 60, 100, etc). Finally, to compare nicotine self-administration with that of another stimulant, subjects were subsequently given access to 0.01 mg/kg cocaine using identical testing procedures. Results indicate that nicotine self-administration followed an inverted-U shaped pattern with the peak injections per session at 0.0032 mg/kg. Self-administration of nicotine (at each dose) and cocaine gradually decreased as the fixed ratio size was increased. Application of the exponential model of demand to the FR data found that essential value for cocaine was significantly higher than that for each dose of nicotine. Interestingly, essential value differed according to

nicotine dose with the order: 0.0032 > 0.01 > 0.032 mg/kg/inj. Finally, there were marked individual differences in the reinforcing effectiveness of nicotine. These data show that high levels of nicotine self-administration can be achieved in non-human primates but that its reinforcing strength is limited and variable across subjects.

FUNDING: Supported by NIH DA026892.

JUSTIFICATION: Translational applications include a better understanding of the factors that are important for nicotine to function as a reinforcer.

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POS5-126

PREDICTING ADOLESCENTS' ABILITY TO REDUCE SMOKING: EXAMINING PHYSICAL ACTIVITY, MOTIVES, AND DEPRESSIVE SYMPTOMS

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Not-on-Tobacco (NOT) is a tobacco cessation intervention for high school students. The addition of a physical activity module (NOT+FIT) bolsters participants' quit rates, relative to NOT alone. Importantly, individual characteristics may augment or diminish the effectiveness of either intervention. The purpose of this analysis, therefore, was to examine such characteristics as moderators of cessation outcomes. Youth (N=233), aged 14 to 19, were recruited from West Virginia public high schools and randomly assigned to one of three intervention conditions: NOT, NOT+FIT, or brief intervention (BI). At baseline, participants' levels of physical activity, depressive symptoms, and motivation to quit were measured. Number of cigarettes smoked on a typical day during the weekday (WD) and weekend (WE) periods were obtained at baseline and at a 3-month follow-up. Across these timepoints, cigarette use decreased significantly for those in the NOT (WE only; $p = .007$) and NOT+FIT (WD and WE; p 's < .019) groups, but remained unchanged for those in the BI group (n.s.). Additionally, for youth in the NOT+FIT group, the steepest declines in smoking behavior occurred for those who engaged in a high baseline levels of physical activity ($p = .017$). As for baseline levels of motivation to quit, cigarette use was decreased significantly for youth in the NOT group with low intrinsic motivation levels ($p = .001$) and for youth in the NOT+FIT with moderate to high intrinsic motivation levels (p 's < .039). Baseline levels of extrinsic motivation (e.g., for family, to save money) or depressive symptoms did not moderate outcomes for any condition (all p 's > .05). Results may suggest that the NOT+FIT program is more easily adopted by youth already engaged in physical activity and/or already intrinsically motivated (e.g., health, appearance, or fitness reasons) to quit smoking. In contrast, the original NOT program may be most beneficial for youth not intrinsically motivated to quit prior to enrollment. At the very least, study findings support the idea of a personalized treatment approach. Adolescents may benefit from placement into interventions tailored to their individual profile.

FUNDING: USDHHS Centers for Disease Control and Prevention (# U48 DP000052) awarded to the West Virginia Prevention Research Center.

JUSTIFICATION: This research will directly inform clinical practice and public health by providing data to support a personalized medicine approach for cessation interventions.

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POS5-127

SUPPORT FOR A CIGARETTE TAX INCREASE AMONG THE PUBLIC, OPINION LEADERS, AND ELECTED OFFICIALS IN KANSAS

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Raising tobacco taxes is the most direct and effective method for reducing tobacco use, encouraging cessation, and preventing initiation. Kansas ranks 36th nationally on state cigarette excise tax, and 41st in percent of CDC-recommended funding for tobacco control. Kansas is also a political bellwether state experimenting with lower taxes and smaller government; thus, efforts to raise the cigarette excise tax and increase funding for tobacco control in Kansas requires nuanced understanding of policymaker and public support for these policies. Data for these analyses come from two telephone surveys conducted in 2014: the Kansas Opinion Leader Survey of 912 elected and non-elected leaders sampled from 90 urban and rural counties; and the Kansas General Public Survey of 2,203 adults representative of the statewide adult population. Among the public, 56% of Kansans are in favor of a cigarette tax increase and 67% support earmarking the money for tobacco control. Support for a cigarette tax increase is significantly higher among nonsmokers (66%) than smokers (16%); however, support for earmarking is similar among nonsmokers (68%) and current smokers (63%). Even Kansans who do not support cigarette tax increases still support earmarking (52%). Compared to the public, non-elected opinion leaders (e.g., representatives of business, education, ethnic organizations, health organizations, the media) express significantly higher support for a cigarette tax increase (69%, $p < .001$) and for earmarking tax revenues (79%, $p < .001$). Elected leaders (e.g., mayors, state house and senate members, city council members) also express somewhat higher support than the public for a tax increase (65%) and for earmarking (59%). Most Kansans are in favor of increasing the cigarette excise tax, and most support spending tax revenue on tobacco control programs. These data may be used to inform legislators about the depth of public support for these policies, and help advocates identify influential non-elected opinion leaders to serve as champions for this cause. Moreover, these findings may encourage tobacco control policy advocacy efforts in other states lagging behind the national trend.

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POS5-128

IN THE MOMENT: COMPLIANCE WITH AN ECOLOGICAL MOMENTARY ASSESSMENT (EMA) IN GLOBAL TOBACCO CONTROL RESEARCH

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Background: Ecological momentary assessment (EMA) collects real-time data from individuals in natural environment by sending brief surveys via a mobile device. Tobacco-related EMA studies in western countries have been conducted with high participant compliance, but have yet to be implemented in low- and middle-income countries (LMIC) where tobacco use remains high. This study examined the compliance to an EMA protocol assessing tobacco use and its social and environmental cues in India.

Methods: Two types of surveys—momentary prompt (MP) and end of day (EOD)—were employed using a smartphone application in urban India for 10 days. The MP survey was sent 5-8 times per day during waking hours asking about real-time tobacco use and its social and environmental cues; the EOD survey was sent at 10pm each day, recounting the same events and exposures from that day. Compliance rates, the proportion of surveys completed against the total

sent, were calculated for MP and EOD. Linear regression models predicted MP and EOD compliance using demographic and tobacco-related variables. Pairwise correlation tests analyzed convergent validity between MP and EOD assessments.

Results: The sample (N=205) was mostly male (N=135, 65.9%) with age's ranging between 16 and 40; almost half were tobacco users (N=99, 49.3%). MP and EOD compliance rates were 0.46 (SD=0.21) and 0.72 (SD=0.27), respectively. On average, participants spent 3.78 (SD=2.18) and 3.63 (SD=2.78) minutes completing the MP and EOD surveys, respectively. Being employed ($\beta=0.11$, $p<.01$) and seeing fewer anti-tobacco messages ($\beta=-0.14$, $p<.05$) predicted higher MP compliance. However, none of the variables predicted EOD compliance. Satisfactory convergent validity was found through significant correlations ($r=.17$ to $.55$, $p<.05$) among each pair of MP and EOD assessments.

Conclusions: More research is needed on how to increase LMIC participant compliance with an EMA protocol, as rates were lower compared to those in western countries. Future studies in an LMIC can use the EOD survey as a proxy measure for the MP survey since it is easier to employ and has a higher compliance rate than the MP survey."

FUNDING: This project was supported by an award from the Institute for Global Tobacco Control at the Johns Hopkins Bloomberg School of Public Health with funding from the Bloomberg Initiative to Reduce Tobacco Use.

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POS5-129 INCIDENCE OF TOBACCO-RELATED CANCER AMONG SWEDISH MEN IN BIRTH COHORTS WITH DIFFERENT LEVELS OF SNUS AND CIGARETTE CONSUMPTION

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In international overviews Swedish men stand out with record low incidence of tobacco-related cancer and unique patterns of tobacco use. In earlier born cohorts tobacco use was dominated by cigarette smoking, but in later born cohorts there have successively been substantial changes towards less smoking and more use of the Swedish kind of low-toxicity oral smokeless tobacco called "snus". This raises questions about the role of smoking respectively snus-use as risk factor for tobacco-related cancer, and the current study aims at investigating differences between cohorts with regard to characteristics of tobacco use and incidence of some tobacco-related cancers at three age levels. Birth-cohort-specific and age-specific cancer incidence data were retrieved from the 2014 edition of the NORDCAN database and matched against tobacco use data for corresponding birth cohorts retrieved from large nationwide representative surveys. Incidence rates included cancer of the bladder, larynx, lip, lung, mouth and pancreas. Tobacco use data included primary initiation of daily smoking and primary initiation of daily snus use. For cohorts born in 5-year spans around 1942, 1947, 1952 and 1957 we found a decrease of initiation of daily smoking from 56% in the earliest born cohort to 39% in the latest born one, and an increase of initiation of snus use from 6% to 21%. For all cancers there was, at each age level, a trend towards lower incidence rates when going from earlier born to later born cohorts. For example, the lung cancer incidence rate at age 50-54 was 31.9 per 100,000 in those born around 1942, and 19.1 per 100,000 in those born around 1957. The total initiation of daily tobacco use, smoking + snus use, is about the same in all four cohorts. If snus use would incur similar cancer risk as smoking, cancer incidence rates should be expected to be about the same in all the birth cohorts, but all cancer incidence rates are consistently lower in cohorts with higher snus use. The findings of the current study are consistent with those other studies that have found that Swedish snus is not significantly associated with tobacco-related cancer.

FUNDING: No funding

JUSTIFICATION: The findings of the current study can strengthen the justification for public health policies that support replacement of cigarettes with snus.

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POS5-130 LABORATORY SMOKING BEHAVIOR MAY UNDERESTIMATE TOXICANT EXPOSURE IN CIGARETTE AND LARGE CIGAR DUAL USERS

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There has been little research on the toxicant exposure from cigar smoking. This study compared smoking behaviors and biomarkers of exposure among dual users of cigarillo+cigarette and large cigar+cigarette products. Participants visited the lab twice – in one session they smoked their usual brand of cigarette; in the other they smoked either a Black & Mild cigarillo or a Phillies Blunt large cigar depending on their preferred cigar product type. Participants were asked to indicate the amount of the cigarillo/large cigar they typically smoke and were then asked to smoke as much as they preferred in the lab. A total of 38 participants completed the study (23 cigarillo+cigarette dual users). Participants were mostly male (n=35) and African American (n=29); aged 37.8 (SD=11.0) years. The average FTND score was 6.6 (SD=1.6) and the average cigarettes per day (CPD) was 18.7 (SD=6.1). There were no significant differences in age, FTND, or CPD between the two groups. CO boost was similar for cigarillos (25.4ppm) and large cigars (23.3ppm). Plasma nicotine boost was also similar after cigarillo (21.1ng/mL) and large cigar (16.5ng/mL) smoking conditions. Cigarillo smokers reported smoking approximately 48% of their cigarillo which significantly correlated to the amount actually smoked in the lab (43%); $p<0.05$. However, the amount of the large cigar normally smoked as reported by the participant (43%) and the amount actually smoked during the laboratory smoking session (22%) was not significantly correlated ($p=0.890$) - potentially attributed to the lack of naturalistic setting. These results show that the behavior in the lab may not reflect the actual toxicant exposure seen when smoking large cigars; suggesting exposure may be greater in naturalistic settings. Previous studies that measured butt solanesol in lab- and home-smoked cigarettes indicated the opposite effect - lab smoking was more vigorous and associated with higher toxicant exposure. It may be beneficial to explore other ways of comparing biomarkers of exposure and consumption of tobacco in home and laboratory environments as an estimate of toxicant exposure from large cigar smoking.

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POS5-131 DOSE-DEPENDENT EFFECTS OF SNUS IN NON-TOBACCO USERS

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Snus tobacco pouches have been marketed to smokers as a cigarette alternative. These same pouches may attract non-tobacco users; the nicotine levels were deliberately lowered to produce a more tolerable response for nicotine-naïve individuals. However, the effects of snus have been characterized only in regular tobacco users. The purpose of this study was to examine the acute dose-related effects of snus in non-tobacco users (<100 uses in lifetime, no use in past three months; pre-session CO level <7 ppm, urine cotinine <3). Eleven participants completed one session that included single-blind administration of six pouches in ascending dose order: 0, 20, 40, 60, 80, and 100% nicotine. Doses were created by combining taste-matched active (General White Large, 8mg/g) and placebo (tobacco-free Onico White Large) snus in the appropriate ratios. Each pouch was used for 20 minutes, with 45 minutes separating the start of each bout. Heart rate (HR) and blood pressure (BP) were measured continuously and subjective effects were rated before and after each pouch use. HR and systolic BP were significant for dose x time interactions, while diastolic BP was significant for a main effect of dose ($p's <.05$). Generally, these physiological indices increased with increasing snus dose, though reliable differences were observed only following the two

highest doses. For example, systolic BP increased from 116.7 mmHg (SEM = 4.0) at baseline to 130.8 mmHg (SEM = 3.8) by the end of session. Interestingly, few positive or negative subjective effects were observed. For the item "tastes good" ratings increased significantly pre- to post-0% nicotine [0.0 (SEM=0.0) to 21.6 (SEM=6.9)], but then decreased with higher doses [11.2 (SEM=6.5) post-100% nicotine]. Still, scores for most items were low (mean peak scores in the 20"s, maximum score of 100). These findings are consistent with those revealed in abstinent tobacco users in that acute administration produces mild subjective effects. The significant increases in HR and BP as a function of dose suggest that users are being exposed to nicotine. Results may support the idea that snus products are well-tolerated by non-tobacco users.

FUNDING: Support provided to Dr. Melissa Blank, PhD from the Department of Psychology, West Virginia University.

JUSTIFICATION: Study findings may inform the design of future clinical research (e.g., dose choices), as well as policies surrounding the availability of novel oral tobacco products for non-tobacco users.

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POS5-132 **REASONS FOR INITIATION AND CONTINUATION OF CIGARETTE AND CIGAR PRODUCT DUAL USE**

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While cigarette smoking has decreased, the use of cigar products (CPs) has increased over the past decade. To characterize the reasons for initiation and continuation of CP use in three groups of dual users [concurrent cigarette and: little cigars (LC), cigarillos (CG) or large cigars (LG)], we recruited dual users and administered an open response questionnaire about their thoughts and patterns of current tobacco product dual use. A total of 59 dual users (50 men, 42 African American) completed the study: 21 LC, 23 CG, and 15 LG. Overall, 93% of participants reported that cigarette use preceded cigar use (100% LC, 87% CG, and 93% LG). The primary reasons for initiating dual use were identified as: peer influence (32%), experimentation (24%), cost (14%), availability (15%), flavoring appeal (12%), and comorbid substance use (i.e., alcohol or marijuana use; 8%). There were differences between the CP groups in reasons for initiating use. Initiation due to cost was only cited by the LC group. There were also differences between CP groups in reasons for continued use. The primary reasons for continued use included: flavor appeal (34%), cost (27%), physiological and subjective effects (i.e., stress relief and addiction; 19%), and product diversity (14%). Additionally, among all participants, 81% reported trying flavored CPs; typically, fruit (42%), chocolate/vanilla (32%), or wine (17%). Only 3% of the sample reported menthol as a cigar "flavor" although 25% of all participants reported regular use of menthol cigars (all were LC) and 86% reported menthol cigarette use. The data show that peer influence and experimentation are common reasons for initiating dual use while flavor and cost were common reasons for continuing use. Eliminating cost differences between cigarettes and CPs and eliminating flavoring availability in CPs could contribute to reducing CPs dual use prevalence. These results also illustrate the misperception among dual users that menthol is not a "flavor" in CPs. Moreover, this data may guide development of large population questionnaires to better understand patterns of CP use.

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POS5-133 **CHARACTERISTICS OF CIGARETTE SMOKING IN INDIVIDUALS IN SMOKING CONCORDANT AND SMOKING DISCORDANT COUPLES**

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Introduction: Partner smoking status may impact smoking cessation outcomes (Dollar et al., 2009; Monden, De Graaf, & Kraaykamp, 2003). To date, no studies have compared smokers in smoking concordant couples (both partners smoke) vs. smokers in smoking discordant couples (one partner smokes) on variables that have been shown to be important for quitting smoking.

Methods: Participants were 123 cigarette smokers with co-habiting romantic partners (smoking discordant: n=60, smoking concordant: n=63). We examined differences between groups on demographic, smoking history and behavior, and psychosocial variables.

Results: Compared to participants in smoking concordant couples, participants in smoking discordant couples were more likely to have made a quit attempt in the last year ($p = .027$), smoked a greater number of cigarettes per day ($p = .048$), smoked for a greater number of years ($p = .009$), and were less likely to view partner involvement in their smoking treatment as helpful ($p < .001$). Smoking discordant couples also reported greater positive outcome expectancies of smoking (negative affect reduction, boredom reduction, social facilitation and craving reduction, all p 's $< .05$) than smoking concordant couples.

Conclusions: Smoking discordant couples may have more difficulty quitting smoking than smoking concordant couples, despite being more likely to have made a quit attempt in the last year. The results of this study may guide the development of smoking cessation interventions that attend to the unique needs of smoking concordant and discordant couples.

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JUSTIFICATION: The results of this study could provide guidance in designing effective interventions for smokers with smoking partners and smokers with nonsmoking partners.

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POS5-134

PERCEPTIONS OF E-CIGARETTE USE IN COLLEGE STUDENTS: FORMATIVE RESEARCH TO DEVELOP HEALTH EDUCATION MESSAGES

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Background: Health communication campaigns have been recognized as a recommended strategy to inform youth and young adults about tobacco use. However, research regarding effective health communication messages to educate college students on the use of new and emerging tobacco products, including e-cigarettes, is lacking.

Purpose: The goal of this qualitative study was to identify the theoretical constructs from the Health Belief Model that were most salient with respect to e-cigarette use in college students. Results from the qualitative interviews will be used to develop theory-based health education messages regarding e-cigarettes.

Methods: This study involved 30 semi-structured qualitative interviews with college students, with 15 e-cigarette users and 15 non-users, 16 females and 14 males, age 17 to 25 (mean=20.4). Interviews were transcribed and coded for themes using NVivo 10.

Results: Knowledge of electronic cigarettes varied with many participants (14 of 30) unsure of the definition of an e-cigarette. Some participants stated that e-cigarettes contain tobacco (5 of 30), while others stated that e-cigarettes produce water vapor (6 of 30). The most commonly mentioned perceived benefits included beliefs that e-cigarettes are healthier than conventional cigarettes (17 of 30), tools for quitting conventional cigarette use (13 of 30), available in different flavors (7 of 30), and better smelling than conventional cigarettes (7 of 30). With respect to perceived risks, most participants (23 of 30) stated that e-cigarettes were less harmful than conventional cigarettes. Additionally, becoming addicted to nicotine (9 of 30), health issues (11 of 30), social stigma (7 of 30), and the cost of use (5 of 30) were commonly mentioned themes with respect to risks associated with e-cigarette use.

Conclusion: Results from this study indicate that many college students lack knowledge about the content of e-cigarettes and identified perceived consequences of e-cigarette use ranging from nicotine addiction to social stigmatization. This study will inform the development of health education messages to provide accurate information to college students about e-cigarette use.

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JUSTIFICATION: Results from this study will be used to develop health education messages regarding e-cigarette use in college students that can be used in future health education campaigns.

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POS5-135

N-ACETYLCYSTEINE RESTORES NUCLEUS ACCUMBENS GLUTAMATE SIGNALING AND INHIBITS CUE-INDUCED NICOTINE RELAPSE

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Cigarette smoking is a leading cause of preventable death, and addiction to nicotine produces long-lasting, stable changes in brain synaptic physiology that might contribute to the vulnerability to relapse. While targeting glutamatergic

signaling has shown somewhat effective in preventing cocaine relapse, there is limited utilization of compounds targeting the dysregulation of glutamatergic signaling in promoting smoking cessation. As well, existing smoking cessation treatments are insufficient as relapse rates remain high. Thus, we examined the efficacy of a glutamatergic agent (the antioxidant N-Acetylcysteine; NAC) in reducing both nicotine self-administration and reinstatement of cue-induced nicotine seeking in a preclinical model nicotine relapse. Additionally, we examined if chronic treatment with NAC could inhibit alterations in nucleus accumbens core (NAcore) synaptic plasticity and glial glutamate transport (via GLT-1) that occur following withdrawal from nicotine self-administration. Following chronic treatment with NAC (30 mg/kg, i.p. for five consecutive days) during withdrawal with extinction training from nicotine self-administration, sodium-dependent glutamate uptake was restored compared to vehicle control animals. Additionally, NAC inhibited rapid, transient synaptic plasticity (measured via dendritic spine head diameter and AMPA/NMDA ratio in NAcore medium spiny neurons) that occurs during cue-induced nicotine seeking. These results show that NAC may be an important pharmacotherapeutic avenue in reducing nicotine relapse vulnerability.

FUNDING: NIH grants K99 DA036569 (CDG) and DA015369/DA003906 (PWK)

JUSTIFICATION: These experiments were designed to evaluate the ability of a novel pharmacotherapeutic treatment to inhibit nicotine relapse-associated changes in brain synaptic physiology.

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POS5-136

EFFECT OF SMOKE-FREE PATIO POLICY OF RESTAURANTS AND BARS ON EXPOSURE TO SECOND-HAND SMOKE

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Background: While there is increasing support for restricting smoking in restaurants and bars patios, there is limited evidence on the effectiveness of this policy. This study examined the effect of smoke-free patio policy of restaurants and bars on adult second-hand smoke (SHS) exposure.

Methods: Data were drawn from the 2005-2012 Canada Tobacco Use Monitoring Survey (n=89,743), a repeated cross-sectional survey of youth and adult. Regression analysis, a quasi-experimental design was used to examine the effect of provincial smoke-free patio policy on self-reported exposure to SHS.

Results: Analyses suggest that exposure to SHS on patios of bars and restaurants declined following the adoption of provincial smoke-free patio policy. Relative to pre-policy SHS exposure, regression results showed a reduction in the probability of SHS exposure of up to 25% in Alberta. Similarly, in Nova Scotia, the probability of SHS exposure declined by up to 21%. Analyses stratified by smoking status found similar significant effect on both smokers and nonsmokers.

Conclusion: Findings suggest that provincial patio smoking ban on bars and restaurants had the intended effect of protecting non-smokers from SHS exposure. This study is consistent with a large body of evidence showing that a strong smoke-free legislation is an effective public health measure.

FUNDING: None

JUSTIFICATION: Smoke-free patio policy is an important public health intervention measure

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POS5-137

SUPPORT FOR MARIJUANA LEGALIZATION AMONG US YOUNG ADULTS: TOBACCO USE AND OTHER RISK-RELATED CORRELATES

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Little is known about the impact of marijuana policy changes on marijuana use in young adults, who have the highest rates of tobacco and substance use. This study examined the prevalence and correlates of support for marijuana legalization and likelihood of more frequent marijuana use, if legalized, in a national sample of young adults. Data were from Wave 7 (n = 3,552) of the Legacy Young Adult Cohort, a nationally representative sample of men and women aged 18 to 34 (data collected October to November 2014). Using weighted estimates, bivariate models showed that 39% of the sample supported marijuana legalization. Support for legalization was significantly correlated with older age (25-34 vs. 18-24); being White; being male; having some college education or higher; current depression and anxiety; and current use of alcohol, marijuana, other drugs, cigarettes, e-cigarettes, and LCCs. The majority of participants who endorsed that marijuana is 'less harmful than cigarettes' supported marijuana's legalization, as did more than 60% of cigarette "smokers" and 50% of "social or occasional" smokers. Among non-current marijuana users, 8.4% reported that they would use marijuana more often if legalized. These participants were more likely to be male and to report current depression and anxiety, use of alcohol, other drugs, and all tobacco products measured; and endorse perceptions that marijuana is less harmful than cigarettes. State-level marijuana policy was associated neither with support for legalization, nor likelihood of more frequent use if legalized. A multinomial multivariable logistic regression model showed that among non-current users of marijuana, likelihood of more frequent marijuana use, if legalized, was positively associated with support for legalization, lower harm perceptions of marijuana, and other current drug use. It was negatively associated with college education and self-identifying as a non-smoker or an ex-smoker, controlling for age, sex, and race. Lower harm perceptions, coupled with tobacco use, mental health and substance use vulnerabilities among some young adults may be risk factors for experimentation and future use of marijuana.

FUNDING: Findings have the potential to inform policy about the impact of marijuana legalization on substance use and relations to other health-risk behaviors.

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POS5-138

NICOTINE, BUPROPION, AND VARENICLINE ENHANCE REINFORCER DEMAND IN MALE AND FEMALE RATS

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Previous research reveals differences in sensitivity between males and females to the motivational effects of nicotine in tobacco use. Nicotine has been demonstrated to enhance the reinforcement value of non-nicotine rewards contributes and this effect is believed to contribute to nicotine reward in smoking. Similar value-enhancing effects have been observed by the two most commonly prescribed smoking cessation aids, bupropion and varenicline. The present research investigated the value-enhancing effects of nicotine, bupropion and varenicline in both male and female rats using a behavioral economic, reinforcer demand approach. Additionally, the role of dopamine D1 and D2 receptor families and of $\alpha 4\beta 2^*$ and $\alpha 7$ nicotinic acetylcholine receptors (nAChRs) were investigated in the enhancing effects of nicotine and of bupropion and varenicline, respectively. In two experiments, rats were trained to lever-press maintained by visual stimulus (VS) reinforcement. The response requirement was systematically increased over blocks of 16 sessions according to the following sequence of fixed ratio schedules: 1, 2, 4, 8, 16, 32, 64, 128, 256, 512. Saline, nicotine and bupropion (Experiment

1) or varenicline (Experiment 2) were administered preceding sessions within each session block. Demand for VS reinforcement was analyzed under each drug condition and between the sexes using a behavioral economic model. The effects of dopamine (D1 or D2 family, Exp1) or nAChR antagonism ($\alpha 4\beta 2^*$ and $\alpha 7$, Exp2) under each drug condition were also analyzed on responding maintained by progressive ratio VS reinforcement. Nicotine, bupropion and varenicline each enhanced the value of VS reinforcement in male and female rats. Females showed greater sensitivity to the value-enhancing effects of each drug, especially on measures of persistence. Enhancement by bupropion but not nicotine was attenuated by D2 family antagonism in both sexes. Antagonism of $\alpha 4\beta 2^*$ but not $\alpha 7$ nAChRs attenuated the value-enhancing effects of nicotine and varenicline in females, but only of nicotine in males.

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POS5-139

DISPARAGEMENT OF HEALTH WARNING LABELS ON CIGARETTE PACKAGES AND SMOKING CESSATION: RESULTS FROM FOUR COUNTRIES

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Background: Some researchers have criticized prominent pictorial health warnings (HLWs) on cigarette packs due to concerns that they may promote defensive responses that undermine their efficacy. Message disparagement is one way to engage in defensive avoidance of threatening messages. We aimed to assess factors related to disparagement of HWLs and to determine whether HWL disparagement is associated with subsequent cessation attempts.

Methods: Data were analyzed from seven survey waves of adult smokers from online consumer panels in Canada, Australia, United States (US), and Mexico. Participants were surveyed every four months between September 2012 and September 2014. Samples were replenished to maintain sample sizes of approximately 1000 participants in each country at each wave, except for the US, where 1400 were surveyed at each wave. HWL disparagement was measured by asking participants how often they had made fun of the warning labels in the last month, with responses coded into three categories: 1) not at all; 2) once; 3) a few times, often, or very often. Country-specific GEE models were estimated to assess correlates of HWL disparagement and whether HWL disparagement at time t was associated with making a quit attempt by time t+1.

Results: At each wave, across all countries, 18% to 37% of the sample reported HWL disparagement at least once in the last month. In all countries, more frequent disparagement was found among younger participants, males, and those with a higher education, greater addiction, and who made a recent quit attempt. In fully adjusted models for all countries, HWL disparagement was an independent predictor of subsequent cessation attempts (i.e., OR few times or more vs never=1.52, 1.76, 1.90, and 1.48, for Canada, Australia, US, and Mexico, respectively).

Discussion: HWL disparagement appears to indicate greater engagement and HWL message processing, suggesting that it does not result in counterproductive effects. This is consistent with some research suggesting that message disparagement indicates greater message relevance and processing.

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POS5-140

TIME VARYING TREATMENT EFFECTS: THE ROLE OF ANHEDONIA ON SMOKING QUIT ATTEMPTS

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Recent studies suggest that anhedonia, the reduced experience of pleasure in response to reward, may be an important barrier to successfully quitting smoking. Examining this relatively understudied construct may be important for improving the effectiveness of tobacco dependence treatment. We analyzed ecological momentary assessments (EMA) from a smoking cessation trial to (1) study the course of anhedonia and its association with craving and negative affect during the critical two-week period following quitting smoking, and (2) estimate the time-varying effect of smoking cessation pharmacotherapies on these dynamic processes. Data were from 1123 adults (58% women) from a randomized controlled trial of smoking cessation therapies. Participants were assigned to one of 6 conditions: placebo (N=131), bupropion (alone or with nicotine lozenge; N=402), and nicotine replacement therapy only (lozenge, patch, both; N=590). Participants completed EMA assessments 4 times per day for two weeks after quitting, resulting in 25,141 assessments. We used time-varying effect modeling (TVEM) to examine mean anhedonia and its associations with other withdrawal symptoms as a function of time and treatment group. Preliminary results indicate that the placebo group had an elevated mean level of anhedonia immediately after quitting, which fell to levels similar to the treatment groups after Day 7 postquit. Nicotine replacement therapies were effective at reducing anhedonia early in the quit attempt. The time-varying association between craving and anhedonia was complex and varied across treatment groups. The positive association between negative affect and anhedonia was modest but stable over time throughout the study period for both active treatment groups; however, this association was quite strong for the placebo group during Days 1-6 but non-significant thereafter. Understanding the time-varying associations of anhedonia with other nicotine withdrawal symptoms may improve understanding of processes contributing to smoking relapse, and may guide the development of intervention approaches that adapt in real time with the changing needs of individuals.

FUNDING: This research was supported in part by grant 9P50CA143188 from the National Cancer Institute to the University of Wisconsin-Center for Tobacco Research and Intervention; by grant M01 RR03186 from the General Clinical Research Centers Program of the National Center for Research Resources, NIH

JUSTIFICATION: Examining post-cessation anhedonia may be important for improving the effectiveness of tobacco dependence treatment.

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POS5-141

READY TO QUIT: DEVELOPMENT OF A PREDICTIVE ANALYTIC MODEL FOR ENROLLMENT IN SMOKING CESSATION MODALITIES

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Of approximately 236,000 smokers in Kaiser Permanente Southern California (KPSC), approximately 1.6% enrolled in 2013 in smoking cessation modalities that include in-person classes, telephone coaching, and an online cessation program. Prior research has shown that enrollment in in-person classes, for example, was associated with one-year abstinence rate of 38%. KPSC population-wide interventions to increase enrollment in smoking cessation modalities have proven costly with minimal effect, necessitating the development of a more cost-effective model. To increase the cost effectiveness and efficiency of outreach, the team developed a logistic regression model with >60 variables from the Kaiser Permanente electronic health record (EHR), KP Health Connect. The model included data on demographics, diagnoses of chronic and smoking-related conditions, medications for chronic conditions and tobacco cessation, previous enrollment in smoking cessation efforts, and use of the EHR patient portal,

including patients sending secure email related to smoking. The model population was randomly sub-divided into training (N=141,600) and validation (N=94,400) sub groups; the model's C-stat in the validation cohort was 0.76. More than twenty variables were significant predictors of enrollment. Most significant (in descending order) were age, previous enrollment in smoking cessation programs, a diagnosis of asthma, prescribed nicotine replacement therapy, African American race/ethnicity, higher disease burden, and patient portal use. Previous enrollees in smoking cessation efforts are 2.4 times more likely to enroll than were those without previous enrollment. Interaction with the patient portal was a significant predictor; members who sent a smoking-related email were 1.5 times more likely to enroll than were those who did not. KPSC will apply the model to outreach targeting the top tier of the modeled population, utilizing 20% of previous outreach cost with the potential to reach 50% of potential enrollees in smoking cessation programs. This study was supported by Kaiser Permanente.

FUNDING: No funding.

JUSTIFICATION: The basis for this model can be tested and applied in a variety of different settings and for different conditions and programs with the cost savings over time exceeding the costs of development.

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POS5-142

INCREASING EXPOSURE TO ANTI-TOBACCO MESSAGES IN ECONOMICALLY DISADVANTAGED DOMINICAN REPUBLIC COMMUNITIES

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Objective: To examine the effects of an intervention to increase exposure to messages regarding dangers of tobacco use in economically disadvantaged communities.

Background: Low-middle income countries such as the Dominican Republic (DR) are expected to bear the brunt of global tobacco-caused morbidity and mortality in this century. The DR had no national tobacco control program or anti-tobacco campaigns prior to our trials, with a corresponding lack of awareness of dangers of tobacco use by communities.

Methods: Six economically disadvantaged communities were randomized within pairs to intervention or control. Intervention included community-partnered campaigns on dangers of tobacco use. Intervention exposure was assessed from two sets of surveys at baseline and one year follow-up by local data collectors trained and supervised by a joint DR-US team: 1) cross-sectional community surveys of randomly selected adults from randomly selected households (N approx. 1050/survey); 2) cohort surveys of tobacco users (N=421). Surveys queried whether respondents had seen information about the dangers of smoking in venues where interventions had been targeted.

Results: Using GLIMMIX modeling to account for clustering of individuals within communities, increased exposure to anti-tobacco messaging was reported in intervention relative to control communities at one year follow-up (p<.01 for all comparisons) in healthcare settings, colmados (local convenience/grocery stores), Community Technology Centers that served as bases for project operations, schools, and on radio. No difference was found in exposure to poster messaging. Results were consistent across community and tobacco user samples.

Conclusions: Results support community penetration of anti-tobacco messaging in multiple venues in economically disadvantaged DR communities where previously no such campaigns had occurred. The consistency across community and tobacco using samples supports the robustness of this effect.

Rapids Poster Session 5 • Saturday, February 28, 2015 • 11:30 a.m.-1:00 p.m.

Engaging communities in providing anti-tobacco messaging and increasing awareness of tobacco harms are key to overall tobacco control in countries where such efforts have been lacking.

FUNDING: Funded by NIH National Cancer Institute grant R01CA132950 and Fogarty International Center grant TWO5945 (Ossip, PI)

JUSTIFICATION: Little empirical data on tobacco intervention are available from many low-middle income countries (including the Dominican Republic), thus the ability to demonstrate penetration of an anti-tobacco campaign in a region where such intervention has been lacking is key to implementing overall tobacco control programs.

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POS5-143 INCORPORATING A SMOKING CESSATION INTERVENTION INTO LUNG CANCER SCREENING: PRELIMINARY STUDIES

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Objectives: The "teachable moment" that can occur after a health event such as cancer screening has been shown to enhance intention to quit smoking and smoking cessation. We conducted two preliminary studies to assess whether telephone counseling is a feasible intervention that can enhance motivation to quit following lung cancer screening.

Methods: In the telephone counseling (TC) pilot study, participants included 7 current smokers enrolled in the Georgetown Lung Cancer Screening Program (mean age = 63, pack years = 61.5). Participants completed two telephone-based assessments (pre-screening and post-receipt of the screening results), three TC sessions that incorporated the screening result as a motivator, and a final assessment one-month post-TC. In the qualitative study, we conducted four focus groups with 11 current and 5 former smokers (mean age = 63, pack years = 55). Participants discussed whether the results of a CT scan might affect their smoking, cessation methods they were willing to try, and their interest in TC specifically.

Results: In the TC study, participation (87.5%) and retention (85.7%) rates were good. Further, four smokers reported quitting (three with biochemical verification). Of the four who quit, three had received abnormal screening results (suspicious for lung cancer) and one received a normal result. In the qualitative study, several participants expressed an interest in TC as a cessation intervention to use in conjunction with lung screening. Further, most participants believed that an abnormal screening result would motivate them to quit smoking, and that a normal result would not decrease their motivation to quit.

Conclusion: These studies suggest that a telephone-based cessation intervention may be feasible and potentially efficacious when delivered within a lung cancer screening program. Further research is needed given the likelihood of increased screening rates that will follow the mandated coverage for lung screening beginning in 2015.

FUNDING: This was an investigator-initiated study funded by the Prevent Cancer Foundation. Additional support was provided by the Lombardi Comprehensive Cancer Center Support Grant P30 CA 051008.

JUSTIFICATION: These pilot studies provide preliminary evidence that a telephone-based smoking cessation intervention may be feasible and potentially efficacious when delivered in conjunction with a lung cancer screening program.

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POS5-144 ATTITUDES ABOUT E-CIGARETTE USE AMONG COLLEGE STUDENTS

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Recent data show that e-cigarette use is increasingly popular among young adults. Data show 4-13% of young adults have used an e-cigarette at least once in their lifetime (Choi & Forster, 2013; Suffin et al., 2013; Pokhrel et al., 2013). Despite these statistics limited research has identified attitudes surrounding the use of these devices among young adults. The current study aimed to identify such attitudes among college-aged students. It was hypothesized that participants would view e-cigarette use as positive, endorsing views of beneficial health outcomes and safety. Participants completed self-report questionnaires through a secure online database. Participants included 361 college students (81.4% female; 76.7% Caucasian); average age was 19.93 (SD=1.61). 23.5% of participants have tried e-cigarettes in the past year and 8.9% of participants have tried e-cigarettes in the past month; 1.7% of participants reported daily e-cigarette use in the past month. More female participants reported trying an e-cigarette in the past month than males, $t(347)=2.71, p=0.01$. Daily e-cigarette use in the past month was reported among 8.3% of daily conventional cigarette smokers while 41.7% of daily conventional smokers reported trying an e-cigarette in the past month. A principal components analysis of 44 items reflecting potential attitudes and perceptions about e-cigarette use safety and benefit, yielded 2 factors reflecting the pros and cons of e-cigarette use. The final version of this form retained 30 items. Average scale scores for pros of e-cigarette use differed significantly between nonsmokers ($M=3.83; SD=.97$) and students who had tried e-cigarettes ($M=4.36; SD=.96$) [$F(3,291)=6.50, p<.001$]. Differences on average scale scores for cons of e-cigarette use among cigarette smokers ($M=4.43; SD=.57$), e-cigarette users ($M=5.12; SD=.75$) and students who currently smoked both cigarettes and e-cigarettes ($M=5.21; SD=.61$) approached significance, $p<.10$. These results show that there is a need for health education among this population, particularly among cigarette smokers, as well as tailored therapeutic treatments to address the daily use of e-cigarettes in college students.

FUNDING: No Funding

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POS5-145 OVER-TIME IMPACTS OF PICTORIAL HEALTH WARNING LABELS: TRAJECTORIES OF RESPONSE AMONG SMOKERS IN AUSTRALIA, CANADA AND MEXICO.

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Background: Countries with pictorial health warning labels (HWLs) on tobacco products often rotate HWL content to prevent "wearout". Three countries that innovated HWL policies implemented changes in 2012: 1) In Canada (CA), pictorial HWLs were changed for the first time since 2001, including for package inserts with cessation information; 2) In Australia (AU), pictorial HWLs were changed for the first time since 2006 and were accompanied by "plain" packaging (i.e., no brand imagery); 3) In Mexico (MX), pictorial HWL content continued to

be changed every six months, the fastest rate in the world. This study examines changes in smokers' responses to pictorial HWLs both across and within these three countries.

Methods: Adult smokers were recruited from online consumer panels in AU (n=2,756), CA (n=3,155) and MX (n=3,466). From September 2012 - May 2013, data were collected from 1,000 smokers in each country every 4 months, using replenishment to maintain sample size. Both country-specific and pooled latent growth curve models were estimated to assess HWL responses (i.e., attention to HWLs; cessation-related cognitive responses to HWLs; forgoing of a cigarette due to HWLs) over this period to: 1) estimate trajectory parameters (i.e., intercepts, slopes) for each HWL response; and 2) determine socio-demographic (e.g., age, sex, education, income, country) and smoking-related (e.g., quit intentions, smoking intensity) correlates of trajectories

Results: Across countries, attention to HWLs significantly decreased over time, cognitive HWL reactions increased and forgoing cigarettes remained stable in AU & MX while forgoing significantly decreased over time in CA. Correlates of slope were similar across countries. Within all three countries, trajectories of attention to HWLs were similar across population sub-groups, whereas there were some sub-group differences in trajectory parameters for cognitive reactions and forgoing.

Conclusions: HWLs appear effective over time and across key smoker sub-groups. "Wearout" of attention to HWLs appears accompanied by strengthening of cognitive responses that predict cessation attempts.

FUNDING: Data collection and analyses for this project were supported by a grant from the U.S. National Cancer Institute (R01 CA167067).

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POS5-146

DEVELOPING MEDIA MESSAGES TARGETING PERCEPTIONS ABOUT HOOKAH SMOKING AMONG MULTI-ETHNIC YOUNG ADULTS: A QUALITATIVE ANALYSIS

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Hookah smoking rates amongst young adults is growing at an alarming rate despite hookah tobacco having the same health risks as cigarettes, including nicotine addiction and cancer. More alarming is that users are exposed to larger quantities of tobacco toxicants in a single session of hookah consumption. While hookah is known to expose users to these risks, young adults generally endorse positive attitudes, normative beliefs, and self-efficacy towards its usage. This study aimed to identify risk perceptions and beliefs about hookah tobacco smoking among racially-diverse young adults. Transcripts from eight focus groups conducted at two large universities in the state of Georgia in 2012 were analyzed using a model encompassing the Theory of Planned Behavior and Slovic's risk perception theory. Content analysis of focus group data generated important information regarding reasons for and attitudes towards hookah usage, as well as the role of hookah establishments in hookah popularity. Participants reported viewing hookah as less addictive and safer than cigarettes, attributing this to the filtering of the smoke through water in the vase of the hookah. Hookah was also reported to be more socially acceptable and fashionable. These findings will be used to develop counter-marketing media messages to address young adults' misperceptions regarding the safety of hookah smoking that are lacking in current anti-tobacco campaigns.

FUNDING: Study data funded by American Lung Associate, SB-188046-N. Pilot Award funded through the Pilot and Development Core of GSU TCORS supported by grant number 1P50DA036128-01 from the NIDA and FDA Center for Tobacco Products

JUSTIFICATION: This study aims to provide evidence about young adults' perceptions of hookah smoking that will be used to develop anti-tobacco media messages that are hookah-specific given the lack of such campaigns at this time.

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POS5-147

CHEMICAL, PHYSICAL AND TOXICOLOGICAL CHARACTERIZATION OF EXPERIMENTAL RESEARCH CIGARETTES CONTAINING DE-NICOTINIZED TOBACCO

Bonnie G. Coffa*, PhD, Christopher R.E. Coggins, PhD, Carson Watts Consulting, Michael S. Werley, PhD, Michael J. Oldham, PhD and Marc W. Fariss, PhD, Altria Client Services

The Family Smoking and Prevention Tobacco Control Act gave FDA the authority to establish standards for tobacco products, including reducing the levels of nicotine in tobacco products. Regulatory decisions regarding a nicotine product standard will be based upon scientific research conducted using very low nicotine (VLN) cigarettes. There are several different types of VLN cigarettes that have been used in research studies. However, before using these cigarettes in studies to assess tobacco use behaviors it is important that they be well characterized

We present an approach for characterization of VLN cigarettes through assessing design parameters, mainstream smoke chemistry and in-vitro toxicity. VLN cigarettes were made using blended tobacco processed through a supercritical fluid extraction to remove 96% of nicotine (denicotinized (denic) tobacco). Three types of test cigarettes (TC) were manufactured in 2004, with tobacco filler blends containing 100% denic tobacco (TC100), 50% denic tobacco and 50% unextracted tobacco (TC50/50) and 100% unextracted tobacco (TC0). Undiluted mainstream smoke condensate from these cigarettes were generated for measurement of 46 analytes and cytotoxicity and mutagenicity determination.

On a per mg TPM basis, statistically significant decreases were observed in mainstream smoke levels of formaldehyde, tobacco specific nitrosamines, and phenol and statistically significant increases in levels of select aromatic amines, vinyl chloride, aliphatic hydrocarbons, select aldehydes and metals in smoke condensate from TC100 as compared to TC0 cigarettes. The Ames test and neutral red assays indicated similar mutagenicity and cytotoxicity responses respectively for cigarette smoke condensates from TC100, TC50/50 and TC0 cigarettes.

Use of denic tobacco resulted in several changes in chemical composition of mainstream smoke, but the changes did not modify biological activity as measured by the cytotoxicity and mutagenicity assays used here. These results highlight the importance of characterizing experimental research cigarettes for physical design, smoke chemistry, and toxicity.

FUNDING: No Funding. This study was conducted at IIT Research Institute on behalf of Altria Client Services.

JUSTIFICATION: Toxicological characterization of very low nicotine research cigarettes previously used in tobacco use behavioral studies.

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POS5-148
DIFFERENCES IN THE BACTERIAL MICROBIOTA ASSOCIATED WITH MENTHOLATED VERSUS NON-MENTHOLATED CIGARETTE TOBACCO

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There is a paucity of data regarding the microbial constituents of tobacco products and their impacts on public health. Specifically, there has been no comparative characterization performed on the bacterial microbiota associated with mentholated versus non-mentholated cigarette tobacco, and how these differences could potentially impact the health of menthol versus non-menthol cigarette users.

To address this knowledge gap, we conducted time series experiments with five different commercially-available brands of cigarettes (menthol and non-menthol varieties) placed under three different conditions of temperature and relative humidity. On days 0, 5, 9 and 14, subsamples of each product were subject to DNA extraction using enzymatic and physical lysis. Following purification, the DNA was amplified in PCR assays of the V3-V4 hypervariable regions of the 16S rRNA gene, and the resulting 16S PCR amplicons were sequenced on the Illumina MiSeq platform. Sequences were then analyzed using the QIIME analysis software and the MetagenomeSeq package implemented in R.

2,046 different bacterial operational taxonomic units (OTUs) were identified from a total of 3,886,999 sequences. 27 different bacterial phyla were identified, with dominant phyla (>5.0%) being Proteobacteria, Firmicutes, Bacteroidetes, and Actinobacteria. Many of the microorganisms detected were OTUs uncharacterized at the genus level; however, mentholated tobacco seems to select for hardy bacteria that are able to withstand harsh environmental conditions (elevated pH, wastewater/sediment environments, industrial processes). Mentholation also seems to reduce rhizospheric bacteria.

These data provide preliminary evidence that the mentholation process used in the production of commercially-available cigarettes can impact bacterial communities in these products, possibly selecting for microorganisms that are resistant to harsher environmental conditions. However, because 1) many of the tobacco-associated bacteria detected here are poorly characterized; and 2) the overall public health implications of these findings are unclear, additional studies are warranted.

FUNDING: P50CA180523

JUSTIFICATION: The novel science generated in this study is directly relevant to the Family Smoking Prevention and Tobacco Control Act because it can be used to inform potential new microbial-related tobacco regulations that have never before been considered despite the reality that the microbiology of tobacco has been of interest to the tobacco industry for the past 60 years.

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POS5-149
DIRECTLY OBSERVED VARENICLINE THERAPY IMPROVES ADHERENCE BUT NOT CESSATION RATES AMONG METHADONE MAINTAINED SMOKERS

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Background: Despite the high burden of tobacco use among methadone maintenance patients, smoking cessation intervention efficacy in this group is limited. This may be partially due to poor medication adherence rates. Interventions to improve tobacco cessation medication adherence for opioid-dependent

smokers have not yet been investigated. Our objective was to evaluate the efficacy of varenicline modified directly observed therapy (DOT) versus treatment-as-usual (TAU) on varenicline adherence and smoking cessation rates among opioid-dependent smokers.

Methods: Methadone maintained smokers were randomly assigned to receive 12 weeks of varenicline, either directly observed with their daily dispensed methadone or self-administered. Outcomes were adherence, measured by pill count and analyzed as a continuous variable, and 7 day point prevalence tobacco abstinence, verified by expired CO < 8 p.p.m. Adherence was compared between groups using linear mixed effects models. Tobacco abstinence was compared between groups at the end of intervention (12 weeks).

Results: 100 methadone maintained smokers were enrolled, and 50 were randomized each to the varenicline DOT and TAU groups. Participants had a mean age of 49, 56% were male, 45% Latino, 28% Black, and smoked a median of 10 cigarettes/day. There were no significant differences in baseline demographic, smoking or clinical factors between groups. Adherence in the DOT group was significantly higher than in the control group over the 12 week intervention period; the estimated overall adherence was 78.8% in the DOT group compared to 56.5% in TAU (p<.001). CO-verified abstinence at 12 weeks was not significantly different between groups (18.8% v 10.6% in DOT and TAU groups, respectively, p=.27).

Discussion: Methadone clinic-based varenicline directly observed therapy was associated with significantly increased varenicline adherence compared to self-administered treatment, but tobacco cessation rates were similar between groups. Other interventions are necessary to optimize smoking cessation medication effects and reduce the burden of tobacco use among opioid dependent smokers.

FUNDING: Supported by NIDA K23 DA025736 and R25 DA023021

JUSTIFICATION: This trial investigates an intervention to optimize delivery of evidence-based treatment among a population of smokers with co-morbid substance use disorders.

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POS5-150
A REVIEW OF INTERVENTIONS FOR TOBACCO USE APPROPRIATE FOR DELIVERY BY A BEHAVIORAL HEALTH PROVIDER IN PRIMARY CARE

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Background: Clinical practice guidelines recommend treatment for tobacco use disorder in the primary care setting, but implementation of these recommendations by primary care providers has been limited. The recent movement to integrate behavioral health providers into the primary care setting could help provide a way to increase implementation, as these providers are well positioned to deliver brief smoking interventions due to their background and experience with behavior change strategies. However, guidance on evidence-based treatments that fit a brief format of treatment (i.e., 1-6 sessions) is limited.

Methods: A literature search was conducted in PubMed to locate empirical studies examining behavioral interventions of six or fewer sessions delivered by behavioral health professionals that targeted tobacco use. The search included "tobacco" in combination with each of the following terms: brief, short, abbreviated, treatment, or intervention. Exclusion criteria included: no comparison group, children or adolescents, group based intervention, special training/equipment needed to conduct the intervention, or no face-to-face contact.

Results: The literature search generated 8150 articles, 11 of which were eligible for inclusion in the review. Interventions averaged 2.6 sessions (median= 1, mode= 1) and employed diverse treatment modalities including motivational interviewing, cognitive behavioral therapy, self-determination theory based

interventions and the 5 A's approach. Outcome data on the effectiveness of these interventions compared with a control condition were mixed; only 3 studies found that participants in the intervention condition had better outcomes than those in the control group, and another 3 studies reported mixed results.

Discussion: This review provides a synthesis of the evidence-based interventions for tobacco use available to behavioral health providers in primary care. Although some treatments show promise for delivery in this type of format, further studies may be needed to best inform successful smoking cessation strategies in this context.

FUNDING: This research is supported by the Department of Veterans Affairs Office of Academic Affiliations Advanced Fellowship Program in Mental Illness Research and Treatment, the VA Western NY Healthcare System, and the Department of Veterans Center for Integrated Healthcare.

JUSTIFICATION: This study will help inform the clinical practice of providers delivering interventions for tobacco cessation in primary care settings.

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POS5-151 **PREDICTORS OF PERSONAL SMOKE-FREE POLICIES AMONG** **COMMUNITY COLLEGE STUDENTS**

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Objective: To determine associations between living with a smoker and having a smoke-free home or car policy in Community College students enrolled in a cessation trial. **Background:** Smoke-free policies have a cumulative effect on smoking behavior. In a retrospective analysis of baseline survey data of participants of a Randomized Trial with Web Assisted Tobacco Interventions (WATI), we examined the association between living with another smoker and having a smoke-free policy.

Methods: Baseline survey data were collected on 891 Community College students recruited online between October 10th, 2012 and September 15th, 2014. Data include having a smoke-free policy in their car or home, and whether they live with others who smoke. Other variables examined were age, gender, ethnicity, perceived confidence in this quit, marital status, frequency of smoking inside the home, having children in the home, and frequency of smoking. Analyses were performed to explore associations with the outcome variable (having smoke-free policies).

Results: The average age was 27 (sd=9) years, ranging from 18 to 64 years. Participants who did not live with smokers had 3.47 times greater odds of having a smoke-free policy (home or car) compared to those who do live with other smokers (95% CI 2.537, 4.739). Variables associated with having a smoke-free policy (home, car, both) were: perceived confidence in this quit, and living with children. Variables associated with both living with smokers and having a smoke-free policy were: frequency of smoking in the home and frequency of smoking. A multivariate regression model was constructed with a c-statistic of 0.795.

Conclusions: Associations were observed between living with smokers and having smoke-free policies in the home and/or car. For hypothesis generation and further exploration in this trial, findings may aid in understanding key behaviors, motivation, and environmental factors associated with successful quitting.

FUNDING: This work was supported by National Cancer Institute Grant #R01CA152093-01 (McIntosh, PI).

JUSTIFICATION: This study presents relevant personal smoking and smoke-free policy variables in a population of Community College students enrolled in a Web Assisted Tobacco Intervention, and associations between these variables as they

provide contextual information potentially relevant to successful cessation in this understudied priority population.

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POS5-152 **STUDENT TOBACCO ATTITUDES AND BEHAVIORS SURVEY** **(TABS)**

Rosemary Collier*, Geraldine Britton, Lori-Marie Sprague, Joyce Rhodes Keefe, Arianne Storch, Shirley Shum, Diana Sireci, Lila Oلمان, Courtney Berenato, Gabrielle Schiller, Brittany Bungert, Meredith Summers, Victoria Bogil, Gabrielle Amaro, Katherine Kaplan (SUNY Binghamton, Decker School of Nursing)

Background: Tobacco usage has been a worldwide concern for decades. One goal of Healthy People 2020 is to reduce illness, disability, and death related tobacco use and secondhand smoke exposure. Use of Hookah and e-cigarettes is increasingly popular among college-age students. These products are perceived as less harmful despite containing many of the same ingredients as cigarettes including nicotine, tar and dangerous byproducts.

Purpose: Therefore, the purpose of this study was to explore cigarette, smokeless tobacco, e-cigarette, and e-hookah prevalence and predictors in a college-aged population at a northeastern public university.

Methods: A descriptive correlational design using a twenty-question survey was administered in a highly trafficked area on campus. Questions included demographic information. A total of 357 surveys was completed over two events (n=186 and n=171 respectively). Students were entered into a drawing for a gift card as an incentive for participation. Data were analyzed using SPSS version 22. Tests included frequencies, Chi Square, T-tests and Spearman's Rho.

Results: Participants (n=357) were 50.4 % female, 47.5% male, 89% undergraduates, 10.7% graduate students, and 13.3% were international, with a mean age of 22.3 years. Domestic students were significantly more likely (p < 0.001) to use e-cigarettes than international students while the latter were more likely to use smokeless tobacco (p<0.16). Of importance, 34% of those who reported smoking less than 100 cigarettes in their lifetime stated that they use e-cigarettes and smokeless tobacco (p < 0.001). Female students (22.5%) reported higher usage of e-cigarettes than male students (20.8%).

Conclusions: Despite the thinking that alternative products like e-cigarettes would be used as smoking cessation agents these results indicate that in the college age community they instead may be gateways to tobacco use. More research is needed as to the motivation, knowledge and attitudes of college-aged students regarding this emerging health risk behavior.

FUNDING: Internal Provost grant (SUNY Binghamton)

JUSTIFICATION: Use of e-cigarettes and hookah is an emerging field of research, and can inform potential educational interventions in campus populations.

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POS5-153 **EXPECTANCIES FOR THE EFFECTS OF ALTERNATIVE TOBACCO** **PRODUCTS**

Nicholas Felicione, BA*, Chit Yuen Yi, M.S., Amy Gentzler, PhD, & Melissa Blank, PhD, Department of Psychology, West Virginia University

Expectations regarding the effects of cigarette smoking reliably predict initiation, frequency of use, and cessation outcomes. Few data are available on expectancies related to use of alternative tobacco products: cigars, waterpipes (WP), smokeless tobacco (SLT), and electronic cigarettes (ECIGs). The purpose

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of this analysis, therefore, was to examine the relationship between frequency of use of such products (days in past month) and positive outcome expectancies. Students, faculty, staff were recruited from a large, public university in the southern United States to complete an online survey. Expectancies were measured via the Brief Smoking Consequences Questionnaire-Adult subscales of negative affect reduction, stimulation, sensorimotor manipulation, social facilitation, and boredom reduction. Respondents (N=124) were aged 18-63, and primarily Caucasian (86.4%) and female (60.0%). A subset of these respondents reported past month use of cigarettes (n=89), cigarillos (n=31), WP (n=37), and ECIGs (n=29). Other tobacco products (large/little cigars, traditional/novel SLT) were used too infrequently (n's < 11) for analysis inclusion. Partial correlations, controlling for age, revealed that frequency of cigarette use was associated significantly with all subscales (r's = .24 - .57) except sensorimotor manipulation. Frequency of use was also associated significantly with expectancy of sensorimotor manipulation (r = .38) for cigarillos and with negative affect reduction (r = .36) and boredom (r = .56) for WP. For ECIGs, higher rates of use were associated significantly with expectancies of negative affect reduction (r = .55), stimulation (r = .39), and social facilitation (r = .44). Of course, expectancies for the effects of alternative tobacco products may be affected by history of cigarette use, and thus further work is needed to elucidate these effects in dual versus single product users. Still, study findings are among the first to examine the role that expectancies play in the use of tobacco products other than cigarettes.

FUNDING: Support provided to Dr. Melissa Blank, PhD from the Department of Psychology, West Virginia University.

JUSTIFICATION: Study findings may translate into public health or policy practices regarding the design and implementation of intervention and media messages.

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POS5-154 **ASSOCIATION OF SOCIO-DEMOGRAPHIC AND SMOKING RELATED FACTORS WITH THE USE OF E-CIGARETTES AMONG CURRENT SMOKERS: RESULTS FROM A POPULATION BASED STUDY.**

Raees A. Shaikh*, University of Nebraska Medical Center, Mohammad Siahpush, University of Nebraska Medical Center, USA, Wan Neng, University of Utah, USA.

Objective: Only a few studies have examined the association of different socio-demographic as well as smoking-related factors with the use of e-cigarettes. Our aim was to examine the association of a wide range of such factors, specifically among current smokers, using a population-based sample.

Methods: We conducted a telephone survey to collect data on 999 current smokers in Omaha, Nebraska. E-cigarette use was assessed using self-reported trying of e-cigarettes among current smokers. We used logistic regression to examine the bivariate association of socio-demographic factors such as sex, age, race/ethnicity, income, employment, education, self-reported health, and smoking-related factors such as social acceptability of smoking, heaviness of smoking index, age of initiation, intention to quit, motivation to quit, self-efficacy to quit, physicians advice to quit, number of friends who smoke, and smoking inside home, with e-cigarette use. Factors found to be associated (p<0.05) with the outcome in bivariate analyses were then used in a multivariate logistic regression model to determine the odds of using e-cigarettes.

Results: There was evidence that race/ethnicity (p<0.001), age (p<0.001) and social acceptability of smoking (p=0.026) were significantly associated with the use of e-cigarettes. Smokers who were non-Hispanic White, young, and perceived smoking as socially unacceptable had higher odds of using e-cigarettes as compared to others. None of the other socio-demographic or smoking-related factors were associated with e-cigarette use.

Conclusion: There is a lack of substantial evidence either in favor or against the harm-reduction or cessation aid usability of e-cigarettes among current smokers. However, researchers and policy makers on either side of the debate could focus on factors such as race, age and social acceptability of smoking to guide future research and policies toward e-cigarettes use among current smokers.

FUNDING: National Institute of Health grant # R01CA166156

JUSTIFICATION: This study could help guide public health policies towards electronic cigarettes.

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POS5-155 **THE ASSOCIATION OF SELF-REPORTED EXPOSURE TO POINT-OF-SALE CIGARETTE MARKETING WITH SMOKING INDUCED DEPRIVATION IN A POPULATION-BASED STUDY**

Raees A. Shaikh*, University of Nebraska Medical Center, Mohammad Siahpush, University of Nebraska Medical Center, USA, Wan Neng, University of Utah, USA.

Objective: Little is known about the association of self-reported point-of-sale (POS) cigarette marketing with smoking induced deprivation. Our aim was to examine this association using a population-based sample of smokers.

Methods: We conducted a telephone survey to collect data on 999 smokers in Omaha, Nebraska. Cigarette marketing was measured by asking respondents three questions about noticing ads, promotions, and displays of any brand of cigarettes within their respective neighborhoods. Survey items were combined into a composite (alpha = 0.64). We measured smoking induced deprivation based on a question about whether in the last six months, there had been a time when the money the respondent spent on cigarettes resulted in not having enough money for household essentials such as food. We used multivariate logistic regression and controlled for nicotine dependence, age, income, study recruitment method, urge to buy cigarette and unplanned purchase of cigarettes.

Results: There was evidence that higher levels of POS marketing pertaining to cigarettes in general (p=0.042) was associated with smoking induced deprivation, after adjusting for covariates. Those with higher nicotine dependence (p=0.022), lower income (p<0.001), those experiencing the urge to buy cigarettes (p=0.019) and those making an unplanned purchase of cigarettes (0.013) were more likely to experience smoking induced deprivation than others.

Conclusion: Self-reported exposure to POS cigarette marketing is associated with smoking induced deprivation. Policies that eliminate or limit POS cigarette marketing might reduce the urges and unplanned purchases of cigarettes, preventing smoking induced deprivation which in turn could ameliorate the overall financial stress experienced by smokers.

FUNDING: National Institute of Health Grant # R01CA166156

JUSTIFICATION: This study could guide point-of-sale tobacco marketing policies as they relate to decreasing tobacco use and prevent financial hardship for the smokers.

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POS5-156 **NORMATIVE BELIEFS AND PERCEPTIONS IN RELATION TO TOBACCO USE AMONG SAN DIEGO MIGRANT FARM WORKERS**

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In order for tobacco prevention and cessation methods to improve it is imperative to understand factors that contribute to tobacco use, especially among individuals who experience health disparities. One understudied group that is significantly exposed to tobacco use and second hand smoke exposure are migrant farmworkers. This study examined normative beliefs about smoking and perceptions of tobacco use among a sample of San Diego farmworkers.

A cross-sectional study designed was utilized and resulted in the following demographics: N=100, 54% female, Mage=36, 82%, and 96% Hispanic). Almost half of the participants (48%) smoked at least 100 cigarettes in their lifetime; 28% overall were current smokers, 20% were former smokers, and 29% were never smokers. Among current smokers, 57% reported daily smoking. A small percentage (3%) of the sample reported smoking in the past 30 days but not smoking 100 lifetime cigarettes, and were excluded in analyses. The smoking prevalence perceptions of the participants within their community were: 50% or more of adults in their community smoked, 33% believed half of young adults smoked, and 28% perceived half of the adolescents smoked. Logistic regression analyses were performed with those who smoked in the past 30 days as an outcome variable. Significant predictors of smoking were being male, older in age, lower income, Spanish speaking only, having lower health risk perceptions of smoking, and self-identifying as a smoker. Normative beliefs were associated with smoking as well as perceptions of the prevalence of tobacco use and are important to further examine in this population, where the perceived norm of tobacco use is extremely high. Research within this population remains limited however, it appears that among Hispanic migrant farmworkers prevalence and social perceptions are influential in smoking behavior.

FUNDING: This study was funded by Grant Proposal Seed Money from California State San Marcos.

JUSTIFICATION: This study has informed the need of future research among migrant farmworkers and tobacco use and exposure and will be disseminated as a manuscript to Nicotine & Tobacco Research, in addition, developed into a grant so that we can further examine this topic to ultimately create a Public Health intervention within this community.

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POS5-157

FEASIBILITY OF A RANDOMIZED CROSS-OVER TRIAL OF UNFILTERED CIGARETTES ON SMOKING BEHAVIOR AND TOXIC EXPOSURE

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Plastic filters on cigarette butts are an extraordinary source of non-biodegradable, potentially toxic environmental waste. State legislation to ban the sale of single-use cigarettes is being considered, but scientific evidence on the impact of switching smokers to unfiltered cigarettes on smoking behavior and toxic exposures is needed to advance this policy. We conducted an 8-week, randomized cross-over pilot trial of four adult filtered cigarette smokers who switched to unfiltered cigarettes. There was 1-week baseline period, 2-weeks of smoking filtered or unfiltered cigarettes (groups randomly determined), a 2-week washout period, and a crossover to 2-weeks of smoking the opposite condition (filtered or unfiltered cigarettes). We gathered data to determine changes in: 1) observed topography (i.e., puff count, puff volume) and cigarettes smoked per day (via butt counts and self-report); 2) expired carbon monoxide (CO), urinary cotinine, 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), and volatile organic compound (VOC) excretion; and 3) knowledge and attitudes toward unfiltered cigarettes, satisfaction with smoking, and intention to quit if they were not able to smoke filtered cigarettes. Low cost recruitment methods including flyers and internet postings resulted in screening 33 individuals (47% of the inquiry pool), eight of whom were eligible (24% of the screening pool). The most common reasons for ineligibility were smoking less than 10 cigarettes per day, currently using alternative tobacco products, and medical reasons. Four participants were enrolled; three completed all visits and adhered to the entire protocol and one lost the topography equipment and was disqualified from further participation. The small sample size precludes conclusions being drawn about the results, however we conducted lab analysis of urine samples to demonstrate that the target biomarkers were successfully measured. This pilot study demonstrated study

feasibility and will be used as preliminary evidence in pursuit of funding a project with a larger sample size which will inform proposed state legislation to ban the sale of single-use filtered cigarettes.

FUNDING: This study was sponsored by the American Legacy Foundation.

JUSTIFICATION: This study will inform state policy as a bill to ban the sale of single use filtered cigarettes is currently pending in California.

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POS5-158

LITTLE, IF ANY, CHANGE IN CIGARETTE CONSUMPTION OVER TIME AMONG YOUNGER GENERATIONS.

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Background. Although U.S. Latinos have a lower smoking prevalence than non-Latinos, analyses by gender, national background, nativity, and language preference reveal certain smoking prevalences higher than the national average. While smoking prevalence overall has decreased >50% since 1965, estimates between 2005 and 2010 hovered around 19%. The present study assessed cigarette consumption among current smoking Latinos and non-Latinos by decade of birth to explain the lack of change in smoking prevalence.

Methods. Data from Latino and non-Latino adult current smokers in the 1997-2010 National Health Interview Survey (NHIS) were analyzed. Gender, national background, birth year, nativity, current smoking, and cigarettes smoked per day were assessed by self-report. Language of interview established English-only or Spanish language preference. Means, standard errors, and frequencies were calculated and linear regression was used to test linear temporal trends.

Results. Thirteen percent of the current smoking sample was Latino. Among Latinos, almost half were U.S.-born and 71% preferred speaking English. National background among Latinos was as follows: 11% Central or South American, 6% Cuban, 59% Mexican, 14% Puerto Rican, and 10% Other Latino. Analyses by birth decade found cigarette consumption to be significantly lower among Latinos than non-Latinos for most decades between 1910-1999. Cigarettes per day significantly decreased among Latino males as well as non-Latino males and females between 1997-2010 NHIS survey years. Interestingly, the least amount of change in cigarette consumption over time was consistently found among current smokers born between 1970-1999. Analyses by national background, nativity, and language preference showed varying levels of cigarette consumption but steady declines over time.

Conclusions. The progress that has been made over the last half-century to reduce smoking prevalence appears to have also encouraged reductions in cigarette consumption. However, younger generations, whether they be male or female, Latino or non-Latino, do not seem to have been influenced much by tobacco control efforts over the past decade or so.

FUNDING: UCSF/Clinical and Translational Science Institute (K19683L), NIH/ National Institute on Aging (5P30AG15272)

JUSTIFICATION: This research can be used to direct the design of current tobacco control strategies in order to address weaknesses in past and existing tobacco control efforts, as demonstrated by our findings.

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POS5-159
EFFECTS OF VARENICLINE AND COGNITIVE BIAS
MODIFICATION ON NEURAL RESPONSE TO SMOKING CUES

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Drug-related stimuli that are repeatedly and contingently paired with drug administration acquire powerful motivational properties that can drive drug use, drug craving and relapse. Behavioral interventions, such as cognitive bias modification (CBM) have been developed to reduce the influence of drug-related stimuli, but findings have been mixed. There have also been reports indicating that the smoking cessation drug, varenicline, may also reduce response to smoking-related cues, but the mechanisms underlying these effects are unclear. To address this gap, this study investigated the effects of CBM and varenicline treatment on the neural response to smoking-related cues. Daily smokers (n=68, 50% male) were randomized to receive one-week treatment of either varenicline or placebo (DRUG), and complete one of three CBM interventions: train attention towards smoking cues (attend), train attention away from smoking cues (avoid) or a no training control (CBM). After treatment, all participants completed an fMRI scan during which neural responses to smoking versus control images were compared. Analysis of BOLD response to smoking > control images indicated a DRUG x CBM interaction in a cluster located in the dorsolateral prefrontal cortex (dlPFC; x=34, y=34, z=40; Z=3.1, uncorrected, cluster extent > 20 voxels). In the placebo condition, CBM avoid and attend conditions were associated with greater activation than the control condition, suggesting that the former conditions resulted in greater effortful processing of smoking cues. Varenicline decreased BOLD activation under all CBM conditions, and to the greatest degree in the CBM attend condition. At a lower statistical threshold (Z=2.3, uncorrected), varenicline (compared to placebo) decreased activation in anterior insula, a region associated with cue-provoked craving, while increasing activation in ventral striatum. These findings indicate that varenicline and CBM influence neural responding to smoking cues by different and interactive mechanisms. In particular, CBM to avoid or attend to smoking cues may increase effortful processing of later cues and this may be attenuated by varenicline.

FUNDING: Funded by Pfizer Ltd Investigator Initiated Research Award to Marcus Munafò

JUSTIFICATION: This study provides insight into the mechanisms that underlie the effects of CBM and varenicline on cue-related responding, which will inform future clinical research and practice. In particular, our findings indicate the varenicline may have utility in reducing cue-provoked craving.

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POS5-160
RANGE OF PM2.5 CONCENTRATIONS BEFORE AND AFTER THE
ENACTMENT OF THE SMOKING BAN LEGISLATION IN SOUTH
KOREA

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Objective: The objective of this study was to compare indoor secondhand smoke levels in hospitality venues in South Korea and to assess levels before and after the enactment of the smoking ban legislation. Indoor secondhand smoke levels were evaluated at various venues in campus towns.

Method: In this cross-sectional study, we measured the indoor PM2.5 concentration at hospitality venues as an indicator of secondhand smoke exposure using Sidepak AM510 between October and December 2013, prior

to implementation of the smoking ban, and in May 2014, after implementation of the smoking ban. Measurements (pre-ban: n = 153, post-ban: n = 123) were conducted in PC rooms, billiard rooms, and pubs, selected randomly in a major campus town in Seoul, Daegu, or Asan city.

Result: The median (interquartile range [IQR]) of the PM2.5 concentration for all venues was 51.0 mg/m3 (20.5–95.0 mg/m3) in the pre-ban period and 26.9 mg/m3 (11.6–44.2 mg/m3) in the post-ban period, after subtracting background PM2.5 concentrations (p < 0.0001). The median (IQR) PM2.5 concentration decreased 2.4 times from the pre-ban period to the post ban period (p < 0.0217) in PC rooms whereas the concentrations in the two periods did not differ significantly in billiard rooms and pubs.

Conclusion: Indoor secondhand smoke exposure levels decreased after implementation of the smoking ban, especially in PC rooms. The results of this study support the introduction of more rigorous monitoring of secondhand smoke exposure levels toward an ultimate goal of encouraging a complete smoking ban in hospitality venues, including billiard rooms and pubs.

FUNDING: SELF-FUNDING

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POS5-161
TOBACCO-INDUCED SKELETAL TERATOGENESIS DISCOVERED
WITH HUMAN PLURIPOTENT STEM CELLS

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Tobacco use is a risk factor for osteoporosis, bone fracture and delayed bone healing, thus perpetuating poor bone health. Tobacco products not only contain numerous toxins and nicotine that can have adverse effects on bone, they also generate vast amounts of reactive oxygen species (ROS), which are capable of having detrimental effects on osteoblast function and generation. Because of this proposed mechanism of action, it is conceivable that tobacco products may harm developing fetuses and infants.

The aim of this study was to understand the pathogenesis of tobacco-associated bone toxicity in developing cells as they differentiate into osteoblasts. Human embryonic stem cells (hESCs) were induced to differentiate into osteoblasts in the presence of tobacco products to examine osteotoxicity in vitro. Teratogenic doses of Snus tobacco extracts (STE) (0.1%) exhibited inhibition of osteoblast calcification in the absence of a cytotoxic effect. STE generated excessive ROS, both in the form of O₂- and H₂O₂, during early stages of osteogenic differentiation. The high levels of ROS were coupled with a downregulation of superoxide dismutase (MnSOD) mRNA and enzyme activity. Nuclear activation of β-catenin and FoxO, which transcriptionally co-regulate MnSOD, was downregulated upon cellular exposure to STE. Co-immunoprecipitation analysis further demonstrated that the interaction between β-catenin and FoxO was diminished. Our results demonstrate that STE damages specification of osteoblasts via beta-catenin/ FoxO caused by accumulation of ROS. Therefore, the disruption of β-catenin/ FoxO-mediated transcription should be preventable by antioxidants, suggesting a potential mechanism to ameliorate tobacco-associated birth defects.

FUNDING: International Foundation for Ethical Research, Cornelius Hopper Award TRDRP

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POS5-162

NEUREGULIN 3 REVERSES LONG-TERM POTENTIATION IN ORBITAL FRONTAL CORTEX

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Smoking causes 87% of lung cancer deaths and one third of all cancer deaths. In addition, smoking increases the failure rate of treatment for all cancers. Therefore, smoking cessation approaches represent an effective cancer control strategy. Cigarette smokers have difficulty quitting, which is thought to be related to deficient impulse control. Previous studies from our lab have shown that single-nucleotide polymorphisms across the gene for neuregulin 3 (NRG3) are linked to failed smoking cessation. A recent preclinical study indicates that NRG3 in the frontal cortex regulates impulsivity. However, the mechanism by which NRG3 regulates neuronal signaling in this area is unknown. Here we use electrophysiology field recordings to assess whether NRG3 alters long-term potentiation (LTP) in the orbital frontal cortex (OFC). We found that without NRG3, 50Hz tetanic stimulus induced LTP in OFC. However, in the presence of NRG3, the same stimulus induced long-term depression (LTD). This NRG3-induced LTD was selectively attenuated by Afatinib, an ErbB4 inhibitor, in only a sub-population of recorded slices, suggesting non-canonical NRG3 signaling may be involved. These effects were distinct from those of NRG1 under the same conditions. These data suggest that NRG3 specifically may influence general impulsivity through modulation of long-term synaptic plasticity in the OFC. Current studies are evaluating the mechanisms of NRG3-mediated reversal of LTP in the OFC. These studies may help to define a potential mechanism by which polymorphisms in the NRG3 gene contribute to failed smoking cessation success. This study was supported by NIH/NIDA grants DA032681 (JRT) and DA031747 (PIO).

FUNDING: This study was supported by NIH/NIDA grants DA032681 (JRT) and DA031747 (PIO).

JUSTIFICATION: These data demonstrate a potential mechanism by which polymorphisms in the NRG3 gene may contribute to failed smoking cessation success.

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POS5-163

ASSOCIATIONS BETWEEN SECONDHAND SMOKE EXPOSURE AND SLEEP PATTERNS IN CHILDREN - A LONGITUDINAL COHORT STUDY

Jianghong Liu, PhD* and Lucy Liu, MS, University of Pennsylvania

Background: Limited knowledge on the relationship between early exposure to secondhand smoke (SHS) and later child sleep patterns. We investigated this link in preschool cohort children using both parent-reported and child self-reported questionnaires.

Methods: A sample of 898 father-child pairs from China Jintan Cohort Study were used in the analysis. The household smoking status were assessed when children were 5 years old by asking father "Generally, how many cigarettes are you smoking daily at home?". Children's sleep pattern was assessed for two stages with first stage at 5-6 years old using Child Behavior Checklist (CBCL) during the same time father smoking status was assessed. The 2nd stage of sleep pattern was assessed from both parents report by using Child Sleep Questionnaire (CSHQ) and children self-report by using Pittsburgh Sleep Quality Index(PSQI) when the children were 10-15 years old.

Result: Mean age of sample at father smoking assessment and first stage assessment of sleep problem was 4.74(SD=0.89). Mean age at second stage sleep assessment was 11.67 (SD=0.91), 54.34% were males. 21.49% of father reported smoking with ≥ 10 cigarettes/day. After adjusting age and gender of the children, father's smoking status was associated with higher risk of sleep problems in children during the concurrent time period (age 5-6 year old) showing difficulty initiating sleep (OR=1.57, 95% CI 1.12-2.20) based on parent report from CBCL. Furthermore, father's smoking status also has long term impact on children's sleep

pattern: poor sleep quality (OR=1.78, 95% Confidence interval[CI] 1.08-2.94), sleep parasomnia (OR=1.70, 95% CI 1.03-2.81), and sleepiness (OR=1.99, 95% CI 1.26-3.15) based on CSHQ score; as well as poor sleep efficiency in self-reported PSQI scale (OR=2.39, 95% CI 1.35-4.21).

Conclusion: Secondhand smoke exposure has both concurrent and long term effect on children's sleep problems. Clinical implication is that father's smoking cessation should be encouraged in order to promote healthy sleep pattern in children. More research is needed to assess the mechanism of action.

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POS5-164

INTRA-ORAL PSYCHOPHYSICAL AND PHYSIOLOGIC RESPONSES TO MENTHOL AND NICOTINE

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There is evidence to support that pre-treatment of menthol to the oral tissues reduces the irritant properties of nicotine. The aim of this study was to determine the immediate subjective, psychophysical, and physiologic responses to nicotine and menthol, co-released in gum form, on the intra-oral tissues. Healthy non-smoking participants (N=22) received, in a randomized, cross-over design one of three gums containing either 4 mg nicotine, 30 mg of menthol, or 4 mg of nicotine and 30 mg of menthol. Quantitative sensory testing (QST) consisting of cold detection threshold (CDT), warm detection threshold (WDT), cold pain threshold (CPT), heat pain threshold (HPT), intra-oral blood flow and temperature, area and intensity of pain/irritation and taste experience were assessed before, during or after the completion of a 10-min chewing regime. Preliminary analyses revealed that, in contrast to pre-chewing assessments, nicotine and menthol, alone or in combination, only increased WDT, as measured on the anterior aspect of the tongue-tip. Although blood flow and temperature increased during chewing, differing profile responses could not be shown between the gums. However, temperature and blood flow assessments from the inside of the lower lip, which has a higher vascularization, showed a pronounced and differing temporal profile in relation to blood flow. The perceived area of intra-oral irritation was markedly lower for menthol but similar for nicotine and nicotine-menthol combinations. However, the nicotine-menthol combination was less painful as compared to nicotine alone, even though menthol itself evoked cold-burning sensations in several participants. In contrast to nicotine, a larger area of perceived irritation developed in the back of the throat following the chewing of the combination gum. Qualitative reports indicate that nicotine masks the cooling sensations evoked by menthol, but menthol reduces the nauseating, burning and stinging experiences when combined with nicotine. This study reveals insightful relations between the neurophysiological mechanisms and taste experience of nicotine and menthol.

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POS5-165
PROJECT DEBUNK: INFORMING AND CORRECTING PERCEPTIONS REGARDING TOBACCO PRODUCTS AMONG YOUNG ADULTS

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Young adults are targeted as new consumers of both conventional and new and emerging tobacco products. Use of hookah, electronic cigarettes, and snus are rising with limited access to accurate information regarding their health effects. The young adult population is dynamic, requiring an innovative approach to delivery of health communication information. This cutting-edge research will inform the Food and Drug Administration (FDA) of effective communication strategies for delivering health messages and assess the receptivity and comprehension of the harmful effects of tobacco and nicotine products among young adults. A text message library containing information related to various tobacco products has been created and tested. The text message structure is influenced by the Elaboration Likelihood Model of effective routes of persuasion. The conceptual framework of messages was divided into categories of perceived depth (complex vs. simple), framing (gain vs. loss) and appeal (emotional vs. rational). Focus groups were conducted in two Houston Community Colleges among 18-25 year old, ethnically diverse students. Students reported familiarity with these products, popularity of their use, and preference for messages that contain relevant information. A review was conducted by experts in the fields of tobacco and health communication. Over 50% recognized the "simple/loss/rational" message type however only 18% could identify a "complex/emotional" message with the gain and loss framing. Formal testing of text message designs will be conducted among 640 Houston Community College students with a longitudinal randomized design. Students will receive 1 of 8 message types, each representing a unique combination of characteristics based on a 23 factorial design [Depth-Complex /Simple, Framing-Gain/loss and Appeal-Rational/Emotional]. Project Debunk will identify the most potent of eight message combinations for Conventional vs. New and Emerging tobacco products. We hypothesize that the three main effects of interest (Depth/Framing/Appeal) will have a synergistic effect on perceived risk which is greater than their additive effect. We will test this using a 23 ANOVA framework.

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POS5-166
THE USE OF TOBACCO AND THE USE OF E-CIGARETTES IN RANDOMLY SELECTED PRODUCTIVE CZECH POPULATION IN 2013-2014. PRELIMINARY RESULTS OF KARDIOVIZE BRNO 2030

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